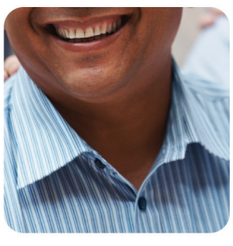
European Commission

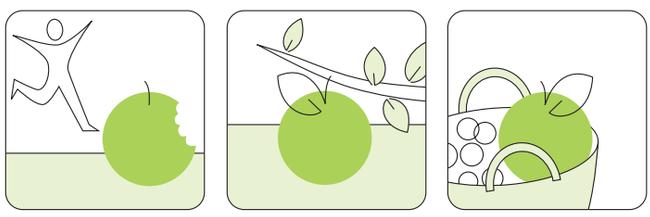
Directorate-General for Health & Consumers

Health of People of Working Age

Full Report







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Authors: W. Oortwijn, E. Nelissen, S. Adamini, S. van den Heuvel, G. Geuskens, L. Burdorf

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Health of People of Working Age

Full Report*

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Dr. Wija Oortwijn, Drs. Emmy Nelissen, Dr. Sandra Adamini
Dr. Swenneke van den Heuvel, Dr. Goedele Geuskens
Prof. Dr. Lex Burdorf

ECORYS Nederland BV
TNO & Erasmus MC, University Medical Centre

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List of Acronyms

ADL	Activities of Daily Living
AHM	Ad Hoc Module
AUD	Alcohol use disorder
BAC	Blood Alcohol Concentration
BoD	Burden of Disease
CARE	Community Road Accident Database
CBT	Cognitive Behavioural Therapy
CHOICE	CHoosing Interventions that are Cost Effective
COPD	Chronic Obstructive Pulmonary Disease
CRA	Comparative Risk Assessment
CRD	Centre for Reviews and Dissemination
CVD	Cardiovascular Diseases
DALY	Disability Adjusted Life Years
DAP	Disability Action Plan
DARE	Database of Abstracts of Reviews of Effects
DG	Directorate-General
DG EMPL	Directorate-General for Employment, Social Affairs and Equal Opportunities
DG SANCO	Health and Consumers Directorate-General
EBM	European Background Module
EC	European Commission
ECHI	European Community Health Indicators
ECHIS	European Core Health Interview Survey
ECHP	European Community Household Panel
ECMHS	European Module on Health Status
EHCM	European Health Care Module
EHDM	European Health Determinants Module
EHIS	European Health Interview Survey
EHSS	European Health Survey System
EMHS	European Module on Health Status
ENWHP	European Network for Workplace Health Promotion
EODS	European Occupational Diseases Statistics
EPLW	Erasmus Productivity Loss at Work database
ESAW	European Statistics on Accidents at Work
ESEMed	European Study of the Epidemiology of Mental Disorders
ESHIS	European Special Health Interview Survey
ESMC	European Survey Module on Care
ESMD	European Survey Module on Determinants of Health
ESS	European Statistical System

EU	European Union
EU-OSHA	European Agency for Safety and Health at Work
EU-SILC	European Statistics on Income and Living Conditions
Eurofound	European Foundation for the Improvement of Living and Working Conditions
EWCO	European Working Conditions Observatory
EWCS	European Working Conditions Survey
FIOH	Finnish Institute of Occupational Health
GP	General Practitioner
HES	Health Examination Surveys
HFA-DB	European health-for-all database
HIA	Health Impact Assessment
HiAP	Health in all policies
HIS	Health Interview Surveys
HISHES	European Health Interview & Health Examination Surveys Database
HLY	Healthy Life Years
HTA	Health Technology Assessment
HWLE	Healthy Working Life Expectancy
IDB	European Injury Database
ILO	International Labour Organisation
ILO-OSH	ILO guidelines for OSH management system
IUHPE	International Union for Health Promotion and Education
LFS	Labour Force Survey
MDB	European Mortality Database
MEHM	Mini European Health Module
MS	Member States
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne
NHS	National Health Service
NHS EED	NHS Economic Evaluation Database
NRT	Nicotine replacement therapies
OECD	Organisation for Economic Co-operation and Development
OHS	Occupational Health and Safety
OMC	Open Method of Coordination
PHP	Public Health Programme
QALY	Quality Adjusted Life Years
RCT	Random Controlled Trial
RIVM	Rijksinstituut voor Volksgezondheid en Milieu
RTA	Road Traffic Accidents
SER	Sociaal-Economische Raad
SHARE	Survey on Health and Ageing in Europe
SDR	Standardised Death Rate
SLIC	Senior Labour Inspectors Committee
SME	Small- and Medium sized Enterprise
UNECE	United Nations Economic Commission for Europe
WHO	World Health Organization
WHP	Workplace Health Promotion
WLE	Work Life Expectancy

Country codes

AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LI	Liechtenstein
LT	Lithuania
LU	Luxembourg
LV	Latvia
MK	FYROM
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovak Republic
TR	Turkey
UK	United Kingdom

1 Introduction

This technical report describes the results of the state of the art review regarding health of people of working age commissioned by the European Commission (EC), Health and Consumers Directorate-General (DG SANCO).

The assignment for the DG SANCO was conducted by the Consortium ECORYS Nederland BV, TNO and Erasmus MC, University Medical Centre during June 2009-March 2011.

1.1 Context of the assignment

1.1.1 The role of the European Union in health

The European Union (EU) has become more active in health, since the entry into force of the Maastricht (1992) and Amsterdam (1998) Treaties that gave the European Community competence in the field of public health. The EU's role in health policy has been reaffirmed in the Lisbon Treaty which came into force in 2009.

Competence for most actions in the field of health policy and healthcare is held by Member States. However, a high level of health protection is one of the goals that must be ensured in all EU policies and actions. Indeed, health plays an important role in addressing the challenges set by the Europe 2020 Agenda as better health and well-being can contribute to increasing both productivity and productive life years. Furthermore, there are areas where cooperative action between Member States is indispensable. There is a role for the EU in assisting Member States to co–ordinate their action and collaboration on health, taking joint action with them on threats to public health, especially where these have a cross–border dimension, and for reducing health inequalities. In this sense, Community actions create European added value to Member States' national health policies.

Over the years, the EU has established policies on a range of issues, including food, consumer protection and health. A first co-ordinated approach to health policy was set out in the European Community Health Strategy put forward in May 2000. A new ***Health Strategy*** 'Together for Health: A Strategic Approach for the EU 2008-2013' [1] was adopted on 23 October 2007. It stresses the importance of improving the health of people of working age. The strategy aims to provide, for the first time, an overarching strategic framework spanning core issues in health as well as health in all policies and global health issues. It aims to set clear objectives to guide future work on health at the

European level, and to put in place an implementation mechanism to achieve those objectives, working in partnership with the EU Member States.

The Strategy focuses on four principles and three strategic themes for improving health in the EU. The principles include taking a value-driven approach, recognising the links between health and economic prosperity, integrating health in all policies, and strengthening the EU's voice in global health. The strategic themes include Fostering Good Health in an Ageing Europe, Protecting Citizens from Health Threats, and Dynamic Health Systems and New Technologies [2].

The ***Second Programme of Community Action in the Field of Health 2008-2013*** is a key instrument to support the Strategy's objectives. It finances projects[1] and other actions which contribute to the aims of the EU Health Strategy, more notably the aim to contribute to increased solidarity and prosperity in the EU by protecting and promoting human health and safety and by improving public health. The programme has a total budget of 321.5 million EUR and is managed by the Commission and the Public Health Executive Agency (PHEA). The programme builds on the First Programme of Community Action in the Field of Health 2003-2008 [3].

The ***Strategy for 2007-2012 on Health and Safety at Work*** is an important strategy which aims to achieve a sustained reduction of occupational accidents and diseases in the EU. It sets out a quantitative objective of 25% reduction of accidents at work through a series of actions at EU and national levels in different areas, namely improving and simplifying existing legislation and enhancing its implementation in practice; defining and implementing national strategies which target the sectors and companies most affected; mainstreaming of health and safety at work in other national and EU policy areas and finding new synergies; and better identifying and assessing potential new risks through more research, exchange of knowledge and practical application of results [4]. In the period 2002-2006, the EU Member States already made real progress by developing and implementing more focused national strategies and action programmes [5].

The ***Europe 2020 strategy*** aims to ensure a healthy EU workforce as it is a key aspect of a productive and efficient economy. By tackling poor health among workers, the employment rate within the EU can be raised in an efficient way, which is necessary to improve Europe's economy after one of the worst economic crisis in decades. One of the 'headline targets' of 'Europe2020' is to raise the employment rate of the population aged 20-64 from the current 69% to 75% [6].

In parallel, European social partners are tackling the issue of a healthy workforce through the European social dialogue process. This process has led to an ***autonomous agreement on work-related stress (2004)*** whereby EU social partners have taken up responsibility for implementing measures at national, sector and enterprise level. The aim of the agreement is to provide employers and workers with a framework to identify and prevent or manage problems of work-related stress [7].

[1] Organisations applying for funding need to be legally established in the EU27, Iceland, Liechtenstein, Norway or Croatia.

1.1.2 The need for a healthy workforce

During the last century, the combined effects of improvements in living and working conditions and advances in medicine and health care contributed to substantial improvements in health and life expectancy in the EU. In 2007 in the EU-27, the life expectancy of a boy at birth was 76.1 years and of a newborn girl 82.2 years. Longer life expectancies coupled with falling birth rates and rising health and social protection costs presents a big challenge to most EU Member States as falling numbers of people in work are coupled with rising numbers of those in retirement. The need to increase work participation is a key part of meeting this challenge. However despite major efforts in the previous years, Europe's employment rates – at 69% on average for those aged 20-64 – are still significantly lower compared to other regions in the world.

Health has a big impact on work. It is well-established that poor health may have a profound impact on withdrawal from the labour force due to disability, early retirement, and unemployment, especially among workers aged 50 years and older. Poor health is also an important barrier in (re-)gaining access to the labour market. Increasing the healthy life-span spent in work could contribute to addressing the age-related expenditure problem as average experience and productivity levels could rise and longer working lives could compensate for age-related increases in, health care utilisation. At the same time a healthy retirement can stimulate demand, especially for services that are an increasingly important sector of the European economy. This means that a healthy workforce contributes to future societal productivity and growth.

Promoting the health of people of working age and enabling people to work longer in good health requires interventions that address the determinants of health. It also requires programmes that facilitate workers with a disease or chronic health problem to be able to continue their job.

Addressing the health of the work force

Any action on health has to take into account the fact that health is not equally distributed in society. Almost all diseases affecting work participation are more common among people with lower levels of education, income, and occupational status. Furthermore a healthy workforce is determined by many factors which influence health some of which start in childhood, others which are related directly to work but the majority of which lie outside of work.

Health is influenced by a broad range of factors, which include individual behaviour and lifestyle, the health care system, social and economic factors, the environment, and biological factors. Policies and actions outside the health care system have a significant impact on public health.

The world of work, and the way that working life is organised in our societies today, is a major determinant of health. Individual health practices are shaped by our workplace cultures and values. The increase in mental health disorders can only be understood in the context of increasing psychosocial stressors and strains at the workplaces. Smoking and alcohol consumption are also examples of behavioural factors whose lie outside work but which can be nevertheless deeply rooted in daily working life.

Workplace health is therefore not confined within the factory or office walls. The workplace has major impacts on the health of families and communities.

1.2 Purpose and specific aims of the review

This review aims to provide a state of the art picture of the health of EU working age population and of some of the activities which are relevant to improving the health of workers and enabling more people to stay in work for longer. It aims to provide a "tool" with useful facts and promising activities which can be used in and adapted to different national/regional or local contexts to further achieve and stimulate good health and well-being of the working age population.
The specific aims of the review are:

- a state of the art review of the health of the working age population (i.e., age group of 16-64 years[2]) in the EU Member States – other countries which are part of the European Economic Area or are accession countries have also been included in places.
- a review and evaluation of policies and initiatives aiming to address workforce health;
- a review of effectiveness, and cost-effectiveness of initiatives (e.g., workplace health and safety initiatives, initiatives to help retain people in work who have chronic illness, workplace health promotion initiatives, initiatives to promote rehabilitation and reintegration into work following a serious health event, initiatives to support people who are on long-term sick leave to get back into work; and other initiatives).

1.3 Approach

Our approach to the state of the art review of the health of the EU working age population involves the following steps:

- Assessment of the state of health of the EU working age population;
- Review and evaluation of policies and initiatives aiming to address workforce health;
- Conclusions regarding the (cost-) effectiveness of categories of initiatives.

Chapter 2 offers more details with respect to what is included under each step and the methodology used.

1.4 Outline of the report

The final report is structured as follows. In chapter 2, we describe the methodology used for each step of this review. In chapter 3, we provide an overview of the health status of people of working age based on existing statistics regarding mortality, morbidity and accidental injuries at the EU-level. In chapter 4, we present the impact of poor health on

[2] The working age population is usually defined as the age group from 16 to 64 years. However, in some statistics only figures regarding the age group of 15-64 is available.

work, in relation to unemployment, incapacity for work and early retirement. An assessment of the risk factors for the main diseases/injuries occurring in the EU working age population will be presented in chapter 5. In chapter 6, we subsequently examine how these risk factors can be tackled and what policies and initiatives exist addressing health aspects of labour market participation and what has proven to be (cost-)effective. Chapter 7 offers an overview of our recommendations.

The report is supported by various Annexes that are presented at the end of the document. Also a summary report is presented in a separate document.

2 Methodology

2.1 Focus on a selection of diseases

It is not possible to comprehensively describe the health status of the working age population taking into account all diseases within the time and budget constraints of this review. Therefore, we created a short list and a long list of the most important health problems that we reviewed. To select diseases for the short list and the long list we applied three criteria in order of importance: (1) the relative burden of disease in the working age population, (2) the relation to work, and (3) the potential for improvement. We have asked our peer reviewers (see paragraph 2.5) to review the methodology used and the selection of diseases. Both reviewers agreed to our proposal and provided useful suggestions for literature review.

Relative burden of disease

To determine the contribution of a disease or injury to the total burden of diseases, Disability Adjusted Life Years (DALYs) are a suitable measure. DALYs are presented in paragraph 3.6. Excluding the main groups that indicate several diseases, unipolar depressive disorders and ischemic heart disease contribute for the largest part to the total burden of disease. Another cardiovascular disease, i.e. cerebrovascular disease also has a high burden of disease. Although heart problems are not typical for the working age population, after back or neck problems they were mentioned most often as the main longstanding health problem. Moreover, these diseases account for almost 24% of the total deaths below the age of 65.

Other diseases with a relatively high burden of disease are hearing loss, lung cancer and alcohol use disorders, and to a lesser extent COPD and osteoarthritis. Unintentional injuries needs to be mentioned as well, since a high proportion of its burden of disease is attributable to the age group 15-59 years.

Relation to work

Chapter 5 presents what is known currently of the work-relatedness of the main diseases, accidental injuries and deaths. It appeared that musculoskeletal diseases and mental health problems such as stress and depression were most often identified as work-related health problems. To a lesser extent, heart diseases, breathing problems, hearing loss, skin problems and accidental injuries were mentioned as health problems caused by work. Work-related mortality is mainly caused by lung cancer, ischemic heart disease, COPD and stroke.

Potential for improvement

This criterion is based on our current knowledge of determinants, preventive measures and existing interventions.

On account of their high burden of disease, we selected cardiovascular diseases and unipolar depressive disorders. We used the main group cardiovascular diseases, because most statistics do not distinguish between the different diseases that fall within this category. However, ischemic heart disease, and to a lesser extent cerebrovascular disease, will have our particular attention and will be distinguished if possible.

Although the separate diseases classified under musculoskeletal diseases do not have a high burden of disease, their relation to work is indisputable. Statistics often mention musculoskeletal diseases as the main work-related health problem, in particular back, neck and upper limb problems. Therefore, we included musculoskeletal diseases in our selection.

The contribution of work-related accidental injuries to the total burden of disease is unclear, since they are not described separately in the WHO burden of disease study. However, it is known that injuries affect the working age population relatively often. For that reason, and because their relation to work is evident we selected accidental injuries at work.

Apart from the diseases or injuries mentioned above, which we selected for the short list, we will pay attention to five more diseases, which also met one or more of the criteria, although to a lesser extent as the diseases on the short list: respiratory disease, alcohol use disorder, hearing loss, lung cancer and road accidents.

In summary, the following diseases were selected for the short and long list:

- **Cardiovascular diseases;**
- **Unipolar depressive disorders;**
- **Musculoskeletal diseases;**
- **Accidental injuries at work;**
- Respiratory disease;
- Alcohol use disorders;
- Hearing loss;
- Lung cancer;
- Road accidents.

Diseases printed in **bold** are the selected diseases for the short list. They have been examined extensively by a review of the literature, analysis of relevant databases and a survey on a selection of (potential) effective and proven ineffective policies and initiatives that were found through the literature review. Diseases on the long list are briefly described by what is generally known from the literature regarding determinants, and what possible interventions aimed at these diseases could imply.

Below, we describe the methodology used in our review, including the main available data sources, their suitability for this project and their shortcomings.

2.2 Methodology: Assessment of the state of health of the EU working age population

The aim is to give an overview of the health status of the EU working age population, the main determinants of impaired health, and the consequences of impaired health on work participation (unemployment, incapacity for work, early retirement and productivity loss). To produce this overview we reviewed the literature, consulted databases and performed analyses on available European databases. Depending on the information available, some tasks were merely based on the document review, whereas others were merely based on analyses.

2.2.1 Literature review

Documentation was carefully reviewed with the objective to collect information on the health status of the EU workforce, determinants of health-related causes of incapacity for work, and insight into its potential for improvement (prevention). In our review we especially focused on the EU-27 plus in places European Economic Area Countries Norway, Iceland, Liechtenstein and accession countries - Croatia, Former Yugoslav Republic of Macedonia, and Turkey. When relevant, we also included information from other countries (e.g. USA, Canada, Australia) We covered the following subjects:

- main causes of mortality in the age group of 16-64 years;
- main health-related causes for incapacity for work (chronic illness and accidental injuries) in the age group 16-64 years;
- main determinants of the most important health-related causes of incapacity for work;
- unemployment, incapacity for work, and early retirement due to impaired health; and
- consequences of impaired health on productivity at work.

For the impact of poor health on work participation search strategies were followed for the pathways incapacity for work, early retirement, and unemployment. Relevant articles were identified by means of a search of the bibliographical databases PubMed from January 1966 and Web of Science from January 1988. All searches were restricted to studies published in the English language, and focusing on health, thus excluding economic literature. Besides, search strategies were restricted to longitudinal studies in order to gain insight in the causal relation between impaired health and consequences for work participation. Regarding incapacity for work the search identified 341 unique abstracts, of which 11 studies were included for further analyses. Regarding early retirement the search identified 347 abstracts from which 6 studies were selected, whereas the search for unemployment resulted in 259 abstracts of which 12 longitudinal studies were included for further analysis (see Chapter 4).

For determinants and prevalence of the main diseases, we consulted key documents on health status in Europe[3]. In addition, we searched the literature for recent articles and reports. Therefore, we searched the electronic databases PubMed/Medline, Centre for Reviews and Dissemination (CRD) – including Database of Abstracts of Reviews of

[3] For example the EUGLOREH-report; European cardiovascular disease statistics 2008; The state of mental health in the EU, etc. For a complete list of the consulted reports we refer to the references.

Effects (DARE), and Web of Science to identify relevant journal articles. The Cochrane Library of systematic and quality assessed reviews was searched to identify rigorous reviews. In addition, standards and methodological documents (e.g. World Health Organization - WHO standards) on Global Burden of Disease, Healthy Life Years (HLY), productivity measurements, etc. were studied.

2.2.2 Database review

The consultation of databases was preceded by an inquiry of available data sources and a selection of sources that were suitable for the aim of our study. This paragraph will give an account of this inquiry. Furthermore, we provide a methodological overview on the coverage of key indicators in the available databases.

Suitable databases were identified and secondary analyses were performed to complement the document review. For some databases, predefined tables could be used. If possible, we compared the results by gender, age group, educational level[4] (as a proxy for socio-economic status), sector and country. Comparisons by country were restricted to tables in the Annexes.

Hence, we aimed to:

- analyse the main causes of mortality in the age group of 16-64 years;
- analyse the main health-related causes for incapacity for work in the age group of 16-64 years;
- analyse determinants of the most important health-related causes for incapacity for work (if not or not sufficiently available in the existing literature);
- determine the proportion of workers who were out of work for reasons of health (unemployment, incapacity for work, early retirement); and
- determine the consequences of impaired health on productivity at work.

We reviewed the available EU-level databases with regard to indicators for health status, indicators for health risks, and indicators for the impact of health on work. As indicators for health status we looked at mortality and morbidity (perceived general health, self-reported chronic morbidity, prevalence of chronic illness and accidental injuries). However, to determine the impact of morbidity and mortality, we need summary measures that combine these indicators. Therefore, apart from mortality and morbidity figures, we examined if health summary measures were used. The level of coverage of key indicators in available databases is described below.

2.2.3 Overview of the coverage of key indicators in available databases

In the following paragraphs, we describe the data sources that were available on morbidity, accidental injuries, mortality, and other health summary measures. We provide a methodological overview on the coverage of key indicators of health in the working age

[4] Educational level was classified into low, intermediate and high, according to Eurostats' LFS userguide; low – ISCED 0-2, intermediate – ISCED 3-4, high – ISCED 5-6.

population in Europe in the available databases. The key indicators refer to indicators for health status, indicators for health risk, and indicators for the impact of health on work.

It should be noted that not all key indicators included in databases were directly available via the internet, or otherwise. This means that data might only be available after registration and payment, or via some other agreement with the data owners. In this case, we used the classification 'not directly available'.

Morbidity

Various data sources on morbidity are available for the EU. Table 2.1 presents an overview. From this overview, it becomes clear that some databases cover the EU-27 and countries involved in the PHP 2008-2013, whereas others only cover a limited number of countries of the EU-27.

To describe the type of health problems that people in the working age population experience, the Health for All database (HFA-DB) of the WHO would have been the first data source of choice. Unfortunately, it is not possible to select only people of working age in the HFA-DB. Several other databases offer the possibility to describe the working age population (16-64 years). In some of these databases people are included irrespective of their present or previous employment status (European Health Interview& Health Examination Surveys Database (HISHES), Statistics on Income and Living Conditions in Europe (EU-SILC), Labour Force Survey Ad Hoc Module 2002 (LFS AHM 2002), Euro barometer 56.1, European Community Household Panel (ECHP), Survey on Health and Ageing in Europe (SHARE)), whereas in other databases only people who are currently working and/or worked in the past are included (LFS AHM 1999, LFS AHM 2007, European Working Conditions Survey (EWCS), European Occupational Diseases Statistics (EODS)). Most databases provide the possibility to describe men and women separately.

An important difference between databases is the operationalisation of morbidity. Since one of our objectives is to answer the question 'what disables people of working age?' we are especially interested in the type of morbidity and not only whether health problems are present (most studies in HISHES, EU-SILC, Euro barometer 65.1). The type of morbidity experienced is assessed in the LFS AHM 1999, LFS AHM 2002, LFS AHM 2007, EWCS, SHARE and EODS. Of these databases, only the LFS AHM 2002 provides the possibility to describe the type of most serious health problem in the total working age population. The other databases (LFS AHM 1999, LFS AHM 2007, EWCS, EODS) contain morbidity caused or made worse by work, and selected people that were employed or were employed previously.

Recently, a new data source has been set up, i.e. European Health Interview Survey data (EHIS). In this study, respondents will indicate which out of 21 health problems they experience. Hence, this study will probably provide the opportunity to describe (the prevalence of) morbidity.

Several databases contain factors that could be considered a risk factor of morbidity. Besides demographic factors, these data are mostly limited to work-related risk factors. This also applies to the LFS AHM 2002.

None of the available data sources provide the possibility to relate the type of health problem to the amount of disability experienced in daily life. The consequences of a health problem for work are described in several databases. In most of these databases, the consequences for work are assessed by employment status and/or sickness absence. Only for the LFS AHM 2002, these outcomes can directly be linked to the type of most serious health problem.

The SHARE study and ECHP database have been used to gain insight in the proportion of loss of work participation which is related to impaired health. In both databases the proportion of subjects with 'poor health' at baseline which left the workforce during follow-up (status: working, unemployed, disabled, early retirement) are described. In addition, the risk of leaving the workforce attributable to impaired health was analyzed. Productivity loss at work for impaired health was analysed by using the Erasmus Productivity Loss at Work (EPLW) database.

The SHARE study includes 4 611 subjects aged 50-63 years, employed at baseline and with complete data on health status at baseline and work status during two year follow-up. The ECHP database consists of 57 436 workers aged 16-65 years who were employed for at least two consecutive years of which 11% left the workforce in the last year of follow-up due to unemployment, retirement, or having to take care of the household.

Table 2.1 Data sources on morbidity in Europe

Data sources on morbidity	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors	Consequences for work
European Health For All Database (HFA-DB)	Yes, but not all indicators could be linked directly	EU27, NO, IS, HR, FYROM, TR	No, selection on age not possible	Yes	For some types of morbidity	Type of morbidity	Life style and environmental risk factors are included, but cannot be linked to health indicator directly	Measures reflecting work status and sick leave due to illness can be described, but cannot be related to morbidity directly
European Health Interview & Health Examination Surveys Database (HISHES)	Yes (partly)	Depending on study	Some surveys in the HISHES database provide the possibility to describe working age population	Many surveys in HISHES database include working and non-working persons	Depending on study	Except for LFS AHM 2002 (see below), surveys in HISHES database document whether persons have a chronic health problem (yes/no) and/or ask for perceived health	Depending on study	Depending on study
Statistics on Income and Living Conditions (EU-SILC)	Yes	EU-27, NO, IS	Yes	Yes	Yes	Questionnaire asks whether persons have a chronic health condition (yes/no) and asks for perceived health	Questionnaire contains risk factors for morbidity, e.g. work related factors	Questionnaire contains employment status

Data sources on morbidity	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors	Consequences for work
European Health Interview Survey data (EHIS) - *first round 2007/2008*	Not known yet	EU-27, Candidate Countries, EFTA countries	Not known yet, but possible	Yes	Not known yet, but possible	Respondents are presented a list of 21 health conditions, and are asked to indicate which health condition they have	Life style, environmental, and work-related risk factors are included in the questionnaire	Employment status is included in the questionnaire
Labour Force Survey (LFS) 2009	Yes	EU-27, IS, NO, HR, MK, TR	Yes, but working age population defined as 15-65 years	Yes	Yes			
Labour Force Survey (LFS) Ad Hoc Module (AHM) 1999	Yes	DK, DE, IE, EL, ES, IT, LU, HU, NL, PT, FI, SE, UK	Yes, but working age population defined as 15-65 years	Yes, but only persons who are currently employed, or were employed in the past, are included	Yes	Respondents were asked whether they suffered from a health problem which was caused or made worse by work. They could indicate which out of 8 health problems was the most serious health problem	Risk factors, including work-related risk factors are included	Sick leave is included in the questionnaire

Data sources on morbidity	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors	Consequences for work
Labour Force Survey (LFS) Ad Hoc Module (AHM) 2002	Yes	EU-27 (except for BG, LV, PL), NO	Yes, but working age population defined as 15-64 years	Yes	Yes	Respondents were asked whether they suffered from a longstanding health problem. They could indicate which out of 14 health problems was the most serious health problem	Risk factors, including work-related risk factors are included	Work status, and restriction in type of work and amount of work that can be done is assessed in questionnaire
Labour Force Survey (LFS) Ad Hoc Module (AHM) 2007	Yes	EU-27, NO, HR	Yes, but working age population defined as 15-64 years	Yes, but only persons who are currently employed, or were employed in the past, are included	Yes	Respondents were asked whether they suffered from a health problem which was caused or made worse by work. They could indicate which out of 11 health problems was the most serious health problem	Risk factors, including work-related risk factors are included	Sick leave is assessed in questionnaire
European working conditions survey (EWCS)	Registration is needed and access needs	EU-27, HR, TR, NO	Yes, but working age population	No, only working persons	Yes	Respondents are asked whether their work affects their	Various work-related risk factors are assessed in	Sick leave is assessed in questionnaire

Data sources on morbidity	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors	Consequences for work
	to be asked		defined as 15-64 years			health (yes/no), and can subsequently choose from 17 different health problems	questionnaire	
European Occupational Diseases Statistics (EODS)	Yes	2001: BE, DK, ES, IE, IT, LU, NL, AT, PT, FI, SE, UK. From 2002: BE, DK, ES, IT, LU, NL, AT, PT, FI, SE, UK. Only the EU-aggregate level data are published. From 2004: implementation in New MS	Yes	No, only persons who are currently working or worked in the past	Yes	EODS harmonized national data on occupational diseases recognized by public or private insurance for occupational diseases or declarations to other relevant national authority	Not included	Not included
Euro barometer 56.1 on job quality	Yes	AT, BE, DK, FI, FR, DE, GR, IE, IT, LU, NL, PT, ES, SE, UK	Yes (15 and over)	Yes	Yes	Respondents are asked for state of health. In addition, questions on stress and musculoskeletal problems as a result of work are asked	Work-related risk factors are asked in questionnaire	Employment status is assessed in questionnaire

Data sources on morbidity	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors	Consequences for work
Survey on Health and Ageing in Europe (SHARE)	Yes	AT, BE, CH, DE, DK, ES, FR, GR, IT, NL, SE	Yes, but population aged 50 years and older	Yes	Yes	European version of self-perceived health, limitative list of chronic diseases, and EURO-D scale of depression	Life style, environmental, and work-related risk factors are included in the questionnaire	Employment status is included in questionnaire
European Community Household Panel (ECHP)	Yes	EU-27	Yes	Yes	Yes	General health on a 5-point scale ranging from “very good” to “very bad”. Suffering from chronic physical or mental health problem, illness or disability (yes/no)	Individual and household characteristics	Employment status is included in questionnaire
Erasmus Productivity Loss at Work database (EPLW)	Own data	EU-NL	Only workers	No	Yes	Self-perceived health, list of 14 chronic diseases	Life style, and work-related risk factors are included in the questionnaire	Employment status is included in questionnaire

Accidental injuries

Many databases are available on accidental injuries. Table 2.2 presents an overview. More than half of the databases cover the EU-27, sometimes complemented with other countries. Apart from the - not yet available - European Health Interview Survey data (EHIS), no database contains complete information on all countries in the EU-27 and those involved in the PHP 2008-2013.

Most databases offer the opportunity to select the working age population, although some do not include non-working persons. Since these databases concern accidents at work, this is no problem. In most databases, separate data are available for men and women, although for some databases this option is not directly publicly available.

All databases contain risk factors. Risk factors could refer to work, life style and road conditions. No databases have data on consequences for work, with the exception of databases on accidents at work, which contain sick leave.

Two databases have data on accidents at work, one of them of two years, which allows studying trends in time. Two databases contain road accidents, and one database contains all types of injuries that were treated in the hospital.

Table 2.2 Data sources on accidental injuries in Europe

Data sources on accidents	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors	Consequences for work
Labour Force Survey (LFS) Ad Hoc Module (AHM) 1999	Yes	DK, DE, IE, EL, ES, IT, LU, HU, NL, PT, FI, SE, UK	Yes, but working age population defined as 15-65 years	Yes, but only persons who are currently employed, or were employed in the past, are included	Yes	The occurrence of accidents at work or in the course of work in the past 12 months was assessed, including the type of injury	Risk factors, including work-related risk factors are included	Sick leave and work status after the accident are included in the questionnaire
Labour Force Survey (LFS) Ad Hoc Module (AHM) 2007	Not available yet	EU-27, NO, HR	Yes, but working age population defined as 15-64 years	Yes, but only persons who are currently employed, or were employed in the past, are included	Not available yet	The occurrence of accidents at work or in the course of work in the past 12 months was assessed, and it was asked whether the accident was a road traffic accident	Risk factors, including work-related risk factors are included	Sick leave assessed in questionnaire
European Health Interview Survey data (EHIS) -	Not known yet	EU-27, Candidate Countries and	Not known yet, but possible	Yes	Not known yet, but possible	Work-related, and non-work-related accidents	Life style, environmental, and work-related risk	Employment status is included in the questionnaire

Data sources on accidents	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors	Consequences for work
first round 2007/2008		EFTA countries				assessed	factors included in the questionnaire	
European Statistics on Accidents at Work (ESAW)	Yes, but not all selections or combinations are possible	EU-27 and NO, TR, JPN, USA	Yes	No, only persons who are currently employed, or were employed in the last year	Yes	Accidents resulting in sick leave for >3 calendar days	Risk factors, including work-related risk factors are included	Not directly available, sick leave assessed in questionnaire
UNECE	Yes	EU-27	Not for all countries	Yes	No	Occurrence of road accidents resulting in injury	Data on accident type, light condition, road condition, and data on alcohol-related accidents available	Not measured
Community database on Accidents on the Roads in Europe (CARE)	Not directly available (data published in report)	BE, CZ, DK, EE, GR, ES, FR, IE, IT, LU, HU, MT, NL, AT, PL, PT, FI, SW, UK	Not directly available	Yes	Not directly available	Occurrence of road accidents resulting in injury	Data on accident type, light condition, road condition, and data on alcohol-related accidents available	Not measured
European Injury Database (IDB)	Yes	AT, DK, FR, NL, PT, SE, UK	Yes, but working age population defined as 15-64 years	Yes	Yes	Hospital treated injuries due to home and leisure accidents	Environmental and life style risk factors are available	Not measured

Mortality

Three data sources on mortality are available for the EU. Table 2.3 presents the data sources that describe mortality by cause of death. All mortality statistics presented in this table are based on the same information, i.e., death certificates. The medical certification of death is an obligation in all Member States. The data cover the EU-27 and most countries involved in the PHP 2008-2013. The Eurostat Standardised death rates (SDR) and European Health for All Database (HFA-DB) offer the possibility to describe mortality by cause of death of persons aged 0 to 64 years in Europe. Data could be described separately for men and women. In the European Mortality Database supplement on mortality (MDB), mortality by cause of death can be described per country in 5-year age groups, but a selection of people aged 15 to 64 years could not be carried out in the publicly available database. Also risk factors of mortality could not be related to causes of death, although they were included in the HFA-DB.

Table 2.3 Data sources on mortality in Europe

Data sources on mortality	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors
Eurostat Mortality data	Yes	EU-27, NO, IS, HR, FYROM	Yes	Yes	Yes	Death rate by cause of death	Not included
WHO European Health For All Database (HFA-DB)	Partly	EU27, NO, IS, HR, FYROM, TR (data TR limited)	Selection of persons below 65 is possible	Yes	Yes	Death rate by cause of death	Life style and environmental risk factors are included, but cannot be linked to cause of death directly
WHO European Mortality Database supplement on mortality (HFA-MDB)	Partly	EU27, NO, IS, HR, FYROM	Selection of different age groups possible, but not possible to select the group aged 16-64	Yes	Yes	Death rate by cause of death	Not included or not available

Summary health measures

Two databases are available containing summary health measures, the Eurostat database Healthy Life Years (HLY) and a database with results of the global Burden of Disease (BoD) study (see Table 2.4).

HLY is a health expectancy indicator, combining information on mortality and morbidity. It measures the number of remaining years that a person of a specific age (in most statistics at birth or at 65) is still expected to live in a healthy condition. A healthy condition is defined by the absence of limitations in functioning/disability. In the Eurostat database, information on mortality is taken from life tables. From the reference year 2004 onwards, the EU Statistics on Income and Living Conditions (EU-SILC) results are used to distinguish between healthy and unhealthy conditions. A healthy condition refers to the absence of limitations by health problems at least for the last 6 months. Using this database makes it possible to compare health status in different countries and between men and women. Also trends in time can be examined. However, it is not possible to study the health of the working age population, the influence of risk factors or the relative importance of specific diseases or injuries.

Disability adjusted life years (DALYs) are the sum of life years lost due to premature mortality and years lived with disability adjusted for severity. One DALY represents one lost year of healthy life and the burden of disease as a measure of the gap between current health status and an ideal situation where everyone lives into old age free from disease and disability. In the BoD study, carried out by the WHO, DALYs have been calculated for all diseases classified in the GBD-cause classification of the WHO, for all WHO Member States. There were 192 Member States in 2004. This information is assembled in an excel sheet, that is free available at the internet.

Unfortunately, no information is publicly available for the working age population, or separately for men and women. In the report of the WHO, separate figures for men and women and for different age groups were mentioned. Therefore, it is possible to interpret the given data in the excel sheet. An advantage is that DALYs allow comparison of the burden of disease of diseases and accidental injuries.

The WHO conducted a project in which the impact of exposure to occupational risk factors on the global burden of disease was assessed. This project, i.e. Comparative Risk Assessment (CRA), is part of the Global Burden of Diseases project. The heart of CRA is determining the number of DALYs and deaths attributable to exposure to the various risk factors. One of the groups of risk factors is formed by selected occupational risk factors [8]. Hence, although no information on DALYs is available for the working age population, information on the impact of exposure to selected occupational risks on the global burden of disease has been described for a few diseases.

Table 2.4 Data sources summary health measures

Data sources on summary health measures	Available	Countries included	Selection of working age population possible?	Are both working and non-working persons included?	Separate data for men and women?	Health indicator	Risk factors
Eurostat Healthy Life Years (HLY)	Yes	EU-27, NO, IS	No	Yes	Yes	HLYs at birth and at 65 years	Not included
WHO Burden of Disease study (excel file)	Partly	EU-27, HR, FYROM, NO, TR, CH, IS	Not in free available file	Yes	Not in free available file	DALYs	Not included

2.2.4 Selection of data sources used

For our review of the health status of the EU working age population we need data sources on morbidity, health related injuries, mortality and summary health measures. None of the available databases contain all variables needed for the aim of this review. Therefore, we used several sources to shed light on several aspects of health. Below we set out the reasons for our choices.

Morbidity

We used data from the EU Statistics on Income and Living Conditions (EU-SILC) to illustrate the general health of the EU working age population and the occurrence of chronic morbidity. EU-SILC covers most European countries and allows a selection of the working age population. EU-SILC contains, however, no information on different types of health problems. For that aim, the LFS AHM 2002 offers the best opportunity, since this data source covers most European countries and refers to the working age population. A drawback of the LFS AHM 2002 is that people could only report their most serious health problem, and the type of health problem that could be chosen was limited to 14 health problems. Although the HFA-DB does contain a large number of diseases, we prefer to use the LFS AHM 2002 for this review, because the HFA-DB does not allow a selection of the working age population.

Three databases contain figures about people at work: the LFS AHM 2007, the EWCS, and the EODS. All databases contain valuable information on work-related diseases from a different angle. Therefore, we included all three of them in our review.

Non-fatal accidental injuries

Many databases are available on accidental injuries. However, none of them can provide all data needed for this review. For road accidents we used the databases of the UNECE and CARE. They both cover most European countries, but do not allow a selection of the working age population. For home and leisure accidents we used the European Injury

Database (IDB), which allows a selection of the working age population, but is only available for a limited number of countries. For accidental injuries at work, two databases are available, the LFS AHM 2007 and the ESAW. For non-fatal injuries we used the LFS AHM 2007, because ESAW is limited to accidental injuries that resulted in 3 days of sickness absence. The LFS AHM 2007 is available for the EU-27, Norway and Croatia. The LFS AHM 1999 was also used, since it allows a comparison in time with the LFS AHM 2007. Unfortunately, data were only available for a limited number of countries.

Mortality

Both Eurostat's mortality data and WHO's HFA-DB offer the possibility to describe mortality by cause of death in people aged 0 to 64 years in Europe. A further selection of the working age population (16-64) was not directly available, but was provided by Eurostat on our request. For our overview we used the Eurostat data, mainly because of the availability of separate data of the working age population.

Summary health measures

We selected the data of the WHO BoD study for our overview, since DALYs allow comparison of the burden of disease for diseases and accidental injuries.

2.2.5 Comparing countries

Substantial differences in health-related variables exist between countries in Europe. Interpretation of these differences is difficult. Some databases are based on survey results, others on registration. Apart from actual differences, country differences could be attributed to differences in culture, health perception, policies, registration methods, awareness of health problems and exposure, the wording of the questionnaires used, and the use of proxies in surveys. Therefore, comparisons between countries should be interpreted with caution; strong conclusions on differences between countries cannot be drawn. However, if substantial differences between countries exist, we mentioned this in the report and refer to the Annexes for the actual figures.

2.2.6 Statistical analyses

In addition to document review as described in paragraph 2.2.1, statistical analyses have been performed on two European databases to gain insight in the proportion of health-based mobility out of employment. These databases concern the Survey on Health and Ageing in Europe (SHARE study) and the European Community Household Panel (ECHP). In both databases the proportion of subjects with poor health within subcategories of work status (still working, unemployed, disabled, early retirement) are described. Own data was used to gain insight in the proportion of illness-based productivity loss at work.

SHARE analyses

The study population consist of subjects with paid employment at baseline and subjects with available work status after two year follow-up. The outcome 'work status' was based on self-reported current economic status with four mutually exclusive categories: paid

work, retired, unemployed, disabled. The European version of self-perceived health, a 5-point scale question ranging between very good to very bad, was used to define poor health (less than good). Frequency tables were used to calculate the proportion of subjects with poor health within subgroups of work status during follow-up.

By means of multi-nominal regression analysis odds ratios were calculated for the likelihood of transition to every state of non-participation, i.e., early retirement, unemployment, and disability for poor health during two year follow-up.

ECHP analyses

In the ECHP, the same question was used to assess self-perceived health as in SHARE, and the same definition of poor health was applied. Frequency tables were used to calculate the proportion of subjects with poor health within subgroups of work status during follow-up. Logistic regression analysis was performed to study the impact of poor health on employment status, adjusted for country, personal and household characteristics.

In both analyses, country was used as a fixed effect. A significance level of $p<0.05$ was considered. Population Attributable Risks were calculated for poor health, using the formula PAR = Pe (OR-1)/(1+Pe(OR-1)). Pe in this formula represents the prevalence of exposure in the study population. All statistical analyses were based on the number of persons with complete data available. The statistical analyses were carried out with SPSS version 15.0.

EPLW database analyses

The main outcome of this study was productivity loss, measured with the Quantity and Quality instrument (QQ) [9]. Respondents were asked to indicate how much work they actually performed during regular hours on their last regular workday as compared to normal. The quantity of productivity was measured on a 10-point numerical rating scale with 0 representing “nothing” and 10 representing “normal quantity”. Diseases were assessed by presenting respondents a list of diseases and ask them to report those diseases that were diagnosed by a physician, irrespective when the diagnosis has taken place.

Productivity loss was defined as a score lower than 10. Frequency tables were used to explore the proportion of productivity loss at work for impaired health. Logistic regression analysis was used to explore the association between the dependent variable productivity loss and independent variables poor health and diagnostic groups.

2.3 Methodology: Review and evaluation of policies and initiatives aiming to address workforce health

2.3.1 Objectives and overall approach

This work focuses on a review and evaluation of policies and initiatives existing within the European Union aiming to address workforce health. Central questions when analysing policies and initiatives were:

- How to get people back to work again?
- How to keep people at work?

Particular focus was put on the effectiveness and cost-effectiveness of reviewed policies and initiatives.

Our terms of reference requested us to specifically review the following categories of policies and initiatives:

- Workplace health promotion initiatives;
- Workplace health and safety initiatives;
- Initiatives to help retain people in work who have chronic illness;
- Initiatives to support people who are on long term sick leave to get back into work;
- Initiatives to promote rehabilitation and reintegration into work following a serious health event; and
- Other policies and initiatives, including those targeted at the societal level (e.g., public health interventions). Public health policies which are aimed at the entire population do indirectly influence worker's health.

As these categories were not defined in our terms of reference we examined a number of definitions and common understandings of the terms used. It is important to realise that several definitions and viewpoints exist and that a clear distinction between the categories on the basis of current information and literature is difficult to make. First of all, not all the categories are commonly used or only used partially. Secondly, when they are used, institutes and authors seem to use them to describe different settings and interpret them differently or do not give an explanation of their definition or interpretation at all. Also, our literature review made it clear that the categories show considerable overlap and are therefore quite often interchangeably used to explain the same policy or intervention. For example, work- and workplace adjustment initiatives that are aimed to assist employees with a chronic illness can both fall under the category "Initiatives to help retain people in work who have a chronic illness" and "Initiatives to support people who are on long term sick leave to get back into work" since employees with a chronic illness can be on long term sick leave. The same applies to rehabilitation of employees who are on long term sick leave; this can be defined as an "Initiative to support people who are on long term sick leave to get back into work" but can also fall under "Initiatives to promote rehabilitation and reintegration into work following a serious health event" if it for example concerns an employee who had a stroke.

As there are no clear definitions available, we used the existing literature to determine our own definitions, trying to avoid any overlap and interpretation difficulties.

We are aware of the fact that our way of defining and delimitation of the categories is only one way and more possibilities exist. We therefore consider our final definitions of the categories as "work-definitions" to make our analysis as transparent and clear as possible.

Table 2.5 provides an overview of the definitions that we used for each category (see also Annex 1B Definitions where more commonly used terms throughout our review such as long-term sick leave, serious health event, chronic illness, etc. are defined).

Table 2.5 Definitions used and typology of interventions

Category	Definition	Main type of interventions
Workplace health promotion initiatives	The **promotion** of workers' health and general wellbeing. This goes further than merely legislation on ensuring health and safety of workers. It focuses on the active pursuit of activities that help employees to improve their own general health and wellbeing.	• Workplace health promotion networks such as the European Network for Workplace Health Promotion; • National legislation (e.g., banning of smoking); • National health promotion initiatives to support and inform employers; • Health check-ups; • Initiatives tackling smoking and alcohol abuse in the workplace (e.g. support to stop smoking); • Initiatives stimulating healthy food and physical activity (e.g. adjustment of food in the canteen and physical activity programmes); • Initiatives tackling mental health (e.g. stress management).
Workplace health and safety initiatives	The **protection** of workers in their employment from risks resulting from work factors adverse to health. It is mainly linked to legislation ensuring the health and safety of workers (e.g., prevention of accidents).	• International, EU- and national health and safety standards, legislation and regulation; • Health and safety guidelines; • National promotion campaigns; • Financial support and incentives; • Risk assessment; • Worker involvement; • Workplace modifications; • Safety devices; • Education and training.
Initiatives to help retain people in work who have chronic illness	The **retention** of workers in employment when they are faced with a chronic illness. It is mainly linked to initiatives that offer support to people with a chronic illness to	• EU- and national **disability** legislation and regulation; • Work (place) adjustment; • Redeployment.

Category	Definition	Main type of interventions
	remain in work. Focus is specifically put on employees with a chronic illness who have not yet experienced a long-term sick-leave. In the latter case, the category "Initiatives to support people who are on long term sick leave to get back to work applies."	
Initiatives to support people who are on long term sick leave to get back into work	The **reintegration into work** of workers who are on long-term sick leave (i.e., six weeks or more). Initiatives are mainly linked to return-to-work tools (vocational and not vocational) designed to improve the work ability of the employee and to increase the chance of return to work. Focus is put on more general rehabilitation and reintegration initiatives which are not specifically related to a serious health event (e.g., back pain). Rehabilitation and reintegration initiatives specifically focused on serious health events are tackled under the category "Initiatives to promote rehabilitation and reintegration into work following a serious health event".	• EU- and national **disability** legislation and regulation; • National reintegration programmes; • Vocational rehabilitation (e.g., training, cognitive behavioural therapy, adjustment latitude).
Initiatives to promote rehabilitation and reintegration into work following a serious health event	The **rehabilitation and reintegration into work** of workers who suffered from a serious health event (i.e., a confirmed diagnosis of cancer, organ failure requiring major organ transplant, loss of independent living, functional loss (paralysis) or stroke). It mainly focuses on the recovery of workers so that they can get back to work. The category "Initiatives to support people who are on long term sick leave to get back to work" includes general rehabilitation and reintegration initiatives not specifically targeted at serious health events.	• EU- and national **disability** legislation and regulation; • Return-to-work coordinator; • Cardiac and other rehabilitation programmes.
Other policies and initiatives	Both **public health policies,** which are aimed at the entire population and therefore indirectly influences worker's health and **individually**	• Intersectoral policy addressing health risk factors (e.g., Health in All Policies); • Alteration of public space and

Category	Definition	Main type of interventions
	targeted policies and initiatives (not in the workplace) affecting the health of an individual.	transport modalities; • Interventions tackling road accidents (e.g., legislation, traffic calming measures, safety campaigns); • Tobacco control interventions (e.g., taxation, bans, warnings, treatment); • Alcohol control interventions (e.g., taxation, brief interventions, advertising controls); • Interventions stimulating physical activity and healthy nutrition (e.g., counselling, campaigns); • Interventions tackling mental health (e.g., cognitive-behavioural therapies, medication, Internet self-help).

For each of the categories we provide a general overview of what the main policies and initiatives are that currently exist in the EU. This overview is not exhaustive and is meant to provide a general idea of what the status currently is. Illustrative country-specific examples provide more details.

This more descriptive overview is followed –when possible– with more specific information with regard to which of these policies and initiatives have proven to be effective in general and for our selection of diseases specifically. As explained before, since it is not possible in this review to describe the health status of the working age population taking into account all possible diseases, we created a short and long list of the most important health problems (see paragraph 2.1). Unfortunately, information on effectiveness remains rather limited for some of the categories since many existing policies and initiatives have not been evaluated yet with regard to effectiveness.

Please note that it sometimes has been difficult to clearly distinguish initiatives and policies that only address workforce health. Obviously initiatives and policies that are carried out on the work floor automatically only target people of working age. Nevertheless, if we only focus on those initiatives and policies, we would ignore the richness of other initiatives and policies that exist outside the work floor and do not specifically a certain age group, but still have a large influence on workforce health. We have therefore taken these broader policies and initiatives – when relevant – in consideration as well.

As explained below, we used several documents and sources to base our literature review regarding (the evaluation of) policies and initiatives aiming to address workforce health in the EU upon. The literature review served as input for the web-based survey.

2.3.2 Literature review

Given the topic at hand, this review considers a broader range of studies than normally considered in systematic reviews of clinical intervention trials; thus, next to the more rigorous quantitative study designs (interrupted time series and controlled before and after studies), cross-sectional studies, general reviews and descriptive case studies are also considered here. Given the approach chosen here with inclusion of a wide diversity of study designs, the present review provides a ***narrative synthesis*** of existing evidence rather than a review using meta-analysis. Characteristic of narrative synthesis is that it involves a textual approach, including descriptive summaries (tables) and comparative analysis of findings between studies and an overall assessment of the robustness of the evidence.

In the review and evaluation of policies and initiatives aiming to address workforce health our ***main review question*** was:

> What is the (cost-) effectiveness of policies and/or initiatives aimed at prevention, rehabilitation and reintegration of workforce health, especially with regard to:
>
> - **Cardiovascular disease;**
> - **Unipolar depressive disorders;**
> - **Musculoskeletal disease;**
> - **Accidental injuries at work;**
> - Respiratory disease;
> - Alcohol use disorder;
> - Hearing loss;
> - Lung cancer;
> - Road accidents.

Our ***search strategy*** to find relevant literature for our review included five stages:

- In the first stage, we searched various databases focusing on the categories of policies and initiatives;
- In the second stage, we searched further for relevant literature specifically with regard to the identified top 4 diseases (see paragraph 2.1);
- In the third stage - which is only relevant for peer-reviewed literature - we specifically focused on identifying relevant systematic reviews and assessing their quality;
- In the final two stages, we examined the identified grey and scientific literature to assess their relevance and level of evidence/quality of the source. Annex 1 D Overview of included grey literature presents our grading of the quality of the relevant grey literature which we used in our review.

In Annex 1, we describe in more detail our ***search protocol*** with respect to the examined sources (databases), the search strategy, data eliciting, used definitions, overview of

included scientific literature and grey literature. What is important to note is that in order to cope with the broad topic at hand we had to narrow down our search strategy. We therefore made some strategic choices with regard to the in- and exclusion of type, language and publication date of studies, geographical zone, what databases to review and what search combinations to use (see below and Annex 1).

Peer-reviewed (scientific) literature

We systematically searched the electronic databases PubMed/Medline, Centre for Reviews and Dissemination (CRD – including Database of Abstracts of Reviews of Effects (DARE), NHS Economic Evaluation Database (NHS EED), Health Technology Assessment (HTA) database), National Bureau of Economic Research and the Cochrane Library to identify relevant journal articles and reviews (see Table 2.6).

Table 2.6 Searched peer-reviewed literature databases

Peer reviewed literature database	Website
PubMed/Medline	http://www.ncbi.nlm.nih.gov/pubmed/
DARE	http://www.crd.york.ac.uk/crdweb/Home.aspx?DB=DARE
NHS EED	http://www.crd.york.ac.uk/crdweb/Home.aspx?DB=NHS%20EED&SessionID=&SearchID=&E=0&D=0&H=0&SearchFor=
HTA Database	http://www.crd.york.ac.uk/crdweb/Home.aspx?DB=HTA&SessionID=&SearchID=&E=0&D=0&H=0&SearchFor=
National Bureau of Economic Research	http://www.nber.org/s/search/
Cochrane library	http://www.mrw.interscience.wiley.com/cochrane/cochrane_search_fs.html

In identifying relevant scientific literature, we followed the guidelines for systematic reviews developed by the CRD at the University of York. The framework for the literature review and the detailed research protocol is based on the Cochrane guidelines for undertaking a systematic review.

Table 2.7 below offers a summary of the selection criteria which we used during our five stage search strategy to identify relevant scientific literature to review.

Table 2.7 Summary of selection criteria

Object of study	• workplace health and safety initiatives; • initiatives to help retain people in work who have chronic illness; • workplace health promotion initiatives; • initiatives to promote rehabilitation and reintegration into work following a serious health event; • initiatives to support people who are on long term sick leave to get back into work; • other initiatives.

Type of disease (MESH headings)	• cardiovascular diseases; • depressive disorder; • musculoskeletal diseases; • occupational accidents; • respiratory disease; • alcohol use disorder; • hearing loss; • lung cancer; • road accidents.
Outcome or effect	Improved health (Physical activity and/or psychosocial health and/or quality of life).
Type of study	RCT, controlled before and after study, interrupted time series, cost-effectiveness analysis, cost-benefit analysis, cost-utility analysis, case study; evaluation; systematic review, survey.
Publication	Academic journal (peer reviewed); grey literature (external/internal or non-reviewed reports).
Population	Working age population 16-64 years.
Publication date	From 1-1-2000 until 31-12-2009.
Language	English, Dutch.
Geographical zone	EU 27, Croatia, Liechtenstein, Norway, Iceland, FYROM, Turkey.

Our search strategy led to an enormous number of peer-reviewed (scientific) articles. Considering time and budget constraints, we decided to focus solely on systematic reviews. The added value is that systematic reviews are of highest quality (level of evidence) and include the results of multiple individual studies, therefore combining results and offering synthesized information. In our analysis, we always prioritised the results from the systematic reviews over the outcomes of the grey literature. An overview of included scientific literature can be found in Annex 1C.

In a preliminary sift (by the individual that carried out the search), systematic reviews that were clearly not relevant to the key questions of our study were eliminated based on their title. Also, duplicate publications (e.g. in different languages) and reviews in other languages than English or Dutch were excluded.

All abstracts of the remaining systematic reviews were screened for potential relevance. Also, interventions that were not studied within countries included in our geographical scope (EU 27, Croatia, Liechtenstein, Norway, Iceland, FYROM, and Turkey) were excluded. Any disagreement by the reviewers was resolved in a consensus meeting and with help of another reviewer if necessary.

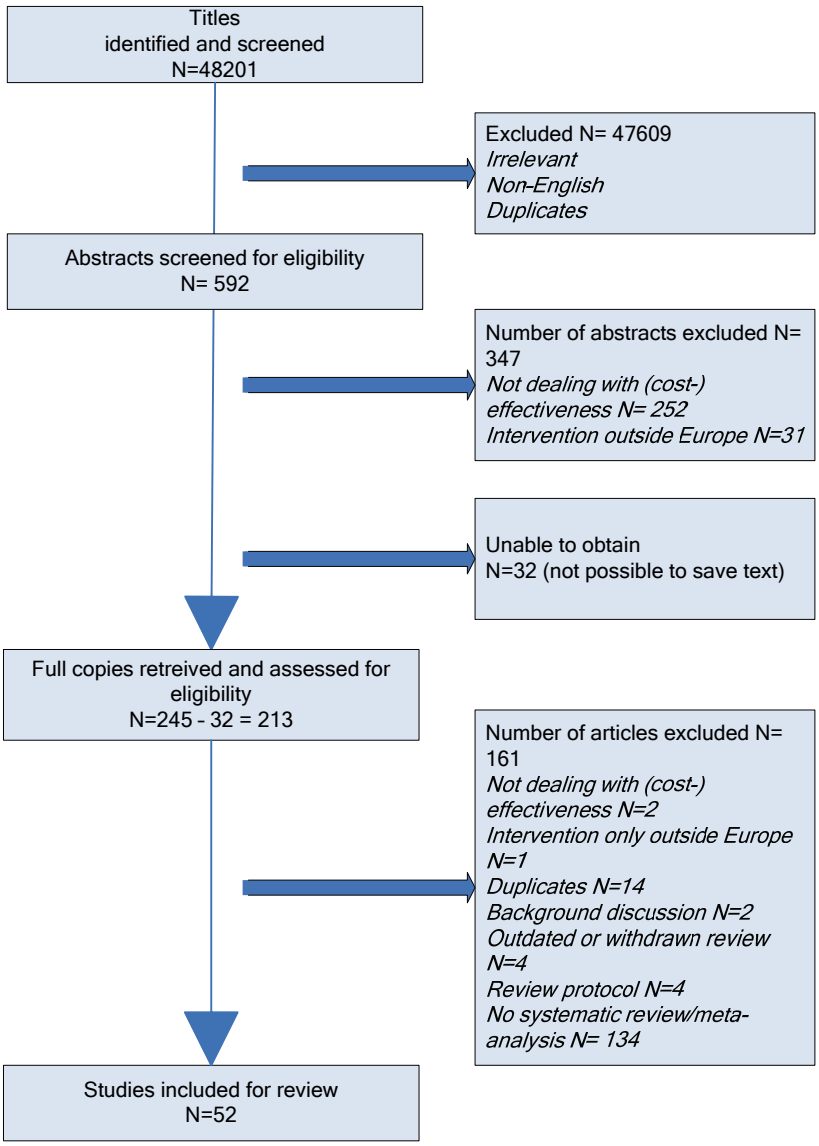
The search identified in total 48 201 publications (including duplicates) (see Table 2.8).

Table 2.8 Identified publications

Database	Total titles screened
PubMed	1 1819
Cochrane	6 915
DARE	11 535
NHS	15 544
HTA	2 374
NBER	14
Total	**48 201**

Of these 592 articles were retrieved for closer inspection on the basis of their title (at abstract level). Based on the abstract, 245 articles were deemed to fulfil the inclusion criteria. For 32 publications we were not able to retrieve the full text. We subsequently reduced the number of 213 included articles further to 52 by only including systematic reviews, which contain the highest level of evidence (see Figure 2.1).

Figure 2.1 Flow chart showing the various steps of scientific literature selection



Grey literature

Our review of scientific literature (systematic reviews) was complemented by a review of relevant grey literature.[5] It encompasses reports from governments, scientific research groups, working papers from committees, and other relevant socio- and political literature.

We explored relevant sources in relation to the evaluation of existing policies and initiatives in EU Member States, and where available and appropriate from Norway, Iceland, Liechtenstein, Croatia, Former Yugoslav Republic of Macedonia and Turkey.

[5] Definition of grey literature according to the grey literature Network Service (GreyNet): Information produced on all levels of government, academics, business and industry in electronic and print formats not controlled by commercial publishing i.e. where publishing is not the primary activity of the producing body. (Luxembourg, 1997 - Expanded in New York, 2004) (GreyNet, http://www.greynet.org/)

This included a review of ministerial websites – both health ministries and social affairs ministries, health portals (such as the EU Health Portal), projects funded by the Public Health Programme, and Framework Programmes, websites of WHO and the Organisation for Economic Co-operation and Development (OECD) and key policy documents (of DG SANCO and DG EMPL. In addition, we conducted a search among wider information sources (newspaper, broadcast and on-line news websites and professional organisations at national and EU level) at a secondary level. We used the same search strategy and search terms as used in the scientific literature search (see Annex 1 for more information). Table 2.9 below offers an overview of the main reviewed sources.

Table 2.9 Main reviewed sources to identify relevant grey literature

Grey literature	Website
EU Health Portal	http://ec.europa.eu/health-eu/index_en.htm
EU Public Health Programme	http://ec.europa.eu/health/index_en.htm
FP6	http://cordis.europa.eu/fp6/dc/index.cfm?fuseaction=UserSite.FP6HomePage
FP7	http://cordis.europa.eu/fp7/
WHO-Europe	http://www.euro.who.int/
	World Health Organization Library Information System (WHOLIS) (http://dosei.who.int/uhtbin/cgisirsi/Tue+May+12+11:04:42+MEST+2009/0/49)
WHO nutrition policy database	http://data.euro.who.int/nutrition/
WHO physical activity policy database	http://data.euro.who.int/PhysicalActivity/
OECD	http://www.oecd.org/topic/0,3373,en_2649_37407_1_1_1_1_37407,00.html
DG SANCO	http://ec.europa.eu/dgs/health_consumer/index_en.htm
DG EMPL	http://ec.europa.eu/social/home.jsp?langId=en
European Agency for Safety and Health at Work	http://osha.europa.eu/en/front-page/view
Ministries of Health	Websites of the national Ministries of Health (see Annex 1)
Ministries of Social Affairs	Websites of the national Ministries of Social Affairs (see Annex 1)

In total we retrieved 118 documents of which 37 were deemed not to be relevant according to our inclusion criteria. The remaining 81 documents were analysed in detail on the basis of their level of evidence (see Annex 1D Overview of included grey literature) using a typology in which we combined the different categories of interventions with the diseases under study (see Table 2.10).

Table 2.10 Typology of interventions for both scientific and grey literature

Category	Type of interventions	
Workplace health promotion	• Workplace health promotion networks such as the European Network for Workplace Health Promotion • National legislation (e.g., banning of smoking) • National health promotion	• Introduction; • Most important interventions found at international level, EU level, EU Member State level, and company level; • Evidence on (cost-) effectiveness of intervention(s);

Category	Type of interventions	
	initiatives to support and inform employers • Health check-ups • Initiatives tackling smoking and alcohol abuse in the workplace (e.g. support to stop smoking) • Initiatives stimulating healthy food and physical activity (e.g. adjustment of food in the canteen and physical activity programmes) • Initiatives tackling mental health (e.g. stress management)	• Recommendations; • Best practice(s) cases, particularly at EU Member State and company level.
Workplace health and safety initiatives	• International, EU- and national health and safety standards, legislation and regulation • Health and safety guidelines • National promotion campaigns • Financial support and incentives • Risk assessment • Worker involvement • Workplace modifications • Safety devices • Education and training	
Initiatives to help retain people in work who have chronic illness	• EU- and national **disability** legislation and regulation • Work (place) adjustment • Redeployment	
Initiatives to support people who are on long term sick leave to get back into work	• EU- and national **disability** legislation and regulation • National reintegration programmes • Vocational rehabilitation (e.g., training, cognitive behavioural therapy, adjustment latitude)	
Initiatives to promote rehabilitation and reintegration into work following a serious health event	• EU- and national **disability** legislation and regulation • Return-to-work coordinator • Cardiac and other rehabilitation programmes	
Other policies and initiatives	• Intersectoral policy addressing health risk factors (e.g., Health in All Policies) • Alteration of public space and transport modalities • Interventions tackling road accidents (e.g., legislation,	

Category	Type of interventions	
	traffic calming measures, safety campaigns) • Tobacco control interventions (e.g., taxation, bans, warnings, treatment) • Alcohol control interventions (e.g., taxation, brief interventions, advertising controls) • Interventions stimulating physical activity and healthy nutrition (e.g., counselling, campaigns) • Interventions tackling mental health (e.g., cognitive-behavioural therapies, medication, Internet self-help)	

Methodological issues

In assessing both the scientific and grey literature we encountered several methodological issues that have been of influence on the quality of our review (Chapter 6):

- **Quality of studies -** In the large number of systematic reviews that have been published over the years, it was often stated that the design of individual studies and the quality of the reporting on the studies (e.g. description of the randomization procedure) could improve. However, this message has not yet reached the majority of the research community. The most common design flaws in the more recent studies are still a lack of blinded outcome assessment, no measurement of compliance and the short follow-up period. This means that the number of high-quality papers on which statements of (cost)-effectiveness can be based are limited;
- **Scope limitation -** Type of interventions reviewed include workplace health and safety initiatives, initiatives to help retain people in work who have chronic illness, workplace health promotion initiatives, initiatives to promote rehabilitation and reintegration into work following a serious health event, initiatives to support people who are on long term sick leave to get back into work and other initiatives.[6] As the research base for the latter category is enormous, we included only interventions aimed at health-related behaviour (e.g. counselling, cardiac rehabilitation). This limitation of the review means that this report does not present the full picture of potentially interesting interventions to address the health of the working population;
- **Lack of distinction between interventions -** For interventions that are focused on prevention[7] of risk factors, the distinction between primary, secondary or tertiary

[6] According to the terms of reference of this review.

[7] Primary prevention measures fall into two categories. The first category includes actions to protect against disease and disability. Examples of primary prevention of accidents include government and state requirements for workplace safety to prevent industrial injuries and equipping automobiles with air bags and anti-lock brakes. General action to promote health is the other category of primary prevention measures. Health promotion includes the basic activities of a healthy lifestyle: good nutrition and hygiene, adequate exercise and rest, and avoidance of environmental and health risks. Limiting

interventions is often not clear. Authors use different terms for these interventions without properly defining them (for example community based approach to curb alcohol consumption). Also, the type of intervention is often not clearly described, particularly for tertiary interventions (i.e., studies often failed to define chronically disabling conditions). In addition, there is often a lack of description of what the setting is (healthcare, work-based, etc.), what is exactly done and by whom. As a consequence, details on the interventions studied could not always be provided;

- **Lack of outcome measures -** Another important finding is that outcome measures are often not clearly defined (e.g. pain reduction, back to work, sickness absence reduction, etc.). In combination with the heterogeneity of outcome measures used, direct comparisons between interventions or the evaluation of the efficacy of certain intervention types is difficult.

2.3.3 Web-based survey

The analysis of the scientific and grey literature served as input to the development of the web-based survey.

Development and pilot of the survey

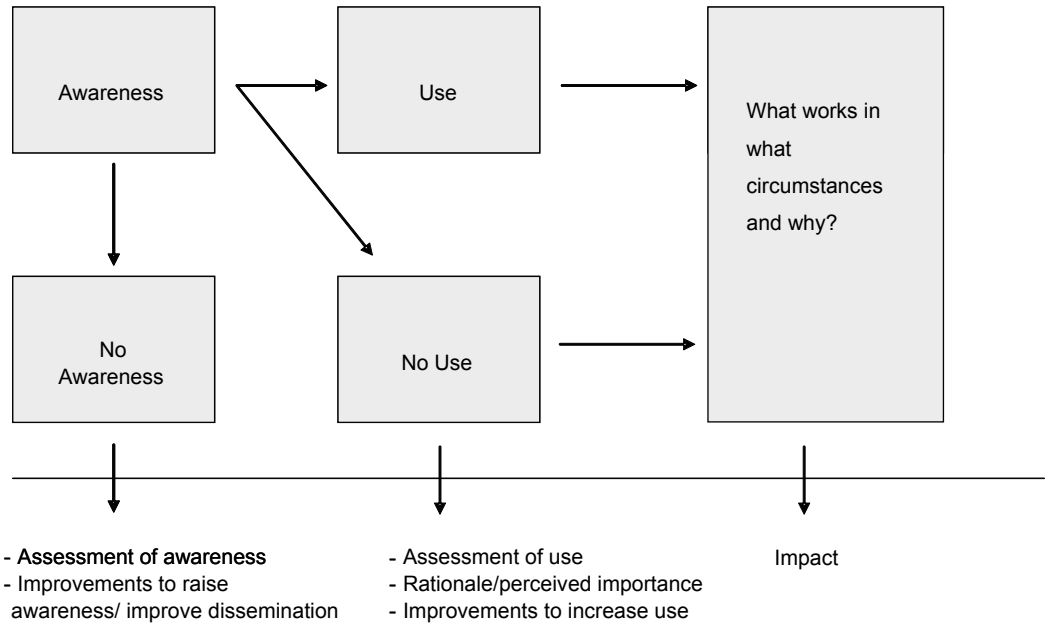
We have developed a web-based survey, which has two objectives. First, to collect additional information regarding:

- the awareness of stakeholders with regard to selected policies and initiatives to address work-related health; and
- the direct suitability and utility of these policies and initiatives (i.e., what mechanisms have been successful and in what circumstances?) (See Figure 2.2).

Second, to identify good practices in the EU that are not (yet) published.

exposure to sunlight, using sunscreen, and wearing protective clothing are examples of primary prevention measures to reduce the risk of developing skin cancer. The goal of secondary prevention is to identify and detect disease in its earliest stages, before noticeable symptoms develop, when it is most likely to be treated successfully. With early detection and diagnosis, it may be possible to cure a disease, slow its progression, prevent or minimize complications, and limit disability. An example of secondary prevention that is conducted by many different professionals (physicians, nurses, allied health professionals) in a variety of settings (medical offices, clinics, health fairs) is blood pressure screening to identify people with hypertension (high blood pressure). Tertiary prevention programs aim to improve the quality of life for people with various diseases by limiting complications and disabilities, reducing the severity and progression of disease, and providing rehabilitation (therapy to restore functionality and self-sufficiency). Unlike primary and secondary prevention, tertiary prevention involves actual treatment for the disease and is conducted primarily by health care practitioners, rather than public health agencies. Prevention of Disease - Primary Prevention, Secondary Prevention, Tertiary Prevention, Prevention Research And Goals.

Figure 2.2 Survey elements



The survey consists of the following elements:

- general respondent information;
- awareness of policies and initiatives in a specific domain for a selection of disease categories;
- identification of groups that were targeted by these interventions;
- the use of policies and interventions for a selection of disease categories;
- (cost-) effectiveness of policies and initiatives in a specific domain for a selection of disease categories;
- monitoring of (cost-) effectiveness of policies and initiatives in a specific domain for a selection of disease categories; and
- the effect of policies and interventions for each selected disease category.

The survey was developed by using the online software platform 'Check Market', which offers applications for distribution and analysis of online surveys [10].

Before launching, the survey has been pilot tested both internally by the project team and externally by Dr. José Asua (one of our peer reviewers – see paragraph 2.5) and Prof. David Banta (public health consultant for WHO). The pilot testers were asked to provide feedback on:

- approximate length of time for completion;
- clarity of instructions and questions;
- appropriateness of answering categories;
- order of the survey questions;
- technical difficulties; and
- issues not covered.

Based on the feedback received the survey has been improved. The survey is included in Annex 2.

Distribution approach

The survey was developed after approval of the interim report by the EC (end of January 2010). It was launched on 19 March 2010 and open until 21 April 2010. To enhance cooperation we have included an introduction letter in the survey, approved by the EC, to the stakeholders being surveyed.

The survey has been sent to a selection of stakeholder categories:

- Representatives of several DGs of the EC (Commission Officials) and representatives of the European Parliament, including the Employment and Social Affairs Committee of the European Parliament [11];
- Representatives of national health ministries. These persons were identified by using the following sources: High Level Committee on Public Health [12], National Focal Points of MS and participating countries in the PHP 2008-2013 [13], and national websites of health ministries;
- Representatives of other ministries involved in health-related work (e.g., labour departments, economic affairs, finance). These persons were identified on the basis of the document review and important sources as the Employment Committee for the European Employment Strategy [14], the Social Protection Committee [15], and national ministry websites;
- Representatives of companies from different economic sectors. Representatives are identified through the Governing Board of Eurofound that represents the social partners and national governments of all MS, as well as the EC; national focal points of the European Agency for Safety and Health at Work (OSHA) and presenters at relevant European conferences such as the conference on promoting workplace health of the European Network for Workplace Health Promotion [16].

In total, we invited 475 respondents.

Response rate and analysis of the survey

By 21st April, 2010 (closing date of the survey) a total of 58 answers were recorded, as shown in Table 2.11 below. Efforts were made to ensure a good response rate, with reminder emails sent twice to invitees that had not responded and to those who had only partially completed the survey.

Table 2.11 Response of web-based survey

Number of invitations sent	Total answers	Complete answers	Partial answers	Invalid answers	Total valid answers
475	58	29	9	20	38

It can be observed that from the 58 responses received (response rate of 12%), 29 were completed and 9 were only partially completed. Those respondents who are labelled as invalid (n=20), did not fill in the survey (n=15), did not provide meaningful answers (n=3), completed the survey twice (n=1) or requested that their answers were disregarded (n=1).

The low response rate is possibly due to the wide scope of the subject under study. Several respondents found it difficult to answer all the questions of the survey. For example, as one of the respondents noted "We have had difficulties to put together the answers for this survey due to the fact that it in its major part concerns areas where other state agencies are the main actors. Our answers concern the work we as an organisation are involved in: health promotion and disease prevention. In areas concerning working life and rehabilitation other state agencies are the main actors".

Survey analysis

The survey data is quantitatively assessed by using SPSS Statistics 17.0 including a qualitative analysis of open answer categories (see Annex 3 Survey results). In the analysis only questions that were meaningfully answered are included. This means that answers in the category 'don't know' are excluded to prevent for bias in the presentation of the analysis.

Partially completed surveys are included in the analysis if at least one question (apart from the general information questions) has been meaningfully answered, including the answer "don't know". For example, it is important to highlight when large portions of the respondents chose the "don't know" answer, as it may point to a significant information gap. In total 38 surveys were included in the final analysis (valid response rate: 8%). In general response rates for online surveys range from 2%-30% [17]. Due to the low number of valid surveys, the results are only indicative; strong conclusions cannot be drawn on the awareness and use of (cost-) effective interventions to address work-related health.

2.4 Methodology: Conclusions regarding the (cost-) effectiveness of categories of initiatives

To draw conclusions regarding the (cost-) effectiveness of categories of initiatives we have analysed the findings. This was used as input to an internal workshop (in April 2010) with project members to synthesise the material and prepare the technical and summary reports.

The conclusions are based on evidence generated through our review. On the basis of sound evidence-based conclusions, we have drawn relevant lessons and formulated concrete recommendations to support the activities of the European Commission to tackle health inequalities and to address determinants of health. In particular the conclusions and recommendations aim to support the development of the forthcoming communication on the health of the workforce (see Chapter 7 and summary report).

2.5 Peer review

The work was subject to a peer review process – resembling the process used for academic journals. We took into account comments of six peer reviewers as well as those of Commission officials. In addition, an internal quality check was undertaken by a senior expert in the field of disability policy and return to work policy.

3 Health status of the EU working age population

3.1 Introduction

In this chapter we present an overview of the health status of the EU working age population. The working age population was defined as people aged 16 to 64 years in the Member States of the EU. If possible, we included data of EEA countries, i.e. Norway, Iceland, Liechtenstein, and accession countries - Croatia, Former Yugoslav Republic of Macedonia, and Turkey. We aimed to collect figures for the working as well as the non-working population.

The overview is based on existing documents and statistics to answer the following questions:

- What kills and disables people of working age?
- What are the main health-related causes of incapacity for work?
- What compromises their lives including work?

We start the description of the health status of the EU working age population with perceived health. Health should not only be considered as the absence of diseases, since positive health is also important for well-being, and physical and mental abilities. Moreover, positive health has favourable consequences for productivity at work. Subsequently we will describe traditional health indicators: morbidity, non-fatal accidental injuries and mortality. However, to determine the impact of morbidity and mortality, we need summary measures that combine these indicators. We discuss briefly the merits of different summary measures. For this review we used Disability Adjusted Life Years (DALYs) as a summary measure to combine morbidity and mortality data.

This overview is based on several health statistics, available as an online database, published in reports or provided on request by Eurostat. For an explication of the choice of databases and documents we refer to the methodology chapter (Chapter 2).

3.2 Perceived health

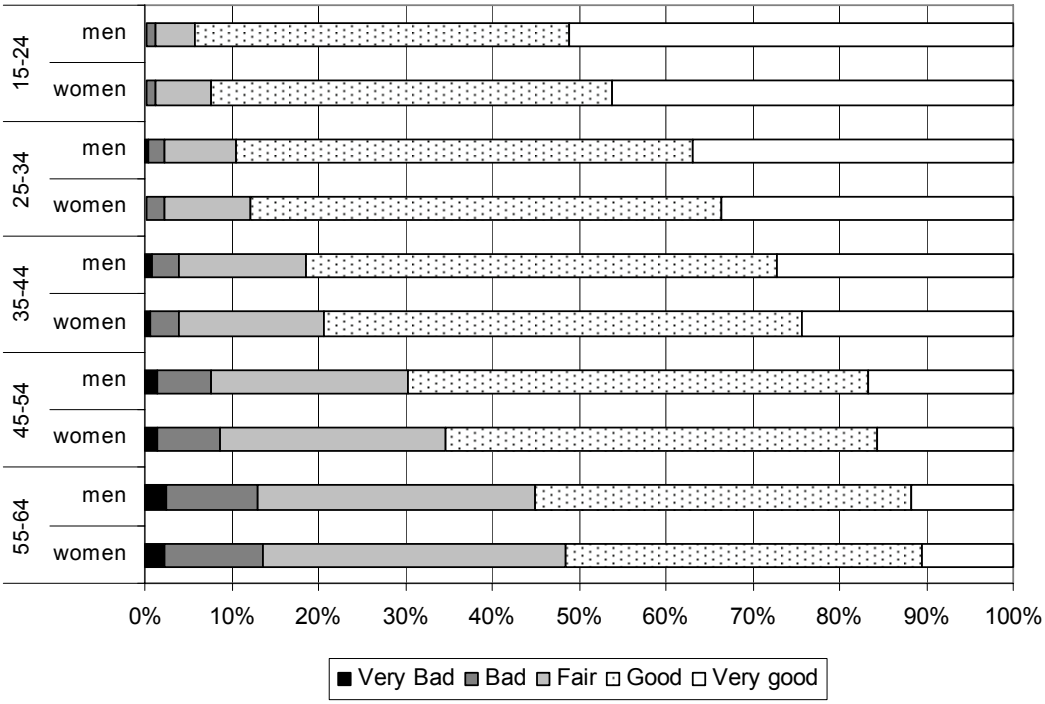
The majority (**77%**) of the EU working age population (15-64 years), report that they are in good or in very good health. Of the rest, **18%** regard their health as fair, nearly **5%** report bad health, and **1%** very bad health (EU-SILC 2008).

Small differences between men and women in the EU-27 exist; **78%** of the men and **75%** of the women report that they are in good or in very good health, **16%** of the men and

19% of the women regard their health as fair, **4%** of the men and **5%** of the women report bad health, and **1%** of both men and women experience very bad health. Older persons more often report (very) bad health than younger persons (see Figure 3.1).

Substantial differences in self-perceived health exist among countries (for the figures per country see Annex 4 Perceived Health in the separate report). While the percentage of people reporting bad or very bad health is about 6% in the whole of Europe, this percentage is 13% in Hungary and 11% in Latvia and Portugal. In some countries a considerably lower percentage was found. In Malta and Ireland only 2% reported a bad or very bad health and in Iceland 3%. However, it should be noted that answers to questions on perceived health will at least partly reflect cultural differences in health perception (see paragraph 2.2.5).

Figure 3.1 Self-perceived health in people aged 15-64 year in the EU-27



Source: EU-SILC 2008, Eurostat.

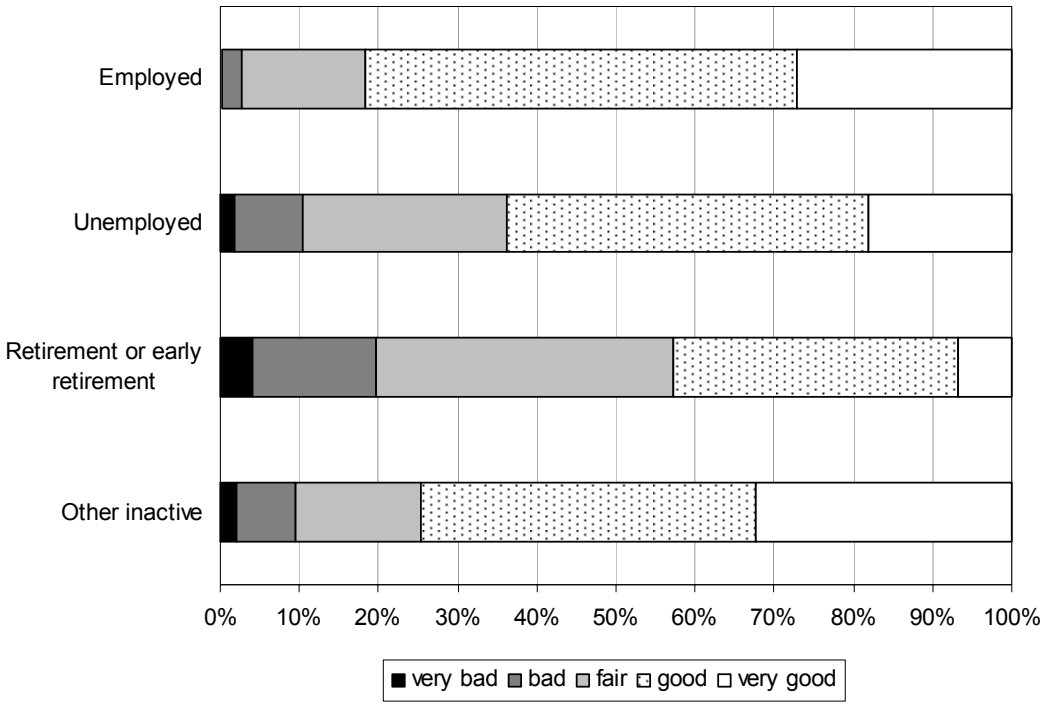
Employment status

Perceived health in the working age population in the Europe is strongly related to activity status (see Figure 3.2). Only **2.7%** of the employed people reports very bad or bad health, whereas **10.5%** of the unemployed, **19.6%** of the retired or early retired, and **10.5%** of the other inactive people report very bad or bad health.

The phenomenon that the health of employed people is better than the health of other people in the general working age population is called the “healthy worker effect”. The difference in health can be explained by the fact that poor health increases the likelihood of withdrawal from the labour force. Poor health may also be an important barrier in (re)gaining access to the labour market. In addition, unemployment and loss of employment may cause poor health or worsen health status [18-20]. Moreover, poor

health is associated with socio-economic factors, such as educational level, occupational class and income level [21].

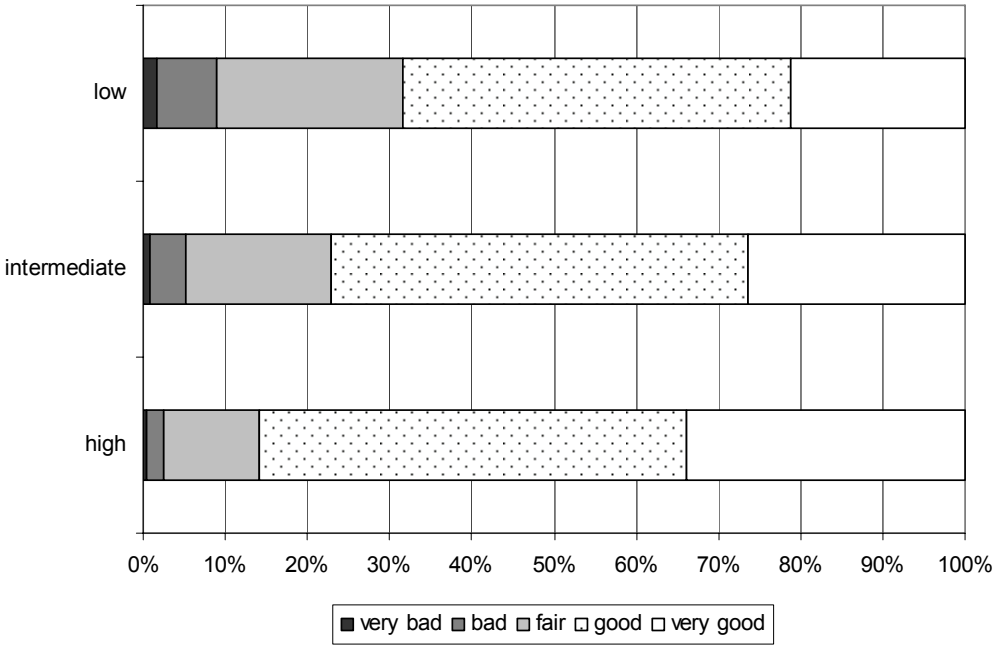
Figure 3.2 Self-perceived health in people aged 15-64 year in the EU-27 by activity status



Source: EU-SILC 2008, Eurostat.

From the literature it is known that poor health is associated with socio-economic factors, such as educational level, occupational class and income [21]. This is confirmed by data from EU-SILC that includes self-perceived health by educational level. Figure 3.3 shows that high educated people more often perceived their health as good or very good compared to low or intermediate educated people.

Figure 3.3 Self-perceived health of people aged 15-64 year in the EU-27 in 2008 by educational level

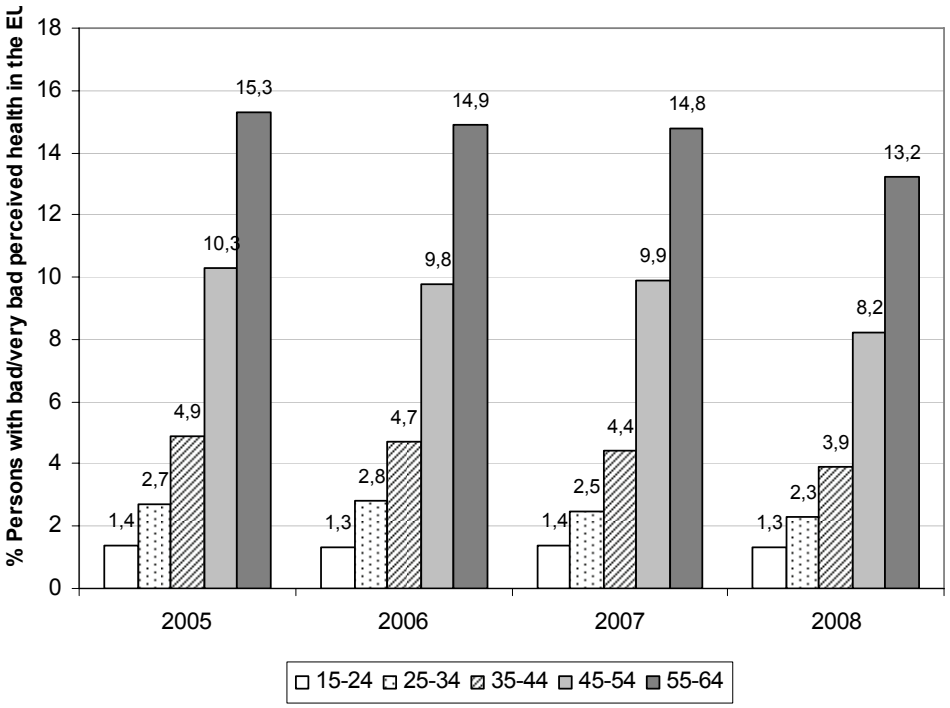


Source: EU-SILC 2008, Eurostat.

Trends

The proportion of people in the working age population with bad or very bad health slightly decreased over time from **6.9%** in 2005 to **6.7%** in 2006, **6.6%** in 2007 and **5.8%** in 2008. Figure 3.4 shows the proportion of people with bad or very bad perceived health over time in different age groups (years refer to the survey year). Due to the short time period (2005, 2006, 2007, 2008), the trends should be considered carefully, and longer follow-up periods are needed.

Figure 3.4 Bad or very bad perceived health in the EU over time



Source: EU-SILC 2005, 2006, 2007, 2008, Eurostat.

3.3 Morbidity

The previous paragraph referred to the perceived health status in general. In this paragraph we will focus on chronic morbidity. Morbidity refers to a disease state, disability, or poor health due to any cause. In most surveys, chronic morbidity refers to the self-declaration of respondents whether they have or have not a longstanding illness or condition.

We provide an overview of the prevalence of chronic morbidity and present the causes of chronic morbidity and the type of health problems and their relation to work. These figures refer to the working age population, including people working and people not working. In the last part of this section we focus on the working population and on work-related health problems, i.e., health problems caused or made worse by work.

3.3.1 Prevalence of chronic morbidity

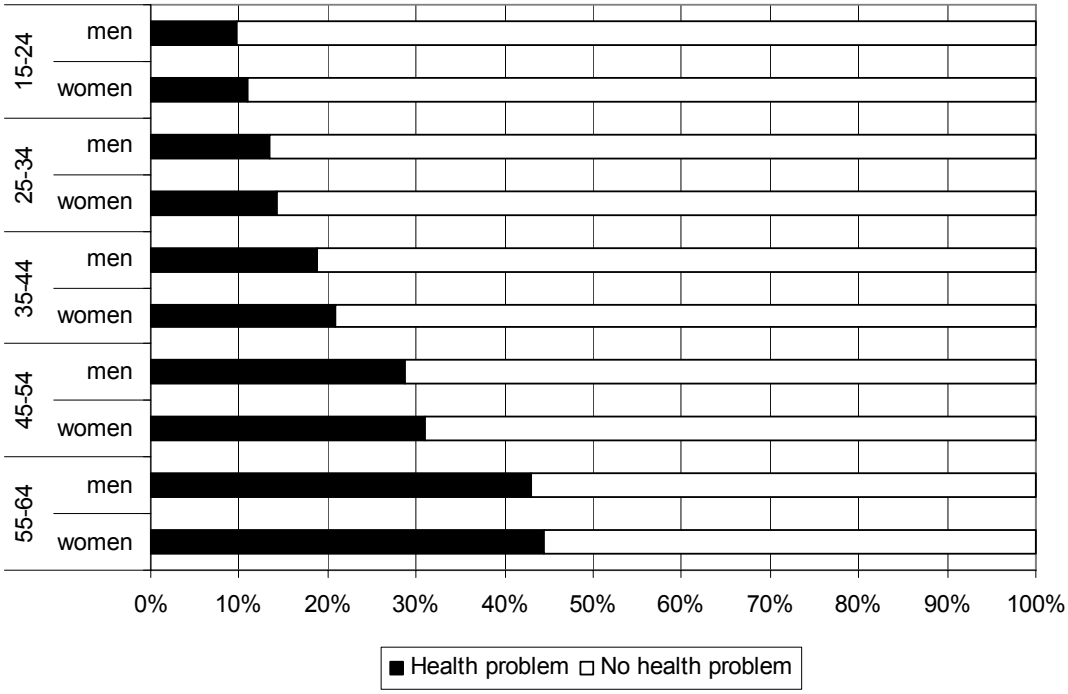
In the EU Statistics on Income and Living Conditions (EU-SILC), respondents are asked whether they suffer from any chronic (longstanding) illness or condition (health problem) (yes/no). In total **23.5%** (men **22.5%**, women **24.5%**) of the people in the working age population in the EU-27 reported chronic morbidity in 2008. In line with perceived health, the prevalence of chronic morbidity strongly increases with age in Europe (Figure 3.5). Amongst people aged 15-24, 10.3% reported a longstanding health problem in 2008

compared to 43.8% of those aged 55-64. In all age groups, women more often report a longstanding health problem than men, but the differences are not large.

In 2008, about **1 in 6** persons of the EU working age population reported limitations in their daily activities for 6 months or more due to health problems. In total **12.5%** of the people in the working age population in the EU-27 reported *some* limitations (men **11.4%**, women **13.6%**), and an additional **5.0%** reported *severe* limitations for at least 6 months (men **5.1%**, women **4.9%**). Limitations due to health problems increased with age in a similar pattern as the occurrence of chronic morbidity (see Annex 5 Limitations in daily activities – men/women).

Figures per country can be found in Annex 6 Longstanding Illness. There are large differences in the reporting of chronic morbidity. In some countries more than 30% report a longstanding health problem (Finland, Slovenia and Hungary), while in other countries this percentage is lower than 15% (Greece, Italy and Romania). Again, it should be noted that answers to questions on health will at least partly reflect cultural differences in health perception (see paragraph 2.2.5).

Figure 3.5 Occurrence of longstanding illnesses or health problems in people aged 15-64 years in the EU-27

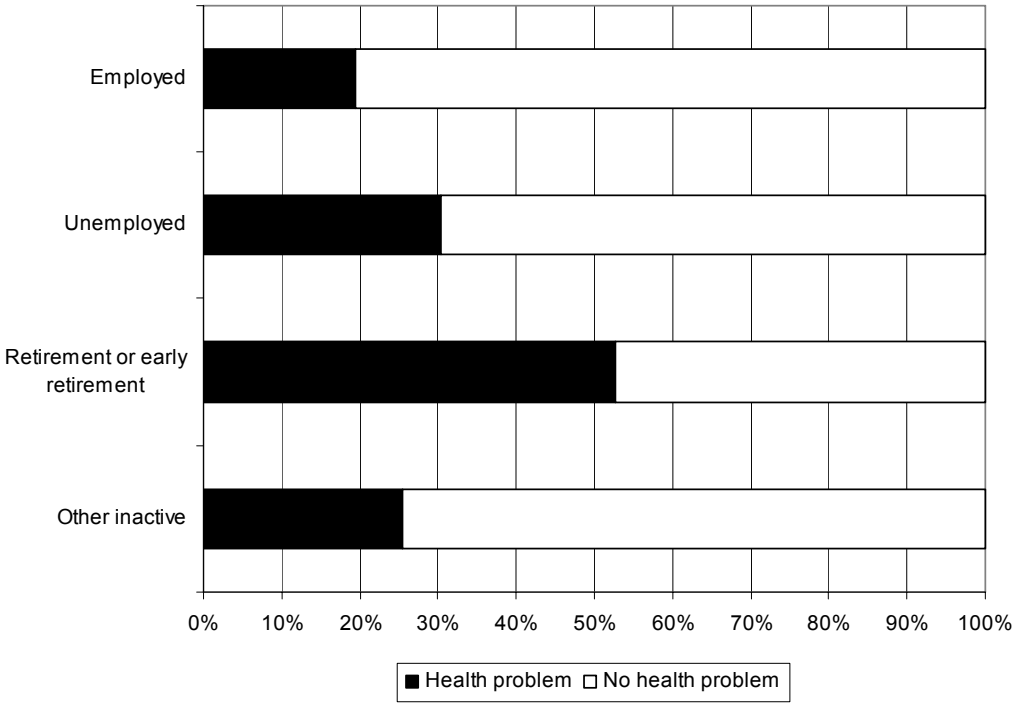


Source: EU-SILC 2008, Eurostat.

In line with perceived health, the prevalence of chronic morbidity differs between people with a different activity status (Figure 3.6). In 2008, about **19%** of the employed persons reported a longstanding health problem (men **18%**, women **21%**), whereas about **30%** of the unemployed (men **30%**, women **30%)**, **52%** of the retired or early retired (men **52%**, women **53%**), and **26%** of the other inactive persons reported a longstanding health

problem (men **27%**, women **25%**). Again, the "healthy worker effect" probably plays a role (see paragraph 3.2 - employment status).

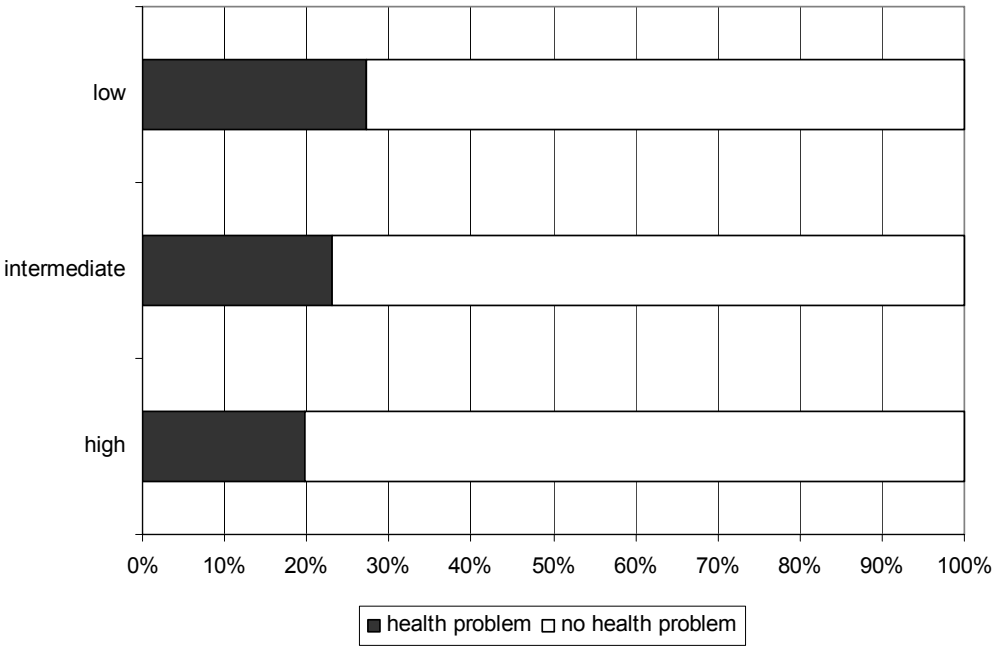
Figure 3.6 Occurrence of longstanding illnesses or health problems in people aged 15-64 years in Europe by activity status



Source: EU-SILC 2008, Eurostat.

Also in line with perceived health, among high educated people less longstanding illnesses or health problems were reported than among less educated people. Figure 3.7 shows that health problems were reported by **20%** of the high educated people (**20%** in both men and women), **23%** of the intermediate educated people (**22%** in men, **24%** in women), and **27%** of the low educated people (**25%** in men, **29%** in women).

Figure 3.7 Occurrence of longstanding illnesses or health problems in people aged 15-64 years in Europe by educational level

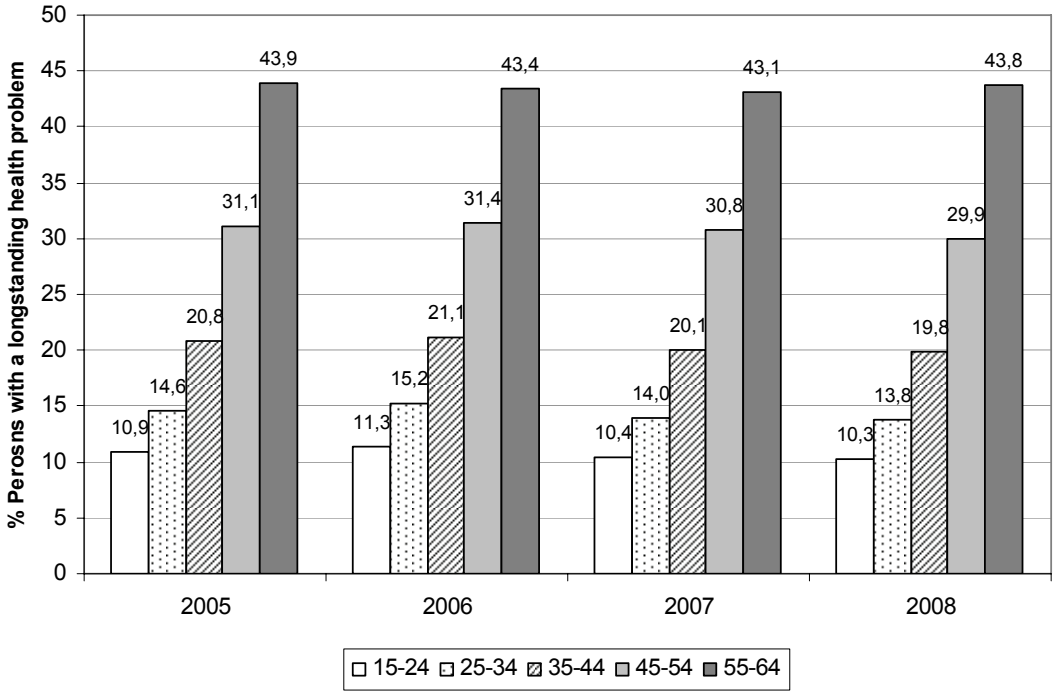


Source: EU-SILC 2008, Eurostat.

Trends

Even though a small decrease in the proportion of persons with a very bad or bad health was found in the working age population in Europe between 2005 and 2008 (see paragraph 3.2), the proportion of persons with a longstanding health problem seemed to remain relatively constant. In 2005, **24.1%** of the persons had a longstanding health problem, in 2006 **24.4%**, in 2007 **23.6%** and in 2008 **23.5%**. Figure 3.8 shows the occurrence of longstanding health problems in different age groups over time (years refer to the survey year). Due to the short time period (2005, 2006, 2007, 2008), changes should be considered carefully, and longer follow-up periods are needed.

Figure 3.8 People with a longstanding health problem in the EU over time



Source: SILC 2005, 2006, 2007, 2008, Eurostat.

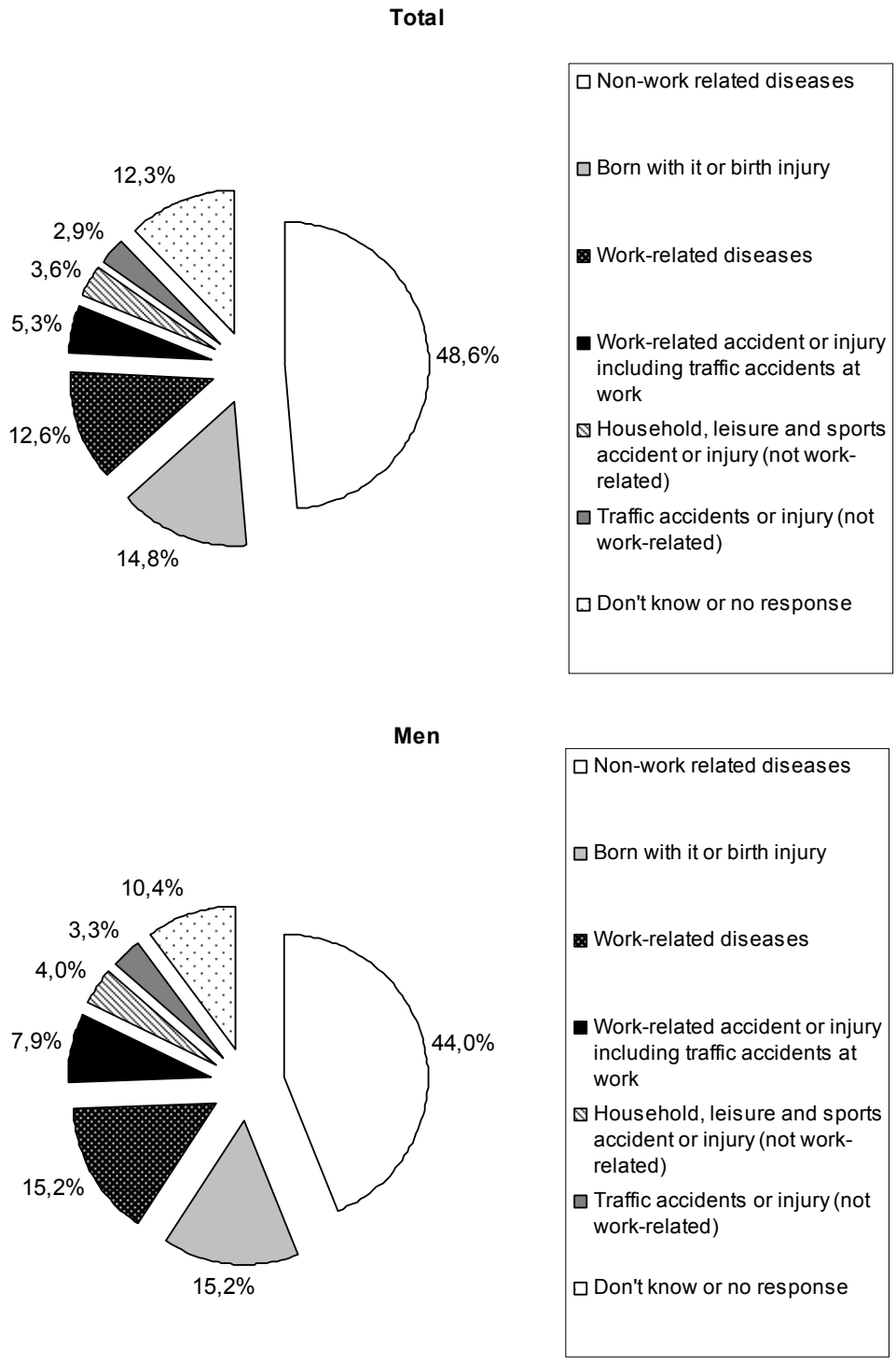
3.3.2 Causes of chronic morbidity

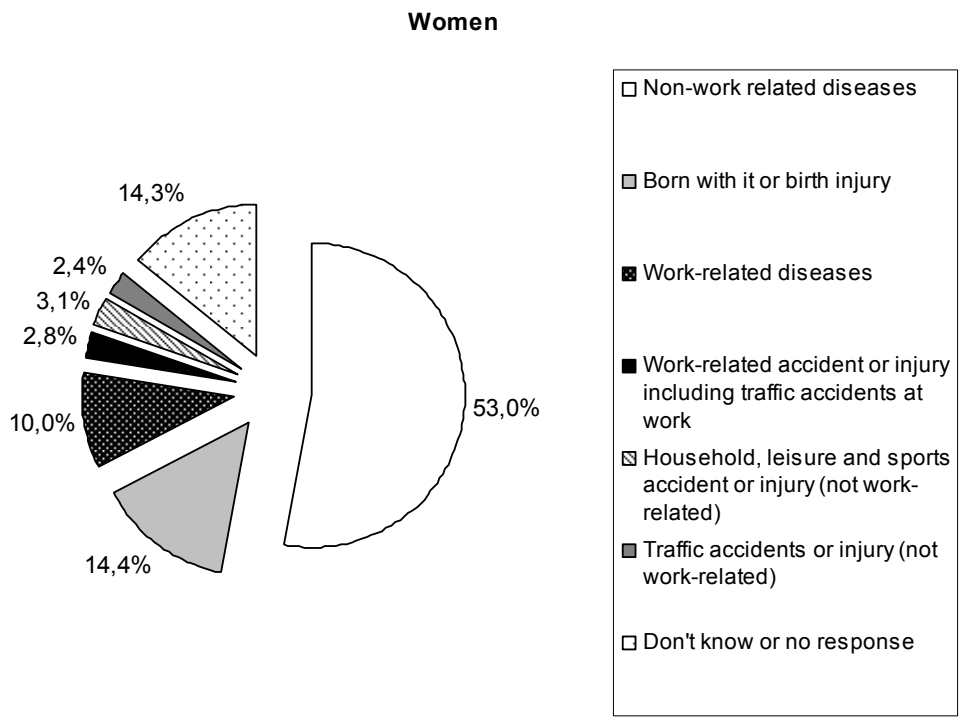
Chronic morbidity may result from various causes. Figure 3.9 presents the self-reported causes of longstanding health problems in the working age population in the EU-25 in 2002. Over **80%** of longstanding health problems were regarded as not work related. This included **48.6%** due to a disease (not work-related), **14.8%** reported to be born with the health problem, and **6.5%** due to accidents which were not work related. The most common congenital anomaly at birth is congenital heart disease [22]. However, it was not assessed which congenital anomaly is most prevalent in the working age population in the EU. More information on the type of health problems in the working age population are presented in the paragraph below.

In total around one sixth (**17.9%**) of the chronic morbidity was caused by work according to self-reporting (**23%** in men, **13%** in women) (Figure 3.9). This included work-related diseases (**12.6%**) and longstanding health problems due to an accidental injury at work, including road traffic injuries (**5.3%**). Work-related causality of diseases (12.6%) is a complex topic. In some cases a work-related factor may be the only cause of the health problem, but it is much more common that work-related factors increase the risk of a health problem together with other factors. Furthermore it is also frequent that work-related factors aggravate an already existing health problem [23]. Hence, it is possible that the proportion of health problems attributed to work is underestimated, or overestimated. Work-related disease will be discussed further in paragraph 3.3.4.

Work-related (5.3%) and non-work-related accidental injuries (6.5%) contributed to **11.8%** of the chronic morbidity. In paragraph 3.4.1, the occurrence of non-fatal accidental injuries will be described.

Figure 3.9 Distribution of cause of longstanding health problems in the working age population (15-64) in the EU-25





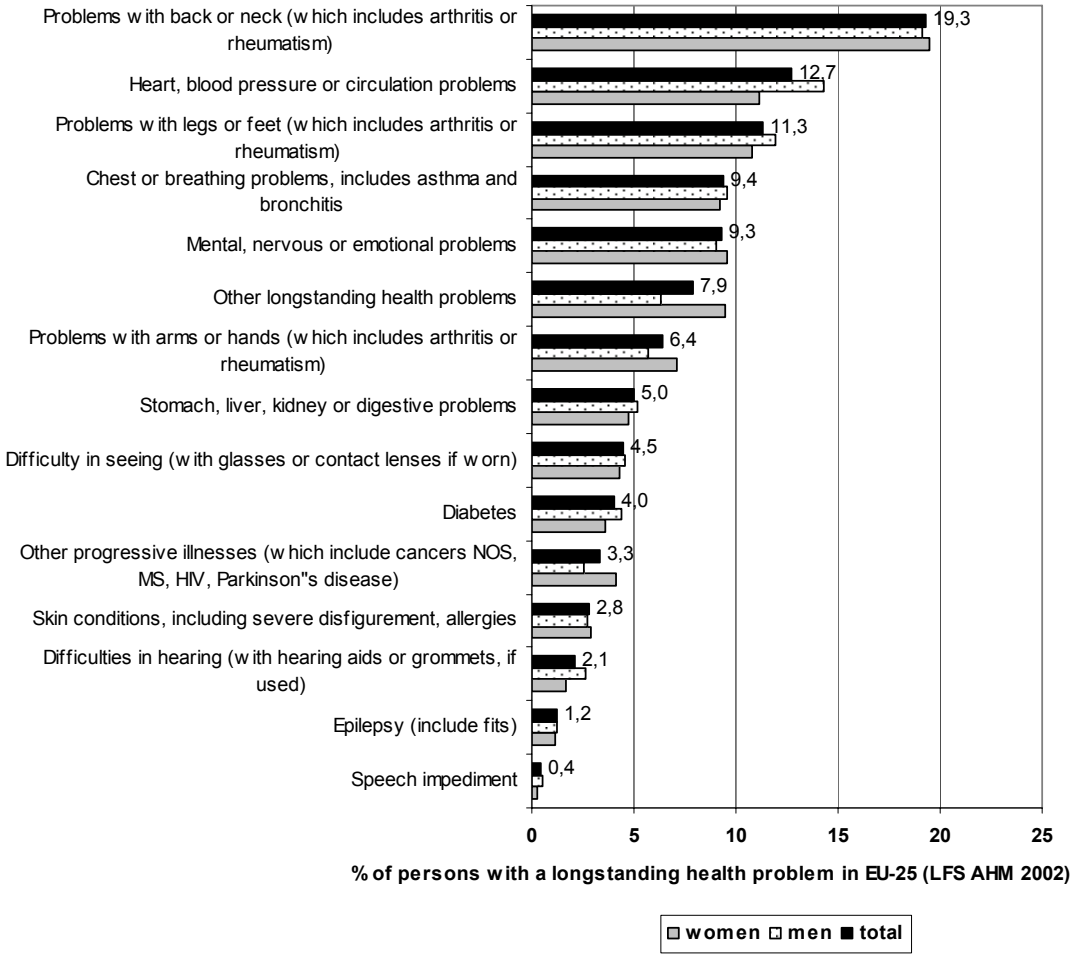
Source: LFS AHM 2002, Eurostat.

3.3.3 Type of health problems

Main health problems

In the Labour Force Survey (LFS) 2002, an ad hoc module (AHM) on longstanding health problems was included. In total **16.2%** of the people aged 15 to 64 years in the EU-25 reported a longstanding health problem or disability. Respondents were asked to describe their main health problem. Hence, this ad hoc module does not provide the *prevalence* of each health problem, but provides insight into the *main* health problem. Figure 3.10 shows that musculoskeletal health problems (back or neck (**19.3%**), legs or feet (**11.3%**), hands or arms (**6.4%**)) were frequently identified as the main health problem among those with a health problem. Cardiovascular diseases (**12.7%**) and chest or breathing problems (**9.4%**) were also often selected as the main health problem. Mental, nervous, or emotional problems were mentioned as the main health problem in **9.3%** of the people with a health problem. In Annex 7 the main health problems are presented by country. It appears that musculoskeletal health problems were in almost all countries most often identified as the main health problem. A relatively high percentage (>25%) of people in Romania, Greece and Hungary mentioned cardiovascular diseases as the main health problem. In Finland, United Kingdom and Ireland chest or breathing problems were mentioned relatively often (about 15%).

Figure 3.10 Main health problem among people aged 15-64 year with a health problem in the EU-25



Source: LFS AHM 2002, Eurostat.

The occurrence of health problems does not provide information on the severity of the resulting disability. In the working age population, **3.4%** of the people reported very severe restrictions regarding the type and amount of work that can be done and the mobility to or from work. Another **4.5%** of the working age population experienced severe restrictions (LFS AHM 2002).

Prevalence of disability due to health problems

According to the WHO report on the global Burden of Disease (2004 update), depression is the leading cause of moderate or severe disability among people aged 0-59 years in both high income countries and low or middle income countries. However, Figure 3.10 shows that musculoskeletal problems are most frequently indicated as the main health problem in the EU working age population. This fact from Eurostat data seems to contrast the data of the WHO, showing that mental problems are by far the most occurring disabling condition. The two data sources are not strictly comparable however, because they refer to different populations and they use different methods. There is also a different treatment of disability in these statistics. The WHO explicitly refers to causes of

disability, whereas Eurostat refers to the main health problem, irrespective of the disability involved.

One indicator of disability concerns the figures from national disability benefits. The figures on health problems in the available statistics are frequently based on self-reports. A disadvantage of self-reported health problems is that they might underestimate mental health problems, due to a stigma associated with them. European statistics on disability benefits show that one-third of the benefits are related to a mental condition, rising to as high as 40-45% in some countries. In young people the proportion of mental health problems is even higher. The other major cause of disability is musculoskeletal problems [24].

Unfortunately, these registered data have their drawbacks as well. Many factors influence these figures other than actual disease specific factors. Countries are not readily comparable due to cultural differences in the recognition of diseases and different systems of disability benefits. Nevertheless they show a certain trend towards a higher contribution of mental health problems to the total sum of disability benefits. For detailed figures we refer to Annex 8 Inflows into disability by health condition 2000-2007.

3.3.4 Work-related morbidity

As described above, part of the longstanding health problems is work-related. In the following, we describe the type of work-related morbidity in the working age population. Subsequently trends are identified.

Occurrence of work-related morbidity

Table 3.1 presents data on health problems in the working age population. Data of the Labour Force Survey (LFS) ad hoc module (AHM) 2002 are described in paragraph 3.3.3 (Figure 3.10), and reflect the main health problem, irrespective of its relation to work and the employment status.

In the LFS AHM 2007 and the European Working Conditions Survey (EWCS) 2005, self-reported *work-related* health problems are assessed. Work-related health problems reflect health problems *caused* or *made* worse by work. The LFS AHM 2007 is restricted to people that work or ever worked, whereas the EWCS is restricted to people that work.

According to the LFS AHM 2002, **16.2%** (men **16.3%**, women **16.1%**) of the working age population experienced a longstanding health problem, and **12.6%** of these people reported that their health problem was caused by work. This corresponds to 2% of the working age population having a health problem caused by work. In the LFS AHM 2007, **8.6%** (men **8.6%**, women **8.5%**) of the people reported a work-related health problem, and in the EWCS 2005 **35%** of the workers reported that work affected health. The lower proportion of people attributing health problems to work in the LFS AHM 2002 is probably due to the more strict condition of causality in this survey, whereas the phrasing in the LFS AHM 2007 includes not only health problems that were *caused* by work, but also health problems that were *made worse* by work.

The results from the EWCS show a much higher percentage of work-related health problems. The difference is probably due to the phrasing of the questions in the survey. In the LFS AHM 2007 respondents were asked if they have suffered from a health problem during the last 12 months, caused or made worse by work, while respondents of the EWCS were asked if their work affected their health. Since, an affirmative answer to the latter question does not necessarily involve a health problem during the last 12 months, the percentage of the EWCS is higher.

In the LFS AHM 2007, among those with a work-related health problem, musculoskeletal problems and stress, anxiety or depression were most often identified as the main work-related health problem (Table 3.1). Sickness absence was reported by **62%** of those with a work-related health problem (men **63%**, women **61%**). About **35%** reported sickness absence of at least one day but less than one month, and **27%** reported absence for at least one month. Therefore, about 2% of all workers in the EU-27 were off work at least one month in the past 12 months due to their most serious work-related health problem.

The results from the EWCS are difficult to compare with the LFS AHM 2007, because in the EWCS, workers experiencing an impact of work on health were allowed to describe *all* work-related health problems. Most workers reported between two and six different symptoms or health problems (EWCS). However, in line with the LFS AHM 2007, musculoskeletal problems (back, muscular pain) were mentioned most often (see Table 3.1). Fatigue, stress, headache, and irritability were also frequently reported.

A comparison between the three statistics shows that musculoskeletal problems constitute an important proportion of the health problems in all surveys, despite the differences in the population, relation to work, and answering categories used.

Table 3.1 Type of health problems in the working age population in Europe

Population	LFS AHM 2002[1]	LFS AHM 2007[2]	EWCS[3]
Countries	EU-25	EU-27	EU-27
Work status	All	Work or ever worked	Work
Health problem	Main health problem	Main work-related health problem	Work-related health problem (more than one choice was possible)
	% of population (% of those with health problem)	% of population (% of those with health problem)	% of population
One or more health problem	16.2	8.6	35.0
Health problem			
MSDs		5.1 (59.8)	
• *back*		2.4 (28.4)	24.7
• *back or neck*	3.1 (19.3)		
• *neck/shoulder/arms/hands*		1.6 (18.8)	
• *hands or arms*	1.0 (6.4)		
• *hip/leg/feet*	1.8 (11.3)	1.1 (12.6)	
• *muscular pain*			22.8

Population	LFS AHM 2002[1]	LFS AHM 2007[2]	EWCS[3]
Heart, blood pressure or circulation problems	2.1 (12.7)	0.5 (5.9)	2.4
Breathing problems (asthma, bronchitis)	1.5 (9.4)	0.4 (5.2)	4.8
Mental, nervous or emotional problems	1.5 (9.3)		
Stress, depression or anxiety		1.2 (13.7)	
Stress			22.3
Anxiety			7.8
Fatigue			22.6
Headaches (or Headaches/eyestrain)		0.4 (4.4)	15.5
Irritability			10.5
Sleeping problems			8.7
Stomach, liver, kidney or digestive problems	0.8 (5.0)		5.8
Difficulty in seeing	0.7 (4.5)		7.8
Diabetes	0.6 (4.0)		
Other progressive illnesses (which include cancers, multiple sclerosis, HIV, Parkinson's disease)	0.5 (3.3)		
Skin conditions, including severe disfigurement, allergies	0.5 (2.8)	0.1 (1.3)	6.6
Difficulties in hearing	0.3 (2.1)	0.1 (1.4)	7.2

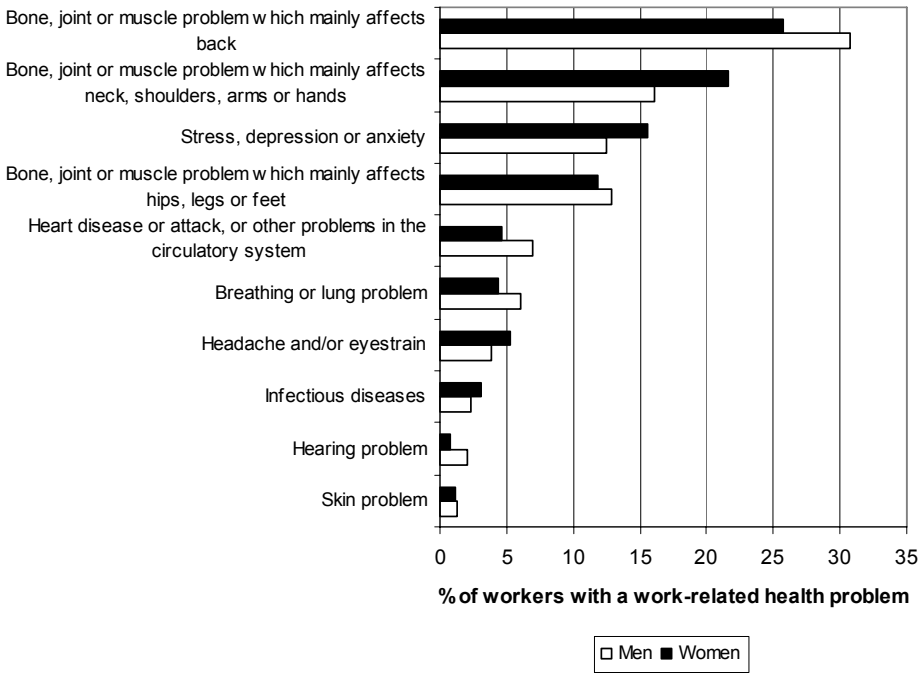
[1] LFS AHM 2002: Employment of disabled people.

[2] LFS AHM 2007: Accidents at work and work-related health problems.

[3] European Working Conditions Survey 2005.

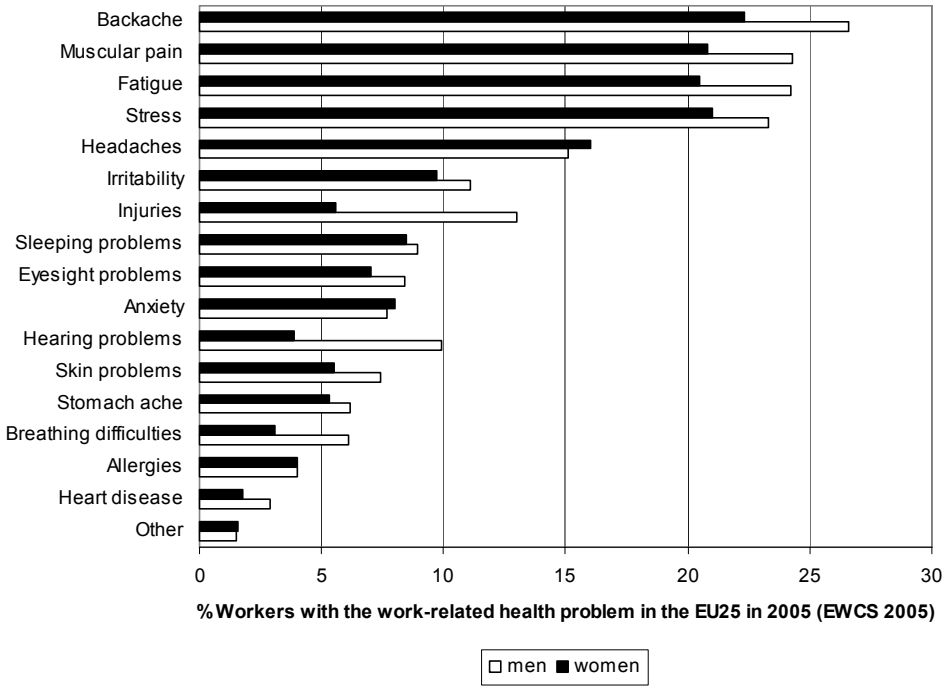
Figure 3.11 and Figure 3.12 show the difference between men and women with regard to the type of work-related health problems in both surveys. The distribution of health problems in men and women appeared to be relatively similar in the LFS AHM 2007 (Figure 3.11). In the EWCS 2005 most health problems were reported more often by men than by women (Figure 3.12). In the LFS AHM 2007 both men and women identified bone, joint or muscle problems the most often as the most serious work-related health problem. Stress, anxiety and depression were more often identified as the main problem by women compared to men. In the EWCS 2005, men mentioned stress more often than women, although some health problems that may be stress-related, like headaches en anxiety, were mentioned more often by women.

Figure 3.11 Main work-related health problem among people that work or ever worked for men and women in the EU-27



Source: LFS AHM 2007, Eurostat.

Figure 3.12 Percentage of workers reporting each individual symptom for men and women in the EU-27

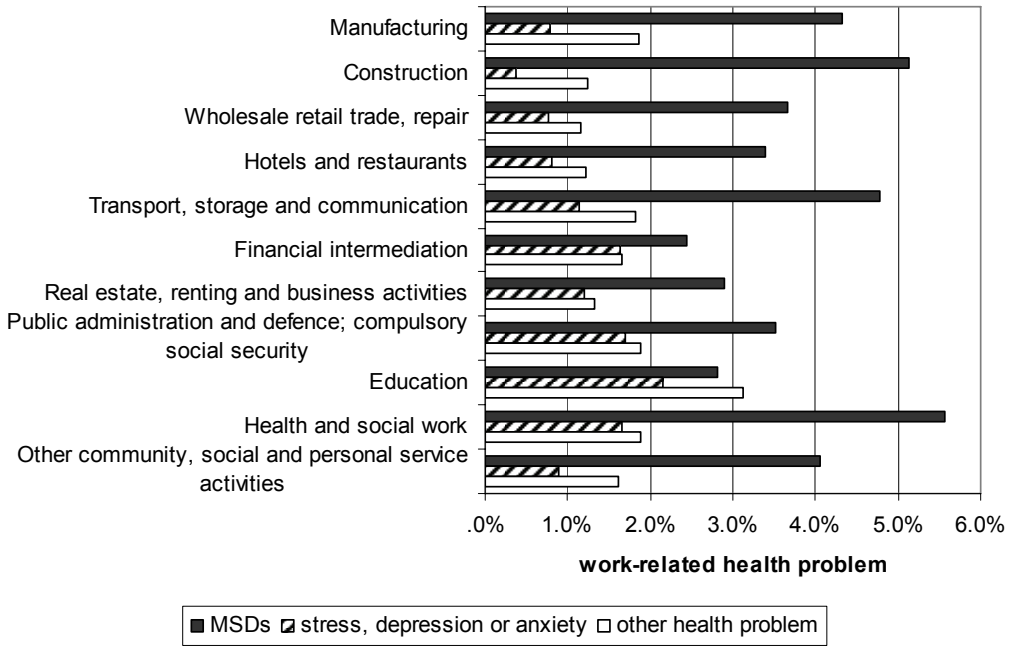


Source: European Working Conditions Survey 2005, Eurofound.

Work-related health problems vary by sector. According to the Labour Force Survey, work-related health problems most often occurred in the sectors 'Agriculture, hunting and forestry' and 'Mining and quarrying'. Workers in the sectors 'Wholesale retail trade and

repair', 'Financial intermediation' and 'Real estate, renting and business activities' reported relatively few work-related health problems[25]. Also the type of work-related health problem varies among sectors. Figure 3.13 shows that in all sectors MSDs were reported most often as the main work-related health problem. In the sectors Education, Financial intermediation and Public administration, stress, depression and anxiety were reported relatively often.

Figure 3.13 Type of work-related health problems in the EU-27 for different sectors*

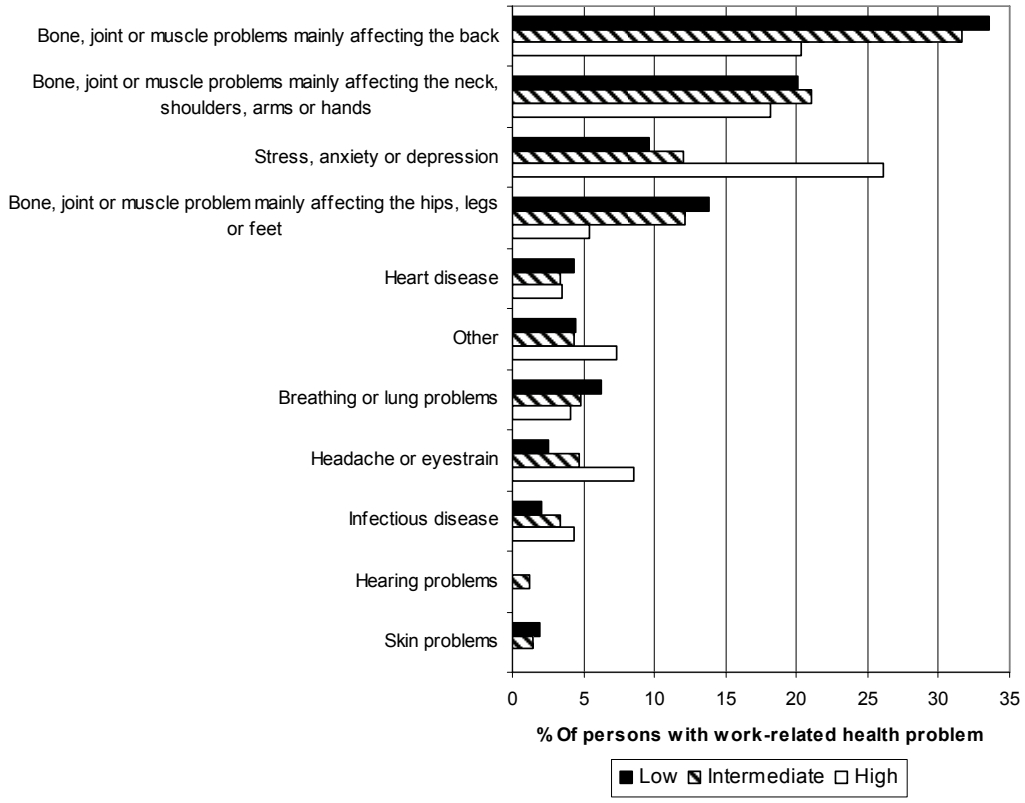


Source: LFS AHM 2007, Eurostat

*Sample size of at least one of the categories below publication limit for sectors Agriculture and hunting, Fishing, Mining and quarrying, Electricity gas and water supply, Private households with employed persons, and Extraterritorial organizations and bodies.

Work-related health problems differ among educational levels. High educated people report less work-related health problems compared to people with a medium or low educational level (**7.3%** versus **8.9%** and **8.9%**), in particular among men (**6.3%**)[25]. Figure 3.14 shows that also the type of work-related health problem identified as the most serious differs between educational levels. Low or intermediate educated people more often identified musculoskeletal problems as the most serious work-related health problem compared to high educated people, although for problems with the 'neck, shoulders, arms or hands', educational differences were smaller. In contrast, high educated people more often reported 'stress, anxiety or depression' than intermediate or low educated people. High educated people also more often reported 'headache or eyestrain'.

Figure 3.14 Main work-related health problem among people that work or ever worked for different educational levels in the EU-27*



Source: LFS AHM 2007, Eurostat

* Sample size below publication limit for skin problems (high education) and hearing problems (high and low education).

The occurrence of work-related health problems varies between countries in Europe (figures per country are provided in Annex 9 Main work-related health problems by country). According to the LFS AHM 2007, **60%** (men: **60%**, women: **59%**) of the people in Europe with a work-related health problem mentioned musculoskeletal problems as the main health problem, **14%** (men: **12%**, women: **16%**) mentioned stress, anxiety or depression and the remaining **26%** (men: **28%**, women: **25%**) mentioned other health problems. In some countries the proportion of musculoskeletal health problems was higher than 65% (Norway, Finland and Austria). Stress, anxiety and depression were mentioned as the main health problems relatively often (>20%) in Sweden, France, United Kingdom, Slovenia, Luxembourg and Denmark, and relatively little (<5%) in Cyprus, Greece, Slovak Republic, Estonia and Romania. It should be noted that differences between countries do not only reflect real differences, but also differences in wording of the questionnaires and cultural differences between countries (see paragraph 2.2.5).

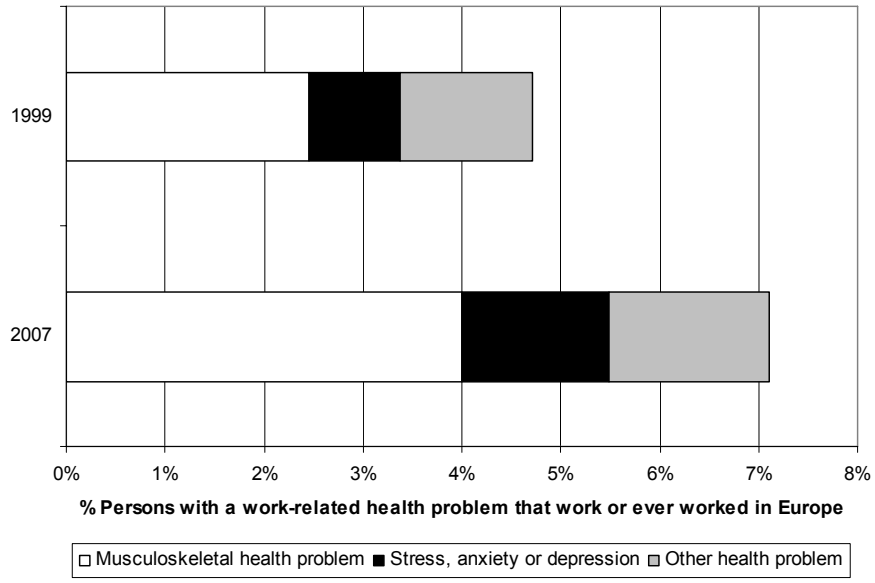
For some diseases, the occupational origin of the disease has been approved by the national compensation authorities. These diseases are classified as occupational diseases. This concept of occupational diseases is obviously dependent on the national legislation and compensation practice, which typically restrict the compensation to cases for which

the occupational factor is the only, or the most important cause [23]. According to the European Occupational Diseases Statistics (EODS), the incidence rate of occupational diseases per 100.000 workers in 2001 was higher in men (48 per 100.000 people per year) than in women (22 per 100.000 people per year). This could be explained by the fact that the workforce is predominantly male in those occupations in which some occupational diseases are common (e.g. asbestos-related diseases, noise-induced hearing-loss). The ten most common occupational diseases in 12 Member States[8] in 2001 were hand or wrist tenosynovitis (5.379 cases), epicondylitis of the elbow (4.585), contact dermatitis (4.457), noise-induced hearing loss (4.068), Raynaud's syndrome or vibration white-finger (3.120), carpal tunnel syndrome (2.483), mesothelioma (1.168), asthma (1.075), asbestosis (738) and coal worker's pneumoconiosis (547) [26].

Trends in work-related morbidity

According to the LFS AHM 1999 and 2007, the proportion of workers with a work-related health problem increased from 4.7% in 1999 to 7.1% in 2007 in nine European countries (DK, ES, FI, HU, IT, LU, PT, SE, UK) (Figure 3.15). Please note that years refer to the year of survey. Among those with a work-related health problem, the distribution in the type of work-related health problem (i.e. musculoskeletal problem, stress depression or anxiety, or other) remained quite similar. It should be noted that the increase might also (partly) reflect increased awareness of work-related health problems.

Figure 3.15 Occurrence of work-related health problems and distribution of type of main problem in people that work or ever worked (15-64 yr) in nine European countries*



Source: LFS AHM 1999 and 2007, Eurostat.

* DK, ES, FI, HU, IT, LU, PT, SE, UK.

[8] BE, DK, ES, IE, IT, LU, NL, AT, PT, FI, SE, UK.

3.4 Non-fatal accidental injuries

In reports and databases, the term ‘accident’ is interchangeable used to either describe damage-only accidents or injury caused by accidents. In this report, we use the term accidental injuries to indicate physical or mental harm caused by accidents.

Unfortunately, some databases do not distinguish between age groups. Therefore, several figures refer to the total population instead of people of working age. Also, not all European countries are included in the existing databases and statistics.

In this paragraph we describe the occurrence of non-fatal accidental injuries in the EU, differences in non-fatal injuries between groups (men/women, age groups) and differences over time. We will also pay attention to the work-relatedness of accidental injuries. In all statistics accidental injuries at work will be mentioned separately. Fatal accidental injuries are described in paragraph 3.5 (Mortality).

3.4.1 Occurrence of non-fatal accidental injuries in the EU

Non-fatal accidental injuries are categorised in unintentional and intentional injuries. The majority of medically treated injuries (**92.6%**) are caused by unintentional injuries and only **7.4%** by intentional injuries [27]. These figures refer to all age groups, and not only to the working age population. Unintentional injuries are further categorized into transportation injuries, workplace injuries and home and leisure injuries. Intentional injuries are classified into two categories: homicide, assault or other violence and attempted suicide (see Table 3.2). In total, **0.4%** of all medically treated injuries in the EU in 2005 were fatal.

Table 3.2 shows the incidence rates of non-fatal accidental injuries in Europe. Most injuries occur during ‘home and leisure activities’, which is defined as injuries that occur at home, at school, during leisure time and sports activities. Second most often occurring injuries are workplace injuries, which happen approximately 50% less often as home and leisure injuries.

Of all home and leisure injuries, most injuries occurred in the residential area and sports area, during play and leisure activities or during sports and exercise. Most injuries were bruises, fractures and open wounds [27]. However, it should be mentioned that the above information was based on only six countries (AT, DK, FR, NL, PT, SE), for which information was available, and that the figures are not limited to the working age population, but refer to all age groups.

Table 3.2 Incidence rates (per 1000 habitants) of non-fatal accidental injuries in Europe (all age groups)

		Males	Females	Total EU
Unintentional injuries	Transport	-	-	3.5 [1]
	Workplace	40	21	32 [2]
	Home and leisure	78	54	66 [3]
Intentional injuries	Homicide and other violence	-	-	4.9 [4]
	Suicide (attempt)	-	-	0.5 [4]

[1] Injuries in 2004, average from EU-27 and Iceland, Croatia, Liechtenstein, Norway, Yugoslav Republic of Macedonia and Turkey, all age groups, Source: UNECE statistics, CARE, population demographics from 2002 (Greece, UK, Croatia, Belgium) or 2003 (other countries), Source: Council of Europe.

[2] Accidental injuries at work, averaged for all EU-27 countries. Source: LFS-AHM 2007.

[3] Hospital treated injuries in 2005, average from six countries (AT, DK, FR, NL, PT, SE) for age group 15-64. Source: Injury DataBase (IDB).

[4] 3-year average (mostly 2003-2005) of intentional injuries, average from EU-27. Source: Injuries in the EU. Statistics summary 2003-2005.

3.4.2 Differences in non-fatal accidental injuries between groups and over time

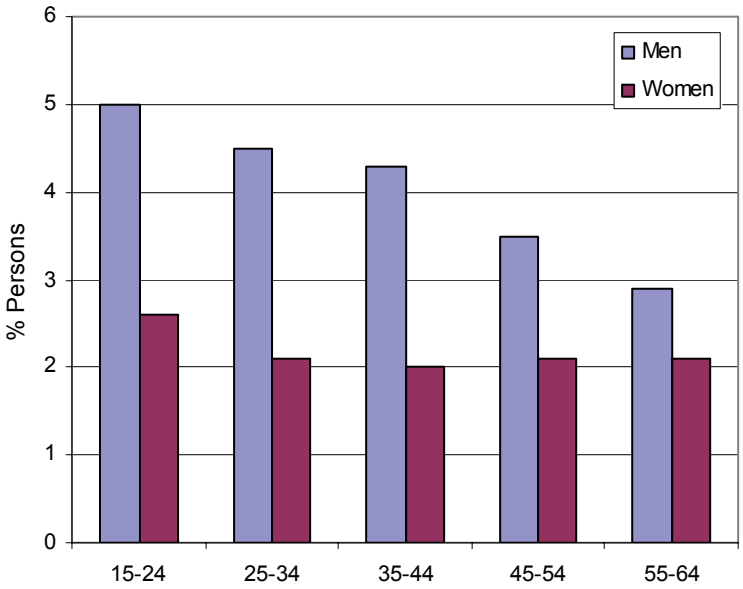
Differences between groups

Table 3.2 shows that men had more workplace injuries as well as home and leisure injuries than women. Figures on injuries due to road accidents are not available for men and women separately. Differences between countries are large, ranging from 0.03% in Romania to 0.9% in Slovenia. For an overview of injuries due to road traffic accidents of each country separately, we refer to Annex 10 Road accidents.

From the recent ad hoc module of Eurostat's Labour Force Survey, more is known about accidental injuries at work. The survey showed that **3.2%** of the workers in the EU-27 had an accident at work during a one year period. Men (**4.0%**) more often reported accidental injuries than women (**2.1%**) (see Figure 3.16). Injuries occur most often in the youngest age group. In the older age groups the percentage of injuries remains rather stable in women, whereas the percentage decreases steadily with the increase of age in men. Differences by country are presented in Annex 11 Accidents at work by country. Country figures range from 0.6% in Bulgaria to 6.3% in Finland, but should be interpreted with care (see paragraph 2.2.5).

A small part of these injuries are due to road traffic accidents (**9.6%**). Men (**9.9%**) are more likely to have a road traffic injury then women (**9.1%**), and 71% of all road traffic injuries are reported by men. About 18% of the road traffic injuries occur in the transport sector, and 17% in the manufacturing sector. In Poland 28.5% of the accidents at work concern road accidents (see Annex 11 Accidents at work by country, separate report).

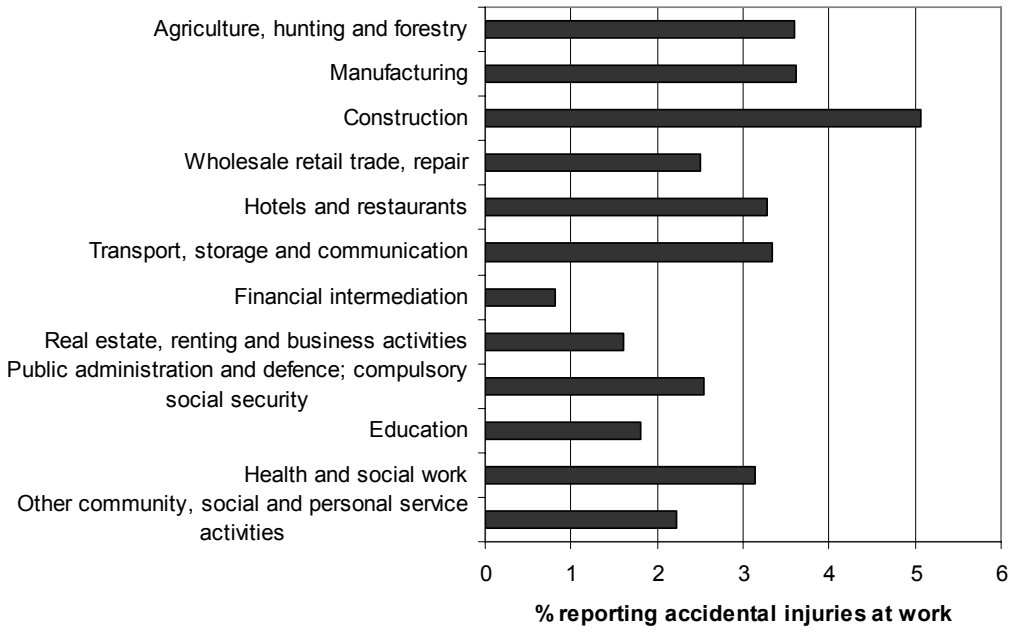
Figure 3.16 Accidental injuries at work in the past 12 months in the EU-27 in different age groups



Source: LFS AHM 2007, Eurostat.

Figure 3.17 shows that accidental injuries were reported most often in the construction sector. Other sectors where the percentage of reported accidents is relatively high are agriculture and manufacturing and to a lesser extent transport, hotels and restaurants and health and social work. The percentage of accidents is very low in the sector financial intermediation.

Figure 3.17 Accidental injuries at work in the past 12 months in the EU-27 in different sectors*

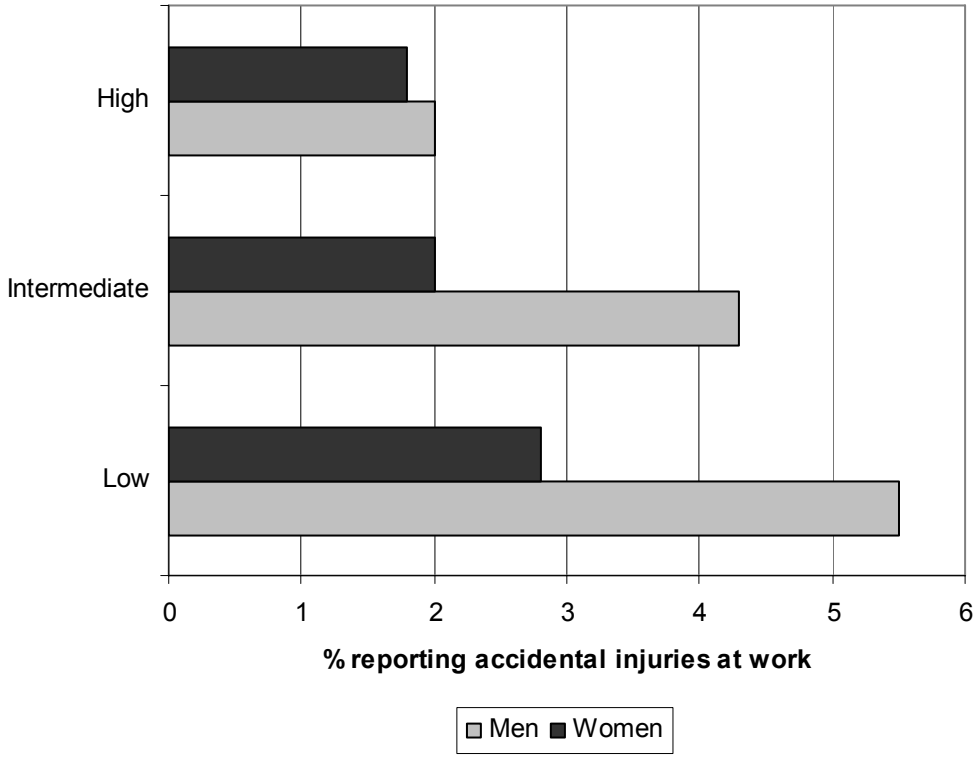


Source: LFS AHM 2007, Eurostat.

*Sample size below publication limit for sectors Fishing, Mining and quarrying, Electricity gas and water supply, Private households with employed persons, Extraterritorial organizations and bodies.

Accidental injuries at work were more often reported by low educated persons (**4.3%**) than intermediate (**3.3%**) and high (**1.9%**) educated persons. Figure 3.18 shows that differences among men are larger than differences among women. The highest percentage of accidental injuries at work was reported by low educated men (**5.5%**).

Figure 3.18 Accidental injuries at work in the past 12 months in the EU-27 in different educational levels



Source: LFS AHM 2007, Eurostat.

Trends

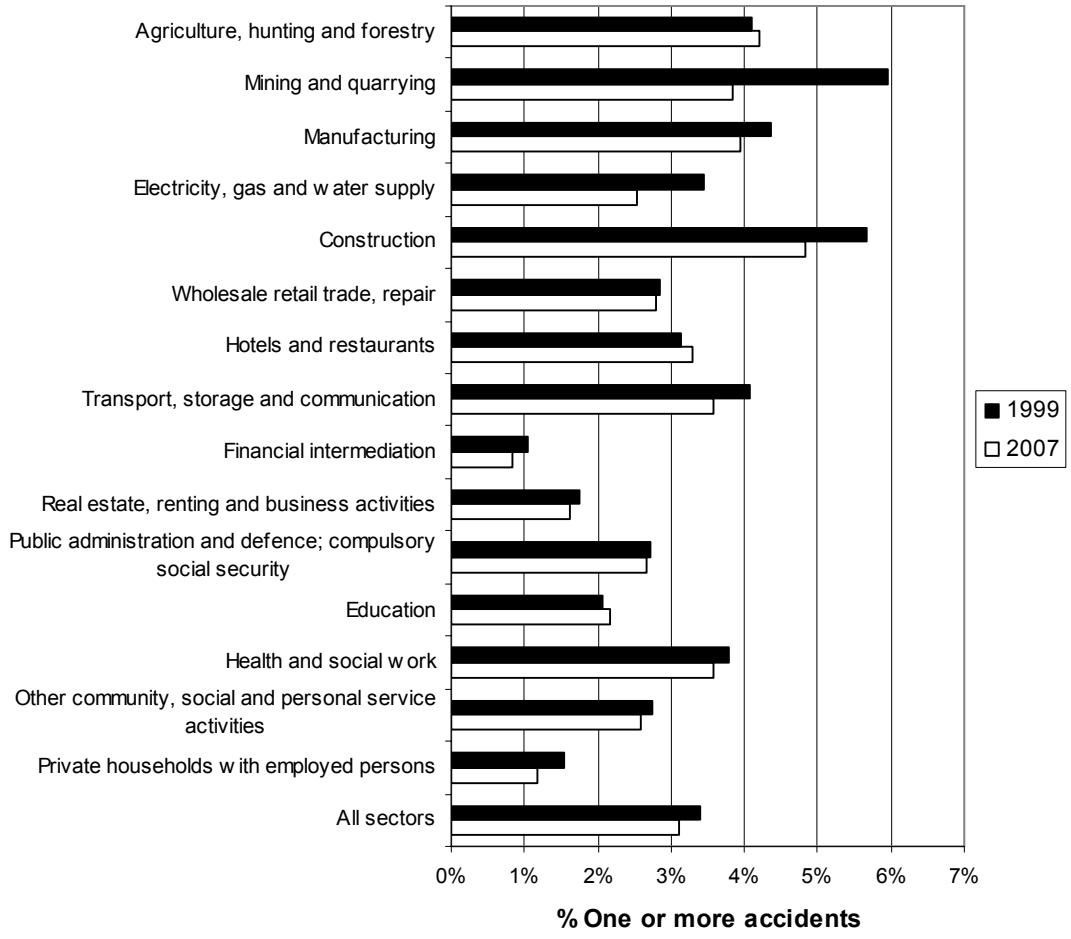
Limited information is available on trends in non-fatal accidental injuries. A longitudinal road injury database, comparing injury data from 14 countries[9] in 1997 and 2006, showed that in all countries a decrease in road fatalities was seen over time, and that most countries show a decrease in road traffic injuries over the course of 10 years. On average road traffic injuries decreased by 25% [28].

For 10 European countries[10], information is available of the occurrence of accidental injuries at work in 1999 and 2007 (LFS AHM, 1999 and 2007). The figures show that the occurrence of accidental injuries at work decreased from 3.5% in 1999 to 3.3% in 2007. Figure 3.19 presents the occurrence of accidental injuries in different sectors in Europe in 1999 and 2007 (years refer to the survey year). Only people working during the reference

[9] BE, CZ, DK, EE, GR, ES, FR, HU, MT, AT, PT, FI, SW, UK.
[10] DK, ES, FI, HU, IE, IT, LU, PT, SE, UK.

week were included, and workers with an accident in their second current job, job one year ago or some other job were excluded. Figure 3.19 shows that in most sectors, a decrease in the occurrence of accidental injuries was found between 1999 and 2007.

Figure 3.19 Occurrence of accidental injuries at work in the past 12 months by sector in 1999 and 2007 in people aged 15-64 years in 10 European countries*



Source: LFS AHM 1999 and 2007, Eurostat.

* DK, ES, FI, HU, IE, IT, LU, PT, SE, UK.

3.5 Mortality

In this paragraph we will present data on mortality. After an overview of overall mortality in the working age population, we will present the main causes of death, followed by a description of work-related causes of death.

Mortality is usually expressed in crude death rates or in standardised death rates (SDR). In SDR the age effect can be taken into account, which improves the comparability over time and among countries. Since we are particularly interested in death among the working age population we will express mortality also in premature mortality. Premature

mortality is the number of deaths in the working age population as a percentage of the total number of deaths.

3.5.1 Overall mortality

Mortality in the working age population covers about **19%** of all deaths in the EU-27, which corresponds to approximately **0.9** million persons in 2007. Two third of these premature deaths occur in men (**0.6** million) and one third in women (**0.3** million). Table 3.3 presents the actual number of deaths by age group.

The SDR in the EU working age population is **269.9** per 100,000 persons. In men aged 15-64 the SDR is **371.7** per 100.000 men, and in women aged 15-64 the SDR is **171.2** per 100.000 women. Table 3.3 shows that in every age group of the EU working age population, the proportion of men that die prematurely is higher than the proportion of women.

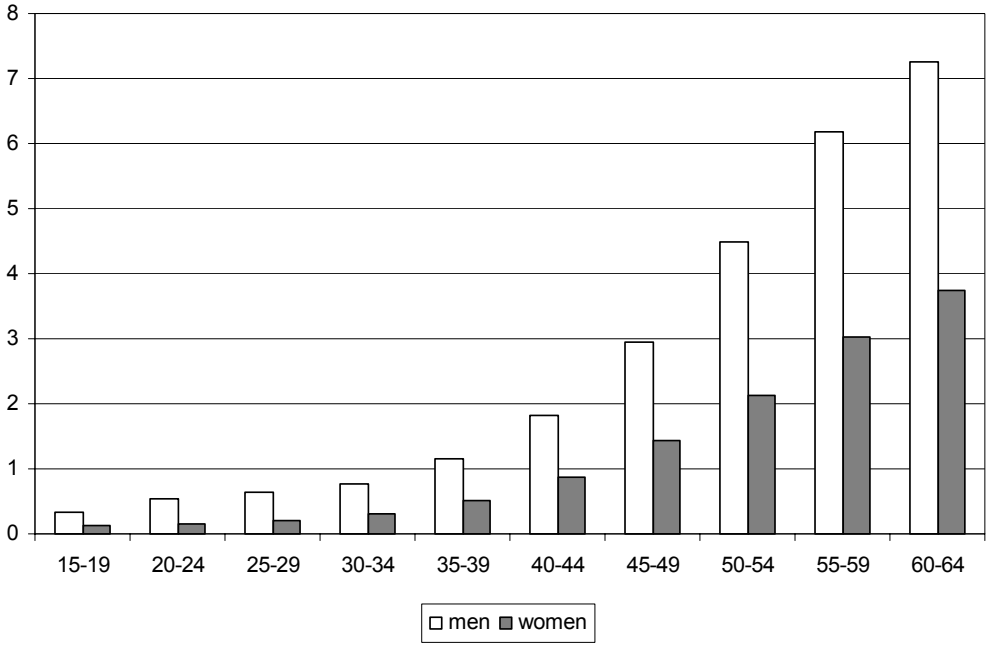
Table 3.3 Number of deaths and death rate per age group in people aged 15-64 years in the EU-27 (2007 or most recent data)

Age	Absolute number of deaths (x1.000)			Deaths per 1.000 individuals		
	Men	Women	Total	Men	Women	Total
15-19	8,2	3,2	11,5	0.5	0.2	0.4
20-24	13,2	3,9	17,1	0.8	0.3	0.5
25-29	15,1	4,9	20,0	0.9	0.3	0.6
30-34	18,7	7,1	25,8	1.0	0.4	0.7
35-39	27,8	12,3	40,1	1.5	0.7	1.1
40-44	43,8	20,8	64,7	2.3	1.1	1.7
45-49	71,0	34,4	105,4	4.0	1.9	3.0
50-54	107,7	51,2	158,9	6.5	3.0	4.8
55-59	148,5	72,7	221,1	9.6	4.5	7.0
60-64	174,7	89,6	264,3	14.0	6.7	10.2

Source: Eurostat Mortality (hlth_cd_anr).

Figure 3.20 shows the premature mortality in the working age population (15-64 years) as a percentage of the total number of deaths. In men, **26%** of all deaths occur in people aged 15-64 years, whereas in women **13%** of all deaths occur in the working age population.

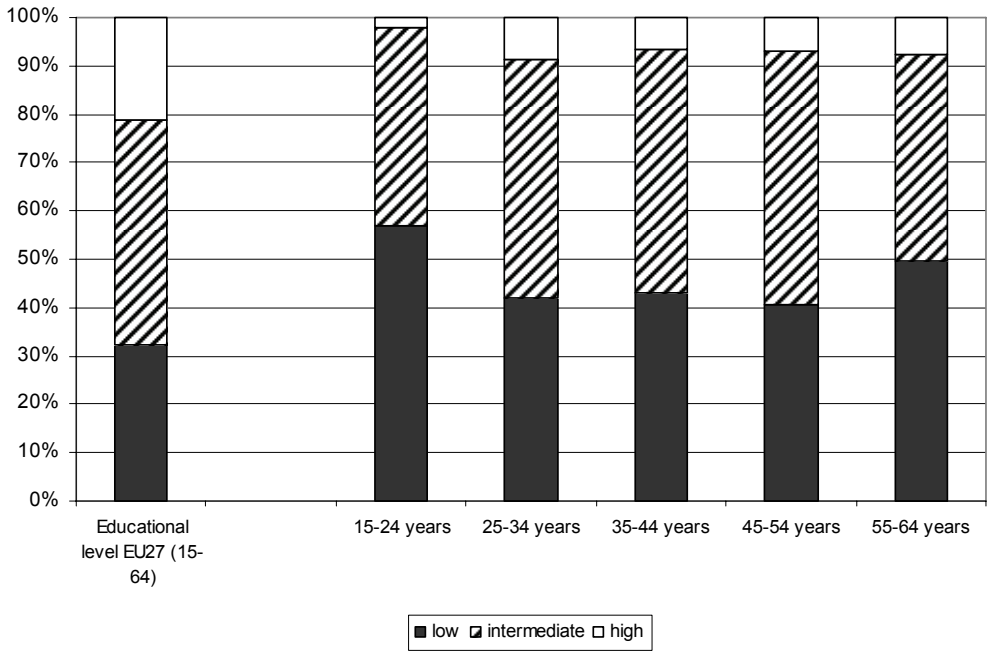
Figure 3.20 Premature mortality among people aged 15-64 in the EU-27 as a percentage of total number of deaths (2007 or most recent data)



Source: Eurostat Mortality (hlth_cd_anr).

Premature mortality varies among socio-economic status. Figure 3.21 shows the educational level of the cases of premature mortality in each age group for eleven European countries. For comparison the overall educational level of the EU-27 is shown as well. It appears that among the premature deaths the group of low educated persons is higher than average in all age groups, in particular among the 15-24 years old. Highly educated people are underrepresented among the premature deaths, in particular in the youngest age group.

Figure 3.21 Educational level of deaths in each age group and the educational level of the EU-27 among people aged 15-64 in eleven European countries*

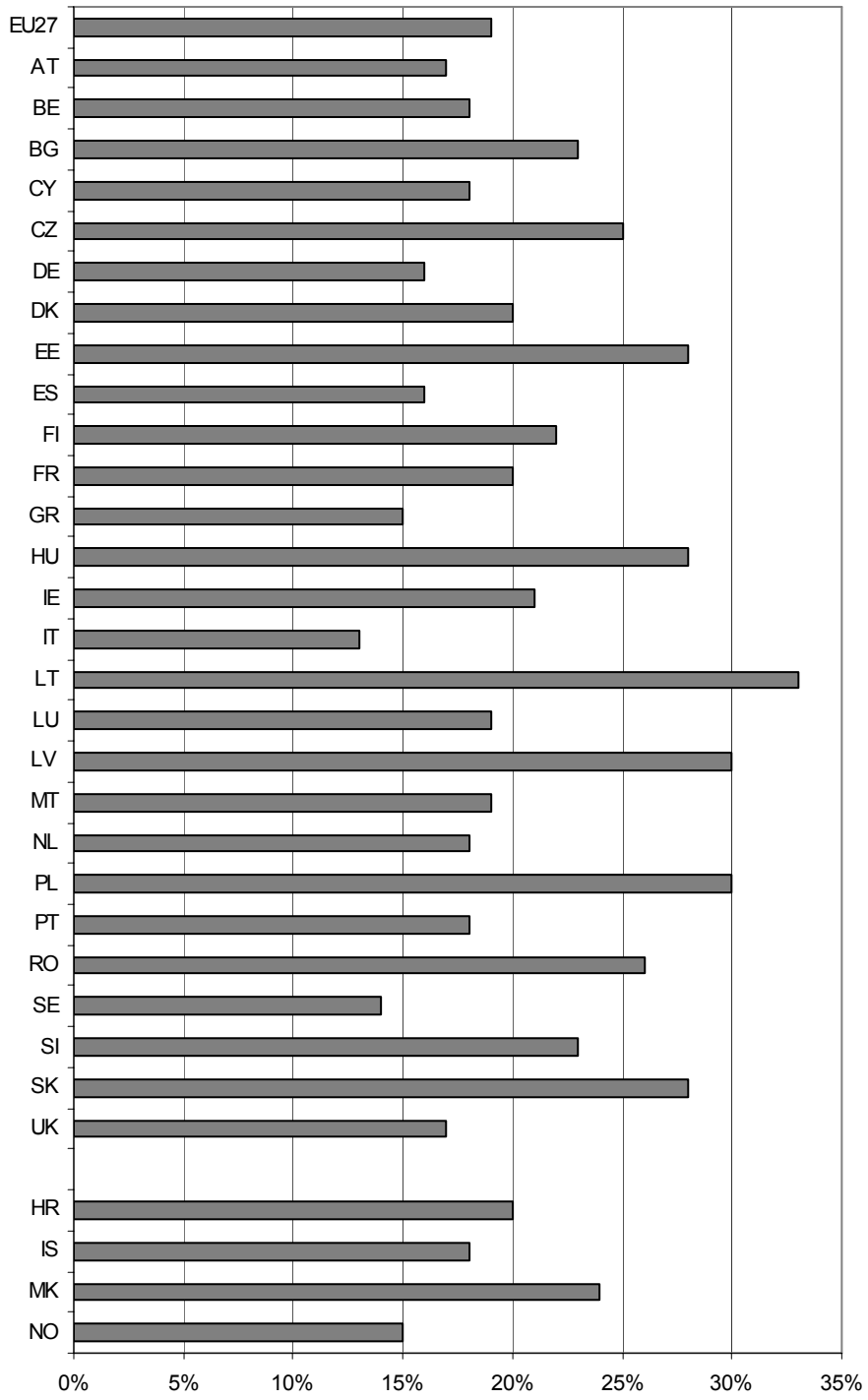


Source: Eurostat Population (demo_maeduc)

* BG, CZ, DK, EE, HU, MT, RO, SI, FI, SE, NO

Large differences in premature mortality exist among European countries (Figure 3.22). Countries with a high premature mortality are Lithuania (33%), Latvia and Poland (both 30%). Countries with a low premature mortality are Italy (13%) and Sweden (14%). In Annex 12 Premature mortality for men and women by country, differences in premature mortality between men and women are presented by country. In most countries the same pattern is observed with premature mortality being twice as high for men than for women. Lithuania has an extremely high premature mortality for men (46%), but premature mortality for women is also relatively high (19%).

Figure 3.22 Premature mortality among people aged 15-64 years as a percentage of number of deaths (2007 or most recent data)



Source: Eurostat Mortality (hlth_cd_anr).

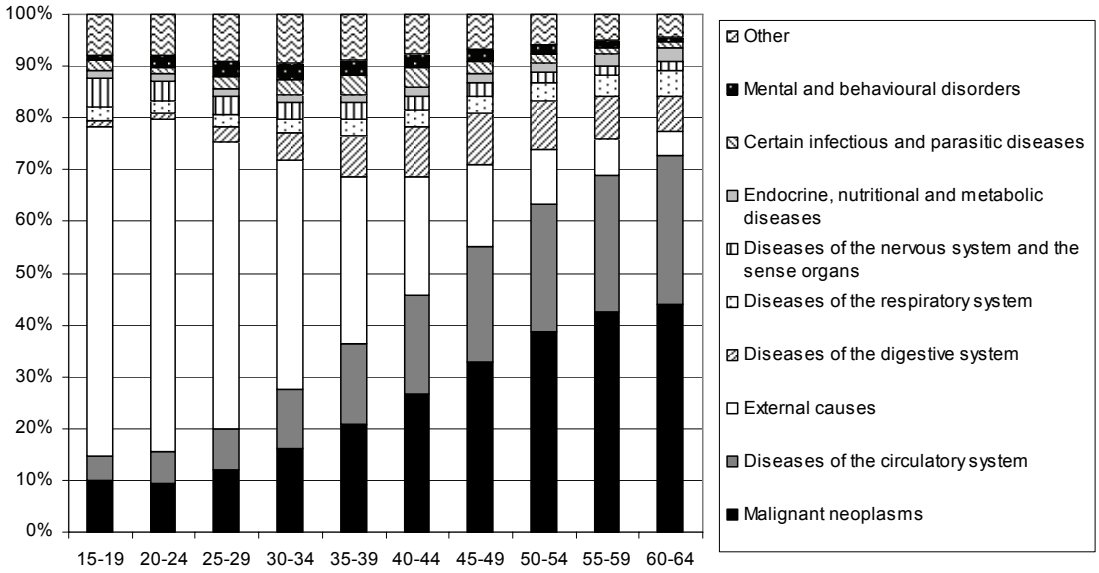
Annex 13 describes premature mortality in different age groups by country. For figures on the standardized death rates per country we refer to Annex 14.

3.5.2 Main causes of death

In 2007, the most important causes of death in Europe in people aged 15 to 64 years were cancer (malignant neoplasms), cardiovascular disease (diseases of the circulatory system), and external causes of death, most notably fatal accidents (Figure 3.23, Table 3.4). Almost **347** thousand people of working age died from cancer in the EU in 2007, **226** thousand working age people died from cardiovascular diseases, and almost **133** thousand working age people died from external causes. These three causes of death represent almost three quarter of the premature mortality in the working age population. Cancer was the cause of death in **36%** of the people in the working age population, diseases of the circulatory system in **24%** and external causes in **14%** (Table 3.4; for all causes of death see Annex 15).

The relative importance of the causes of death changes with age. In people aged 15 to 29 years, 55% to 64% of the deaths are from external causes. The proportion of people dying from cancer and cardiovascular disease strongly increases with age. In people aged 60-64, 72% of the people die from cancer or cardiovascular disease. In the older age groups people also die relatively often from respiratory diseases and diseases of the digestive system (Figure 3.23). In most European countries, cancer is the main cause of death in the working age population, but in some countries cardiovascular diseases are more often the main cause of death (Figure 3.24). Countries where relatively more people die from cardiovascular diseases are Latvia, Lithuania, Bulgaria, Romania and Estonia. Deaths from external causes are particularly high in Lithuania, Latvia and Estonia.

Figure 3.23 Main causes of death as a percentage of total deaths by 5-year age group (2007 or most recent data)



Source: Eurostat Mortality (hlth_cd_asdr).

In Table 3.4, the standardized death rates[11] clearly show differences between men and women. Working age men more often die from cancer than women. Among men, lung cancer occurs most often, whereas women most often die from breast cancer. Furthermore, men die substantially more often from ischemic heart disease and external causes than women.

In paragraph 3.3, it was pointed out that musculoskeletal diseases are a frequent cause of morbidity. However as shown in Table 3.4, relatively few people in the working age population die from musculoskeletal diseases. Musculoskeletal diseases account for only **0.3%** of the premature deaths in the working age population. In Annex 15 the number of deaths and the standardized death rates of 65 causes of death are provided.

In addition to the overview presented in Table 3.4, it should be noted that alcohol-related causes of death often occur. In 2007, it was estimated that 18.1 out of 100.000 people died from alcohol-related causes of death (SDR 28.5 in men and 8.2 in women) [29].

Table 3.4 Absolute number of deaths, standardized death rates and contribution to premature mortality in the working age population (15-64 years) in Europe by cause of death (2007 or most recent data)

Cause of death	Absolute number of deaths (x 1.000 persons)			Standardized death rate (per 100.000 persons)			Contribution to premature mortality (% of total deaths in working age population)		
	men	women	total	men	women	total	Men	women	total
Certain infectious and parasitic diseases	**12.3**	**4.9**	**17.2**	**4.5**	**1.7**	**3.1**	**1.9%**	**1.6%**	**1.8%**
Malignant neoplasms	**201.7**	**144.8**	**346.6**	**72.9**	**49.2**	**60.5**	**31.4%**	**47.1%**	**36.4%**
• colon	11.5	8.4	19.9	4.1	2.8	3.4	1.8%	2.7%	2.1%
• pancreas	11.5	6.9	18.4	4.1	2.3	3.2	1.8%	2.2%	1.9%
• larynx, trachea, bronchus and lung	66.6	24.4	91.0	24.0	8.2	15.7	10.4%	7.9%	9.6%
• breast	0.3	33.0	33.3	0.1	11.3	5.9	0.1%	10.7%	3.5%
• primary of lymphoid, haematopoietic and related tissue	13.0	8.6	21.6	4.8	3.0	3.9	2.0%	2.8%	2.3%

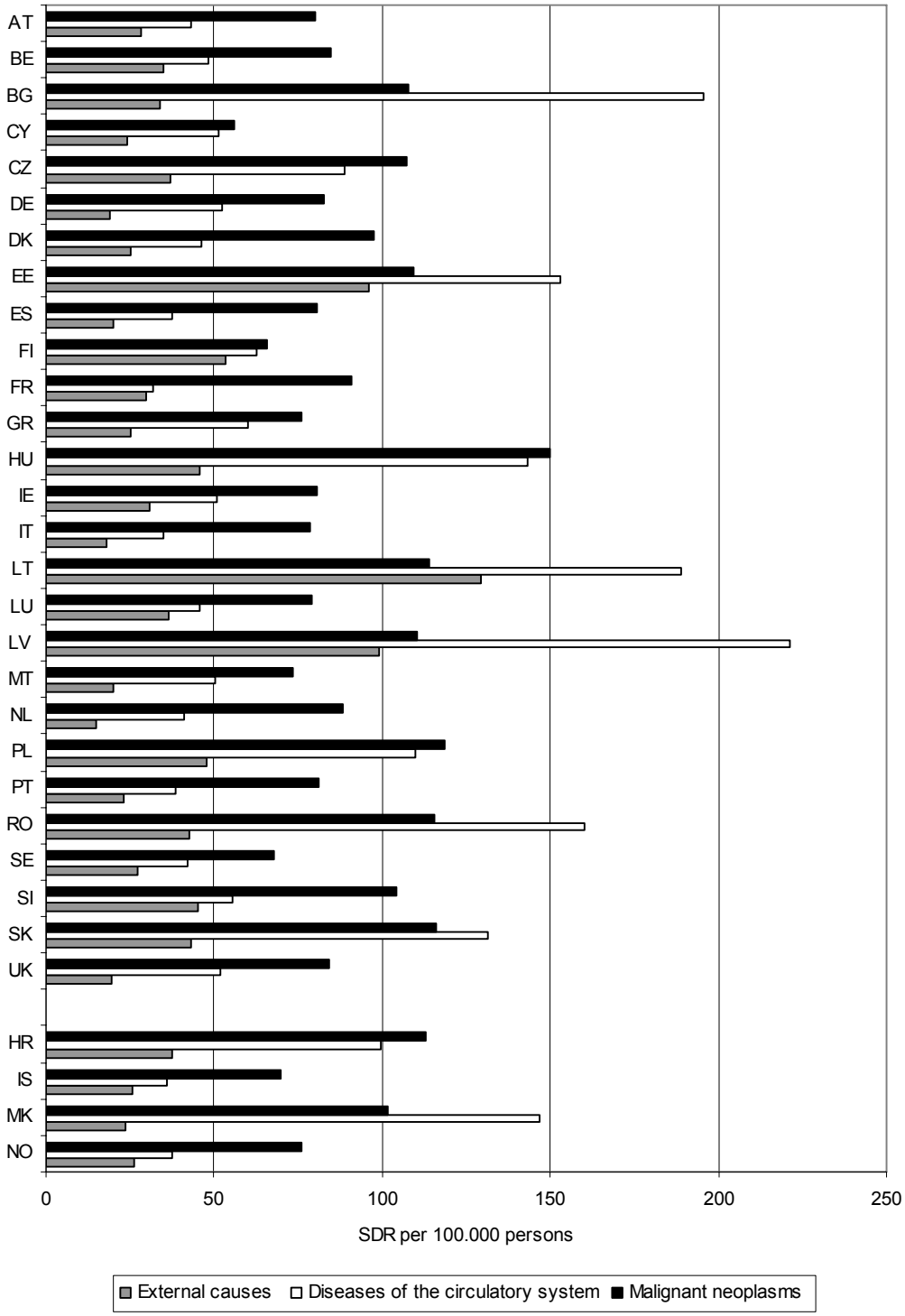
[11] Standardized death rates indicate the number of persons that die per 100.000 persons adjusted for the age structure.

Cause of death	Absolute number of deaths (x 1.000 persons)			Standardized death rate (per 100.000 persons)			Contribution to premature mortality (% of total deaths in working age population)		
	men	women	total	men	women	total	Men	women	total
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	**1.1**	**0.9**	**2.1**	**0.4**	**0.3**	**0.4**	**0.2%**	**0.3%**	**0.2%**
Endocrine, nutritional and metabolic diseases	**12.3**	**6.8**	**19.0**	**4.5**	**2.3**	**3.3**	**1.9%**	**2.2%**	**2.0%**
Mental and behavioural disorders	**12.7**	**3.5**	**16.2**	**4.7**	**1.2**	**2.9**	**2.0%**	**1.1%**	**1.7%**
Diseases of the nervous system and the sense organs	**12.9**	**8.5**	**21.4**	**4.8**	**3.0**	**3.9**	**2.0%**	**2.8%**	**2.3%**
Diseases of the circulatory system	**166.7**	**59.5**	**226.2**	**60.3**	**19.9**	**39.4**	**25.9%**	**19.4%**	**23.8%**
• ischemic heart diseases	81.1	20.1	101.2	29.3	6.6	17.6	12.6%	6.5%	10.6%
• cerebrovascular diseases	28.8	16.8	45.6	10.4	5.7	7.9	4.5%	5.5%	4.8%
Diseases of the respiratory system	**25.3**	**12.1**	**37.4**	**9.2**	**4.1**	**6.5**	**3.9%**	**3.9%**	**3.9%**
Diseases of the digestive system	**52.1**	**21.6**	**73.7**	**19.0**	**7.4**	**13.1**	**8.1%**	**7.0%**	**7.7%**
• chronic liver disease	35.5	14.0	49.5	13.0	4.8	8.8	5.5%	4.5%	5.2%
Diseases of the skin and subcutaneous tissue	**0.3**	**0.3**	**0.6**	**0.1**	**0.1**	**0.1**	**0.1%**	**0.1%**	**0.1%**
Diseases of the musculoskeletal system and connective tissue	**1.1**	**1.5**	**2.6**	**0.4**	**0.5**	**0.5**	**0.2%**	**0.5%**	**0.3%**
Diseases of the genitourinary system	**4.2**	**2.8**	**7.0**	**1.5**	**0.9**	**1.2**	**0.7%**	**0.9%**	**0.7%**
External causes	**105.8**	**26.8**	**132.6**	**39.7**	**9.9**	**24.7**	**16.4%**	**8.7%**	**13.9%**
• transport accidents	29.4	6.8	36.2	11.2	2.6	6.9	4.6%	2.2%	3.8%
• intentional self-harm	31.9	8.9	40.9	11.9	3.2	7.5	5.0%	2.9%	4.3%

Source: Eurostat Mortality (hlth_cd_asdr).

NA = data not available.

Figure 3.24 Standardized death rates[12] in the working age population for the main causes of death, i.e. cancer, diseases of the circulatory system, and external causes of death



Source: Eurostat Mortality (hlth_cd_asdr).

[12] Standardized death rates indicate the number of persons that die per 100.000 persons, adjusted for the age structure.

3.5.3 Work-related mortality

Work-related deaths originate from fatal accidental injuries and from occupational or work-related diseases. An occupational disease may be defined as a disease that results from exposure during a work activity. However, a limited number of diseases are recognised and accepted as occupational disease. The European statistics on occupational diseases (EODS) contain only cases that are recognised as an occupational disease by the national compensation or other competent authorities [26]. In 2003 the European Commission issued a recommendation concerning occupational diseases, which contains a list of diseases that should be linked directly to occupation and a list of diseases suspected of being occupational in origin [30]. Apart from occupational diseases, work-related diseases attribute to work-related mortality as well. Work-related diseases have been shown to have an association with work, but have a multi-factorial origin and have not been caused by work exclusively.

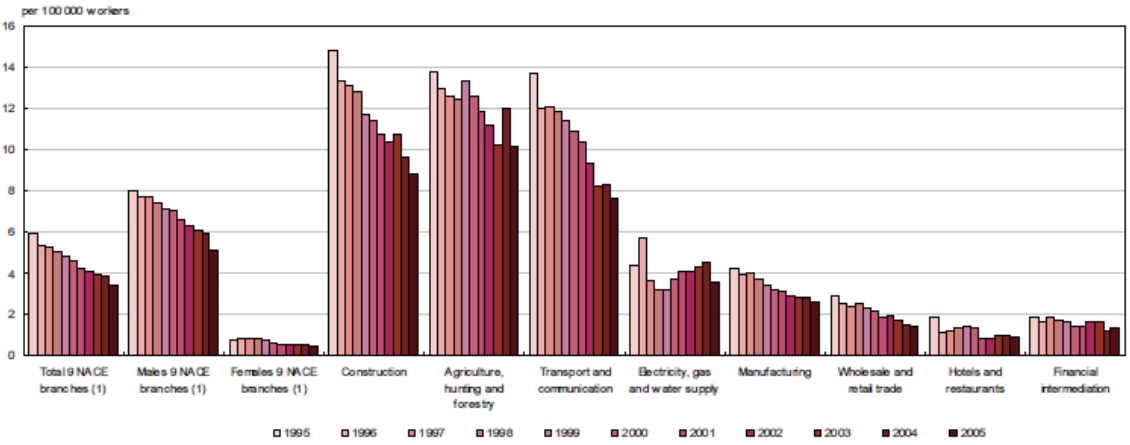
Fatal accidental injuries at work

In 2005, of all accidental injuries at work resulting in more than 3 days' absence, **0.1%** were fatal. The number of fatal accidents at work in the EU-15 was **4,011**, corresponding to an incidence rate of **3.4** per 100,000 workers per year. Only **4%** of the fatal accidents occurred among women. Although older workers in general were less likely to be involved in an accidental injury, the reverse was observed for fatal injuries, with an increase of incidence rates proportionally to the age of workers [31].

The most common types of injury were 'bone fractures', 'concussion and internal injuries' and 'multiple injuries'. These accounted for **59.7%** of all fatal accidental injuries. Road traffic injuries account for more than **39%** of fatal accidental injuries at work in 2005. It should be noted that accidental injuries occurring while commuting to work are not included [31].

Figure 3.25 shows the incidence rates of fatal accidental injuries at work from 1995 to 2005 for nine occupational groupings, and for men and women. The same decreasing trend of risks was observed in all occupational groups, and for men as well as women with an incidence rate significantly higher than the total nine NACE branches. Over a ten-year period, the occupational groups of 'construction', 'agriculture' and 'transport' registered the highest incidence of fatal accidental injuries [31].

Figure 3.25 Incidence rates of fatal accidental injuries at work for nine occupational groups, and for men and women, EU-15, 1995-2005



Source: Eurostat ESAW.

Occupational and work-related diseases

In 2001, the EODS collected data on deaths due to occupational diseases. Only six Member States[13] could provide data on fatal cases. During this reference year, there were 1 362 deaths due to occupational diseases included in the EODS data collection. Extrapolated to the total EU-15 workforce this would mean 5 950 fatalities. In the 6 Member States providing data the most common fatal occupational diseases were coal worker's pneumoconiosis (595 cases), mesothelioma (328), lung cancer due to asbestos (127), asbestosis (101) and silicosis (50). The majority of the deaths occurred in men (97%) and in people aged 65 years or more (79%) [26].

Work-related mortality cannot be easily calculated. Apart from the occupational diseases, mentioned above, work-related diseases attributable to work-related mortality have multiple causes [32]. A measure to assess the proportion of deaths that is related to work is to estimate the attributable factor, representing the fraction of the disease cases that would not have been observed if the risk factor had not existed [33].

A Finnish study has attempted to estimate the proportion of annual deaths related to occupational factors in Finland. They found that the attributable fraction of work-related mortality in the relevant disease and age categories was estimated to be 7% and for all diseases and ages 4%. For men the attributable fraction was higher than for women. Work-related diseases with a high attributable fraction were lung cancer (24%), ischemic heart disease (17%), COPD (12%) and stroke (11%) [33].

[13] BE, DK, IT, LU, AT and FI.

3.6 Summary health measures - DALYs

As we have seen in the previous part of this chapter, European statistics contain mortality data, data on health problems and data on accidents. Statistics differ in several aspects regarding study population and health measure: they refer to people in employment or to people of all age groups, they focus on the main health problem or on all existing health problems, they are limited to work-related diseases or to all diseases, etc. Therefore, they are hard to compare. Moreover, it is not always clear how to compare mortality and morbidity data. Some diseases cause early death but little disability, other do not cause death but do cause disability. To overcome this problem summary health measures have been developed to combine the information on morbidity, the disability involved, and mortality. In the following paragraph we discuss three frequently used summary health measures. Subsequently, we will give an overview of the most important causes of poor health in terms of one of the summary health measures, DALYs.

3.6.1 Different types of summary health measures

Healthy Life Years (HLYs)

Life expectancy is increasing in the EU. However, it is not clear if these extra years are spent in good health. Chronic disease and disability tend to become more prevalent at older ages. The Healthy Life Years (HLYs) indicator (also called disability-free life expectancy) introduces the concept of quality of life and distinguishes between years of life free of activity limitation and years experienced with activity limitation [34]. Usually, the number of HLYs are presented as a value at a certain age, often at birth or at age 65 [35]. HLYs have been calculated also at 50 years, to examine labour force participation of older people [36].

Health expectancies (and the HLY indicator) are most often calculated using the 'Sullivan method' based on the age specific prevalence of a health measure (for instance the proportion of the population with and without disability) and on mortality data [34]. The data required are the age-specific prevalence (proportions) of the population in healthy and unhealthy conditions and age-specific mortality information. A healthy condition is defined by the absence of limitations in functioning/disability. HLYs allow direct comparison of different population subgroups such as sexes, socio-economic groups, regions or countries [35]. Furthermore, this health indicator is appropriate for comparing time trends in health [21]. However, due to cultural differences, considerable care must be taken when comparing different countries [21, 37].

Work Life Expectancy (WLE)

A similar health measure, but more focused on the workforce is Work Life Expectancy (WLE). WLE is an indicator for the future time that a person at a given age is expected to spend in employment. WLE can provide useful information for evaluating the potential of the working-age population to work [37].

Although WLE seem to be an appropriate indicator for evaluating the health of the working age population, there seems to be no consensus on the calculation and

application of this measure. One study states that the indicator does not assume that the years of working life are necessarily healthy years of life [37]. Another study dealt with Healthy Working Life Expectancy (HWLE) and focused on the "healthy *and* working" status [38]. Also, WLE has been defined as a measure that estimates how many work life years a person loses because of *work-related* disability [39].

Disability Adjusted Life Years (DALYs)

Another health indicator combining mortality and morbidity data is the so-called "disability adjusted life years" (DALYs). DALYs are the sum of life years lost due to premature mortality and years lived with disability adjusted for severity. One DALY represents one lost year of healthy life and the burden of disease as a measure of the gap between current health status and an ideal situation where everyone lives into old age free from disease and disability [40].

DALYs allow comparison of the burden of disease of diseases and accidental injuries. Since our aim is to determine which diseases or injuries have an impact on the health of the working age population, DALYs is the most appropriate indicator for this review.

3.6.2 Overview of DALYs

Table 3.5 shows the DALYs for the causes of the global burden of disease (GBD). These GBD categories are based on the International Classification of Diseases, tenth revision (ICD-10), and are grouped into three broad groups, 21 smaller groups and a high number of specific diseases or accidental injuries (see Annex 16 Global burden of disease and ICD codes). Apart from the groups, only diseases or injuries that attributed more than 1% to the total burden of disease in Europe were included in Table 3.5. For an overview of all causes, we refer to Annex 17 Burden of disease in percentage of total DALYs.

Figures for just the EU working age population are not readily available from this study. To gain insight in the burden of disease of the working age population, we added the percentage of the burden of disease for all age groups that is attributable to age group 15-59[14]. Percentages are presented for the high and middle income countries[15]. These figures show that neuropsychiatric disorders, injuries and, in particular in middle income countries, musculoskeletal diseases affect the working age population relatively often. For figures per country we refer to Annex 18 Age-standardised DALYs per country.

[14] For example, the burden of disease of 'maternal conditions' is for almost 100% attributable to age group 15-59, since women of other age groups are seldom pregnant, whereas only 6% of the burden of diseases of 'Alzheimer and other dementias' is attributable to age group 15-59, since people usually develop this disease at an advanced age.

[15] Most countries in Europe are high income countries, with the exception of Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Macedonia and Turkey.

Table 3.5 Burden of disease in percentage of total DALYs for Europe and % of DALYs attributable to age group 15-59 years for all high and middle income countries worldwide

GBD cause	Europe* all age groups % of total Burden of Disease	World % of total Burden of Disease attributable to age group 15-59 years	
		High income countries	Middle income countries
All causes	100.0	57	59
I. Communicable, maternal, perinatal and nutritional conditions	**6.9**	**43**	**39**
A. Infectious and parasitic diseases	**2.2**	**62**	**57**
B. Respiratory infections	**1.4**	**23**	**22**
Lower respiratory infections	1.3	23	22
C. Maternal conditions	**0.4**	**100**	**99**
D. Perinatal conditions	**1.8**	**0**	**0**
E. Nutritional deficiencies	**1.1**	**56**	**35**
II. Non-communicable conditions	**84.7**	**55**	**62**
A. Malignant neoplasm's	**14.9**	**43**	**59**
Colon and rectum cancer	1.7	38	55
Trachea, bronchus and lung cancers	3.0	37	52
Breast cancer	1.5	61	73
B. Other neoplasm's	**0.27**	**37**	**64**
C. Diabetes mellitus	**2.4**	**56**	**66**
D. Endocrine disorders	**1.1**	**60**	**52**
E. Neuropsychiatric disorders	**23.3**	**74**	**78**
Unipolar depressive disorders	7.2	87	86
Bipolar affective disorder	1.2	96	95
Schizophrenia	1.3	83	89
Alcohol use disorders	3.0	96	94
Alzheimer and other dementias	3.2	6	15
Drug use disorders	1.1	98	96
Migraine	1.2	74	67
F. Sense organ disorders	**6.9**	**56**	**65**
Refractive errors	2.1	56	59
Hearing loss, adult onset	3.2	56	75
Macular degeneration and other	1.0	55	61
G. Cardiovascular diseases	**19.0**	**38**	**46**
Ischemic heart disease	8.2	36	47
Cerebrovascular disease	5.2	40	41
H. Respiratory diseases	**5.3**	**52**	**49**
Chronic obstructive pulmonary disease	2.5	56	42
Asthma	1.2	52	55
I. Digestive diseases	**4.5**	**63**	**68**
Cirrhosis of the liver	1.7	71	76

		World % of total Burden of Disease attributable to age group 15-59 years	
J. Dis. of the genitourinary system	**0.9**	**41**	**69**
K. Skin diseases	**0.2**	**41**	**68**
L. Musculoskeletal diseases	**4.4**	**59**	**77**
Osteoarthritis	2.5	49	76
M. Congenital abnormalities	**1.0**	**10**	**6**
N. Oral diseases	**0.7**	**54**	**48**
III. Injuries	**8.3**	**78**	**74**
A. Unintentional	**6.2**	**74**	**68**
Road traffic accidents	2.1	84	81
Falls	1.3	58	62
Other unintentional injuries	2.1	64	63
B. Intentional	**2.2**	**88**	**90**
Self-inflicted injuries	1.7	87	86

* EU-27 + Croatia, Iceland, Norway, Switzerland, Macedonia, Turkey.

Source: The Global Burden of Disease. 2004 update. World Health Organization 2008.

3.6.3 Differences in DALYs between men and women

DALYs are not available for all EU countries by gender. To study the differences between men and women, we have drawn on worldwide figures. These figures distinguish between high, middle and low income countries. A table containing for each disease or injury the percentage of total burden of disease is presented for all countries in Annex 19. It appears that for women breast cancer, neuropsychiatric disorders, in particular depression, and to a lesser extent musculoskeletal diseases account for a relatively large part of their total burden of disease. Men have – compared to women – a relatively high burden of disease due to lung cancer, alcohol and drug use disorders, ischemic heart disease and injuries. These gender differences occur in high income countries as well as in middle income countries.

3.7 Summary of health status of the EU working age population

The majority (77%) of the EU working age population (15-64 years), report that they are in good or in very good health. Of the rest, 18% regard their health as fair, 5% report bad health, and 1% very bad health. Nearly 1 in 4 indicate that they suffer from a longstanding problem which restricts their daily activities.

Older people more often report bad health and longstanding health problems than younger people. In general, women slightly more often perceive their health as bad compared to men, and they report slightly more often a longstanding health problem. High educated people more often perceived their health as good or very good compared to low or intermediate educated people and they reported less health problems.

The main causes of longstanding health problems in the working age population are chronic diseases, while a much smaller part is attributable to congenital anomalies or accidental injuries. The main diseases that caused long-standing health are musculoskeletal diseases, cardiovascular diseases, respiratory diseases, and mental, nervous or emotional problems. European statistics on disability benefits show that, apart from musculoskeletal diseases, mental health problems cause a substantial part of disability, in particular among young people. One-third of the benefits are related to a mental condition, rising to as high as 40-45% in some countries.

Work-related health problems are reported most often in sectors such as‘ agriculture, hunting and forestry’ and ‘mining and quarrying’, and more by low and intermediate educated people than by high educated people. Low or intermediate educated people more often identify musculoskeletal problems as the most serious work-related health problem, while high educated people more often reported ‘stress, anxiety or depression’.

Non-fatal accidental injuries

Accidents are an important contributor to poor health in the working age population. In 2007, 3.2% of the workers had an accident at work. They were reported most often in the construction sector. People in the older age groups were less likely to be involved in an accident resulting in injury, but injuries were more often fatal. Men and low and intermediate educated people more often reported accidental injuries at work than women and high educated people.

Mortality

Deaths of people of working age are a major problem across the EU. Around 900,000 people of working age die each year representing about 19% of all deaths. There are very big differences between countries in the size of the problem. In some countries nearly half of all males die before the age of 65. Many of the deaths which occur in working aged people are avoidable.

Premature mortality before the age of 65 is about twice as frequent in men as in women and higher among low educated people compared to intermediate and high educated people. In 2007, the most important causes of death in Europe in people aged 15 to 64 years were cancer, cardiovascular diseases, and external causes of death, most notably fatal accidents. These three causes of death represent almost three quarter of the premature mortality in the working age population. Cancer was the cause of death in 36% of people in the working age population, diseases of the circulatory system in 24% and external causes in 14%. The importance of the causes of death changes with age. In people aged 15 to 29 years, 55% to 64% of the deaths are from external causes. With age, the proportion of people dying from cancer and cardiovascular diseases strongly increases. In people aged 60-64, 72% dies from cancer or cardiovascular diseases.

Trends

The health of the working age population is fairly consistent over the past few years. Although a slight decrease has occurred in the percentage of people reporting bad or very bad health, the percentage of people with a longstanding health problem has remained more or less the same over the period between 2005 and 2008. One survey showed that

the proportion of workers with a work-related health problem increased between 1999 and 2007 in nine European countries, while the occurrence of accidental injuries decreased. It should be noted that the increase in work-related health problems might partly be due to increased awareness of work-related health problems. Disability benefits show a certain trend towards a higher contribution of mental health problems to the total sum of disability benefits.

According to Eurostat's LFS, the age of the European workforce is increasing and the proportion of women is higher[41]. An older workforce may imply more health problems in the working age population in the future. The consequences of a higher work participation of women is unclear, since differences between men and women with regard to health can be attributed for a large part to their working conditions and those might change as well if women participate more in the workforce.

Work and health

The relationship between work and health is complex. In general, working persons have a better health status than non-working persons. This phenomenon is called the "healthy worker effect". Morbidity may increase the likelihood of withdrawal from the labour force. Health problems may also be an important barrier in (re)gaining access to the labour market. In addition, unemployment and loss of employment may adversely affect health or may worsen health in persons with health problems. On the other hand, work may adversely affect health. Work-related factors may be the only cause of the health problem, but it is much more common that work-related factors increase the risk of a health problem together with other factors. Furthermore, work-related factors may aggravate an existing health problem.

Summary health measures - DALYs

Some diseases cause early death but little disability, whereas other health problems do not cause death but do cause disability. As a consequence, it is difficult to compare the importance of different health problems. To overcome this problem summary health measures have been developed to combine the information on morbidity, the disability involved, and mortality. DALYs are widely used to compare the burden of disease of different health conditions. According to DALYs mental health problems, in particular unipolar depressive disorders, and cardiovascular diseases - in particular ischemic heart disease - contribute largely to the total burden of disease of all age groups. However, mental health problems are more typical for the working age population than cardiovascular diseases. Musculoskeletal diseases do not contribute largely to the total burden of disease, but this is mainly due to the low mortality rate for this type of disease. Accidental injuries also contribute highly to the burden of disease, in particular in the working age population.

4 The impact of poor health on work

4.1 Introduction

In this chapter we present an overview of the consequences of poor health on work participation and productivity while at work using document review and data-analyses.

This chapter addresses the following questions: what is the proportion of people that is not able to work for reasons of health?; and what are the consequences of poor health on productivity at work?

We start with statistics with regard to people out of work for reasons of health. Subsequently, we present a literature overview of the relation between poor health and exit from the workforce through work incapacity, early retirement, and unemployment.

Work incapacity is defined as permanent disability as established by a disability pension scheme. The literature overview also presents the effects of health on productivity loss at work. Thereafter, we present the results of quantitative analyses on the proportion of ill-based mobility out of employment, and productivity loss at work.

As described in Chapter 2 (Methodology), two European databases were used to gain insight into the proportion of mobility out of employment which was related to poor health. These databases are the Survey on Health and Ageing in Europe (SHARE study) and the European Community Household Panel (ECHP). The population of the SHARE study consists of workers aged 50 years and older. The population of the ECHP study consists of workers aged 16 to 65 years. In addition, data on 11,318 Dutch employees (EPLW Database) were used to gain insight in the role of poor health on productivity loss at work.

4.2 People out of work for health reasons

Labour force participation among people with health problems is very low and has not increased over the past decade. The level of unemployment is twice as high as for people without disability. On average, OECD countries spend 1.2% of GDP on disability benefits. This figure reaches 2% when including sickness benefits. Trends in disability recipiency rates are unclear, with countries having increasing, stable and decreasing rates[24]. According to the latest figures, EU governments have been spending twice as much on illness and disability benefits as on unemployment benefits. Despite various schemes aiming to reduce work incapacity rates, some data indicate that there has been a

substantial increase in the number of young people with health problems (many of whom have mental health problems) accessing the disability benefits system across the EU[42].

Table 4.1 shows that **10%** of the people that were previously employed left their job mainly for reasons of health. Other possible answers were 'Dismissed or made redundant', 'A job of limited duration had ended', 'Looking for children', 'Other personal or family responsibilities', 'Education or training', 'Retirement', 'Compulsory military or community service', or 'Other reasons'. Health reasons were mentioned more often by men and by people in the older age groups.

Table 4.1 Percentage of people that were previously employed and answered the main reason for leaving their job was 'Own illness or disability"

Category	Left last job for reasons of health
Men	11%
Women	9%
15-24	2%
25-34	4%
35-44	9%
45-54	18%
55-64	13%
Total	**10%**

Source: EU-LFS 2009, Eurostat.

Table 4.2 shows that **4%** of all people of working age are not searching for employment due to health reasons. Among those not searching for employment this percentage is **14**%. Apart from health reasons ('Own illness or disability') possible answers were 'Awaiting recall to work', 'Looking after children or incapacitated adults', 'Other personal or family responsibilities', 'Education or training', 'Retirement', 'Belief that no work is available', or 'Other reasons'. Although fewer women were searching employment, they are not different from men in their answers with regard to health reasons. Health reasons are more often mentioned as the main reason for not searching employment in the older age groups.

Table 4.2 Percentage of people not searching employment answering the main reason is 'Own illness or disability"

Category	Reasons for not searching employment		
	Employed, found a job, or searching a job	Not searching for health reasons	Not searching for other reasons
Men	81%	4%	16%
Women	68%	4%	29%
15-24	49%	1%	50%
25-34	86%	2%	12%
35-44	89%	2%	9%
45-54	85%	5%	10%
55-64	52%	9%	39%
Total	**74%**	**4%**	**22%**

Source: EU-LFS 2009, Eurostat.

Reasons for leaving the last job were different among European countries. Health as the main reason for leaving a job ranged from less than 1% to 41%. Countries with a high percentage of people leaving employment for reasons of health are Norway (41%), Denmark (22%) and the Netherlands (21%). Countries with a low percentage are France and FYROM (both 2%), and Hungary and Croatia (both 3%) (See also Annex 20).

An indirect way in which health affects work participation is the increasing group of voluntary care givers for people with chronic sickness and disability. The fact that the European population is ageing has not only consequences for the workforce, but will also result in an increasing demand for care services for the elderly. This type of care is often supplied by families and relatives, due to a limited access to formal care[43].

In 2005, the LFS ad hoc module examined the number of people in Europe aged 25-64, regularly taking care of ill, disabled or elderly relatives/friends. The results show that the proportion of caregivers in this age group in the EU-25 was **5.5%**, varying from 0.5% in Luxembourg to 9.7% in Cyprus. Women were more involved in caring than men. Of these caregivers, **71%** is employed[43], which is about the average employment rate of people aged 25-64 in the EU-25 in the same year (70%).[16]

Caring for disabled people might hamper work participation. Among all people in the age group 15-64 not searching for employment, **10%** answered that the reason was 'looking after children or incapacitated adults'.[17] Of all caregivers aged 25-49, 10% wished to work less to have more time for caring, while 14% wished to work or to work more and reduce caring time[43].

Some national studies report a higher risk at poor health for family care givers[44]. One of the recommendations of a European research project aimed at services for supporting family care givers (EUROFAMCARE) was to promote flexible workplace practices, including the development of part-time work for both men and women with full pension and insurance credits for specified periods of time devoted to the care of children, dependent adults and older dependent people[44].

4.3 Incapacity for work

In 11 longitudinal studies the influence of poor health or specific diagnostic group cardiovascular complaints, depression, musculoskeletal complaints or accident on incapacity for work was studied. Work incapacity is defined differently across studies and countries, but primarily reflects permanent disability as established by a disability pension scheme.

The main diagnostic group with an increased risk for incapacity for work were musculoskeletal complaints [45-51] with risks varying from 1.4 to 3.3. The influence of

[16] Website Eurostat; Employment and unemployment [lfsq_ergan] http://epp.eurostat.ec.europa.eu/portal/page/portal/employment_unemployment_lfs/data/database

[17] Website Eurostat; Employment and unemployment [lfsa_igar] http://epp.eurostat.ec.europa.eu/portal/page/portal/employment_unemployment_lfs/data/database

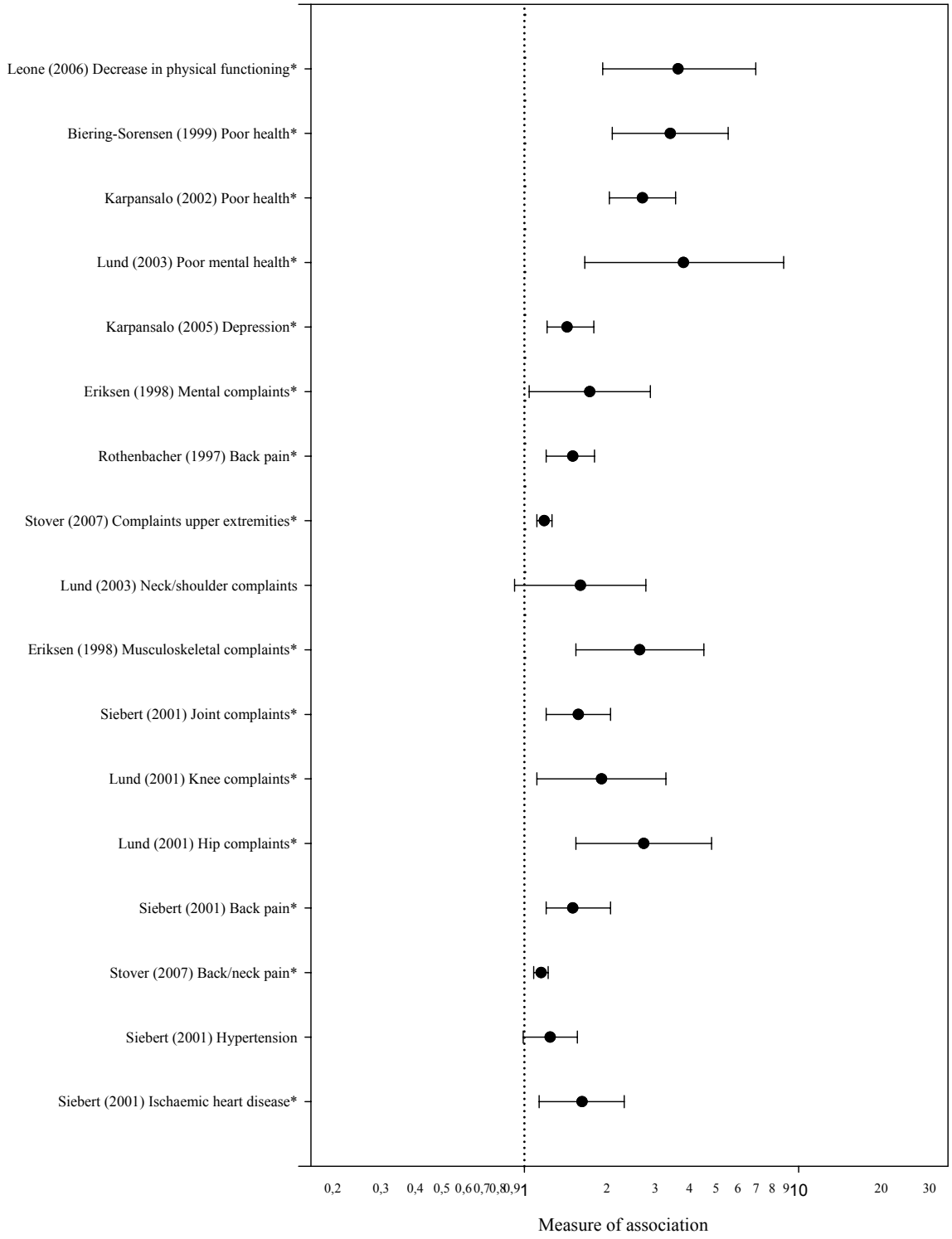
poor health on incapacity for work was found in a broad range of occupational populations (see Table 4.3 and Figure 4.1). The measure of association in the selected studies describes the ratio of the probability of becoming incapacitated in the group of workers with the specific health problems versus those workers without this determinant. This approximates how much more likely a worker is to become incapacitated due to health problems.

Table 4.3 Associations between poor health and incapacity for work in epidemiological cohort studies among occupational populations. (RR= relative risk, OR=odds ratio, HR = hazard ratio, 95% CI= 95% confidence interval, F=females, M=males, * = p<0.05)

Authors	Follow-up	Study population	Determinant	Association	95% CI
Arndt et al. 2005 [45]	10 yr	Germany, 14474 male construction workers, 25-64 yr	Musculoskeletal complaints	RR 2.16*	2.03-2.30
			Mental impairments	RR 0.95	0.81-1.11
			Cardiovascular diseases	RR 1.09	0.98-1.20
Biering-Sørensen et al. 1999 [52]	15 yr	Denmark, 892 workers in the general population	Poor health	OR 3.40*	2.09-5.53
Eriksen et al. 1998 [46]	4 yr	Norway, 1426 workers in the general population, 18-62yr	Moderate emotional complaints vs. little	OR 1.04	0.06-1.78
			Many emotional complaints vs. little	OR 1.73*	1.04-2.88
			Moderate musculoskeletal complaints	OR 1.41	0.79-2.52
			Many musculoskeletal complaints	OR 2.63*	1.54-4.51
Haahr et al. 2007 [47]	2 yr	Denmark, 2080 female workers in the general population, 18-67 yr	Musculoskeletal complaints	OR 3.0*	1.6-5.1
		Denmark, 1181male workers in the general population, 18-67 yr	Musculoskeletal complaints	OR 3.3	0.9-11.1
Karpansalo et al. 2004 [53]	6 yr	Finland, 1748 male workers in the general population	Poor health	OR 2.69*	2.04-3.56
Karpansalo et al. 2005 [54]	1-6 yr	Finland, 1726 male workers in the general population	Many depressive complaints	HR 1.43*	1.21-1.79
			Moderate depressive complaints	HR 1.06	0.89-1.26
Leone et al. 2006 [55]	4 yr	Netherlands, 127 workers with 6-26 weeks sickness absence in the general workforce	Decrease in physical functioning in past 3 years	OR 3.63*	1.93-6.97

Authors	Follow-up	Study population	Determinant	Association	95% CI
Lund et al. 2001 [49]	2,5 yr	Denmark, 2033 waste collectors, road workers, and park maintenance workers	Knee complaints	OR 1.91*	1.11-3.28
			Hip complaints	OR 2.72*	1.54-4.81
Lund et al. 2003 [48]	7 yr	Denmark, 3163 workers in the general population, 19-59 yr	Poor mental health	OR 3.8*	1.66-8.81
			Musculoskeletal complaints	OR 1.6	0.92-2.77
Rothenbacher et al. 1997 [54]	4.4 yr	Germany, 4576 male construction workers, 40-64 yr	Back complaints	RR 1.6*	1.3-2.1
Siebert et al. 2001 [55]	4,5 yr	Germany, 9977 construction workers, 15-64 yr	Hypertension	RR 1.24	0.99-1.56
			Ischemic heart disease	RR 1.62*	1.13-2.31
			Back complaints	RR 1.50*	1.20-1.88
			Joint complaints	RR 1.57*	1.20-2.06

Figure 4.1 Overview of associations between poor health and incapacity for work



4.4 Early retirement

Determinants of early retirement were reported in 6 longitudinal studies (see Table 4.4, Figure 4.2). Most Scandinavian and one European study defined early retirement as retirement during the age of 55-65 year [19, 49, 53, 54, 56]. Other age definitions were used in a British study (50-59,5 year) [57]. The measures of associations in the selected studies describe the ratio of the probability of becoming incapacitated in the group of workers with the specific health problems versus those workers without this determinant. This approximates how much more likely a worker is to retire early due to health problems.

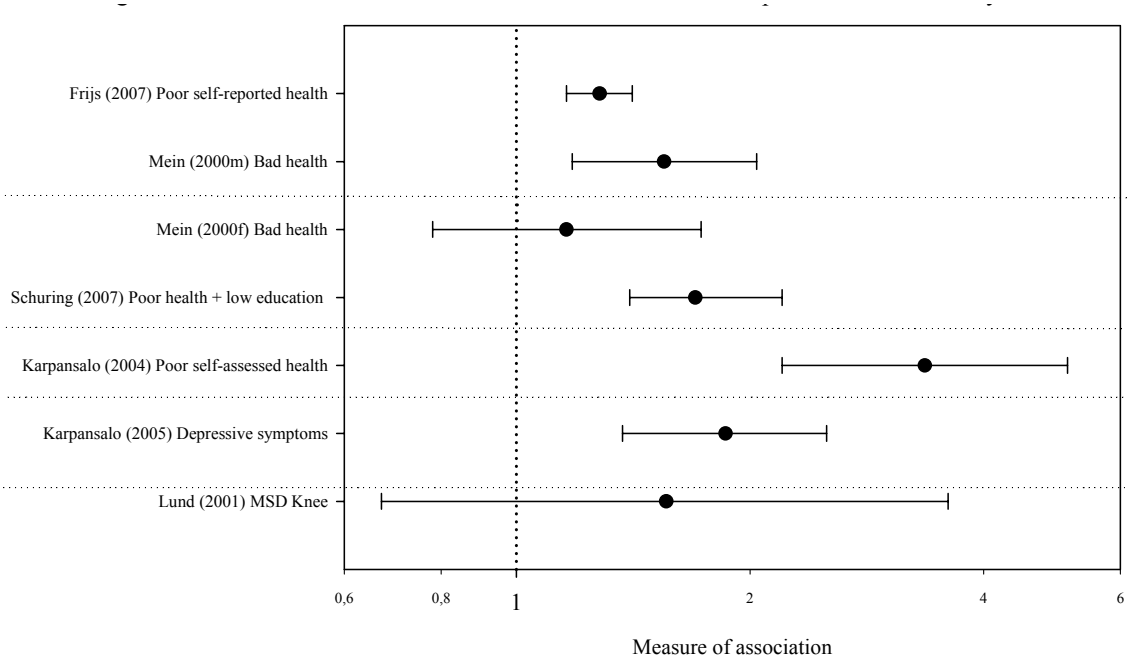
Six studies reported associations between poor health and early retirement, with risks varying between 1.16 and 3.36, and 4 out of 6 studies showed a statistically significant association [18, 58-60].

Table 4.4 Associations between poor health and early-retirement in epidemiological cohort studies among occupational populations. (HR = hazard ratio, RR= relative risk, OR=odds ratio, 95% CI= 95% confidence interval, F=females, M=males, * = p<0.05)

Authors	Follow-up	Study population	Outcome	Determinant	Association	95% CI
Friis et al. [60]	9 yr	Denmark, 5538 nurses aged 51-59 yr	Early-retirement	Less than good health	HR 1.28*	1.16-1.41
Karpansalo et al. 2004 [57]	11 yr	Finland, 1748 middle-aged men in the general population	Non-illness-based pension	Poor health	OR 3.36*	2.20-5.13
Karpansalo et al. 2005 [58]	1-6yr	Finland, 1726 middle-aged men in the general population	Non-illness based pension	High depressive symptoms vs. low depressive symptoms	HR 1.86*	1.37-2.51
				Moderate depressive symptoms vs. low depressive symptoms	HR 1.04	0.78-1.37
Lund et al. 2001 [52]	2.5 yr	Denmark, 149 male waste collectors, road workers, and park maintenance aged >56	Early-retirement	Musculoskeletal disorders of the knees	OR 1.56	0.67-3.60
Mein et al. 2000 [61]	7 yr	England,1699 males civil servants age 50-59.5yr	Early-retirement	Moderate health vs. good/very good health	RR 1.23	0.98-1.54
				Bad/very bad health vs. good/very good health	RR 1.55*	1.18-2.04
		England, 833	Early-	Moderate health vs. good/very good	RR 1.16	0.78-

Authors	Follow-up	Study population	Outcome	Determinant	Association	95% CI
		females civil servants age 50-59.5 yr 4514 workers age55-65 yr	retirement	health		1.73
				Poor health-low education vs. good health-high education	OR 1.7*	1.4-2.2
Schuring et al. 2007 [28]	1 yr	50 078 workers in the general workforce in 11 European countries , 16-65 yr	Early retirement	Good health-low education vs. good health-high education	OR 1.3	1.0-1.6
				Poor health-intermediate education vs. good health-high education	OR 2.0*	1.6-2.7
				Good health-intermediate education vs. good health-high education	OR 1.4*	1.1-1.6
				Poor health-high education vs. good health-high education	OR 1.5	1.0-2.2

Figure 4.2 Overview of the associations between poor health and early retirement



4.5 Unemployment

Table 4.5 (and Figure 4.3) show(s) an overview of the influence of poor health on the risk for unemployment. In 12 longitudinal studies poor health was studied as a predictive factor for unemployment. In four studies a poor mental health or psychological problems or depression showed an increased risk for unemployment with risks varying from 1.16 to 7.75 [61-64]. The measures of associations in the selected studies describe the ratio of the probability of becoming incapacitated in the group of workers with the specific health

problems versus those workers without this determinant. This approximates how much more likely a worker is to become unemployed due to health problems.

Regarding depression, one study reported an increased risk for future unemployment (OR=1.6) [64], whereas three other studies reported increased risks for future unemployment for impaired mental health [61-63].

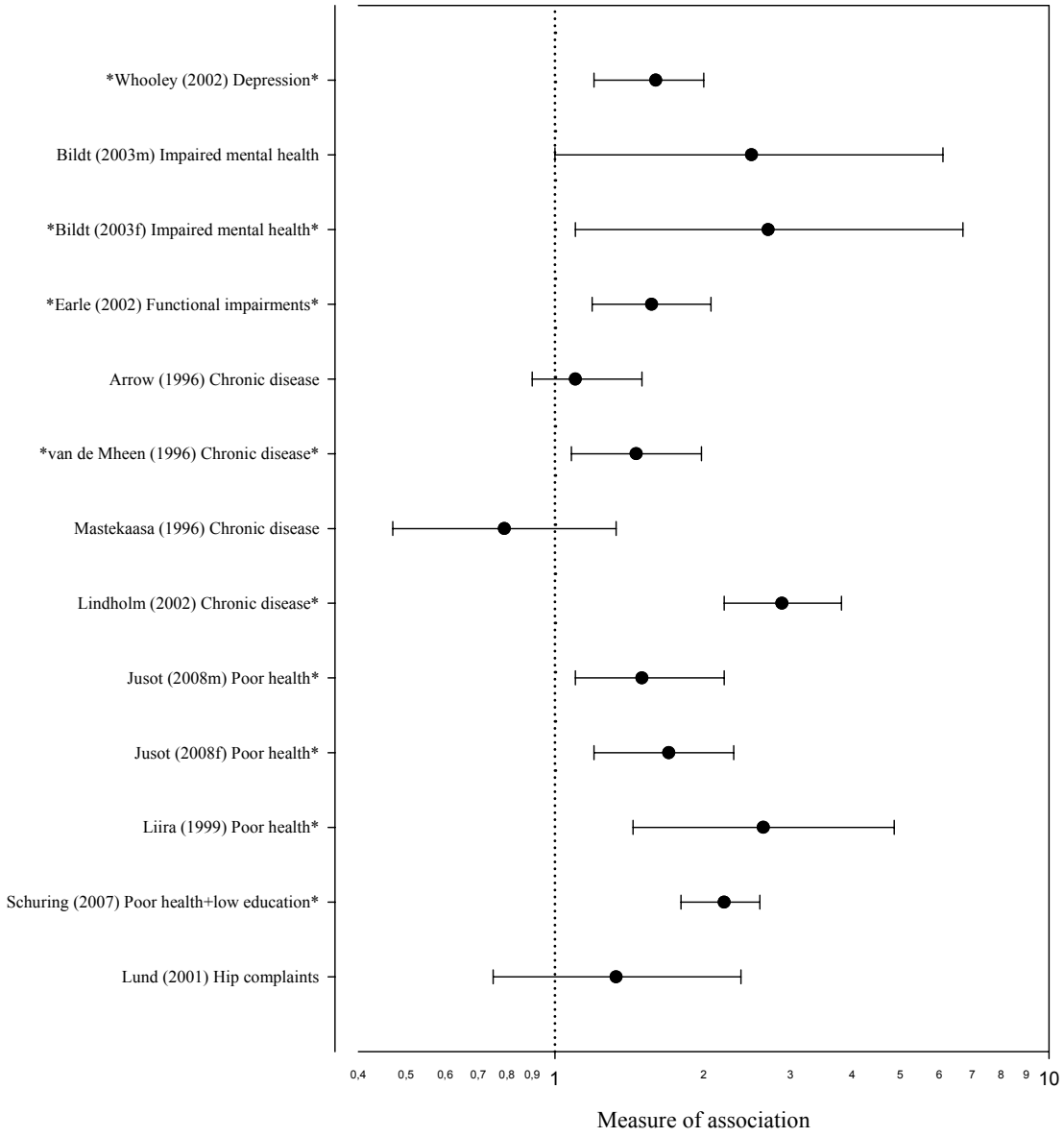
Regarding musculoskeletal complaints, one study reported no significant association between hip complaints and future unemployment [65]. For cardiovascular disease, and accidents no study results were found.

Table 4.5 Associations between poor health and unemployment in epidemiological cohort studies among occupational populations. (RR = relative risk, OR=odds ratio, 95% CI= 95% confidence interval, F=females, M=males, * = p<0.05)

Authors	Follow-up	Study population	Determinant	Association	95% CI
Arrow 1996 [66]	6 yr	Germany, 2424 employees in the general workforce, 18-64 yr	Chronic disease	RR 1.1	0.9-1.5
Bildt et al. 2001 [65]	4 yr	Sweden, 220 female workers in the general population, <59 yr	Impaired mental health	RR 2.7*	1.1-6.7
		Sweden, 198 male workers in the general population, <59 yr	Impaired mental health	RR 2.5*	1.0-6.1
Earle et al. 2002 [67]	7 yr	USA, 783 female workers in the general population	Functional impairments	OR 1.57*	1.19-2.07
Jusot et al. 2008 [68]	4 yr	France, 2420 female workers in the general population, 30-54 yr	Poor health	OR 1.7*	1.2-2.3
		France, 3287 male workers in the general population 30-54 yr	Poor health	OR 1.5*	1.1-2.2
Leino-Arjas et al 1999 [66]	4 yr	Finland, 586 male construction workers, 40-59 yr	Poor mental health	OR 7.75*	1.51-39.93
Liira et al. 1999 [69]	5 yr	Finland, 692 male construction and forest workers <50 yr	Poor health	OR 2.64*	1.44-4.86
Lindholm et al. 2002 [70]	8 yr	Sweden, 1620 workers in the general workforce, 25-64 yr	Blue collar workers, chronic disease	OR 2.88*	2.2-3.8
			White collar workers, chronic disease	OR 2.15*	1.5-3.1
Lund et al. 2001 [52]	2,5 yr	Denmark, 2068 male waste collectors, road workers, and park maintenance workers	Hip complaints	OR 1.33	0.75-2.38

Authors	Follow-up	Study population	Determinant	Association	95% CI
Mastekaasa et al. 1996 [67]	4 yr	Norway, 2119 workers in the general population	Chronic disease	OR 0.79	0.47-1.33
			Psychological problems	OR 1.16*	1.03-1.31
Schuring et al. 2007 [28]	1 yr	50 078 workers in the general workforce in 11 European countries , 16-65 yr	Poor health – low education	OR 2.2*	1.8-2.6
			Good health – low education	OR 1.9*	1.7-2.2
			Poor health – intermediate education	OR 2.4*	2.0-2.9
			Good health – intermediate education	OR 1.4*	1.2-1.6
			Poor health – high education	OR 2.1*	1.6-2.6
Van de Mheen et al. 1999 [71]	4 yr	Netherlands, 1506 workers in the general population, 15-74 yr	Moderate/poor health	OR 1.42*	1.00-2.02
			Chronic disease	OR 1.46*	1.08-1.98
Whooley et al. 2002 [68]	5 yr	USA, 2334 workers in the general workforce	Depression	OR 1.6*	1.2-2.0

Figure 4.3 Overview of associations between poor health and unemployment



4.6 Productivity loss at work

Productivity loss at work can be defined as the decreased productivity that workers experience caused by functional limitations due to health problems, when they are present at work [72]. This loss of productivity at work includes increased time on tasks, decreased quality of work and reduced creativity [73]. In the scientific literature different terms are used for the phenomenon that workers show up at work despite their health complaints: ‘productivity loss at work’, ‘presenteeism’, ‘on-the-job productivity’ etc. Productivity loss not at work, or in other words sickness absence, will not be dealt with in this section.

Because objective measures of productivity at work are rarely available or are difficult to assess, most studies use self-reports to estimate the decrease in productivity that is associated with health problems at work [74].

A considerable proportion of a company's health-related productivity loss derives from work presenteeism (i.e., decreased work performance while at work) [75]. Among Dutch workers about 45% of the workers reported some degree of productivity loss on the previous workday, with an average loss in quantity of productivity of 11%. However, most productivity loss at work will occur due to non-health related causes, for example machine breakdown, quality problems, and logistic problems. It has been estimated that the presence of functional limitations is accountable for 7% of the occurrence of productivity loss in the general workforce, whereas the presence of severe functional limitations is accountable for 6% of the occurrence of productivity loss in the general workforce [76]. Therefore productivity loss at work is most present among workers with health problems.

A systematic review including 37 studies on presenteeism concluded that several health conditions, such as depression, as well as unhealthy lifestyle factors (e.g., obesity and physical inactivity) are associated with reduced on-the-job productivity [77].

Cardiovascular disease

On average the percentage of productivity loss due to presenteeism among workers with heart disease was reported 6.8% per year and an average of 0.5 hours lost per day (assuming an eight-hour work day).Among workers with hypertension the average percentage of productivity loss at work was 6.9%, with an average of 0.6 hours lost per day [78].

Depression

On average the percentage of productivity loss due to presenteeism among workers with depression was reported 15.3% per year and an average of 1.2 hour lost per day (assuming an eight-hour work day) [78].

The National Co-morbidity Survey found that 59% of American workers with lifetime prevalence of major depressive disorder were unable to work 35 days in the past year [79]. Another study analyzed the work output for patients with dysthymia and depressive disorder and reported presenteeism losses between 6% and 10%, compared to healthy controls [80]. A fourth study showed that the negative effect of depression on productivity increased as the severity of depression increased [81]. Furthermore, productivity was more impacted by depression when work tasks contained a high level of interaction with customers.

Musculoskeletal disorders

For example, 56% of the subjects with upper extremity disorders reported that the disorder impaired their productivity at work; the average reduction thereof was 34% [82]. The occurrence of productivity loss in terms of decreased performance at work, decreased speed or decreased working hours, was reported among 13% of Dutch computer workers with neck/shoulder symptoms only, 22% hand/arm symptoms, and 21% among cases with both symptoms [73]. Among workers returning to work from 2- to 6-week sickness

absence due to musculoskeletal disorders reduced productivity (in terms of amount of work done on a regular workday) was prevalent for 60% of the workers, and for 40% still at the 12-month follow-up. The median productivity loss shortly after the return to work and at the 12 month follow-up for the workers who reported lost work time due to musculoskeletal disorders was 1.6 hours per day [83]. Among workers with musculoskeletal problems amounted to 0.5 hr/day (7%) for industrial workers and 2.0 hr/day (25%) for construction workers [72].

Among workers with early inflammatory joint conditions 49% reported productivity loss after 6 months follow-up [84]. In this group predictors of presence of reduced productivity at work were intermediate levels of pain (OR 3.1), poor physical functioning (OR 2.8), poor mental health (OR 2.1), and low support from colleagues (OR 2.2).

Swedish computer workers estimated that the mean loss of productivity among those with musculoskeletal complaints amounted nearly 17 hours per month [85].

Accidents

The number of studies in the literature focusing on presenteeism and occupational accidents is surprisingly sparse. In our literature search none was found.

4.7 Quantitative analyses

Study population 1 (SHARE study)

The study population consisted of participants of the Survey on Health and Ageing in Europe (SHARE study). SHARE is a longitudinal survey that aims to collect medical, social, and economic data on the population aged over 50 years in 11 European Union countries (Sweden, Denmark, The Netherlands, Belgium, Germany, Austria, Switzerland, France, Italy, Spain, and Greece) [86, 87]. Individuals aged 63 years and older were excluded from the current study, since it was assumed that workers normally retired when they became 65 years old at the end of follow-up. While this assumption certainly has limitations, given the complexity to define retirement at the individual level and the small proportion of workers above the age of 63 years in the study population (about 2%), it was considered to be the definition that was most comparable across countries. For the longitudinal analysis of the influence of poor health on exit of the labour market, a cohort was available of 4,611 subjects with paid employment in 2004 and complete information on individual and work related characteristics at baseline and work status at follow-up in 2006.

Study population 2 (ECHP study)

The data were derived from the first five waves (1994–8) of the European Community Household Panel (ECHP). The ECHP is a social survey among member states of the European Union with a longitudinal design to describe the social dynamics in Europe. All surveys were based on a non-stratified random sampling design among all national private households. The overall household response in the first wave was 72%, but varied considerably among countries. The response in later waves of the ECHP study was higher. A detailed description of sampling procedures and response percentages has been published elsewhere [88, 89].

For the purpose of this study, subjects aged between 16–65 years were selected, with available information on employment status and health status during at least three consecutive annual measurements, whereby the employment status remained unchanged in the first and second measurement and a possible employment transition had occurred in the third measurement. This employment transition was defined as becoming unemployed, taking early retirement, or taking care of household. The possibility of becoming disabled could not be studied, since subjects who left paid employment due to permanent disability were classified into the general category 'economically inactive persons', which also included subjects who were without work and who do not wish to consider themselves as unemployed.

Although employment status was ascertained annually, we considered this status as representative for the whole year preceding the administration of the questionnaire. This procedure resulted in a cohort with 3 years of follow-up, with two consecutive years before a possible employment transition. Thus, for every subject, an employment transition was possible in a given year and labour status was regarded as constant in the 2 years before the possible employment transition.

Self-defined employment status was classified into four mutually exclusive categories: employed (paid employment at least 15 h/week, paid apprenticeship or self-employment), unemployed, retired or taking care of household. The study population consisted of 57 436 workers who were employed for at least two consecutive years, of which 6191 (11%) people left the workforce in the last year of follow-up due to unemployment (n = 3000), retirement (n = 2017) or having to take care of the household (n = 1174).

Study population 3 (EPLW database)

The Erasmus Productivity Loss at Work database contains health and productivity data of 11.318 workers in 51 different companies in the Netherlands in 2005-2009. Work settings could be characterized in four main sectors: non-commercial services (n=3527), construction work (n=193), commercial services (n=5458), and industrial manufacture (n=2140). These companies had commissioned an occupational health organization to set up a programme to investigate the employability of the workforce and as part of this programme a questionnaire survey was conducted on health, work demands, work ability, and productivity at work.

The main outcome in this analysis is self-reported productivity loss at work, collected using the quantity scale of the Quantity and Quality (QQ) instrument [76]. Respondents were asked to indicate how much work they had actually performed during regular hours on their last regular workday relative to a normal workday. The quantity of productivity was measured on a 10-point numerical rating scale with 0 representing "nothing" and 10 representing "normal quantity". The outcome was dichotomized into those with productivity loss at work (score less than 10) and those without (productivity score = 10), using the median as cut-off, since the productivity scores were not normally distributed.

Results health related proportion of decrease in work participation (SHARE)

About 17% of the employed workers reported less than good health. During the two year follow-up period 17% (n=794) of employed workers exited the workforce, primarily due to retirement (11%). The proportion of poor health among workers which left the

workforce was 28%, whereas the proportion of poor health among workers which continued working during follow-up was 15%.

Self-perceived poor health was a risk factor for transition to unemployment (OR 2.49), retirement (OR 1.50), and work disability (OR 5.04). All four health measures were associated with any exit from work (ORs 1.56-2.08).

The population attributable fractions of a less-than-good self-perceived health for transition into unemployment, retirement, and disabled were 27%, 9%, and 61%, respectively (see Table 4.6). Under the assumption that the observed associations represent a causal process, these associations and population attributable fractions indicate that a good health is an important factor in maintaining paid employment.

Table 4.6 Proportions, risk and attributable fraction due to poor health among different workers who continued working or left paid employment among 4611 European subjects aged 50 years and older

	Continued working	Exit workforce		
		Retired	Unemployed	Work disabled
Perceived poor health (%)	15.3%	22.8%	33.9%	47.8%
Risk (OR)	-	OR 1.50	OR 2.49	OR 5.04
Fraction of risk attributable to poor health	-	9%	27%	61%

Results health related proportion of decrease in work participation (ECHP database)

About 24% of the employed workers reported less than good health in the year preceding the possible transition out of paid employment. During the one year follow-up period 10.7% of employed workers exited the workforce due to unemployment (5.2%), taking early retirement (3.5%), or taking care of household (2.0%). The proportion of less than good health among workers which left the workforce was 36%, whereas the proportion of less than good health among workers which continued working during follow-up was 23%.

Self-perceived poor health was a risk factor for transition to unemployment (OR 1.43), retirement (OR 2.30), and taking care of household (OR 1.35). The population attributable fractions of a less-than-good self-perceived health for transition into unemployment, retirement, and taking care of household were 14%, 46%, and 12%, respectively (see Table 4.7). Under the assumption that the observed associations represent a causal process, these associations and population attributable fractions indicate that a good health is an important factor in maintaining paid employment.

A stratified analysis for age classes 16 to 35 years, 35 to 50 years, and 50 to 65 years showed comparable odds ratios for the effect of less than good health on the likelihood of becoming unemployed or taking care of household. Due to the increasing prevalence of less than good health with age, the fractions of risk attributable to poor health increased from approximately 0.1%-5.0% in the youngest age group, to 8.1%-8.3% in the middle age group, and 11.7%-11.9% for the subjects aged 50 years and older. Taking early retirement took place almost exclusively among subjects 50 years and older.

Table 4.7 Proportions, risk and attributable fraction due to poor health among different workers who continued working or left paid employment among 57.436 European subjects aged 16 years and older

	Continued working	Exit workforce		
		Retired	Unemployed	Take care of household
Perceived poor health (%)	22.9%	44.8%	31.3%	30.8%
Risk (OR)	-	OR 2.30	OR 1.43	OR 1.35
Fraction of risk attributable to poor health	-	46%	14%	12%

Productivity loss at work

A quantitative analysis was conducted on a database containing health and productivity data of 11 318 workers in 51 different companies in the Netherlands in 2005-2009. Work settings could be characterized in four main sectors; non-commercial services (n=3527), construction work (n=193), commercial services (n=5458), and industrial manufacture (n=2140). These companies had commissioned an occupational health organization to launch a programme to investigate the employability of the workforce and as part of this programme a questionnaire survey was conducted on health, work demands, work ability, and productivity.

Within the whole population 5011 (44%) workers perceived productivity loss of which the mean productivity loss was 26% compared with a regular workday. Among workers diagnosed with at least one disease, irrespective of disease diagnosis, 3825 (47%) workers perceived productivity loss. Mean productivity loss at work was 26.4% among workers with a chronic disease versus 24.6% among workers without a chronic disease.

For all diseases a positive association between disease diagnosis and occurrence of productivity loss at work was found. Under the assumption of a causal association between disease and productivity loss, we estimated that about 14% of productivity loss was attributable to having a chronic disease. For workers with specific health problems percentage attributable to the specific diagnosis varied from 0.1 to 6.3%.

It can be concluded that poor health has negative consequences in terms of productivity loss at work. Health related productivity loss will occur in approximately 7% of the workforce. The prevalence of this productivity loss within groups of workers with specific health problems varied from 13 to 56%.

Productivity loss at work was most profound among workers with depression (mental) complaints, whereas the percentage of productivity loss attributable to the poor health condition was highest for workers with musculoskeletal disorders (see Table 4.8).

Table 4.8 Prevalence, univariate odds ratios (OR) and 95% confidence intervals (CI) of history of accident and different diseases for productivity loss among workers in different companies in the Netherlands (n=11 318)

Disease	Prevalence disease (%)	Prevalence productivity loss (%)	OR	95% CI	Attributable fraction
Accident (N=1293)	11%	49%	**1.26**	1.12-1.41	1.5%
Musculoskeletal disorder (N=4931)	44%	48%	**1.29**	1.20-1.39	6.3%
Cardiovascular disease (N=1631)	14%	48%	**1.19**	1.07-1.32	1.4%
Psychological disease (N=1448)	13%	58%	**1.86**	1.67-2.08	4.5%
Total (N=3117)	**28%**	**47%**	**1.42**	**1.31-1.55**	**14.1%**

4.8 Summary of the impact of poor health on work

In Europe each year around 10% of the people that were previously employed left their job mainly for health reasons. Health reasons are more important as a reason for leaving work amongst men and in people in older age groups. In the EU Labour Force Survey amongst all people of working age, 4% indicated that they were out of the labour market and not searching for employment due to their health. Among those not searching for employment, 14% indicated that health was the main reason. Health reasons are more often mentioned as the main reason for not searching employment in the older age groups.

Poor health and exit from the workforce

Quantitative analysis on the role of poor health in future exit among workers aged over 50 years in 11 EU countries during two year follow-up (database Survey on Health and Ageing in Europe (SHARE)) showed that the fraction of risk attributable to poor health varied between 9% for retirement, 27% for unemployment, and 61% for work incapacity. Compared to other health measures, self-perceived health was strongest related to future exit. In the analysis of another European survey (ECHP database) similar results were found, whereby self-perceived poor health was a risk factor for transition to unemployment (OR 1.43), retirement (OR 2.30), and taking care of household (OR 1.35). The population attributable fractions of a less-than-good self-perceived health for transition into unemployment, retirement, and taking care of household were 14%, 46%, and 12%, respectively. Due to the increasing prevalence of less than good health with age, the attributable fractions of poor health increased with age.

Poor health and productivity loss at work

Depression and musculoskeletal diseases, as well as unhealthy lifestyle factors (e.g., obesity and physical inactivity) are associated with reduced on-the-job productivity. The average percentage of productivity loss at work among workers with cardiovascular diseases (heart disease or hypertension) is estimated as 7%, compared with 15% on average among workers with depression, and 34% among workers with upper extremity disorders.

Quantitative analyses among Dutch workers showed that productivity loss at work was most profound among workers with depression (58%), whereas the percentage of

productivity loss attributable to the poor health condition was highest for workers with musculoskeletal diseases (6%).

Economic consequences

It can be concluded that poor health has a considerable influence on the ability to work. The consequences of poor health differ per diagnostic group in frequency and amount of productivity loss at work. The negative effects of poor health on work have also profound economic consequences. On average, OECD countries spend 1.2% of their GDP on disability benefits alone. This figure reaches 2% when including sickness benefits. For example, in the United Kingdom it was estimated that the annual economic costs of sickness absence and reduced work participation due to poor health amounted to over annually £100 billion among 40 million persons in the working age. The Health and Safety Executive in the United Kingdom has estimated the total cost to employers in Britain of workplace injuries and work-related poor health. The total costs were estimated at £2.9 billion to £3.2 billion per year. This estimate does not take into account societal costs due to reduced work participation.

5 Risk factors of the main diseases/accidental injuries in the working age population

In this chapter we will describe the most important risk factors for the main diseases in the working age population, i.e. cardiovascular diseases, unipolar depressive disorders, musculoskeletal diseases and accidental injuries at work. We will also briefly discuss the risks for respiratory diseases, alcohol use disorders, hearing loss, lung cancer and road accidents. The choice for these diseases was based on their relative burden of disease, their relation to work and their potential for improvement (see paragraph 2.1). It is not our intention to give a complete overview of all possible risk factors. We will quote authoritative studies in this field and add results from recently published reviews, whenever relevant.

5.1 Cardiovascular diseases

Cardiovascular diseases consist of different diseases of the heart and circulatory system. As described in Chapter 3, ischemic heart disease, and to a lesser extent cerebrovascular disease, strongly contribute to the DALYs lost in the working age population. Ischemic heart disease is a disease characterized by reduced blood supply to the heart muscle, usually due to coronary artery disease. Cerebrovascular disease is a group of brain dysfunctions related to disease of the blood vessels supplying the brain, and can result in stroke. Many statistics do not distinguish between different types of cardiovascular diseases and their risk factors. In this paragraph, we focus on ischemic heart disease and, to a lesser extent, on cerebrovascular disease whenever possible.

First, the prevalence of cardiovascular diseases and its impact are described in more detail. Risk factors are addressed thereafter, and subsequently their potential for change, and hence opportunities for prevention, are discussed. Finally, we describe the awareness and use of interventions by survey respondents.

5.1.1 Prevalence and trends

In 2002, **2.1%** of the persons in the working age population (15-64 years) in the EU25 identified ‘heart, blood pressure or circulation problems’ as their most serious health problem (LFS AHM 2002). This corresponded to **12.7%** of all persons with a health problem.

Cardiovascular diseases are the second most important cause of death after cancer in persons aged 15-64 years in EU27 (Eurostat, causes of death). About one in four deaths

of all men and about one in five deaths of all women before the age of 65 are from cardiovascular diseases [90]. Most people die from ischemic heart disease. In 2007, the standardised death rate of ischemic heart disease in persons aged 15-64 years in Europe was **17.6** per 100.000 persons, and the death rate due to cerebrovascular disease was **7.9** per 100.000 persons (Table 3.4; Eurostat Mortality database (hlth_cd_asdr)).

Important differences between countries and regions exist for mortality due to coronary heart disease (ischemic heart disease) (see Figure 5.1, Figure 5.2) [90]. Overall, mortality rates are higher in Central and Eastern Europe. Men die more often from coronary heart disease than women. Cardiovascular disease importantly contributes to the total burden of disease in Europe as expressed by DALYs. Overall, most DALYs are estimated to be lost due to ischemic heart disease (see also Chapter 3).

Figure 5.1 Age standardised death rates from coronary heart disease among men aged 0-64 years in Europe (latest available year) [90]

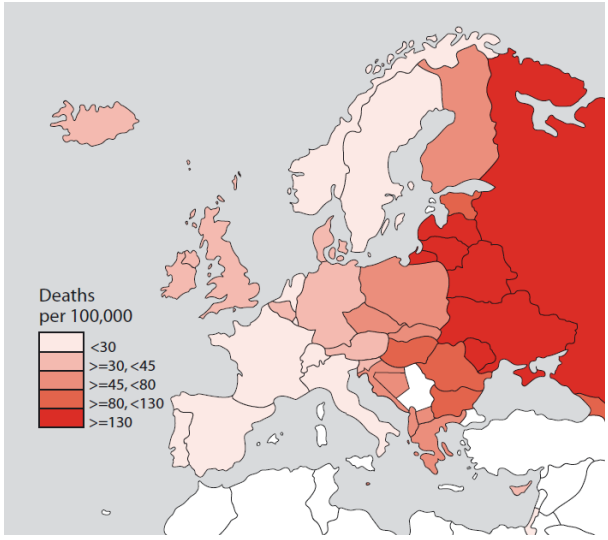
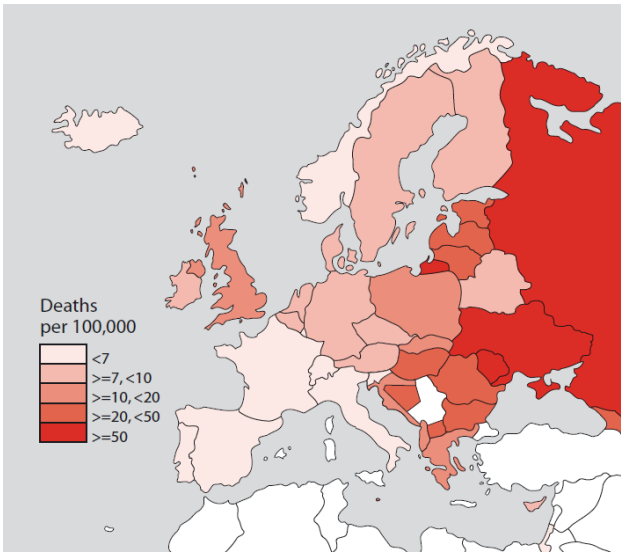


Figure 5.2 Age standardised death rates from coronary heart disease among women aged 0-64 years in Europe (latest available year) [90]



Over the past decades, mortality due to ischemic heart disease changed considerably. In the mid-1970s, a decline in mortality due to ischemic heart disease began in Western European countries, and this continued through the 1990s. In the Eastern part of the EU mortality increased until the 1990s, and subsequently started to decrease. The decline in mortality in the different populations could partly be explained by changes in the average level of risk factors. The more recent decline is also due to the improvement in therapies to be applied in the acute phase, in more efficient therapies for chronic conditions, and the management of risk factors [21].

Mortality from stroke in the general population has also decreased over time. The trends suggest that stroke events become milder, and that the prevalence of stroke survivors is increasing. However, in the 1990s we can see an increase in stroke mortality in the Eastern part of the EU [21].

5.1.2 Risk factors of cardiovascular diseases

Cardiovascular diseases have a multifactor aetiology. Cardiovascular diseases generally clinically manifest themselves in middle life and older age. However, they are responsible for almost 25% of deaths in the working age population (see paragraph 3.5.2), and exposure to the key risk factors (e.g., high blood pressure, elevated levels of cholesterol, diabetes, unhealthy lifestyle, etc.) takes many years and starts during working age [21]. Greenland et al. (2003) showed that 87% to 100% of the persons with fatal coronary heart disease were exposed to at least one of the following major risk factors: high blood pressure, elevated levels of blood cholesterol, smoking, or diabetes [91].

In the following, we describe important risk factors of cardiovascular diseases (Table 5.1). We first describe the risk factors high blood pressure, cholesterol levels, diabetes, and obesity. Thereafter, we address life styles including smoking, diet, alcohol, and physical activity. Finally, (work-related) stress and mental ill health are addressed. Most risk factors that we address are related. High blood pressure, elevated blood cholesterol levels, obesity, and diabetes are for example mostly caused by the interaction of unhealthy lifestyles (smoking, obesity, lack of physical activity) and a genetic predisposition [21].

Table 5.1 Risk factors of cardiovascular diseases

Risk factors of cardiovascular diseases
Blood pressure
Blood cholesterol
Diabetes
Obesity and overweight
Smoking
Diet
Alcohol
Physical activity
(Work) stress

Blood pressure

The risk of cardiovascular diseases is strongly related to both systolic and diastolic blood pressure [90]. In the world health report 2002, it was estimated that in the general population of developed countries, 50% of the coronary heart disease and almost 75% of stroke is related to systolic blood pressure levels in excess of the theoretical minimum (115 mmHg) [92]. In the INTERHEART case-control study, it was estimated that 22% of the heart attacks in Western Europe and 25% of the heart attacks in Central and Eastern Europe are related to a history of high blood pressure [93].

The prevalence of high blood pressure increases with age, and is higher in women than in men [21]. Systolic blood pressure varies considerably among countries and regions in Europe [92, 94]. In the WHO MONICA project, trends data showed that between the mid-1980s and mid-1990s the majority of the European populations aged 35 to 64 years included in the study experienced a decline in the average systolic blood pressure [95].

Cholesterol

The risk of cardiovascular diseases is also strongly related to blood cholesterol levels [90]. In the world health report 2002, it was estimated that over 60% of the coronary heart disease and about 40% of the ischemic strokes in the general population is related to total blood cholesterol levels in excess of the theoretical minimum (3.8 mmol/l) [92]. In the INTERHEART case-control study, it was estimated that abnormal blood lipids were related with a three times increased risk of a heart attack. According to this study, 45% of the heart attacks in Western Europe and 35% of the heart attacks in Central and Eastern Europe could be attributed to abnormal blood lipids [93].

The prevalence of high levels of blood cholesterol increases with age, and is higher among elderly women in older age groups (45+) [21]. Blood cholesterol varies considerably among countries and regions in Europe [92, 93]. Trends data of the WHO MONICA project showed that in persons aged 35 to 64 years in the European region, average blood cholesterol levels declined between the mid-1980s and mid-1990s in about half of the populations included in the study [95].

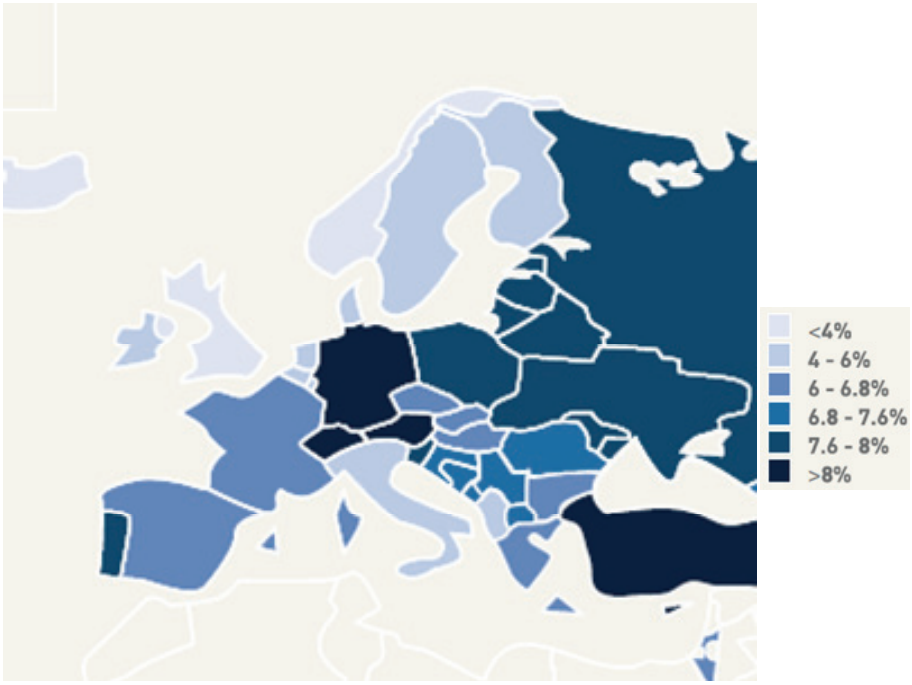
Diabetes

Diabetes substantially increases the risk of cardiovascular diseases, and also magnifies the effect of other risk factors of cardiovascular diseases, including elevated blood cholesterol levels, raised blood pressure, smoking, and obesity [90]. In the INTERHEART case-control study, it was estimated that persons with a diagnosis of diabetes were at three times the risk of a heart attack compared to those without diabetes [93]. Using data from the Framingham Heart Study, Franco et al. (2007) showed that having diabetes increased the risk of developing cardiovascular diseases by about two and a half times [96].

In the International Diabetes Federation's Diabetes Atlas, it was projected that 8.5% of the persons aged 20-79 in the Europe Region will suffer from diabetes (diagnosed and

undiagnosed) in 2010. National prevalence rates for diabetes will show a wide variation, ranging from 2.1% in Iceland to 12.0% in Germany (see Figure 5.3). It was also projected that the prevalence of diabetes in the European Region will increase to 10% of the adults aged 20-79 years in 2030 [97].

Figure 5.3 Prevalence estimates of diabetes in persons aged 20-79 years in the European Region in 2010 [97]



Obesity and overweight

Obesity and overweight are among the most important risk factors of cardiovascular diseases [21, 90, 98]. Obesity is also a major risk factor of other risk factors of cardiovascular diseases, including high blood pressure, elevated blood cholesterol levels, and diabetes [21, 90]. In the world health report 2002, it was estimated that in the general population in developed countries, around one third of the coronary heart disease and ischemic stroke, and almost 60% of the hypertensive disease were related to a body mass index above the theoretical minimum (21 kg/m2) [90, 92]. In the INTERHEART case-control study, it was estimated that persons with abdominal obesity (a high waist to hip ratio) are over twice the risk of a heart attack compared to those without abdominal obesity. It was also estimated that 63% of the heart attacks in Western Europe and 28% of the heart attacks in Central and Eastern Europe could be attributed to abdominal obesity [90, 93]. Abdominal obesity seems to be a better predictor of heart attack than the total body mass index [90, 93, 99].

Based on national surveys, the WHO made estimates of the expected average BMI in men and women in the European Region in 2010 (Figure 5.4, Figure 5.5) [90, 95]. In 2010, many Europeans are projected to be overweight, and a wide variation exists across countries. Because the prevalence of overweight and obesity is growing rapidly in many European countries, obesity has been classified as a ‘global epidemic’ by the WHO [21].

Figure 5.4 Projection of the mean body mass index in 2010 in men aged 15 and over [90]

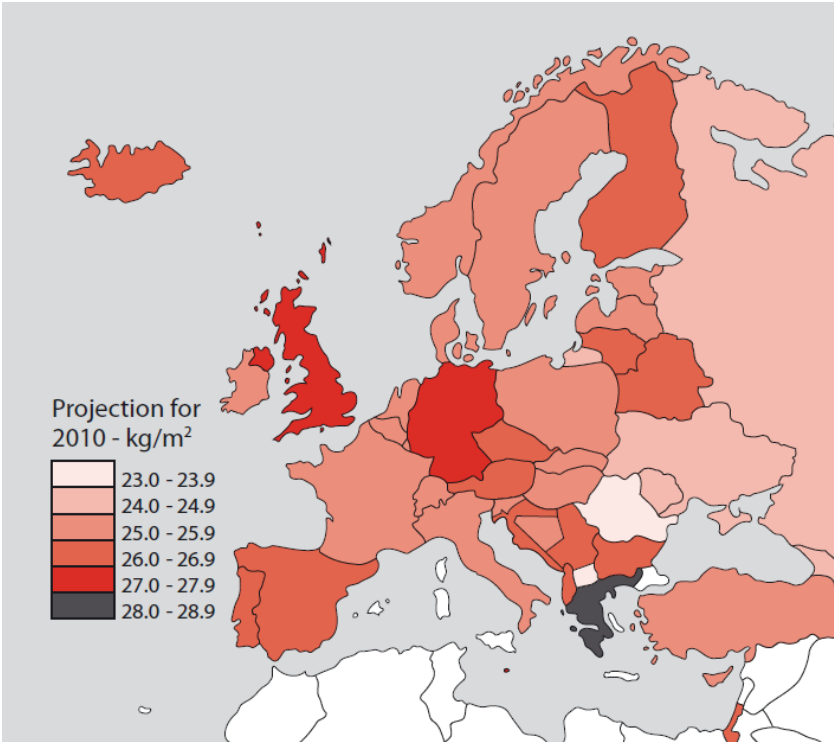
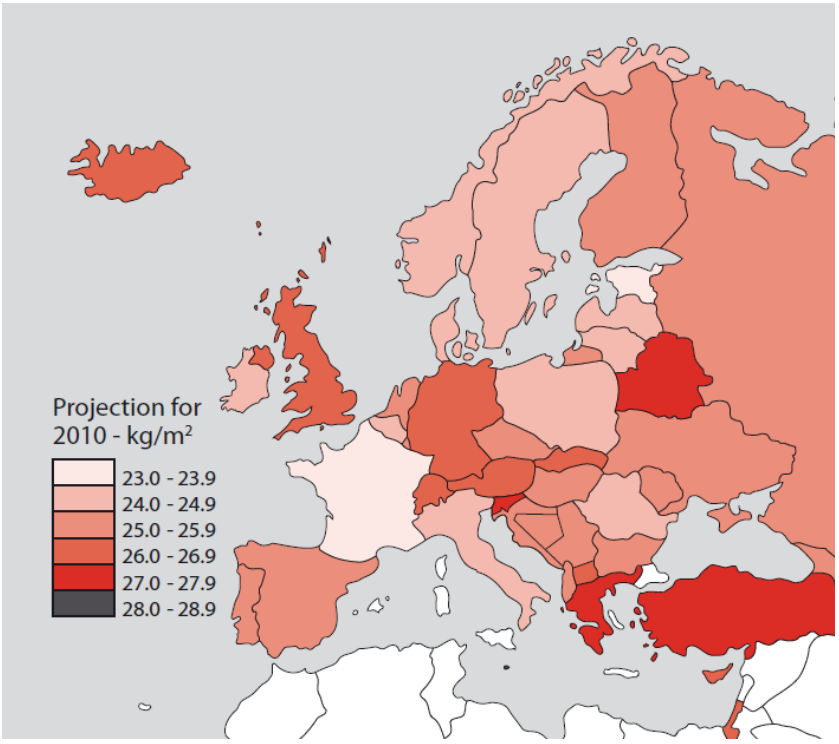


Figure 5.5 Projection of the mean body mass index in 2010 in women aged 15 and over [90]



Smoking

Smoking is a strong risk factor of cardiovascular diseases. The effect of smoking on cardiovascular health is evident even at the lowest levels of exposure. In 2006, 16% of the deaths from cardiovascular diseases in men and 5% of the deaths from cardiovascular diseases in women in the EU25 were due to smoking. Smoking is especially important in premature death, since smoking causes 28% of the cardiovascular death in men aged 35 to 69 years, and 13% of the cardiovascular death in women aged 35 to 69 years [90]. In the INTERHEART case-control study, it was estimated that 29% of the heart attacks in Western Europe and 30% of the heart attacks in Central and Eastern Europe were related to smoking [90, 93].

In the EU25, about 27% of the population aged 15 years and over smoked regularly in 2006 [100]. According to the most recent available data, the proportion of adults who smoke in the EU27 ranges from 15.9% in Sweden to 37.6% in Greece [21]. In general, men smoke more than women. Trends over the past decades show that the differences in smoking prevalence for men and women are declining. The prevalence of smoking in men has fallen over the past 25 years in many Northern, Southern and Western European countries. The prevalence of smoking among women has also fallen in some, but not in all countries. In many countries where there has been a decline in smoking among women, this decline has been less marked [90].

Diet

A diet which is high in fat, salt, and free sugars, and low in complex carbohydrates, fruit, and vegetables increases the risk of chronic diseases, in particular cardiovascular diseases and cancer [90]. Diet is related to several other important risk factors of cardiovascular diseases, including obesity and overweight, diabetes, and blood cholesterol. In the world health report 2002, it was estimated that in the general population in developed countries, just under 30% of coronary heart disease and almost 20% of stroke is due to fruit and vegetable consumption levels below 600 g per day [92].

In the vast majority of countries in Europe that have been studied, the average intake of fruit and vegetables seems to be below the intake recommended by the WHO, whereas the average total fat intake seems to be above the intake recommended [90].

Figure 5.6 and Figure 5.7 illustrate differences in the fruit and vegetable and fat intake in Europe. Trends data suggest that over the past 30 years levels of fat consumption have remained stable in many Northern and Western European countries, whereas the fruit and vegetable intake has increased. In Southern, Central, and Eastern European countries, the fat intake used to be low, but is currently rising. Fruit intake has not increased in these areas, or is even declining in some countries [90].

Figure 5.6 Quantity of fruits and vegetables consumed in Europe in 2001/2003 [90]

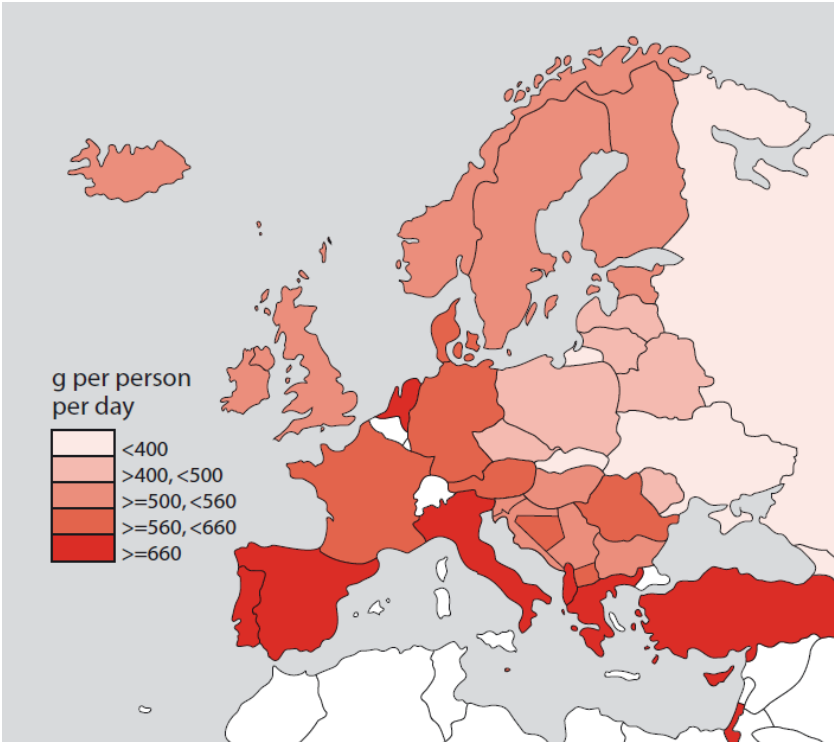
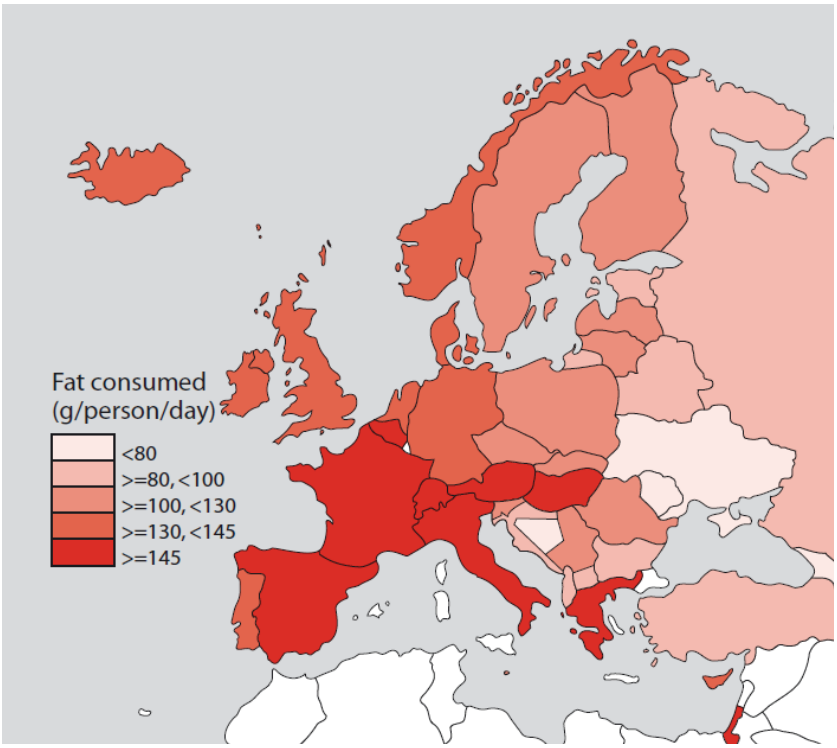


Figure 5.7 Quantity of fat consumed in Europe in 2001/2003 [90]



Alcohol consumption

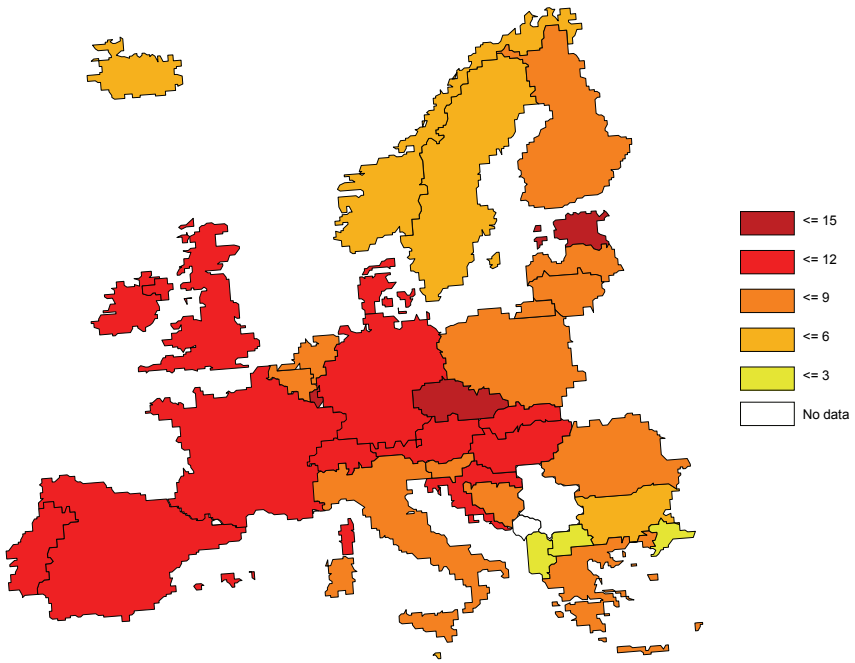
Moderate alcohol consumption reduces the risk of cardiovascular diseases, whereas high levels of intake increases the risk of cardiovascular diseases [90, 101, 102]. Alcohol consumption may increase the risk of liver cirrhosis, injuries, and some forms of cancer.

In populations, the negative effects of alcohol in general outweigh the positive effects [90].

In the world health report 2002, it was estimated that for men in developed countries, 2% of the coronary heart disease and almost 5% of stroke is due to alcohol. In contrast, the impact of alcohol in women was estimated to be positive, with an increase of 3% in coronary heart disease and 16% in stroke if no alcohol were consumed [92]. To fully understand the positive influence of light to moderate consumption of alcohol on cardiovascular diseases, the effects of the role of drinking patterns, beverage types, genetic variations influencing alcohol metabolism, and other factors need to be studied further [101].

The average alcohol consumption in the EU15 was 9.35 litres per person in 2003 (most recent data), and varied across countries (Figure 5.8) [100]. Trends data show that the alcohol consumption has fallen in many Northern, Southern, and Western European countries between 1975 and 2003, but increased in a few countries [90].

Figure 5.8 Alcohol consumption in litres per person in adults aged 15 years and over in Europe in 2003 [100]



Physical activity

A lack of physical activity increases the risk of cardiovascular diseases and other chronic diseases [90]. Physical activity is related to other risk factors of cardiovascular diseases,

including obesity, hypertension, and stress [21, 103]. In the world health report 2002, it was estimated that in the general population in developed countries, 20% of the coronary heart disease and 10% of the stroke was due to physical inactivity (less than 2.5 hours per week of moderate exercise or 1 hour per week of vigorous exercise) [93].

The data on levels of physical activity in the European Region are poor, but data from 2005 suggested that the proportion of the adults in the EU15 who regularly undertake physical activity is low. Over 40% of the adults in the EU15 for example reported no moderate levels of physical activity in the past week [90].

Mental ill health

Mental ill health is an independent risk factor of cardiovascular diseases. In a meta-analysis, it was found that depression predicts the development of coronary heart disease in initially healthy persons [104]. Mental health may influence cardiovascular risks directly via biological reactions such as the release of stress hormones, and indirectly via unhealthy lifestyles (e.g. physical inactivity, smoking, diet, alcohol). The strength of the association between mental ill health and cardiovascular diseases is of similar magnitude to that of standard risk factors such high cholesterol or a lack of physical activity [105]. In the INTERHEART case-control study, it was found that persons who reported depression had a 55% increased risk of myocardial infarction [106]. The prevalence of depression will be further discussed in paragraph 5.2.1. In addition to depression, some studies suggest that anxiety is also related to an increased risk of cardiovascular diseases [105].

(Work) stress

Chronic stressors including work stress, marital unhappiness, and the burden of care giving may affect cardiovascular health [105, 107]. Permanent stress at home was associated with an about twofold increased risk of acute myocardial infarction in the INTERHEART case-control study [106].

According to a meta-analysis of prospective cohort studies, work stress is associated with about a 50% excess risk of coronary heart disease [108]. Permanent work stress was associated with an approximately twofold increased risk of acute myocardial infarction in the INTERHEART case-control study [106]. Besides, work stress has been related to other risk factors of cardiovascular diseases, such as hypertension, diabetes, and unhealthy lifestyle behaviour [105].

Specific job characteristics that influence job stress have been studied in relation to cardiovascular health. High job demands and low job control over working tasks increase the likelihood of cardiovascular diseases in men and women, and low levels of support further increase these risks. In addition, an imbalance between the effort of the job and the reward received (effort-reward imbalance (ERI)) also contributes to coronary heart disease and cardiovascular mortality [107]. In a meta-analysis of prospective cohort studies, an imbalance between effort and reward appeared to be related to an almost 60% increased risk of coronary heart disease [108]. Enterprise restructuring and job insecurity may also adversely affect cardiovascular health [109].

The prevalence of work stress is substantial according to the European Working Conditions Survey 2005, and work stress is not equally distributed across European countries and different socioeconomic groups [110]. In 2005, almost two-third of the

workers in the EU25 reported working with tight deadlines for at least one quarter of their working time. A similar proportion reported they have to work at a very high speed. More than one third of the workers reported not to have control over the order of working tasks, and a slightly lower proportion had no control over work methods or pace. Moreover, about one third of the workers reported low social support from colleagues. More than every second worker believed he was not well paid for the job he did, and almost two-thirds considered the job does not offer good prospects for career advancement. In total 13% of all workers in the EU25 in 2005 feared to lose their job in the next 6 months [105, 110].

In addition to work stress, other work-related factors may contribute to the risk of cardiovascular diseases. One of the risk factors that is currently gaining attention is exposure to traffic-related air pollution in road workers.

5.2 Unipolar depressive disorders

Unipolar depression (also known as clinical depression) is a mental disorder characterized by an all-encompassing low mood accompanied by low self-esteem, and loss of interest or pleasure in normally enjoyable activities (WHO definition). Depression and mental disorders in general are usually non-fatal. However, they are associated with marked disability and functional impairment [105]. As described in Chapter 3, depression is the leading cause of moderate or severe disability worldwide in persons aged 0-59. Unipolar depression is highly co-morbid with other mental disorders such as anxiety disorders and alcohol misuse, but is also associated with physical chronic disease. About 50% of mental disorders are estimated to be co-morbid, and thus, diagnoses such as pure depression or pure anxiety disorders are relatively rare [105].

In this paragraph, we describe the prevalence of depression and trends over time. Then, risk factors for depression are described, as well as their relation to work. Since many statistics do not distinguish between different types of mental illness, we report on mental illness in general if no separate data on depression is available.

5.2.1 Prevalence and trends

In the general population of the EU, the 12-month prevalence of depression ranges between 3-10%. The lifetime risk of depression has been estimated to be even higher (12-16%). Furthermore, relapse of depression is frequent up to 10 years from first presentation [111]. The peak age of a first-onset major depressive episode is between 25 and 45 years of age, although there is an increasing recognition of depression during adolescence and young adulthood [111, 112]. Depression ranks as the second leading contributor to the total burden of disease in Europe [113]. Since, the percentage attributable to age group 15-59 years is very high (86-87%, see Table 3.5, Chapter 3), we estimate depression to be even the most important cause of disability in the working age population. However, due to the often non-specific complaints, under diagnosis and under treatment are still common. For example, depression is not recognized in about 50% of people in primary care [114]. The reasons for under treatment can be due to stigma

associated with mental disorders or limited access to health services in different countries [21]. The WHO commented that the incidence of mental ill health and mental health problems – and their role in causing sickness absenteeism and work disability – are currently increasing [105]. Also, statistics on disability benefits show a certain trend towards a higher contribution of mental health problems to the total sum of disability benefits [24].

5.2.2 Risk factors of depression

Both work-related and non-work-related factors have been found to be associated with depression. An overview of the most important risk factors of depression is given in Table 5.2. The two most consistently identified risk factors for depression are low socio-economic status and female sex.

In the following paragraph, we discuss these factors, as well as the other factors mentioned in Table 5.2. Some of the risk factors are related or mediated through a second factor. For example, work stress can be responsible for sleeping disorders, both of which factors are associated with depression [105].

Table 5.2 Risk factors of depression

Risk factors of depression
Gender
Socio-economic status
Negative life events
Work stress
Social support/interpersonal relationships
Disability/sick leave/unemployment/job insecurity
Chronic diseases

Gender

Unipolar depression is much more common among women; in Europe, prevalence is 9% for adult men and 17% for adult women [115]. Two factors that might explain part of this difference are the following; women are found to be more likely to approach their primary care physician for help and doctors are more likely to diagnose depression in women compared to men, even with similar scores on standardised measures of depression [21]. It is interesting to note that sex differences in rates of depression are strongly age-related; the greatest differences occur in adult life, with no reported differences in childhood and few in the elderly [112].

Socio-economic status

Low socio-economic status is one of the main risk factors for mental illness. The prevalence of depressive symptoms in low-income, single mothers can be as high as 49-75% [21, 116]. Epidemiological studies have shown that poverty and other social inequalities are strongly associated with mental illness through a variety of mechanisms, including poor nutrition, unhygienic living conditions, alcohol misuse, inadequate access

to health care, lack of education, employment opportunities and debt or financial strain [21, 105, 116].

Psychosocial factors at work

Adverse psychosocial factors in the workplace are related to an elevated risk of subsequent depressive symptoms or major depressive episode [117]. Indications for a relation between high job strain (a combination of high job demands and low decision latitude) and risk of depression among men was found, but this was less so among women. A possible explanation for this difference in gender may be that job demands may be different and have a different meaning for men, particularly in higher status jobs [118]. The combination of putting in high effort and receiving low reward (effort-reward imbalance) has strong associations with depression [118].

In a recent review, low decision authority, low decision latitude, high job demands, low occupational social support and job insecurity were associated with a moderate risk of common mental disorders (defined as mild-to-moderate depressive and anxiety disorders) [118]. According to the ESEMeD study (European Study of the Epidemiology of Mental Disorders with data from Belgium, France, Germany, Italy, the Netherlands and Spain) unemployed persons have a two-fold higher risk of any mental disorder compared to those in paid employment [115]. Respondents who were disabled or on sick leave also had a higher risk of mood and anxiety disorders.

Finally, people with depression suffer more often from a lack of social support or are victims of bullying; bullied workers run a fourfold risk of depression compared to non-bullied employees [119, 120]. On the other hand, high levels of social support at work from colleagues and supervisors have been found to be protective of mental health. Also, indications for a protective effect of high levels of decision latitude on mental health has been found [118].

Chronic diseases

People suffering from chronic diseases are more likely to develop mental disorders such as depression. For example, in people with HIV/AIDS the prevalence of depression is as high as 44% [113].

Growing scientific knowledge exists about the bi-directional relationship between cardiovascular diseases and mental ill health. A comprehensive body of research found that mental ill health is an independent risk factor for CVD and mortality. Particularly, people with depression are at greater risk of developing a heart disease (this is further explained in paragraph 5.1.2). Although less is known about the role of CVD as a risk factor for mental ill health, estimations from the existing evidence show that up to 20% of individuals experience a major depressive episode within a few weeks of an acute cardiovascular event, with a further 25% having minor depression or dysthymia [105].

Other factors

Several other factors are associated with unipolar depression. Low birth weight has been linked to depression and schizophrenia [121]. Several studies have found a higher prevalence of depression in urban areas compared to rural areas [112]. A lifetime history of depression is a risk factor for a new episode of depression, as is a high consultation

rate in the general practice [111]. Also, marital status is a key demographic variable associated with mental health [122]. It has been shown that first partnerships which last are associated with good mental health.

A number of studies show that exposure to violence as a result of war, acts of terrorism or community violence, is a risk factor for mental illness (for an overview: see [105]). Childhood maltreatment (physical neglect, physical abuse, sexual abuse), mental, physical and sexual abuse of women and bullying are also well-recognized risk factors [123, 124]. Negative life-events, especially in childhood and adolescence, increase the risk for depression two- to three-fold [112].

5.3 Musculoskeletal diseases

Musculoskeletal diseases are characterized by pain and physical disability. As described in Chapter 3, musculoskeletal diseases contribute relatively much to the burden of disease in the working age population. Musculoskeletal diseases especially contribute to the years lived with disability; they are rarely fatal. However, life expectancy may be reduced in a number of specific conditions, such as rheumatoid arthritis and as a consequence of osteoporotic fractures [21].

Musculoskeletal diseases can be specific and non-specific with respect to their cause. For example, specific low back pain is defined as low back pain caused by specific pathophysiological mechanisms such as spinal stenosis, arthritis, and a fracture. Low back pain cannot be attributed to a specific cause in about 90% of the cases. Since the exact cause of musculoskeletal symptoms is often unclear, musculoskeletal problems are frequently described by the region that is symptomatic, i.e. low back pain and neck pain [21]. We will also use this approach in the present report. Our focus will be on non-specific symptoms.

In the following, the prevalence of musculoskeletal diseases and trends will be described in more detail. Risk factors are addressed and we will focus on back, neck, and upper extremity problems. We focus on these musculoskeletal health problems, because they are highly prevalent in the working age population, and their relation to work is evident.

5.3.1 Prevalence and trends

Musculoskeletal pain is experienced by most people at some time. Symptoms often have a poorly defined onset, and musculoskeletal pain may also be episodic. Symptoms may resolve and may return again at some other time. Given the high prevalence of low back pain, neck pain, and upper extremity symptoms, persons often experience more than one musculoskeletal complaint.

European surveys showed that musculoskeletal problems often occur in the working age population. In 2002, 16.2% of the persons in the EU25 (15-64 year) reported a health problem in the past 12 months, and **37%** of those with a health problem reported that musculoskeletal problems were their most serious health problem (LFS AHM 2002). In

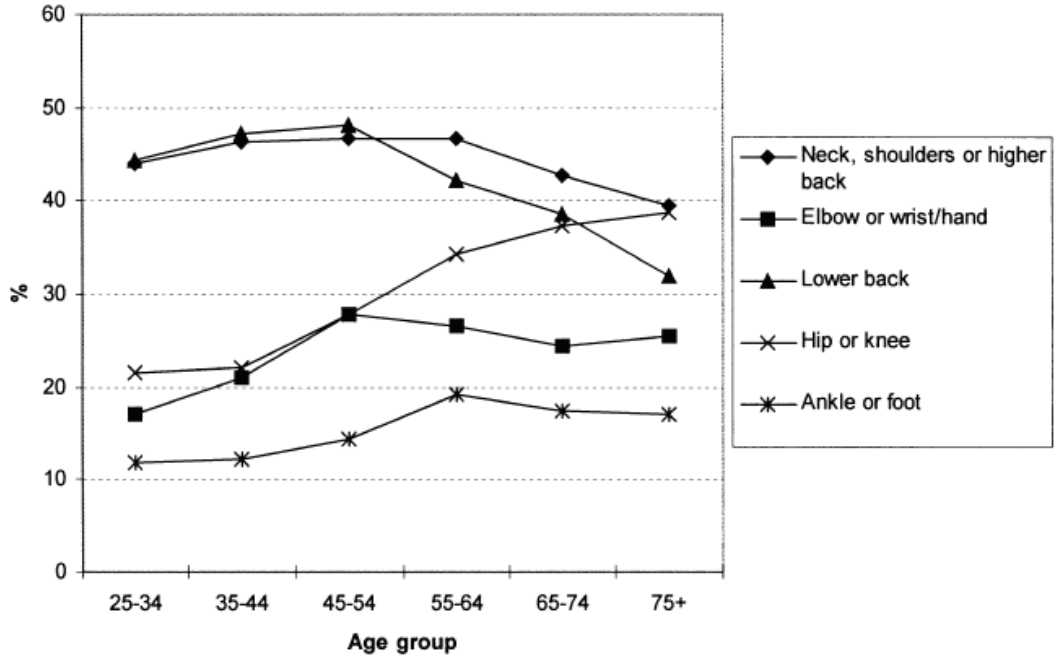
2007, 8.6% of the persons in the EU27 that work or ever worked (15-64 year) reported a work-related health problem in the past 12 months. Among those with a work-related health problem, **60%** identified musculoskeletal problems as the main problem caused or made worse by work (LFS AHM 2007). Back problems were most often reported. In total **48%** reported back problems, followed by problems of the neck and upper extremities (**31%**), and problems of the hips, knees and feet (**21%**). In the EWCS, workers were asked to describe all their work-related health problems, and not only their main problem. Out of all health problems, workers in the EU25 most often reported that work affected their health in terms of back problems (**25%**) and muscular pain (**23%**).

Other studies showed that at least half of the general population will experience low back pain at some point in their life, with reported rates ranging from 51% to 84%. Around 33% of the working age population will report having experienced low back pain in the past month, whereas 39% to 52% will report an episode of low back pain in the past 12 months [125]. Most persons with low back pain recover quickly and without residual functional loss, irrespective of treatment. Overall, 60–70% recovers by 6 weeks, and 80–90% by 12 weeks. Recovery after 12 weeks is slow and uncertain [126]. Although the majority of the persons with low back pain have recovered after several weeks, recurrence frequently occurs. In different studies the recurrence rate ranges from 20% to 44% within one year in the working population. Lifetime recurrence ranges up to 85% [126].

The prevalence rates on shoulder pain in the general population also strongly diverge among studies. Prevalence figures differ from 6.9% to 26% for point prevalence, 4.7%-46.7% for 1-year prevalence and 6.7%-66.7% for lifetime prevalence. In the Netherlands, a study found that in 2002 and 2004, 28% of the working age population reported neck/shoulder or elbow/hand/wrist symptoms in the previous 12 months. A study in fifteen European countries showed that 25% of the workers reported work-related neck/shoulder pain, and 15% reported work-related arm pain [127]. The prognosis of neck/shoulder pain is relatively poor according to most studies, but large differences between studies exist. About 25% to 50% of the women and 30% to 60% of the men has recovered 6 months to 5 years after symptom onset. Most persons seem to recover within 6 months [128].

The prevalence of musculoskeletal pain is related to age. The occurrence of musculoskeletal pain increases up to the age of 65 years, and declines thereafter [21]. Figure 5.9 shows the increase with age of the prevalence of musculoskeletal pain in different anatomical areas, as reported in a Dutch study. With the exception of pain in the hip and the knee, the prevalence decreased again after the age of 45-54[129, 130]. The fall-off in symptoms in older age groups could be related to a change in risk factors for the onset and persistence of musculoskeletal problem, such as a change in work place factors after retirement [125]. The prevalence of musculoskeletal symptoms is also related to gender. For example, the prevalence of neck and upper extremity symptoms is higher in women[59, 125, 131], and the prevalence of low back pain is higher in men [130].

Figure 5.9 The prevalence of musculoskeletal pain in different anatomical areas by age group [129]



As presented above, studies differ considerably in their findings on the prevalence of musculoskeletal diseases. Several factors may be related to these differences. First, the prevalence may be influenced by the population under study. Second, studies differ with respect to the definition that is used to identify a person with musculoskeletal complaints, i.e. the case definition. Another factor that complicates comparisons between studies is the difference in the recall period, i.e. the period during which symptoms may have occurred [125, 130, 132].

Trends

Studies on trends in the prevalence of low back pain are limited, and they report contradicting findings [125]. One study compared the prevalence of low back pain in the UK at an interval of 10 years. This study suggested that the one year prevalence of back pain increased from 36% in 1987-8 to 49% in 1997-8. The trend was consistent across all ages in both men and women, within social classes and regions. Remarkably, an increase in less disabling back pain was found. This suggested that the increase in back pain in the UK was related to greater awareness and willingness to report minor symptoms [133]. Other studies found that the prevalence of low back pain remained relatively constant, or reported a decrease [125]. Hence, it is unclear whether the prevalence of low back pain has increased or not during the past decades.

Studies on trends in the prevalence of neck and upper extremity symptoms are scarce too. In a Swedish study, the prevalence of self-reported neck-shoulder-arm pain slightly increased from 1990 to 2006, i.e. from 23% to 25% in women and from 13% to 15% in men. The prevalence of neck-shoulder-arm pain with concurrent back pain also slightly rose, i.e. from 8% to 11% in women and from 5% to 7% in men. In addition, the prevalence of neck-shoulder-arm pain with concurrent psychological distress rose substantially, i.e. from 4.4% to 8.5% in women and from 2.0% to 4.3% in men. It is of interest that all prevalence rates increased from 1990 to 2002, and decreased again in

2006 compared to 2002 [131]. Although this study suggests that the prevalence of neck and upper extremity disorders has increased, it is still too early to conclude that a peak in the prevalence was reached or was passed. Moreover, additional research is needed to investigate whether the increase in the prevalence of neck and upper extremity symptoms is not related to greater awareness and willingness to report the symptoms.

5.3.2 Risk factors of musculoskeletal diseases

Musculoskeletal diseases have a multifactor aetiology, which means that several factors simultaneously affect their development. Risk factors may be for the occurrence or for its outcome (severity, chronic state, progression), but it is often difficult to make a distinction between these [130]. Risk factors of musculoskeletal diseases can reinforce each other, and their influence can also be mediated by cultural or societal factors. In this paragraph, risk factors of low back pain and neck and upper extremity symptoms will be addressed. First, individual risk factors will be described, and subsequently work-related risk factors are presented.

Individual risk factors

Individual risk factors of back, neck, and upper extremity symptoms include a wide variety of factors that are comparable to those of cardiovascular diseases. In the following, the influence of previous complaints, physical capacity, overweight, lifestyle, and mental well-being will be addressed.

Previous low back pain constitutes an important risk factor of future low back pain. In general, recurrences will be more frequent and more severe if persons had frequent or long lasting back pain in the past [60]. The predictive value of previous symptoms also applies to neck pain and upper extremity disorders [58].

Various studies investigated the influence of muscle strength, muscle endurance, and joint mobility on low back pain and neck and upper extremity symptoms. A review of longitudinal studies found that trunk muscle endurance is not related to the risk of low back pain [134]. However, a more recent longitudinal study that was not included in this review reported that low back and neck endurance predicted low back and neck pain, respectively[135]. Due to inconsistent results in different studies, it remained unclear whether trunk muscle strength or mobility of the lumbar spine is related to low back pain. The relation between measures of physical capacity and neck/shoulder pain has only been studied in a limited number of longitudinal studies, and therefore, no conclusions can be drawn [134]. Hence, the relation between most measures of physical capacity and back, neck and upper extremity symptoms remains unclear.

Overweight and obesity increase the risk of low back pain. In cross-sectional studies, overweight persons had a higher prevalence of low back pain compared to non-overweight persons, but they had a lower prevalence of low back pain compared to obese persons. Cohort studies found that obesity predicted the occurrence of low back pain in the past 12 months [136].

For the relation between overweight and neck pain, conflicting evidence exists. Therefore, conclusions cannot be drawn yet [58]. Weight-related factors may be related with the incidence of shoulder symptoms, but they do not seem to be related with the persistence or the recurrence of these symptoms [137]. In summary, obesity increases the risk of low back pain, and weight-related factors may also influence upper extremity symptoms.

Leisure time sport or exercises do not seem to influence the risk of low back pain in persons free of low back pain [138]. In agreement, a sedentary lifestyle during leisure time or at work by itself is not associated with low back pain [139]. The relation between different types of leisure time activities (do-it-yourself home repair, gardening, etc) with low back pain is unclear, since studies reported conflicting findings [138]. The relation between physical or sports activities during leisure time and the risk of neck pain and shoulder symptoms is unclear, since the results from different studies are mixed [58, 137].

A recent meta-analysis revealed that both current and former smokers have a higher prevalence and incidence of low back pain compared to never smokers. The association is fairly modest, which stresses the multifactor aetiology of low back pain. Importantly, the results remained consistent after the analysis was limited to studies that controlled for potential confounders such as physical or psychosocial workload [136].

Preliminary evidence exists that smoking is also related to an increased risk of neck pain. Smokers and former smokers were at greater risk to develop neck pain compared to persons who never smoked [58]. Associations between smoking and shoulder disorders were also found. However, they were only found in occupational populations, which suggests that other factors (e.g. work, lifestyle), may underlie this relationship [137].

Stress, anxiety, mood/emotions, and pain behaviour have been related to the occurrence of low back pain. Psychosocial factors may also play an important role in the transition from acute low back pain to chronic low back pain. Distress, depressive mood, and somatisation have been related to low back pain becoming chronic [60].

Preliminary evidence indicates that workers who experienced depressive or emotional symptoms have a higher risk of developing neck pain [58]. Depressive symptoms may also influence work-related neck or upper extremity disorders [127]. In addition, a prospective cohort study showed that illness behaviour and psychological distress were related with the new onset of forearm pain [140].

It is possible that behavioural aspects, such as a work style characterized by over commitment, influence the occurrence of work-related upper extremity disorders. However, studies concerning these factors are scarce [127].

Work-related risk factors

Back, neck, and upper extremity symptoms are influenced by work-related factors. The influence of work can well be illustrated by a study on low back pain, in which the proportion of low back pain that could be attributed to work was estimated. In this study, occupational groups were used to reflect physical and psychosocial stressors at work. It

was found that in Europe, 34% of the low back pain in men and 22% of the low back pain in women could be attributed to occupation. The proportion due to work was higher in men than in women, largely because of higher participation in the workforce in men and more exposure to physical risk factors at work in men [141]. It was concluded that occupational exposures substantially contribute to the occurrence of low back pain in the population. In the following, physical and psychosocial risk factors of low back, neck, and upper extremity symptoms will be described.

Physical risk factors. A review of longitudinal studies in 1999 reported that manual materials handling, bending and twisting, and whole-body vibration were risk factors of low back pain. The evidence was moderate for patient handling and heavy physical work [142]. A recent review on longitudinal studies (2009) presented more moderate conclusions. In this review, some studies found evidence for the relation between heavy physical work (e.g. material handling, lifting, and pushing) and low back pain, whereas others did not find a significant relation. However, no study suggested a protective effect. Similarly, for bending and twisting at work, a few studies found that these factors increased the risk of low back pain, whereas other studies did not report a significant relation with low back pain. The same applied to nursing tasks. For whole body vibration, the review from 2009 found conflicting evidence [138]. On the basis of these studies, it can be concluded that physically heavy work such as frequent manual material handling, and bending and twisting may increase the risk of low back pain.

Differences in the physical workload can explain some of the differences in low back pain between high and low educated persons. A recent French study found that low back pain was associated with a low level of education. This could almost completely be explained by the fact that low educated persons had more exposure to tiring work postures and handling of heavy loads at present or in the past [143].

In addition to heavy physical work, sitting, standing and walking at work has also been studied in relation to low back pain. No evidence was found that sitting or prolonged standing or walking is related to low back pain [138, 142].

Studies in industrial setting showed that repetitiveness, especially in combination with forceful exertions, are generally acknowledged as an important risk factor for neck and upper extremity problems. In office workers, mouse usage for 10 to 20 hours per week may be a risk factor for hand/arm symptoms, but not for neck and shoulder symptoms [127]. A review on neck pain described that repetitive work, precision work, poor computer work station design and work posture, and a sedentary work position were related to neck pain [58]. A review of mainly cross-sectional studies indicated that repetitive movements and vibration were consistently associated with shoulder pain [144].

Although this overview focuses on non-specific musculoskeletal problems, it is of interest to report risk factors of the carpal tunnel syndrome since this disorder is frequently related to work. A recent review showed that the occurrence of carpal tunnel syndrome was associated with high levels of hand-arm vibration, prolonged work with flexed or extended wrists, high requirement of hand force, and high repetitiveness. The findings on

the duration of computer work and the carpal tunnel syndrome were the other way around [145].

Psychosocial risk factors. Psychosocial work characteristics may influence the risk of low back pain and neck and shoulder pain as well. MacFarlane et al (2009) presented an overview of several review studies on low back pain, and compared the findings on the influence of job demands, job control, support at work, and job satisfaction. The studies differed with respect to the criteria used for making conclusions on the strength of the evidence. Most reviews found evidence for a relation between at least two of these psychosocial factors and back pain. The most consistent conclusion was that high job demands, low job satisfaction, and low social support at work increased the likelihood of low back pain. Fewer reviews concluded that there were positive associations between low job demands (2 out of 6 studies) and low job autonomy (1 out of 5 studies) and low back pain [146].

Similarly, an overview of review studies on the relation between psychosocial factors at work and neck/shoulder and arm pain was made. Among these reviews, the most consistent conclusion was that high work demands and low work demands were related to neck/shoulder pain. Low work demands included jobs evaluated as monotonous or with insufficient use of skills. Only one out of six reviews found evidence for a relation between low job control and neck/shoulder pain. None of the reviews found sufficient evidence on the relation with low work support and low job satisfaction. In addition, two out of six reviews concluded there was insufficient evidence for any psychosocial factor studied, and one review concluded there was only evidence for high job demands [127, 146]. Two recent review studies were not included in the overview of MacFarlane et al. The first study found only limited evidence for a causal relation between high job demands, low job control and job strain with neck pain with palpation tenderness [59]. Another review suggested that not only high quantitative job demands were related with neck pain, but also social support and job insecurity [58]. In summary, the most consistent conclusion on the relation between psychosocial factors at work and neck and shoulder pain seems to be that high work demands and low work demands are related with an increased risk of neck/shoulder pain.

Finally, Bongers et al (2006) also studied the influence of perceived job stress. Perceived job stress seemed to be related to neck and upper extremity symptoms. However, the influence of perceived job stress has not been studied frequently yet [127].

A few studies have reported on the relation between psychosocial work factors and the carpal tunnel syndrome. None of these studies found a significant association between job demands, job control or support and the carpal tunnel syndrome [145].

Psychosocial factors may influence back pain and neck and upper extremity symptoms via various pathways. One explanation is that adverse psychosocial factors lead to an increased physical load. For example, high job demands may lead to an increase in the frequency and duration of the physical workload. High job demands could also result in stress, and stress may subsequently lead to physiological responses that enhance the development of musculoskeletal symptoms. Stress could for example result in increased muscle activity, which impairs the circulation and oxygen supply [127].

Methodological considerations. Comparison of studies on the relation between work-related factors and back pain and neck and upper extremity symptoms are hampered by several factors, such as differences in the exposure assessed, measuring the same exposure in different ways, different definitions of the outcome, and different selections of the study population. In addition, the healthy worker effect may considerably affect the results of epidemiological studies in occupational settings. Workers with, for example, low back pain may move to other jobs or their tasks may be adjusted, whereas workers without low back pain may stay in the same job [60].

5.4 Accidental injuries at work

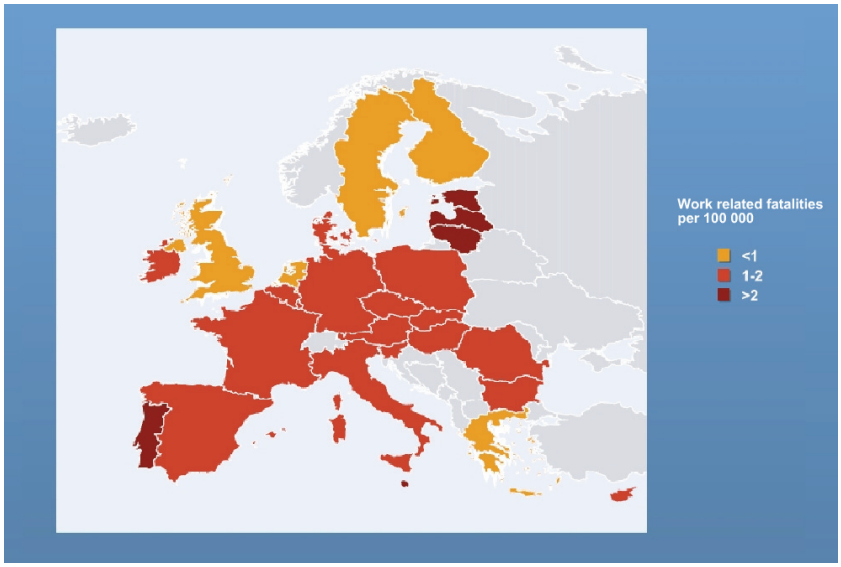
We define accidental injuries at work as non-intentional accidents that happen at work or in the course of work, resulting in both fatal and non-fatal injuries. We do not include commuting accidents, home and leisure accidents and road traffic or transport accidents in the course of private activities. In the following paragraphs, the prevalence of accidental injuries at work and its impact are described, as well as trends in time. Also, risk factors are addressed.

5.4.1 Prevalence and trends

In 2007, **3.2%** of the working population (15-64 years) reported one or more accidents at work in the past 12 months. This percentage corresponds to **6.9** million persons in the EU27. Also, **0.4%** of the working population reported two or more accidents, which corresponds to approximately **0.8** million persons [25]. According to data aggregated by Eurostat and the WHO, more than **6000** work place *fatalities* are recorded per year in the EU27. They range from 0.3 per 100000 inhabitants in the United Kingdom to 3.2 in Portugal (Figure 5.10). Also the rate of *non-fatal* work place accidents shows a significant variation between Member States. These differences between countries are partly due to differences in national definitions and registration practices [21].

Half of all work place fatalities occur in two work sectors: the construction (30%) and the manufacturing branch (20%). These two “leading” branches are followed by the transport sector (18% of all work place fatalities) and the agricultural sector [21, 25].

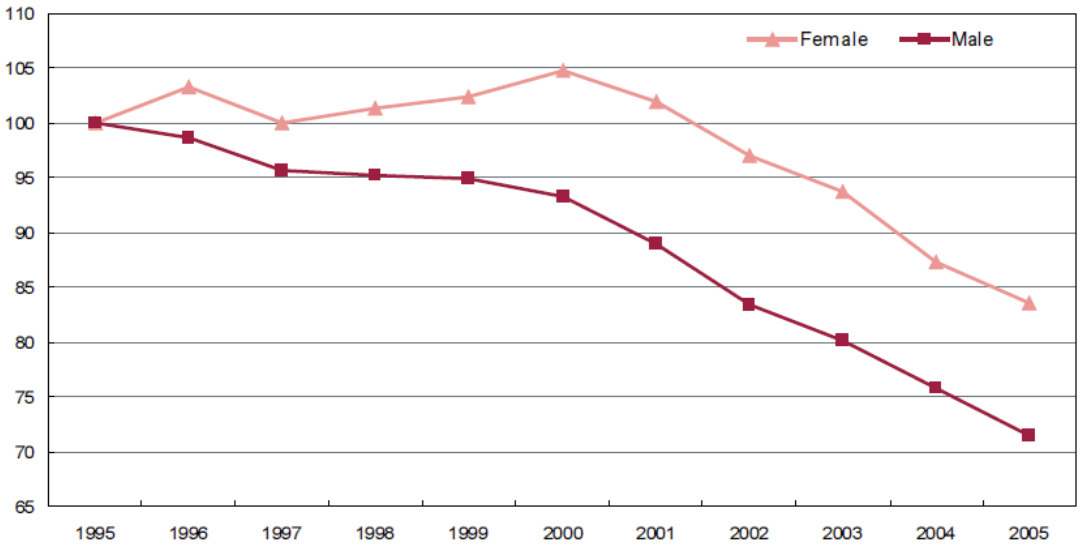
Figure 5.10 Fatalities due to work-related accidents in Europe in 2003-2005 (source: EUGLOREH, KfV)



Around 69% of non-fatal accidents at work are linked to a ‘loss of control’, a ‘fall’ or a ‘physical stress’. In addition, more than 41% of fatal accidents at work were the result of a ‘loss of control’. Around 44% of victims of nonfatal accidents at work and 62% of victims of fatal accidents were injured as a result of an impact or collision with an object [31].

From 1995 to 2005, the incidence rate of non-fatal accidents at work in the EU-15 dropped by **27.4%**, while fatal accidents even decreased with **42.4%**. This significant decreasing trend was strongest for the sectors of ’transport, storage and communication’ (-6.2%) and ‘construction’ (-33.2%) [31]. The reduction of the incidence rate for non-fatal accidents was more important for male workers (**28.5%**) than for female workers (**16.4%**, see Figure 5.11). This could be due to the fact that the workforce in sectors with traditionally recognized high risks is predominantly male, and preventive measures may have been more focused on these sectors.

Figure 5.11 Incidence rate of non-fatal accidental injuries at work with more than 3 days of sickness absence, by sex, EU-15



Source: ESAW – Eurostat[147].

5.4.2 Risk factors of accidental injuries at work

Accidental injuries at work are mainly caused by unsafe work conditions, but some individual characteristics also increase the risk. In this paragraph, an overview of the risk factors found so far is given. It should be noted, however, that not many good-quality studies exist on risk factors of accidental injuries at work [148].

Individual risk factors

Men report more often (**4%**) accidents at work than women (**2.1%**). This is due to the fact that the workforce in sectors with traditionally recognized high risks is predominantly male. Among men, the highest risk is found in the sectors Construction, Manufacturing, and Agriculture, whereas the highest risk among women is found in the sectors Health and social work, and Hotels and restaurants [25]. Among men, the occurrence of accidents at work decreases with age, while this decrease is not seen among women (see paragraph 3.4.2). The highest risk of accidental injuries at work occurs for the youngest age group (15-24). One of the reasons for this might be that the youngest age group has limited knowledge of possible risks and preventive measures.

Health conditions

A recent review showed that impaired hearing, neurotic illness, diabetes, epilepsy and use of sedating medication were moderately positively associated with occupational injuries [148]. Furthermore, a study by Gauchard et al. [149] showed that having a sleep disorder or a physical disability, smoking, and not carrying out any physical activity were risk factors for having more frequent injuries.

Work characteristics

Around 75% of fatal accidents and 68% of non-fatal accidents occurred among ‘craft and related trades workers’, ‘machine operators’ or workers employed in an ‘elementary occupation’ [31]. A multivariate analysis on work-related and personal characteristics

showed similar results: the highest occurrence of accidents was reported by manual workers [25]. Manual work is often related to other unfavourable work characteristics such as shift work and atypical working hours, which also were found to be associated with a high occurrence of accidents [25]. These last factors were also reported in the ESAW report, in which accidents at work occurring at night were more often fatal than those occurring during the daytime (out of 1000 accidents, an average of 2.2 were fatal between midnight and 6:00. This is 50% more compared to the other times of day). This difference in fatalities throughout the day may be partly explained by road accidents, which are more often fatal during night time. Indeed, the 'transport' sector accounts for 37.5% of fatal accidents occurring between midnight and 6:00 [31]. Concerning non-fatal accidents, an increased risk for injuries at work was found for shift work and unusual working hours was found in the LFS AHM 2007 [25], but not in the ESAW 2005 [31].

Other risk factor related to work were being five years or less in the present job, and requesting a job change. These two factors were associated with an increased incidence of frequent occupational injuries [149]. Requesting a job change has been found to result in altered cognitive processes, work abilities, risk assessment and increased stress, and is therefore a risk factor.

5.5 Other important diseases and injuries

In the first part of this chapter we have presented the prevalence and risk factors for the main diseases/injuries of the working age population, as defined in paragraph 2.1. We selected another five diseases/injuries that are also important regarding the health of the working age population. These diseases are respiratory diseases, alcohol use disorders, hearing loss, lung cancer and road traffic accidents. For each of these diseases we provide a summary of the available evidence.

5.5.1 Respiratory diseases

The most common respiratory diseases are chronic obstructive pulmonary disease (COPD) and asthma. COPD refers to pathologies characterized by airflow limitation such as chronic bronchitis and emphysema. In contrast to asthma, the limitation of airflow in persons with COPD is not fully reversible and usually gets progressively worse over time. Asthma is a chronic, inflammatory condition of the airways characterized by airway hyper responsiveness and episodic, reversible, respiratory symptoms[21]. Many statistics do not distinguish between different types of respiratory diseases and their risk factors.

In 2002, **9.4%** of the persons (15-64) with a health problem in the EU27 identified 'chest or breathing problems including asthma and bronchitis' as their most serious health problem (LFS AHM 2002). According to the EWCS 2005, **4.7%** of the workers in the EU25 in 2005 thought that work affects their health in terms of breathing difficulties. Moreover, **5.2%** of the persons with a work-related health problem that work or worked previously reported breathing or lung problems as the main work-related health problem (LFS AHM 2007). As described in Chapter 3, respiratory diseases contribute relatively

much to the burden of disease in terms of disability adjusted life years in people of working age.

Risk factors of COPD have frequently been studied. Active and passive tobacco smoking are major risk factors for COPD. Occupational factors and indoor-outdoor pollution from biomass fuel are other well recognized risk factors. Occupational exposure has been estimated to contribute 10-20% to the burden of COPD. In the European Community Respiratory Health Survey (ECRHS) study, high exposures to dusts and fumes increased the risk for chronic bronchitis from smoking by 160%. COPD is strongly associated with ageing. As a result of the ageing of the population in Europe, COPD is one of several chronic diseases that will probably become more frequent [21].

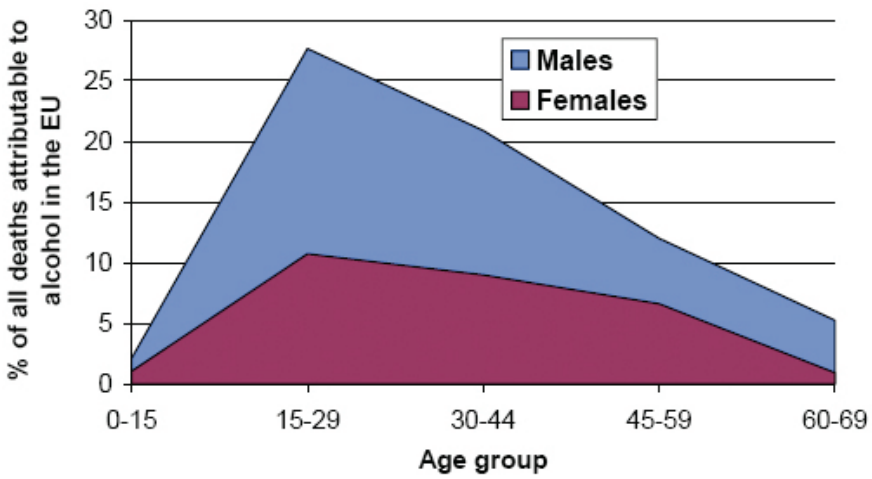
The prevalence of asthma increases and this increase cannot be fully explained by changes in diagnostic sensitivity and reporting attitude. The increase has mainly been attributed to changes in exposure to environmental factors and changes in lifestyle. The main risk factors of asthma that are currently considered in prevention include exposure to allergens and sensitization, (exposure to) tobacco smoking, indoor and outdoor pollution, and changes in dietary habits. Occupational sensitizers are estimated to determine about one in ten cases of asthma in the working age population [21].

5.5.2 Alcohol use disorders

Alcohol use disorders (AUDs) consist of alcohol dependence, alcohol abuse, and dependence or harmful use [150]. Alcohol can affect almost every organ of the body and is causally related to more than 60 different disorders and diseases with short and long-term consequences, including lung disease, breast cancer and mental and behavioural disorders. AUDs often manifest themselves in more general complaints, which make them hard to identity. General complaints reported by people with AUDs are malaise, insomnia, anxiety, sadness, or a range of medical problems [151].

AUDs are common in all developed countries, and are more prevalent in men than women, with lower, but still substantial rates in developing countries. AUDs are responsible for a large proportion of the health-care burden in almost all populations [151]. It has been estimated that harmful alcohol use is the third biggest cause of early death and illness in the EU, behind tobacco and high blood pressure [152]. This is mainly true for men, accounting for 12% of all male ill-health and premature death and a smaller but still sizeable 2% of all female ill-health and premature death (Figure 5.12) [21]. The lifetime risk of alcohol-use disorders for men is more than 20%, with a risk of about 15% for alcohol abuse and 10% for alcohol dependence [21].

Figure 5.12 Percentage of all deaths attributable to alcohol in the EU (Source: Fact sheet Alcohol DG SANCO, '06)



AUDs are related to a combination of biological, psychological and cultural factors. About 40-60% of the risk of alcohol-use disorders is explained by genes. The remaining risk factors include having high levels of stress, poverty, lower levels of education and lower socio-economic status, 'early life events', the availability of alcohol, product quality, attitudes towards drinking and drunkenness and peer pressures (especially among males) [151, 153]. Furthermore, people with depressive and mood disorders have an increased risk of developing AUD [154].

5.5.3 Hearing loss

In 2002, **1.4%** of the persons in the working age population (15-64 years) with a health problem identified 'difficulties in hearing' as their most serious health problem (LFS AHM 2002, EU25). According to the EWCS 2005, **7.3%** of the workers in the EU25 in 2005 thought that work affects their health in terms of hearing problems. Hearing problems occur more often in men than in women. As described in Chapter 3, hearing loss contributes relatively much to the burden of disease. Besides, noise-induced hearing loss is one of the most prominent recognized occupational diseases in the EU [155].

The leading causes of adult-onset hearing loss are presbycusis (age-related hearing loss) followed by noise-induced hearing loss [21]. Noise-induced hearing loss represents excessive 'wear and tear' on the delicate inner ear structures. Hair cells and inner ear structures can be injured by noise from an intense brief impulse, such as an explosion, or from continuous exposure to noise, such as that in a woodworking shop. The rate of hearing loss due to chronic noise exposure is greatest during the first 10–15 years of exposure, and decreases as the hearing threshold increases. This is in contrast to age-related loss, which accelerates over time [155]. Besides age and noise, tooth loss, diabetes, and heart disease are related with an increased likelihood of hearing loss. However, hearing impairments in children and teenagers is rising due to mostly voluntary exposure to loud noise during leisure time (music) [156].

Exposure to noise at work is not notably rising. Hearing loss due to work is reported especially in the manufacturing, construction and transport sectors, whereas it is virtually non-existent in the sector of financial intermediation. The construction sector and the manufacturing sector also have the highest percentage of workers exposed to loud noise in the workplace. Blue-collar workers report the highest rate of hearing problems. Exposure to chemical solvents can also affect hearing, and such effect may be underestimated [155].

5.5.4 Lung cancer

Lung cancer was a rare disease at the start of the 20th century, but exposures to new aetiologic agents combined with an increasing life span made lung cancer a large burden of disease. In 2007, in Europe there were 91,000 estimated deaths from lung cancer (see Table 3.4). Worldwide, lung cancer is the most common cancer and most common cause of cancer death in men, while it is only the third most common cause in women (after breast cancer and colon and rectum cancer). Survival is among the worst for any cancer type, with five-year relative survival of only about 12% in Europe [157].

Lung cancer is largely a preventable disease, and smoking is the primary cause of lung cancer, although pollution and exposure to certain gases/chemicals may also be influential. Studies conducted in Europe, Japan and North America have shown that 87–91% of lung cancers in men (57–86% in women) are attributable to cigarette smoking. Compared to never-smokers, smokers have about a 20-fold increase in lung cancer risk at present. In general, trends of lung cancer occurrence closely reflect patterns of smoking, but rates of occurrence lag smoking rates by about 20 years [158]. Not only active smoking, but also passive inhalation of environmental tobacco smoke (ETS) can cause lung cancer. Almost one fourth of lung cancer cases among never-smokers were estimated to be attributable to exposure to passive smoking [158].

In the past years, there has been emerging evidence on the genetic and nutritional risk factors of lung cancer. Sufficient vegetable and fruit consumption has been shown to provide some level of protection against lung cancer. Also, there are strong indications that eating cruciferous vegetables (cabbage family, containing among others cabbage, broccoli and sprouts, have a significant protective effect against lung cancer [159].

Apart from smoking, lung cancer can be caused by occupational exposure. Exposure to the radioactive gas radon in indoor environments is a well known occupational cause of lung cancer, in particular for miners [158]. The list of human occupational causes of lung cancer also includes arsenic, asbestos, chromates, chloromethyl ethers, nickel, tar, soot, polycyclic aromatic hydrocarbons, radon progeny, and other agents [158].

5.5.5 Road accidents

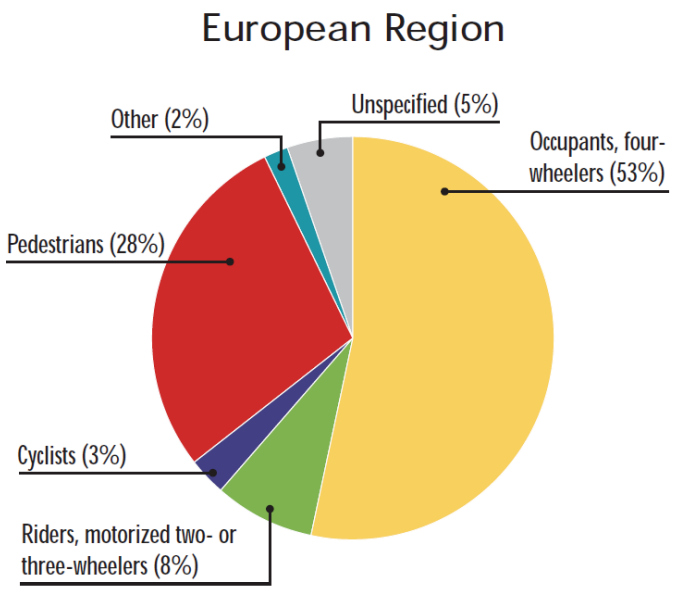
Road traffic accidents in the Member States of the European Union annually claim about 43.000 lives and leave more than 1.8 million people injured [28]. In the age category 15-29, road traffic accidents are the leading cause of death. In 2006 approximately 25000

males died because of road accidents in the EU, while for females, this was only 7000. Remarkably, 70% of all fatalities in males occurred while driving, while in females, this was only the case for about 35% of all fatalities [28]. Figure 5.13 presents the distribution of deaths by road user categories. It shows that vulnerable road users, including pedestrians, cyclists and users of motorized two-wheelers account for 39% of road traffic deaths.

About 25% of all road fatalities in Europe are alcohol-related, whereas about only 1% of all kilometres driven in Europe are driven by drivers with 0.5 g/l alcohol in their blood or more. As the Blood Alcohol Concentration (BAC) in the driver increases, the crash rate rises progressively [160]. Fatigue is a major factor in a large proportion of road crashes (10-20%). A person who drives after being awake for 17 hours has a risk of crashing equivalent to being at the 0.05 blood alcohol level (i.e. twice the normal risk) [161].

Next to alcohol and fatigue, the World Report on Road Traffic Injury Prevention identifies the following factors to be major risk factors for road traffic accidents: high speed driving, disregard for the use of seat-belts, child car restraints and helmets (for riders of motorized two-wheelers) and road-related factors (such as poor road design, roadway environment and visibility). In some countries, road infrastructure, vehicle safety and regulatory practices have not kept up with motorization [162]. Finally, mobile phone use, which increases a driver's reaction time by 0.5-1.5 seconds, is identified as risk factor for road accidents [160].

Figure 5.13 The distribution of deaths by road user categories for the European Region [162]



5.6 Summary of risk factors of the main diseases/accidental injuries in the working age population

Cardiovascular diseases

Cardiovascular diseases are the second most important cause of death after cancer in the working age population. About one in four deaths of all men and about one in five deaths of all women before the age of 65 are from cardiovascular diseases. Overall, mortality rates in relation to cardiovascular diseases are higher in Central and Eastern Europe.

Cardiovascular diseases are strongly associated with systolic and diastolic blood pressure, blood cholesterol levels, diabetes, and obesity and overweight. Mental ill health is also associated with cardiovascular diseases. Many of these risk factors are inter-related. For example obesity is a major risk factor of high blood pressure, blood cholesterol levels, and diabetes.

High blood pressure, elevated blood cholesterol levels, obesity, and diabetes are mostly caused by an interaction of an unhealthy lifestyle and a genetic predisposition. Furthermore, work stress is also related to these risk factors. Smoking is a strong risk factor, and is especially important in premature death. Moderate alcohol consumption reduces the risk of cardiovascular diseases, whereas high levels of intake increases the risk. A diet which is high in fat, salt, and free sugars, and low in complex carbohydrates, fruit, and vegetables, and lack of physical activity increase the risk.

In conclusion, the behavioural component makes cardiovascular diseases eminently preventable; particularly lifestyle interventions may have potential for change. In addition, work stress is a risk factor for cardiovascular diseases. Therefore, workplace interventions aimed to reduce stress have also potential to prevent cardiovascular diseases.

Unipolar depressive disorders

Unipolar depression (clinical depression) is a mental disorder characterized by an all-encompassing low mood accompanied by low self-esteem, and loss of interest or pleasure in normally enjoyable activities. The peak age of a first-onset major depressive episode is between 25 and 45 years of age. Relapse of depression is frequent up to 10 years after first presentation. The lifetime risk of depression has been estimated to be 12% to 16%.

Depression and mental disorders are in general non-fatal, but result in substantial disability. The World Health Organization identified depression as the leading cause of moderate or severe disability worldwide in persons aged 0-59. As mentioned before, statistics on disability benefits show a certain trend towards a higher contribution of mental health problems to the total sum of disability benefits. Disability has consequences for work participation. Several studies show that a poor mental health (often characterized by depressive symptoms) increases the risk of unemployment. Moreover, among those still employed the average percentage of productivity loss was estimated to be 15%.

Various individual risk factors of depression have been identified. Women are more often diagnosed with depression than men. Low socio-economic status has consistently been associated with depression. In this association, a variety of mechanisms may play a role,

including employment opportunities, debt or financial strain, alcohol misuse, and living conditions. Other individual risk factors for depression are health status (suffering from a chronic disease) and negative life events.

Work-related factors may also contribute to the occurrence of depression, in particular psychosocial work characteristics. Putting in high effort at work and receiving low reward has been associated with depression. In addition, low decision authority, high job demands, low social support at work, and job insecurity have been related with a moderate risk of common mental disorders, i.e. depressive and anxiety disorders. Bullying strongly increases the risk of depression as well.

Some risk factors of depression, most notably psychosocial factors at work, may be amendable to change, and hence, offer opportunities for the prevention of depression.

Musculoskeletal diseases

In 2002, musculoskeletal diseases were mentioned most often as the main health problem by persons in the working age population. Back and neck problems occur more often than problems with legs, feet, arms or hands. Musculoskeletal diseases are often episodic, and recurrence frequently occurs.

Musculoskeletal diseases have an unfavourable effect on work participation. Several studies show that musculoskeletal diseases increase the risk of work disability and of productivity loss at work. Analyses among Dutch workers show that the percentage of productivity loss attributable to musculoskeletal diseases is relatively high compared to other diseases.

Several individual risk factors of back, neck and upper extremity symptoms have been identified. Obesity increases the risk of low back pain, and weight-related factors might also influence upper extremity symptoms. Stress, anxiety, emotions, and pain behaviour have been related with the occurrence of low back pain, and may also play an important role in acute low back pain becoming longstanding.

Exposure to occupational risk factors plays an important role in the aetiology of musculoskeletal diseases. Occupation has been estimated to explain 34% of the low back pain in men and 22% of the low back pain in women in the general population in Europe. Physically heavy work, such as frequent manual material handling and bending and twisting at work increases the risk of low back pain. Repetitive movements, especially in combination with forceful exertions, are risk factors of neck and upper extremity symptoms. Frequent mouse usage is a risk factor for hand/arm symptoms, and precision work for neck symptoms. In addition to physical risk factors at work, psychosocial factors play a role. High job demands, low job satisfaction, low social support and low job control have been linked to a higher risk of musculoskeletal diseases, but not all study results are consistent.

In conclusion, musculoskeletal health problems of the back, neck, and upper extremity often occur in the working age population, and interventions targeting physical and psychosocial risk factors at work may offer opportunities for prevention.

Accidental injuries at work

Accidental injuries at work are non-intentional accidents that occur at work or in the course of work, and result in fatal or non-fatal injuries. The contribution of accidents at work to the total burden of disease in the working age population is unknown. However, accidental injuries affect the working age population relatively often. In 2007, **3.2%** of the workers in the EU27 reported an accidental injury in the past 12 months. This corresponds to **6.9** million persons in the EU27. In addition, approximately **6.000** fatal accidents are recorded per year in the EU27. The incidence rate of fatal and non-fatal accidents decreased in the EU15 between 1995 and 2005, with respectively **42%** and **27%**. Due to a lack of studies, little is known on the consequences of work-related accidental injuries for work participation.

Accidental injuries are related with health conditions. Impaired hearing, neurotic illness, diabetes, epilepsy, and the use of sedating medication are moderately associated with injuries at work. Also, several work characteristics increase the risk of accidental injuries. Most accidents - fatal as well as non-fatal - occur in the construction and manufacturing sectors. The most (non-fatal) accidents in women occur in the health and social work sector, as well as in the sector hotels and restaurants. Manual work, atypical working hours, shift work, and being less than five years in the job are related with accidental injuries. Hence, work-related factors offer opportunities for further prevention of accidental injuries at work.

Other important diseases and injuries

Respiratory diseases

- Of the persons in the working age population with a health problem, **9.4%** identified ‘chest or breathing problems including asthma and bronchitis’ as their most serious health problem;
- Respiratory diseases are a relative important cause of death in the older age groups of the working age population;
- Important risk factors for respiratory diseases are poor air quality and smoking.

Alcohol use disorders

- Alcohol can affect almost every organ of the body and is causally related to more than 60 different disorders and diseases with short and long-term consequences, including lung disease, breast cancer and mental and behavioural disorders;
- Harmful alcohol use accounts for 12% of all male poor health and premature death (2% for women);
- Alcohol use disorders are associated with stress, poverty, lower levels of education and lower socio-economic status, early life events, the availability of alcohol, product quality, attitude towards drinking and drunkenness, and peer pressure.

Hearing loss

- Noise-induced hearing loss is one of the most prominent recognized occupational diseases in the EU;
- Hearing loss due to work is reported most often in the manufacturing, construction and transport sectors.

Lung cancer

- Lung cancer is the most common cancer and most common cause of cancer death in men;
- Smoking is the primary cause of lung cancer;
- Occupational causes of lung cancer includes exposure to arsenic, asbestos, chromates, chloromethyl ethers, nickel, tar, soot, polycyclic aromatic hydrocarbons, radon progeny, and other agents.

Road accidents

- In the age category 15-29, road traffic accidents are the leading cause of death;
- About 25% of all road fatalities are alcohol-related, while fatigue is a major factor as well (10-20%);
- Other risk factors are high speed driving, disregard for the use of seat-belts, child car restraints and helmets (for riders of motorized two-wheelers) and road-related factors (such as poor road design, roadway environment and visibility), and the use of mobile phones.

6 Policies and initiatives aiming to address workforce health

6.1 Introduction

In this chapter we offer a review of policies and initiatives to address workforce health with a focus on cost effectiveness.

The policies and initiatives include:

- Workplace health and safety initiatives;
- Initiatives to help retain people in work who have chronic illness;
- Workplace health promotion initiatives;
- Initiatives to promote rehabilitation and reintegration into work following a serious health event;
- Initiatives to support people who are on long term sick leave to get back into work;
- Other initiatives and policies addressing public health.

As described in Chapter 2 (paragraph 2.3.1), we have defined these categories as follows:

Table 6.1 Definitions used and typology of interventions

Category	Definition	Main type of interventions
Workplace health promotion initiatives	The **promotion** of workers' health and general wellbeing. This goes further than merely legislation on ensuring health and safety of workers. It focuses on the active pursuit of activities that help employees to improve their own general health and wellbeing.	• Workplace health promotion networks such as the European Network for Workplace Health Promotion; • National legislation (e.g., banning of smoking); • National health promotion initiatives to support and inform employers; • Health check-ups; • Initiatives tackling smoking and alcohol abuse in the workplace (e.g. support to stop smoking); • Initiatives stimulating healthy food and physical activity (e.g. adjustment of food in the canteen and physical activity programmes); • Initiatives tackling mental health

Category	Definition	Main type of interventions
		(e.g. stress management).
Workplace health and safety initiatives	The **protection** of workers in their employment from risks resulting from work factors adverse to health. It is mainly linked to legislation ensuring the health and safety of workers (e.g., prevention of accidents).	• International, EU- and national health and safety standards, legislation and regulation; • Health and safety guidelines; • National promotion campaigns; • Financial support and incentives; • Risk assessment; • Worker involvement; • Workplace modifications; • Safety devices; • Education and training.
Initiatives to help retain people in work who have chronic illness	The **retention** of workers in employment when they are faced with a chronic illness. It is mainly linked to initiatives that offer support to people with a chronic illness to remain in work. Focus is specifically put on employees with a chronic illness who have not yet experienced a long-term sick-leave. In the latter case, the category "Initiatives to support people who are on long term sick leave to get back to work applies."	• EU- and national **disability** legislation and regulation; • Work (place) adjustment; • Redeployment.
Initiatives to support people who are on long term sick leave to get back into work	The **reintegration into work** of workers who are on long-term sick leave (i.e., six weeks or more). Initiatives are mainly linked to return-to-work tools (vocational and not vocational) designed to improve the work ability of the employee and to increase the chance of return to work. Focus is put on more general rehabilitation and reintegration initiatives which are not specifically related to a serious health event (e.g., back pain). Rehabilitation and reintegration initiatives specifically focused on serious health events are tackled under the category "Initiatives to promote rehabilitation and reintegration into work following a serious health event".	• EU- and national **disability** legislation and regulation; • National reintegration programmes; • Vocational rehabilitation (e.g., training, cognitive behavioural therapy, adjustment latitude).
Initiatives to promote	The **rehabilitation and**	• EU- and national **disability**

Category	Definition	Main type of interventions
rehabilitation and reintegration into work following a serious health event	**reintegration into work** of workers who suffered from a serious health event (i.e., a confirmed diagnosis of cancer, organ failure requiring major organ transplant, loss of independent living, functional loss (paralysis) or stroke). It mainly focuses on the recovery of workers so that they can get back to work. The category "Initiatives to support people who are on long term sick leave to get back to work" includes general rehabilitation and reintegration initiatives not specifically targeted at serious health events.	legislation and regulation; • Return-to-work coordinator; • Cardiac and other rehabilitation programmes.
Other policies and initiatives	Both **public health policies,** which are aimed at the entire population and therefore indirectly influences worker's health and **individually targeted policies and initiatives (not in the workplace)** affecting the health of an individual.	• Intersectoral policy addressing health risk factors (e.g., Health in All Policies); • Alteration of public space and transport modalities; • Interventions tackling road accidents (e.g., legislation, traffic calming measures, safety campaigns); • Tobacco control interventions (e.g., taxation, bans, warnings, treatment); • Alcohol control interventions (e.g., taxation, brief interventions, advertising controls); • Interventions stimulating physical activity and healthy nutrition (e.g., counselling, campaigns); • Interventions tackling mental health (e.g., cognitive-behavioural therapies, medication, Internet self-help).

In the remainder of this chapter, we provide – for each category of policies and initiatives – a general overview of the main policies and initiatives that currently exist at EU level, EU Member State level, sector-specific, and at company level. This overview is not exhaustive and is meant to provide a general idea of what the status currently is. Illustrative country-, sector- and company specific examples provide more details.

Interesting examples from countries outside the EU are added –where relevant– for illustrative purposes.

This overview includes more specific information with regard to which of these policies and initiatives have evidence of cost effectiveness with respect to the diseases and their risk factors as described in Chapter 5. Unfortunately, information on (cost-)effectiveness remains rather limited for some of the categories since many existing policies and initiatives have not been evaluated yet with regard to (cost-) effectiveness. In addition, we describe the awareness and use of interventions by survey respondents.

Please note that it sometimes is difficult to clearly distinguish initiatives and policies that only address workforce health. Initiatives and policies that are carried out on the work floor automatically only target people of working age. Nevertheless, if we would only focus on these, we would ignore initiatives and policies that exist outside the workplace and do not specifically target a certain age group, but still have a large influence on workforce health. We have therefore taken these policies and initiatives – when relevant – in consideration as well.

6.2 Workplace health promotion initiatives

6.2.1 Introduction

We have defined "workplace health promotion" as the promotion of workers health and general wellbeing. This goes further than merely legislation on ensuring health and safety of workers (see paragraph 6.3 for health and safety initiatives). It focuses on the active pursuit of activities that help employees to improve their own general health and wellbeing. This definition fits the common understanding of workplace health promotion of the members of the European Network for Workplace Health Promotion (ENWHP) as set out in the Luxembourg Declaration (see for more information paragraph 6.2.3). Typical examples of health promotion activities are health promotion programs at the workplace, restrictions on smoking in workplaces and health monitoring.

Common understanding of workplace health promotion by the members of the ENWHP

In the Luxembourg Declaration, the members of the ENWHP network agreed on a common understanding of Workplace Health Promotion: Workplace Health Promotion (WHP) is the combined efforts of employers, employees and society to improve the health and well-being of people at work. This can be achieved through a combination of improving the work organisation and the working environment; promoting active participation; and encouraging personal development [163].

6.2.2 Overview of leading global/international policies and initiatives

There are no leading global/international initiatives that specifically focus on health promotion in the workplace, but there are two initiatives/organizations that indirectly address health promotion in the workplace.

Role of the World Health Organization (WHO)

The **Bangkok Charter for health promotion in a globalized world of the WHO** dates from 2005 and identifies actions, commitments and pledges required to address the determinants of health in a globalized world through health promotion. It mainly focuses on how national governments should make health promotion (not specifically in the workplace but in a more general setting) an integral part of domestic and foreign policy and international relations. This requires actions to promote dialogue and cooperation among nations, civil society and the private sector (e.g. employers). Since the adoption of the Ottawa Charter (1986) a significant number of resolutions at national and global level have been signed in support of health promotion, but these have not always been followed by action. It is time to close the implementation gap and move to policies and partnerships for action [164].

The WHO has developed a **mental health policy and service guidance package** to assist policy-makers and planners to develop policies and comprehensive strategies for improving the mental health of populations; use existing resources to achieve the greatest possible benefits; provide effective services to those in need; assist the reintegration of persons with mental disorders into all aspects of community life, thus improving their overall quality of life. The package consists of 14 modules. The guidance package acknowledges in module 13 "Mental health policies and programmes in the workplace" (legislative) action undertaken by governments to address workplace conditions that can lead to poor mental health. It also emphasizes the importance of the role of the government in protecting vulnerable populations groups such as women and disabled people. In addition, it provides guidance to workplaces on how to develop and implement a workplace mental health policy and strategies to improve the mental health of employees [165].

Role of the International Union for Health Promotion and Education (IUHPE)

The **International Union for Health Promotion and Education (IUHPE)** is an important professional association of individuals and organisations committed to promote global health and wellbeing through education, community action and the development of public policy. Its mission is to contribute to the achievement of equity in health between and within countries by encouraging a free exchange of knowledge, experience, and the development of collaborative projects, at regional and global levels [166].

6.2.3 Overview of EU level policies and initiatives

Two main factors provide the current basis for workplace health promotion activity at EU level. First, the Framework Directive on safety and health (Council Directive 89/391/EC) (see also paragraph 6.3.3) prepared the ground for a reorientation of traditional occupations health and safety (OHS) legislation and practice. Second, there is an increasing profile of the workplace as a public health setting [167].

European Network for Workplace Health Promotion (ENWHP)

The EC stimulates workplace health promotion by supporting the **European Network for Workplace Health Promotion (ENWHP)** that was set up in 1996. The ENWHP is an informal network of national occupational health and safety institutes, public health,

health promotion and statutory social insurance institutions from EU Member States, countries of the European Economic Area, Switzerland, and candidate countries. This network facilitates cross-border exchange of information and the dissemination of good workplace practice.

The Luxembourg Declaration on Workplace Health Promotion (WHP) (2007) has been adopted by all the members of the network and offers a definition of workplace health promotion (see paragraph 6.2.1) and outlines a set of aims for the practice of workplace health promotion [167].

Since the establishment of the ENWHP, the ENWHP has - with the support of the EC - carried out a number of European initiatives which have established workplace health promotion as a field of action at European and national level. Several examples are given below.

Move Europe Campaign and Work in tune with life

One example of an ENWHP initiative is the Move Europe Campaign which ran from 2007 to 2009. The aim of the campaign was to improve WHP particularly in the fields of physical activity, nutrition, smoking prevention and mental health. The campaign contained an online "company health check-up", a tool for self-assessment on WHP. The evaluation of the campaign resulted in an overall successful impression. However, there is no quantitative evidence of the effectiveness of the campaign [168]. The currently running ENWHP initiative "work in tune with life" is an extension of the Move Europe campaign and focuses on promotion of mental health in the workplace. The set up is similar to the original Move Europe campaign. Companies can engage in a mental health check-up online and based on that they will receive recommendations for improving their situation. The aim is to increase awareness of needs and benefits of mental health promotion, attract companies to participate in the campaign and design models for best practice and encourage exchange of experiences [169].

Workplace health promotion targeting older workers

Another ENWHP initiative, which ran from 2004 to 2006, focused on workplace health promotion targeting older workers. The initiative included activities and tools available at company level for prolonging working life of this group of workers. The following tools can be used to identify the strengths and weaknesses of the company with the present and future personnel structures and to introduce measures to maintain the working ability of the employees [170]:

- **Ergonomic workplace design**: the ergonomic design of the workplace and working environment is a classic approach of occupational safety and health and should, if possible, already be considered in the planning stage of work systems. The aim is to adapt the technology used, the space conditions at the workplace, the work equipment and the working environment to the physical performance conditions of people so that inappropriate workloads in the pursuance of work activities are avoided from the outset if at all possible. In addition, physical changes related to ageing (reduced strength; speed decline; poor vision; low back pain) should be taken into consideration as well, for example, by using technical, strength increasing work aids. More in general, reduction of ergonomic risk factors is of major importance. An overview of age-related physical and psychological changes and appropriate adaptations of the workplace and the working environment is presented in the report.

- **Work organisation**: work should be organised in such a way that workers repeatedly find themselves in front of a challenge. This enables on the job learning or informal learning. Knowledge and skills are

acquired without the need of formal training courses. Promoting variety and learning on the job seems especially difficult to implement in monotonous, physical demanding jobs. Group work could be the answer to this; workers can then learn skills from group members. However the design of group work is of key importance: there should be a variety of tasks available including light work for elderly workers; composition of the team should be balanced; time latitude for learning and group processes is necessary; regulation should be in place on pay and performance to stimulate learning and there should be an atmosphere of reciprocal support.

- **Organisation of working time**: the design of an appropriate break system deserves special attention regarding people of older working age. Older workers need breaks in short intervals. Even micro breaks of a few minutes can be sufficient. Also, older workers run more risk when having night shifts, which should therefore be avoided if possible. Flexible working hours, for example part-time employment, could also relief some of the physical strain and keep elderly healthier for a longer period.

European Agency for Safety and Health at work (EU-OSHA)

The mission of the **European Agency for Safety and Health at Work (EU-OSHA)** is to make Europe a safer, healthier and more productive place to work. EU-OSHA was set up by the EU to help meet the information needs in the field of occupational safety and health. Based in Bilbao, Spain, EU-OSHA aims to improve the lives of people at work by stimulating the flow of technical, scientific and economic information between all those involved in occupational safety and health issues. The EU-OSHA has a dedicated web portal on workplace health promotion, including two fact sheets. The fact sheets provide information and advice to employers and workers on how to set up workplace health promotion and also includes good practice resources such as useful links and case studies [171].

European social partners

The EC promotes European social dialogue between the representatives of the European trade unions and employers' organisations. This involves discussions, consultations, negotiations, and joint actions on bilateral level (between the European employers and trade union organizations) and tripartite level (also involves public authorities). The bipartite dialogue takes place at cross-industry level and within sectoral social dialogue committees. The European social dialogue process has led to a large number of autonomous agreements at European level which the social partners implement themselves, while others have been transformed into binding legislation [172]. Health and safety is the most discussed subject within sectoral social dialogue (see paragraph 6.3.3), but occasionally also workplace health promotion is put on the agenda.

6.2.4 Overview of EU Member State policies and initiatives

Health and safety in the workplace takes up an important role in national legislation and policy (see paragraph 6.3.4). In the diverse EU Member States the subject of prevention is now increasingly gaining attention in public policy. This has led to the expansion of occupational safety and health (OSH) policy to include more preventive legislation and initiatives under the banner of workplace health promotion. Our survey results indicate that national and regional policies on workplace health promotion aimed at alcohol use

disorder are most common. Of the respondents (n=38) 50% mentioned that such policies are in place. Other popular targets for WHP are mental health and musculoskeletal disorders. In both cases 47% of the respondents indicated that such policies are implemented. It is important to note that 35% to 56% of the respondents do not know whether health promotion policies or initiatives regarding a certain disease are in place.

Legislation on banning smoking in public and workplaces

An example of preventive legislation is the ban on smoking in public- and work places in EU Member States. Bans/restrictions on smoking in public and workplaces do not just protect non-smokers. They also create an environment that encourages smokers to cut down or stop. Furthermore, as many public places are workplaces (e.g. bars, restaurants), a ban on smoking in workplaces will actually ban smoking in most public places. Clean indoor air laws may also prohibit smoking in public places and in public transport. The most extensive laws also include restaurants, bars and private workplaces [173]. A ban on smoking in workplaces is present in Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Slovenia, Spain, Sweden and the UK. It differs per EU Member State whether this ban also applies to the hospitality sector. Countries like Cyprus, Hungary, Luxembourg, Portugal and Slovakia have chosen not to ban smoking from workplaces. In Luxembourg and Cyprus employers are responsible for protecting non-smokers from passive smoking by designing its own regulations. In Hungary workplaces can be divided in smoking and non-smoking areas. Slovakia has banned smoking at the workplace, but only in the case non-smokers are present. In Portugal smoking is allowed when proper air-ventilation is in place. A law that bans smoking in public areas went into force in Czech Republic in 2010. For the workplace however there are no restrictions on smoking. In Austria smoking is banned from the workplace only if smokers and non-smokers cannot be given a separate office. If no one objects, smoking in a working area is allowed. In the hospitality sector smoking is partially banned [174].

Legal restrictions appear to be effective in reducing both demand and consumption of tobacco, though it has been proven to be difficult to quantify these benefits. A systematic review of interventions for preventing smoking in public places concluded that carefully planned restrictions, as elements of a comprehensive strategy, were effective in reducing public smoking. Comprehensive public clean air laws have the potential to reduce prevalence and consumption rates of the entire population (including non-working and non-indoor working smokers) by about 10% [175].

Interestingly a summary study of scientific evidence (period 2000-2006) indicates that the bans only have a small or no impact on smoking prevalence or cessation rates. One review in the summary found significant decreases in smoking prevalence and cigarette consumption after the intervention, but other reviews show no clear evidence for reduced consumption. A problem can be the lack of reinforcement which weakens the effect of the restriction on smoking in the workplace. For example, in Austria neither the police, the food inspection nor the work inspection are empowered to control smoking [174].

Stimulation and dissemination of workplace health promotion at a national level

The increased attention on prevention has led to a growing interest of national bodies to look beyond their legislative “occupational health and safety (OHS) role” and stimulate

and disseminate workplace health promotion initiatives. These initiatives mainly offer support and information to employers to tackle workplace health promotion in their specific work environment. These initiatives varies ranging from the offering of a national top-down approach which can be tailored to the specific needs of a company (see example of Germany below) to a fully fledged network of provincial offices tackling workplace health promotion including social partner involvement (see example of Austria below).

Health Circles – Germany

The health circle approach was developed in Germany as a result of occupational safety and health (OSH) legislation during the 1980's in which greater emphasis was put on prevention activities. The health circle approach is a participative problem approach where expertise of the employees is used to develop suggestions – at company level – to improve working conditions and through this the health and wellbeing at the workplace. The health circle approach is a flexible approach that can be tailored for various companies and situations.

The health circles are discussion groups formed at the workplace which focus on organizational structure and psychological problems that could be the source of health problems. The employees are involved in identifying potential causes for health problems and in finding solutions or improvements that eliminate or lower risks through the use of a professionally trained facilitator. A health circle meets several times over some months. During these meeting, problems employees find relevant are discussed and appropriate action to tackle these problems are proposed. Six months after the last health circle an evaluation meeting is held and/or a survey among participants of the circle is conducted to measure the satisfaction among the circle members. A review of studies on the effectiveness of the health circle approach found that participants of health circles are often very satisfied. A substantial amount of suggestions for improvement developed by health circles is implemented within companies. The studies reviewed indicated a positive effect on health outcomes, work environment and work satisfaction. However, the review acknowledges the poor quality of the studies available and the methodological difficulties of evaluating health circles [176, 177].

National Forum of Austria (Österreichisches Netzwerk Betriebliche Gesundheitsförderung)

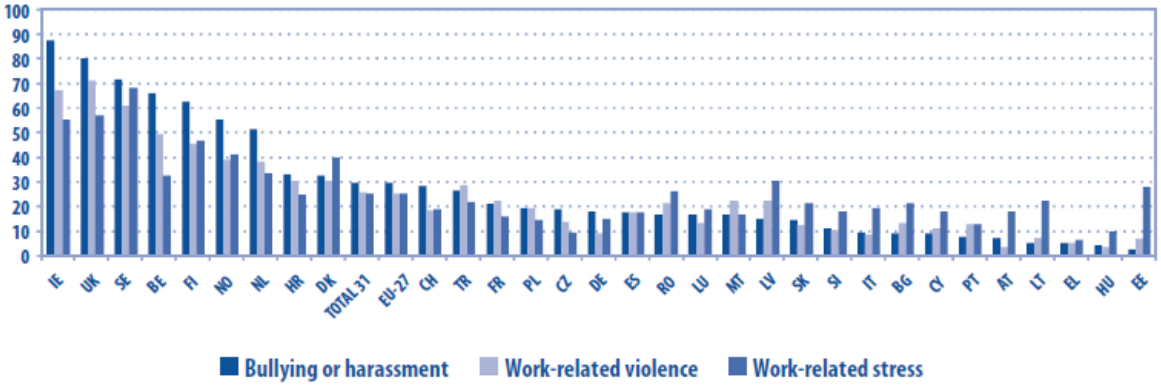
In each of the nine provinces of Austria a regional office exists since 2000 where those interested can obtain information and advice on workplace health promotion. These offices work closely together on workplace health promotion in order to achieve a common understanding of workplace health promotion.

The OÖGKK (a health insurance company) coordinated the network and most of the regional offices have been set up on the premises of local health insurance institutes. The social partners (Chamber of Commerce, Chamber of Labour, Austrian Federation of Industrialists, Austrian Federation of Trade Unions), the umbrella organization of Austrian Social Insurance, the Austrian Workers Compensation Board, the Social Insurance Institution for Trade and Industry, the Austrian Insurance Fund for Civil or Public Servants and the Sickness Fund of Austrian Railway Workers and Miners all work together as partners. New partners are excepted when they are NGOs. The network is funded by the Fonds Gesundes Österreich (Fund for a Health Austria) [178]. See for more information www.netzwerk-bgf.at.

Mental health promotion

Sometimes workplace health promotion initiatives tackle a particular subject such as mental health.

Figure 6.1 Procedures to deal with work-related stress bullying and harassment and work-related violence, by country (in %)



Source: European Agency for Safety and Health at Work. European Survey of Enterprises on New and Emerging Risks: managing safety and health at work, undated, p. 44.

Figure 6.1 shows that Ireland, UK and Slovenia have the highest prevalence of organizations with procedures in place to counter work-related stress, bullying and harassment. In case of the UK this could be explained by the introduction of a national stress management standard, which might have raised company-level awareness on mental health promotion (see example below). In Turkey and Romania, but especially in Portugal, organizations seem to have little procedures or standards to cope with work-related stress, violence and bullying and harassment [179].

Stress Management Standards - UK

In response to high loss of working days, the Health and Safety Executive in the UK issued the Stress Management Standards to help organizations manage the sources of work-related stress. The standards define an organizational culture that controls risks for stress and describes the design of six aspects of work that help maintaining a high mental health. The six aspects addressed by the standard are:

- Demands (workload, work pattern, work environment);
- Role (awareness of role within organisation, preventing conflicting roles);
- Relationships (promotion of positive working practice to prevent conflict and unacceptable behaviour);
- Control (level of influence the worker has);
- Support (encouragement by the organisation, management, colleagues);
- Change (the way organisation change is communicated).

An evaluation of the management standard found a positive relationship between good implementation of the stress management standards and job satisfaction. A negative relationship was found between good implementation of the stress management standards and job-related anxiety, depression and the number of witnessed errors a worker makes. Performance on the six aspects of work described in the standard was measured by an indictor tool in the form of a survey [180, 181].

6.2.5 Company level policies and initiatives

The vast majority of existing workplace health promotion initiatives is carried out at company level. Sometimes these initiatives take a holistic approach including employee involvement to tackle general wellbeing, include health check-ups or focus on a specific health issue. Health issues that are most often tackled within the workplace through workplace health promotion are smoking, alcohol abuse, promotion of healthy food and physical activity and ensuring mental health.

However, workplace health promotion should not focus solely on individual risk behaviour [182]. This approach will lead to limited outcomes since behaviour changes diminish over time and not all employees will participate in programmes. Instead, a multiple-level approach is suggested focusing on individual behaviour, safety systems and corporate culture. Workplace organisation plays a key role here. These are company-level factors such as: structure, climate, culture and practices, philosophy and state of labour management relations and also WHP- and OSH-activities (see also examples presented in paragraph 6.3.5). For example, empowerment of the workforce, delegation of safety activities, seniority of the workforce, good housekeeping and an active role of top management are conditions that keep the amount of injuries within bounds.

Comprehensive ergonomic programmes and behaviour modifications have large effects in reducing occupational accidents. Typical causes of poor health are family-to-work conflicts, stress and high demands compared to control. Five key factors are given for the success of stress prevention: a stepwise and systematic approach, adequate diagnosing or risk analysis, combining work-directed and worker-directed measures, a participative approach and involvement of top management.

Management often is not aware of the effects of workplace conditions on the workers health. To counter these barriers for intervention, government interference could be helpful.

Workplace health promotion in general

A number of reviews on the effectiveness of workplace health promotion demonstrate that workplace health and well-being programmes have a positive economic impact.

The available (though limited) scientific evidence speaks of beneficial effects of the promotion of health and work ability through the reduction of sickness absenteeism, work disability, premature retirement, turnover and increased productivity [183, 184].

A UK study found considerable evidence from literature reviews and over 50 UK-based case studies that workplace health and well-being programmes have a positive impact on intermediate and bottom-line benefits. Intermediate business benefits include reduced sickness absence, reduced staff turnover, reduced accidents and injuries, reduced resource allocation, increased employee satisfaction, a higher company profile, and higher productivity. The available evidence suggests that initial programme costs can quickly be translated into financial benefits, either through cost savings or additional revenue generation. Quantifiable and significant financial benefits from organisations' initiatives were found in a number of cases, including large, private-sector business, public-sector

organisations and small and medium-sized enterprises [177]. The findings of another review indicates that occupational health promotion pays off, particularly due to the reduction of medical costs and reduced absenteeism [185]. This was also found in a follow up review summarising scientific literature from the period 2000-2006. However, the evidence base for the cost-effectiveness of workplace health promotion and prevention focusing on work performance is very limited. This is especially due to the lack of analyses and a uniform methodology as well as the poor quality of evaluation studies [186].

According to various studies and reviews, there are several identified conditions that need to be fulfilled to make a workplace-based health promotion program most likely to succeed. This list of conditions is not exhaustive but shows the most important elements:

- Successful programmes are those that were specifically designed to meet employee needs. There is no 'one size fits all' – what might be right for one set of employees may not be for another, even within one organisation;
- Senior management buy-in is also fundamental to success. Leadership goes beyond endorsement of programmes and involves active and visible participation of senior management in health and well-being programmes;
- Any programme or initiative also needs to be aligned with the businesses overall aims and goals. Rather than these programmes being an afterthought, they will be more effective if they are related to the vision, principles and overall business plan and are integrated into management practices and the daily routine of an enterprise;
- Communication is key, both in terms of employees being informed and updated on any health and well-being initiative, and their being continually consulted;
- Optimal use of on-site resources;
- Accessibility of the programmes;
- Focus on improving the quality of working life and conditions as well as focusing on the behaviour of the individual worker;
- Supportive environment; and
- Finally, if organisations are to form their own business case and share the value of health and well-being programmes with their directors, shareholders and other organisations, then it is imperative that they measure the outcomes of these programmes [168, 177, 187, 188].

Another source, a survey of the ENWHP among companies and institutions that were selected as models of good practice in workplace health promotion, indicated that the change of principal procedures in the companies and the provision of adequate structures, as well as the education of the staff and the formation of awareness and attitude towards healthy behaviour in the organisation, are more vital to the success of workplace health promotion than the appointed resources [168]. According to the models of good practice, a successful integration of health promotion into the company or organisation also includes a proper evaluation of the program and the presentation of the impact, results and effects of the workplace health program to the entire staff [168].

Health check-ups

Health checks are often just one ingredient of a broad workplace health promotion program. An overview on the (cost-) effectiveness of different workplace health promotion initiatives reported evidence of monetary benefits of blood pressure, breast

cancer and depression screening at the workplace in terms of lower medical cost. There is however no evidence on positive returns on investment for the company. Also on the effect on work performance the evidence is weak due to limited research. Depression screening forms an exception; work performance improves already after a short time period. Screening on prostate cancer is not considered cost-effective due to the large amount of false positive test results. The same overview concludes a low participation in health checks by workers. Advice on physical activity given during a health check generally does not lead to behavioural changes [186].

Workplace health promotion with respect to smoking

A literature study shows that controlled studies have provided quite convincing evidence on the effectiveness of workplace health promotion initiatives in the attitude towards smoking. Occupational programmes actually prove to be more effective than community based programmes [185]. A Dutch review comes to a similar conclusion, but also mentioned that it is not known what the effect of these programmes is on absence, productivity and incapacity to work and subjective outcome measures like work satisfaction, work stress, and long-term health effects [189]. Below we offer more information on the effectiveness of smoking cessation services at work and on the effectiveness of banning or putting restrictions on smoking in public and workplaces (see also paragraph 6.2.4).

Information provision and support at work to stop smoking. A Dutch review indicates that information provision and support at work to stop smoking has shown to be effective measures to curb smoking in the workplace [190]. Particular attraction of the workplace is that it provides a route of access for communicating about smoking and offering help to stop. Although people taking up these interventions are more likely to stop, the absolute numbers who quit are low. A number of studies considered methods for increasing participation. From a systematic review it appears that there is limited evidence that participation in programmes can be increased by social and environmental support, competitions and incentives organized by the employer [191]. Evidence from a summary study of scientific evidence (period 2000-2006) also suggests that social support (e.g. by colleagues) and incentives (e.g. bonus for participation and successful quit attempt) do not affect outcomes. Incentives and bonuses, however, constitute a possibility for increasing participation rates and thus (despite an equal cessation rate) the number of abstainers at the end of the program [186, 192].

Bans/restrictions on smoking in public and workplaces. With regard to restrictions at work settings, a WHO report and systematic review [193] indicate that there is evidence that the prevalence of smoking is reduced by almost 4% at smoke-free workplaces, and may also yield reductions of up to 10% [194]. The systematic review further concludes that smoke free workplaces reduce total cigarette consumption per employee by 29%. It also concludes that totally smoke free workplaces had about twice the effect on consumption and prevalence as policies that allowed smoking in some areas [193]. Interestingly a summary study of scientific evidence (period 2000-2006) indicates that the bans only have a small or no impact on smoking prevalence or cessation rates [186].

Workplace health promotion with respect to alcohol

A summary report on scientific evidence (2000 to 2006) shows that the evidence base for programs on alcohol prevention in the workplace is still rather weak due to a lack of high evidence studies [186]. From the limited scientific evidence available it is indicated that several types of work-related interventions have potential to produce beneficial results. These are, for example, brief interventions, psychosocial skills training and peer referral [195]. Another potential effective intervention is an employee assistance programme with a "constructive confrontation strategy" of the alcohol problem by a superior. It has been proven that this "style" is associated with improving the work performance of employees addicted to alcohol [186]. A large EU study on alcohol shows that supervisory training leads to a greater utilisation of employee assistance programmes [196].

From a systematic review it appeared that counselling-based interventions either reported no effect, or the effect was small. The study was based on self-reporting and measured desire to change rather than actual behaviour [195].

In addition to the interventions mentioned above, also mental health promotion interventions that decrease the prevalence of work-related stress are important for prevention of alcohol abuse. Many studies have found significant associations between workplace-related stress and elevated levels of alcohol consumption. An EU study on alcohol found that a workplace prevention training programme for stress management had reduced problem drinking from 20% to 11% and missing work because of a hangover from 16% to 6% [196].

Workplace health promotion with respect to nutrition and physical activity

Workplaces are a sedentary setting for many workers and also a place where access to energy-dense food and beverages is common. There is an association between excessive body weight and risk for a range of occupational conditions, including injury, asthma, musculoskeletal disorders, immune response, neurotoxicity, stress, cardiovascular disease, and cancer. In the workplace, obesity is an important driver of costs associated with absenteeism, sick leave, disability, injuries, and healthcare claims. Employers are keenly interested in programs and policies that improve a worker's health and ultimately reduce healthcare costs [197].

However, a large review of international literature on theories and methodologies for the prevention of obesity at the workplace states that conclusive evidence in regards to the effectiveness of workplace health promotion programmes is yet lacking [198]. This conclusion is backed-up with another review from the Netherlands in which it is mentioned that there is no clear relation found yet with absence, productivity or incapacity to work. In addition, only a relationship is found with intermediary health measures like weight (in combination with physical activity interventions); and although there was more intake of vegetables and fruit and less saturated fat it is still unknown what the effect is on subjective measures such as work satisfaction, work stress and long-term effects are completely unknown.

This is further complicated by the fact that workplace health promotion is contextual and thus influenced by different organisational structures. As a result, it is not possible to produce a general workplace health promotion programme. Nevertheless, given the

diversity in the needs and interests of different occupational settings and their workers, multi-component interventions with environmental modifications, adapted to the particular needs and values of the specific worksite, enhance the chances of successful workplace health promotion programmes [189].

In a large review of international literature it is also mentioned that the primary aim of many workplace health promotion programmes is disease prevention by targeting individuals' lifestyles. These programmes are often based on methods focusing on the individual. However, targeting individual risk factors only has been shown to be insufficient. Targeting the intervention on the organisation level has shown to be more successful [198].

Below we offer more information on the effectiveness of worksite nutrition programmes, environmental changes with respect to nutrition, physical activity programmes, and environmental changes with respect to physical activity that can be applied in workplace health promotion.

Worksite nutrition programmes. According to the scientific literature there is strong evidence of a consistent, albeit modest, effect of worksite nutrition (and physical activity) programmes. The findings are applicable to men and women in a range of worksite settings. The evidence was too limited to draw conclusions about differential effects by program focus (nutrition and physical activity) or program component (information, behavioural skills, or environmental and policy). The literature shows that when more or more intensive modes of intervention were provided to participants there appeared to be an increase in programme impact. For example, offering structured programs (i.e., scheduled sessions) appears more effective than unstructured approaches, and information plus behavioural counselling confers more benefit than providing information alone. There was no apparent difference in program effectiveness based on lay versus professional group leaders [197].

A summary study of scientific literature reports that measures aimed at changing the attitude towards nutrition and lowering the cholesterol level appear to be promising but are inadequately substantiated [185]. It seems clear that occupational nutrition and cholesterol programmes can be carried out and that the participants profit from these short-term. The causal correlation however is not sufficiently substantiated [185].

The effect sizes reported in workplace programs stimulating fruit and vegetables intake generally have not been very large, but this may reflect the diffuse nature of these typical multi-component interventions [199].

A summary study of scientific literature from the period 2000 to 2006 shows that positive results can be achieved through dietary programs in the workplace. The studies found important changes in the consumption of fruit, vegetables, fat and dietary fibres both for individual (e.g. nutrition education) and organisational interventions (e.g. healthy canteen food, posters with information on healthy diet). The literature, however, also shows that studies of sophisticated methods as well as innovative intervention strategies are required in this field [186].

Environmental changes with respect to nutrition. Another systematic review showed that environmental changes such as promotional materials (brochures and posters), expanding availability of healthy products, and efficient food placement are potentially effective in influencing dietary intake (fruit, vegetable and fat). These initiatives can be applied at the workplace. It is important to mention that most studies included environmental strategies as part of a multi-component intervention. It is therefore not possible to solely assess the effect of environmental changes [200].

Physical activity programmes. Physical activity programmes at worksite may include a variety of approaches, such as: aerobic training, strength, and flexibility exercises, physical activity programs with the main focus on the development of cardio respiratory fitness and cardiovascular capacity exercises [201].

A summary report on scientific evidence shows several promising results with respect to the effectiveness of work health programmes activities that focus on increasing physical activity. Reviewed study results indicate that work health programmes improve the fitness of the participants (even if to a lesser degree) and that heart circulation and other risk factors are lessened by the participation in an occupational activity programme [185].

Further, the literature study shows that there is limited evidence at hand for the effectiveness of occupational activity programmes on absenteeism [185]. It is mentioned that the benefits are possibly greater where white-collar workers are concerned, their work featuring hardly any physical activities, than for blue-collar workers. Inconclusive evidence is provided with respect to job satisfaction and job stress [185]. With respect to productivity, the individuals involved see themselves as more productive, but this was not reflected in the objective key data (e.g. test persons were mainly industrial workers, whose productivity is determined by machinery cycles) [185]. Another Dutch report on scientific evidence and scientific study does not deviate from these outcomes [189, 201].

According to a study on the effectiveness and economic benefits of workplace health promotion and prevention, summarising available scientific evidence in the period 2000 to 2006, physical activity programmes are convincing to reduce sickness absence and to prevent musculoskeletal diseases [186].

In the case of (low) back pain, exercise interventions showed evidence of effect on sick leave, costs and prevention of new episodes of (low) back pain [202-204]. One systematic review, however, showed that exercise was effective in reducing severity and activity interference of low back pain, but provided only limited evidence that exercise is an effective intervention in preventing low back pain [205]. The results of another systematic review suggest that some exercise interventions can be cost-effective, with the most convincing evidence for rehabilitation of back pain patients [206].

Further results from a scientific study indicate that although the primary goal of work-place related physical activity programmes (i.e., enhancing general physical activity levels) is achieved this did not result in an improvement of cardio-respiratory fitness. One plausible explanation might be the fact that enhancement of cardio-respiratory fitness requires quite intensive physical activity (at least three times a week at 40 or 50 to 85% of maximum oxygen uptake reserve for at least 20 minutes), and it is likely that participants

in physical activity programmes do not reach this frequency, intensity, and duration [202].

Both individual-focused physical activity programs and group-focused physical activity programs are found effective. They contribute to an increased physical activity of the employees [186, 190].

A Dutch review of scientific evidence mentions the following success factors in physical activity interventions in the workplace [189]:

- Regular participation;
- Personal feedback;
- Social support input;
- Intensity;
- Integration of lifestyle/day- and week rhythm;
- Combinations of measures (e.g. combining it with health eating interventions); and
- Influencing surroundings factors.

Another Dutch review shows that higher participation in company fitness programmes can be achieved by ensuring that the trainers know all the employees. Participants who haven't participated for a while can then be approached in an informal way (hall way chat) to motivate them to come [207].

Suppliers of company fitness programmes mention in Dutch interviews that companies are sometimes not sufficiently open towards supporting PR actions to bring the programmes to the attention of the employees. Better cooperation between the company and the supplier could lead to a higher participation rate and frequency according to these suppliers [207]. Below we provide an example of a physical activity programme offered by a company in the UK.

Employee wellness scheme of Nestlé UK – UK

In line with a business transition from a Food and Beverage manufacturer to a focused Health, Nutrition and Wellness business, Nestlé UK have transitioned occupational health more towards a more integrated "employee wellness" scheme that impacts all of its 6,000 employees in the UK.

The objective of this integrated scheme is to help employees address personal fitness risks which will help their productivity and business engagement with an ultimate improvement in business performance. They helped to change employee's long-term behaviours towards exercise: walking became the primary form of transport; walking accounted for over 66% of all journeys (up from 15%); travelling by bicycle doubled over course of event; journeys by car dropped by over half; and employees used the lifts in the office 50% less.

In 2009 Nestlé UK motivated over 1,800 employees to get involved (around 36% of the workforce). They have also rolled this out across a number of other Nestlé markets including Germany, Spain, Switzerland, Belgium, the Netherlands and Australia. In total, over 6,000 Nestlé worldwide employees made a step towards a healthier lifestyle. The performance of Nestlé UK employees was spectacular and resulted in Nestlé UK taking the trophy for the "Most Active Company in the World" (beating nearly 800 other businesses) for the second year in a row. The average Nestlé employee walked over 12,850 steps per day for 125 days.

With a sustained level of higher physical activity, some substantial health benefits for Nestlé employees were recorded: 35% of participants reported weight loss; and of those that reported weight loss, the average was 4.5kg loss - 63% reported increased energy - 61% reported increased fitness [208].

Environmental changes with respect to physical activity. According to a review of scientific evidence, incidental interventions such as motivating signs for encouraging stair use (offering a 'choice moment') have the potential of reaching the entire staff [186]. Two reviews show that placing signs – In general – to prompt people to use stairs near elevators and/or escalators increases the use of stairs (e.g. the Canadian Cancer Society even mentions a doubling of the use of stairs). Nevertheless, the Dutch review indicates that still little is known of the long-term effect [200, 209]. Since the evidence is not related specifically to a workplace context it has to be examined whether this effect can also be reached on the work floor [190, 210].

Environmental changes combined with individual interventions e.g. sports facilities and lockers on-site plus selective counselling and behavioural skills trainings can successfully increase the physical activity of employees. The same applies to low-cost interventions such as the initiation of jogging groups or prompts to go to the colleague's office instead of using the telephone [186].

Workplace health promotion with respect to mental health

There has been an increasing emphasis on psychological problems and mental health in workplace health promotion. Stress at work and related mental health problems are associated with very high costs. Not only workers, but also employers can suffer from poor mental health of employees due to absenteeism, reduced productivity and increased cost.

Structural changes in the companies' culture, work processes, work atmosphere and formed habits might be necessary to address risk factors of mental health [168]. To support organisations in implementing a good mental health promotion policy, the ENWHP (see also paragraph 6.2.3) defined crucial points for successful stress prevention and mental health promotion. They present a method to approach mental health promotion that maintains and increases efficacy and satisfaction of employees, continuously motivates staff, has a worked-out approach on stress-prevention to reduce stress and control workload and provides adequate stress-management to all company members, as well as the awareness and acceptance of mental health among employees. The setting should provide a physiotherapist available on company grounds, easy access to contact persons on company grounds or via a hotline for employees that are troubled with stress or conflict, as well as company support for work-related education and training of employees. Furthermore, the flexibility of work organisation and the education of the entire staff on stress and conflict management are vital to the concept of stress prevention. Taken together, efficacy of workplace health promotion does not primarily depend on the appointed resources, but much more on an elaborated and sophisticated approach, the provision of a supportive environment in the company, as well as the education of employees on health topics and the creation of awareness towards health-promoting behaviour [168].

Below effectiveness of stress management interventions, increasing employee control and interventions tackling the problems as a result of shift work are discussed.

Stress management interventions. A review of studies by IOM [211] found that there was reasonable evidence for effectiveness of stress management training. A review of studies executed by BOHRF [212] concluded that stress management training that focuses on "problem-solving skills, reducing negative coping styles, identifying potential stressors at work and developing strategies to minimize their impact and developing self-awareness in relation to stressors", have at best a modest or short-term positive effect.

The BOHRF review indicates that for workers with common mental health problems cognitive behavioural interventions are more effective than relaxation techniques. Cognitive behavioural interventions are based on the idea that our behaviour and actions are based on our thoughts. Cognitive behavioural interventions teach workers to react or behave different in certain situation. Especially for those with high-role jobs cognitive behavioural interventions were found effective.

Both the IOM and the BOHRF reviews found that there is limited to reasonable evidence of the effectiveness of physical exercise as a tool for managing stress. Another review of controlled studies also assessed that the implementation of physical activity programs represents a successful strategy to tackle mental ill-health [186]. Another study suggest that although there is limited evidence that aerobic exercise has a positive impact on clinically-relevant outcomes (e.g. reducing anxiety and health complaints), no evidence was found regarding the effects of exercise on work-related outcomes [213].

Likely a combination of psychological and physical management will be most effective.

Increasing employee control. General workplace promotion interventions that focus on increasing employee control (increasing his/her influence on for example work tasks; workplace decision making, etc.) appear to have had mixed impacts on health outcomes. Reviews of employee participation and task restructuring noted positive health effects when job control was increased (and negative effects when job control decreased) [192].

Interventions tackling problems as a result of shift work. Night work can cause psycho- and physiological damage which can have radical effects on a workers physical and mental health, leading to psychological disorders which can eventually lead to increased morbidity and absenteeism. Typical symptoms for shift-workers are sleep problems, digestive troubles, irritability and anxiety. Maintaining social relationships and co-ordination of family timetables is also often problematic. Women seem to be more prone to the negative effects of shift work than men, especially when they are pregnant or have children of a young age. The seriousness of health problems caused by shift work calls for a shift system designed in an optimal way to minimize the impact on (mental) health. Some factors that are of key importance to tolerance of shift systems are:

- Presence of an occupational physician;
- Periodic health checks;
- Support from managers and colleagues;
- A shift system tailored to job demand and personal conditions; and
- Participation of employees in planning [214].

Also interventions aimed at physical activity play an important role regarding shift work. Physical fitness improves the adaptation to shift work [214].

A special case of a shift system is the "Ottawa system". This system is characterized by extended shifts which enable a higher number of days of work. The evidence we found on the health effects of this system compared to a 7-day shift system is however inconclusive.

6.3 Workplace health and safety initiatives

6.3.1 Introduction

We have defined workplace health and safety initiatives as "the protection of workers in their employment from risks resulting from work factors adverse to health." It is mainly linked to legislation that employers need to abide to ensuring the health and safety of their workers.

In this paragraph an overview of workplace health and safety policies and initiatives and their (cost-) effectiveness at the international, EU-level, national-level and company level is given.

6.3.2 Overview of leading global/international policies and initiatives

Globally, especially the ILO plays an important part in health and safety of the working age population.

Role of the ILO

The International Labour Organisation (ILO) establishes international standards on labour and social matters. Its members are countries from all over the world, which are represented by two government delegates, an employer delegate and a worker delegate. This so called tripartism is an important characteristic of the ILO's working method. The delegates are usually assisted by technical advisors and usually headed by Cabinet Ministers who act on behalf of their government. The international labour standards are formulated as Conventions and Recommendations. About 70 of them deal with occupational safety and health matters. Further guidance is provided in Codes of Practice and manuals which are used as reference material by those in charge of formulating detailed regulations or responsible for occupational safety and health [215].

In 1981 the **Occupational Safety and Health Convention** was adopted. In the convention it is stated that the national governments of members are to formulate, implement and periodically review a coherent system regarding occupational health and safety and the working environment. This should happen in consultation with representative organisations, employers and workers. The policy should take into account aspects such as: material elements of work; the relationship between work conditions and the capacities of the worker; training in achievement of adequate levels of health and

safety; communication and co-operation at appropriate levels and protection of workers. Laws concerning occupational health and safety should be enforced by inspection and measured against violations [216].

In 1985 the **Occupational Health Service Convention** was adapted. This convention focuses on health services (usually services with a preventive function) that members should make available for all workers. These services involve risk assessment; surveillance on work environment and conditions that might affect health; advise on planning and organisation of work; participation in programmes for development of improvements of practices and testing of new equipment; advice on safety, health, hygiene, ergonomics and protective equipment; surveillance of health in relation to work; promotion of adaptation to work; contribution to measures of vocational rehabilitation; collaboration in providing training and education on occupational health and safety; organising first aid and emergency treatment, and participation in analysis of occupational accidents and diseases. National governments are responsible for the organisation implementation of the convention [217].

In 2001 the ILO published **guidelines for OSH management system** (ILO-OSH 2001). ILO-OSH 2001 is not legally binding and is not intended to replace national laws, regulations and accepted standards. It reflects ILO values such as tripartism and relevant international standards including the Occupational Safety and Health Convention, 1981 (No. 155) and the Occupational Health Services Convention, 1985 (No. 161). Its application does not require certification, but it does not exclude certification as a means of recognition of good practice if this is the wish of the country implementing the guidelines [218]. On a national level the ILO guidelines mean to support the establishment of national OSH management frameworks. Action at national level includes the nomination of competent institution(s) for OSH-MS, the formulation of a coherent national policy and the establishment of a framework for an effective national application of ILO-OSH 2001, either by means of its direct implementation in organisations or its adaptation to national conditions and practice (by national guidelines) and specific needs of organisations in accordance with their size and nature of activities (by tailored guidelines) [218]. On organisational level the guidelines mainly focus on integration of management systems into the organisation and on motivation of members to improve OSH performance [218]. The guidelines have been adopted in several countries, for example France and Ireland. In other countries, including Poland and Germany, OSH management has been developed on the basis of the ILO guidelines [219].

OSHAS 18000

The **OSHAS 18000 standard** is an international occupational health and safety management system specification. It was created via a concerted effort from a number of world leading national standards bodies, certification bodies and specialist consultancies. It forms a uniform and certified approach/ code of practice for employers with respect to occupational safety and health management [220]. Key elements of the standard are a systemic approach and integration into the organization. The OSHAS model of management systems has the following components: planning (including risk assessment), management programs, implementation and operation, checking and corrective action and management review [219].

Role of the WHO

In 2007 the WHO embraced a "**Global Plan of Action on Worker's Health 2008-2017**" which proposes five main objectives in the field of occupational health and safety:

- devise and implement policy instruments on workers' health;
- protect and promote health at the workplace;
- improve the performance of and access to occupational health services;
- provide and communicate evidence for action and practice; and
- incorporate workers' health into other policies [221].

This action plan adresses gaps that were identified with regard to OSH in the WHO countries.

6.3.3 Overview of EU level policies and initiatives

At EU level, a wide variety of Community measures in the field of health and safety at work have been adopted.

EU Directives

The **European Framework Directive on Safety and Health and Work** (89/391/EEC) was adopted in 1989 and is considered to be a substantial milestone in improving the EU safety and health at work. The Framework Directive guarantees minimum safety and health requirements throughout Europe while EU Member States are allowed to maintain or establish more stringent measures [222]. It includes among other:

- An obligation for employers to take appropriate preventive measures to make work safer and healthier;
- The principle of risk assessment and its main elements (e.g., hazard identification, worker participation, introduction of adequate measures with the priority of eliminating risk at source, documentation and periodical re-assessment of workplace hazards); and
- The obligation to put in place prevention measures implicitly stressing the importance of new forms of safety and health management as part of general management processes [223].

The Framework Directive specifically assigns several responsibilities to the employer among which:

- Responsibilities for providing all of the necessary information concerning safety and health risks and the protective and preventive measures required;
- Obligation to consult with and let workers participate in health and safety at work;
- Responsibility for providing training and health surveillance; and
- Responsibility to enlist competent external services or persons if appropriate services cannot be organised for lack of competent personnel within the company [224].

The Framework Directive is legally binding and had to be transposed into national law by the end of 1992. The repercussions of the transposition on national legal systems varied across Member States. In some Member States, the Framework Directive had considerable legal consequences due to inadequate national legislation while in others no major adjustments were necessary [223].

A series of individual directives focusing on specific aspects of safety and health at work were adopted on the basis of the Framework Directive. Nevertheless, the Framework Directive continues to apply to all areas covered by the individual directives. Where individual directives contain more stringent and specific provisions, these special provisions prevail. Individual directives tailor the principles of the Framework Directive to:

- specific tasks (e.g., manual handling of loads);
- specific hazards at work (e.g., exposure to dangerous substances or physical agents);
- specific workplaces and sectors (e.g., temporary work sites, extractive industries, fishing vessels);
- specific groups of workers (e.g., pregnant women, young workers, workers with a fixed duration employment contract); and
- certain work related aspects (e.g., organisation of working time) [223].

The EC issues European guidelines which are non-binding documents which aim to facilitate the implementation of European directives. Guidelines can be issued in various forms including practical guidelines setting out best practice for the prevention of risks; Council Recommendations; European Commission Communications, etc. [222]. An example is the guidance on practical aspects of implementing risk assessment requirements according to the Framework Directive. This document is addressed to the EU Member States and can be used or adapted to provide advice to employers, workers and other parties when they deal with risk assessment. It concists of guidance on how to carry out risk assessment at work; how employers can engage external services, and also specifically focuses on SMEs [225].

Every five years (every four years for Directives 90/269 and 90/270) EU Member States need to report to the EC on the practical implementation of the Framework and individual Directives. Based on these national reports, the EC evaluates the implementation of the Directives and reports to the European Parliament, the Council and the Economic and Social Committee [226]. A Communication from the European Commission in 2004 (COM[2003]62) concludes on the basis of the national reports that EU legislation contributed to instilling a culture of prevention throughout the EU and led to the rationalisation and simplification of national legislative systems. Nevertheless, the report also highlighted various flaws in the application of the legislation and cases where infringement proceedings had been opened. The next report will cover the period 2007-2012 [223].

Community Strategy on Safety and Health at Work 2007-2012

The Community Strategy on Safety and Health at Work (COM/2007/0062 final) forms the political framework of the European safety and health policy for 2007-2012. It takes a holistic approach towards occupational safety and health by combining legislation, regulation with a variety of other instruments, such as social dialogue, good practice, awareness raising, corporate social responsibility, economic incentives and mainstreaming [227].

The Strategy aims to achieve a sustained reduction of occupational accidents and diseases in the EU. It sets out a quantitative objective of 25% reduction of accidents at work through a series of actions at EU and national levels in different areas. Actions include

improving and simplifying existing legislation and enhancing its implementation in practice; defining and implementing national strategies which target the sectors and companies most affected; mainstreaming of health and safety at work in other national and EU policy areas and finding new synergies; and better identifying and assessing potential new risks through more research, exchange of knowledge and practical application of results [4]. In the period 2002-2006, the EU Member States already made progress by developing and implementing more focused national strategies and action programmes [5].

European social partners

European social partners are consulted at various stages in the European decision-making process in the field of health and safety at work (see for more information on European social dialogue paragraph 6.2.3). European social partners have also adopted several autonomous agreements on work-related stress (2004). For example, EU social partners have taken the responsibility for implementing measures at national, sectoral and enterprise level. The aim of the agreement is to provide employers and workers with a framework to identify and prevent or manage problems of work-related stress [7].

6.3.4 Overview of EU Member State policies and initiatives

National policies in the EU Member States regarding safety and health are primarily based on the implementation of EU legislation and policies. However, also other initiatives are undertaken by some EU Member States that go a step further than the necessary requirements. Examples are benchmarking, additional promotion campaigns and the creation of financial incentives.

The results from our survey show that more than 40% of the respondents is aware of national and/or regional policies or initiatives regarding health and safety at work (particularly with respect to accidental injuries (77%)) in their respective countries. Examples mentioned are the development of safety instructions in the construction industry in Cyprus, compensation for industrial injuries and diseases and the Danish working environmental strategy (2006-2010) to reduce accidental injuries amongst others. Knowledge on the existence of policies or interventions targeted at reducing socioeconomic disparity with regard to accidental injuries is scattered (42% believes there are such policies in place, 24% mentions there are not such policies existing and 34% does not know about such policies).

More than half of our respondents mention that specific interventions to address accidental injuries are used, either by more organizations or nationally. Especially, the use of European safety standards for protective equipment and creating awareness and responsibility towards healthy behaviour among the employees are mentioned. Most respondents do not know about the cost-effectiveness of particular interventions to address accidental injuries. However, more than 50% of the respondents believe that the following interventions and policies have a considerably or moderate impact on the reduction of number of people out of work for health reasons: European safety standards for protective equipment at work, educational safety and prevention programmes and safety devices.

Implementation of the EU Directives in national legislation

The responsibility for enforcing EU laws with respect to occupational health and safety (OHS) lies with the individual EU Member States. As mentioned before, a Communication from the European Commission in 2004 (COM[2003]62) concludes on the basis of the national reports that EU legislation contributed to instilling a culture of prevention throughout the EU and led to the rationalisation and simplification of national legislative systems [223]. Impact has been higher in those EU Member States which had either less developed legislation or legislation based on corrective principles compared to the Member States that had a preventive approach to fight occupational risks. The EU Directives moved away from a technology-driven approach for accident prevention towards a policy of occupational safety and health that focused on the person's behaviour. Organisational structures have the biggest impact in the EU Member States. In transposing it, Member States had to change from prescriptive detailed legislation to objective-driven law [226].

The EC seeks reassurance that the legislation is being applied and enforced effectively and efficiently by the Member States. The Senior Labour Inspectors Committee (SLIC) seeks to encourage consistent and effective enforcement of Community based legislation. To this end, the EU Member States have established common principles of inspection and a system of mutual auditing on a voluntary basis by which national labour inspectorate arrangements are tested against the SLIC's "Common Principles for Labour Inspectorates (LIs) regarding Inspection of Health and Safety at the Workplace" [228].

The example below provides a summary of Swedish legislation on health and safety, which comes directly from the evaluation of the Swedish labour inspectors under the SLIC system.

Work environment legislation - Sweden

The main enactment relating to the work environment is the *Work Environment Act* (1977:1160). Numerous additions and amendments have been made to it since then. The Act contains basic provisions for the achievement of targets in the work environment sector. The Act applies to practically the whole range of working life, with all its various branches of activity and forms of employment and is constructed as a typical framework enactment. Scope is thus left for adapting implementation of the Act to social and technical developments. Due to its general nature, it is often impossible to deduce directly from the Act itself what measures a party responsible for safety must take in order to achieve a satisfactory work environment, and so the Swedish system requires the framework to be filled out by means of more prescriptions that are detailed.

The Parliament has granted the Government extensive powers to issue prescriptions on the work environment. Subsequently, through the Work Environment Ordinance (1977:1166), the Government has relayed those powers to SWEA. There are at present upwards of a hundred SWEA Provisions in force, and they are binding. About 40 of them contain provisions, which carry direct penal sanctions. Infringements are punishable by fines. There are also three Provisions, which carry sanction charges. As regards the content of the provisions, the earlier ones often contain detailed requirements, while those issued in recent years tend to contain requirements of a more functional nature. Another tendency is that provisions drafted nowadays are normally for general application, whereas earlier Provisions were often addressed to a particular industry.

SWEA is distinguished by their being tasked both with issuing implementing provisions to accompany legislation and with checking to see that employers and other parties in Sweden with safety responsibilities conduct their activities in accordance with the legislation and Provisions.

The European health and safety directives started being transposed into Swedish legislation when Sweden became part of the European Economic Area, thus before the country's EU membership. Rules fulfilling the requirements inherent in each directive have been published in the Statute Book of the Swedish Work Environment Authority (AFS). Often, a separate publication with provisions covering the directive in question has been elaborated. Sometimes, the requirements of a directive have been incorporated into a publication with provisions covering a wider scope than that of the EU directive [228].

The evidence that we found in our review on the effectiveness of legislation targeting occupational accidents at work is limited. A systematic review showed that specific legislative mandates expanding the use of Rollover Protective Structures (safety standards) on tractors were not associated with a reduction of injuries in one study in the farming industry. Legislation to ban (Endosulfan) pesticides was however associated with a reduction in fatal poisonings in the long term in another study [229].

National strategies in response to the EU Community Strategy on Safety and Health at Work 2007-2012

Each EU Member State has developed a national strategy in occupational safety and health with regard to the EU Community Strategy on Safety and Health at Work 2007-2012. The strategies have the aim to provide a clearer focus on the overall national direction and to set OSH priorities. The example below offer some details with regard to the Spanish strategy (2007-2012).

The Spanish strategy on safety and health at work 2007-2012

The Spanish strategy had been agreed with all the social partners and autonomous regions. The Strategy forms the instrument for establishing the general policy framework for the prevention of occupational risks in the short, and above all medium and long term. Its aim is to give a coherent and rational structure to the occupational safety and health measures developed by all the significant actors in the prevention of occupational risks. Its two major objectives are to reduce the number of accidents and work and occupational illnesses and to steadily improve the levels of safety and health at work.

Its most important features are as follows:

- It is broad in scope. This is not only because of its five-year duration but because of the enormous number of measures it includes (more than one hundred), which also cover the whole range of fields involved: education, training, research, development and innovation (R&D&I), health, awareness campaigns, measures for enterprises, measures for workers, measures for prevention services and strong and determined institutional and financial support from the Government to develop risk prevention policies and practices;
- It is for small and medium-sized enterprises (SMEs). They will be able to fulfil their obligations more easily and efficiently in the effort to reduce the number of accidents at work and occupational illnesses;
- It is committed to quality and efficiency in prevention. The aim is to carry out more preventive activities in enterprises, and these should be of greater quality;

- It ensures that workers and employers, trade unions and employers' organisations become directly involved in the real and effective compliance with the obligations relating to risk prevention;
- The objectives to be achieved can be divided into two main groups: first, those dealing with occupational risk prevention in the enterprise, aimed at employers and workers; and second, those dealing with public policies to tackle accidents at work and occupational illnesses which are aimed at the public administrations [230].

National initiatives

Throughout the EU, national and regional agencies set -beside legislation- strategies and guidelines for interventions in the field of occupational health and safety. These vary from country to country depending on factors such as the regulatory settings in health and safety and industrial relations models. In this paragraph some strategies for the implementation of OSH in the EU Member States are discussed. A literature review of good practices indicates that the formulation and dissemination of strategies in the field of health and safety by both national and local authorities to those who can intervene in the workplace (particularly the employer) is an effective intervention to tackle occupational accidents [231].

Information, promotion, support and consultancy. Several EU Member States have designed campaigns or policies that aim to offer guidance to companies regarding the implementation of legal requirements for OSH or promoting the implementation OSH management systems. Sometimes campaigns are targeted at SMEs or risk groups such as young or migrant workers. A literature review on good practices indicates that multi-component prevention campaigns (including educational brochures and broadcasting/ publication of television/ radio programmes and local newspaper articles containing expert advice on the subject) are an effective intervention to prevent accidental injuries at work. Sensitisation /informational campaigns that are not implemented in the appropriate settings have been identified as fairly/partially effective [231].

Below an example of an OSH campaign in Poland is given. Because of its extraordinary approach also an Australian example is presented.

Safety Management Implementation Program (SMIP) - Poland

To support the pratical implementation of the legal requirements of the European Directive on OSH, national standards for the implementation of OSH have been developed in Poland. These standards are based on the ILO-guideline (see also paragraph 6.3.2) and include requirements for OSH management systems, guidelines for risk assessment and implementation and auditing of OSH management systems. To promote a structured approach to OSH management the national Labour Inspection, in cooperation with the Central Institute for Labour Protection – National Research Institute (CIOPPIB), launched a program to promote OSH management systems. Activities such as training of company representatives and labour inspectors, seminars for companies that are implementing OSH management systems and internal OSH management audits by the companies' auditor in combination with CIOPPIB experts were elements of this program. Performance on OSH of the 100 companies that participated in the program improved and health and safety levels rose. Among 35 organisations research was done on economic outcomes of implementation of the management systems. 70% of the companies experienced a substantial decrease in accident rates. In 50% of the companies less people worked under hazardous conditions. 70% of the companies benefited from a fall in insurance premiums [219].

The Focused Brand Strategy - Australia

In 2002 the Victorian Government came up with a national 10-year workplace health and safety strategy. The main goal of this strategy is to provide a framework for companies regarding health and safety that would bring back the amount of injuries at work by 40% and the amount of work-related fatalities by 20%. The main idea behind the strategy is that "the meaning of occupational health and the value of OSH regulation should be altered in the public imagination". This approach is unique in the sense that it adapts to the public's emotions. An illustrative example is the "Focused Brand Strategy" which aims to establish "an emotional connection with the community to the value of workplace safety and the importance of WorkCover's role". WorkCover is the Victorian authority for safety and health at work. The Focused Brand Strategy functions as a framework for future campaigns involving the duty to consult and the role of the inspection [232].

Besides national and regional authorities often also insurance companies play an important role in offering information and guidance and by promoting OSH management. Below an example from Austria is given.

AUVA & SMG - Austria

The Allgemeine Unfallversicherungsanstalt (AUVA) is a large social Insurance company in Austria that covers around 3 million employees. AUVA has its own trauma and rehabilitation centres that treat annually approximately 300.000 persons that were involved in an occupational accident. Since 2002 AUVA also offers consultancy on OSH to companies. The AUVA provides advice, information, and support to promote the creation of safe and people friendly workplaces to more than 100.000 small and medium-sized companies. The AUVA also offers a safety and health management system (SMG). The SMG is designed in such a way that it is easy to implement in all companies and can be integrated into existing management systems. The SMG consists of four implementation packages: the company's policy, the company's organisational structure, the organisational progress (which becomes a permanent cycle) and documentation. The AUVA offers a free meeting to inform companies on the SMG and provides services for implementation [219].

Another approach to OSH is applying **benchmarking at a national level.** In Czech Republic this is done by awarding companies demonstrating good health and safety management (see below).

Competition in occupational health – Czech Republic

In 1996 the Czech Ministry of Labour and Social affairs launched the "Safe Enterprise Program". The requirements the program sets for management system are based on international standards from the ILO and the OSHAS 18001 (see also paragraph 6.2.2) and is based on the cooperation of management and workers. The program is designed for large and medium-sized companies whose activities bring about risk for their employees (often manufacturing firms). If all requirements are met, a company can receive a "safe enterprise certificate" which has to be renewed every three years. Companies with the certificate have an efficient occupational health system in place that is in line with the EU directives and Czech legislation. The safe enterprise program is complemented by a national occupational health competition organised by the National Institute of Public Health. This competition awards good occupational health and safety practices, but also health promoting activities are awarded. Because of the value attached to health promotion activities non-manufacturing companies are not excluded as in the safety enterprise program [233].

Financial support & incentives are also sometimes used as a tool to promote good OSH management. Companies with few financial means to invest in OSH management might be triggered to undertake actions with some financial support. Financial tools can also stimulate companies to live up to certain OSH management standards.

Recovering the cost of health and safety management - Luxembourg

The Luxembourgian "L'Association d'Assurance contre les Accidents" (AAA) is responsible for prevention of accidents at work. Promotion of good practices is one of their main tools for preventing accidents and work-related diseases. The AAA defines good practices as practices accoridng to the OSH managements standards OSHAS 18001 (see paragraph 6.3.2) and the Dutch VCA management standard. They stimulate implementation of a management system in accordance to these standards by means of publications and financial incentives. Enterprises can recover the cost of implementing a OSH management system up to an amount of €10.000, but only if the system qualifies as a "good practice". The AAA funding has led to a successful implementation of good practice OSH management in at least 30 companies [219].

Financial support for OSH management of SMEs - Italy

In the ninetees Italian SMEs had problems with mobilizing financial means to implement proper OSH management systems. Authorities, labour unions and business associations decided to join forces in order to overcome these problems. Next to the development of a national guidline (based on the ILO-guideline, see also paragraph 6.3.2, and in agreement with public parties and social partners) and training courses, two financial incentives were designed to stimulate OSH management. First, when introducing a OSH management system a SME can request financial assitance. This has been granted to over 300 SMEs. 80% of these SMEs has used the national guideline for implementation of OSH management. Second, SMEs that have introduced an OSH management system can get a continious discount on their insurance premium of on average 10%.

Social partner involvement

In national health and safety legislation social partners often play an important role in developing health and safety guidelines, provision of information and supporting the relevant sector (e.g. construction, manufacturing, etc.) in which they are active. An example of the involvement of social partners in health and safety issues the Netherlands is provided below.

The Dutch Working Conditions Act

In the Netherlands, the Working Conditions Act presents the general rules and obligations, power and responsibilities with regard to safety, health and wellbeing in the workplace of both employees and employers. The general rules of the Working Conditions Act are elaborated upon in the Working Conditions Decree and the Working Conditions Regulation. The Working Conditions Decree (Arbobesluit) contains concrete provisions which employers must follow, classified by subject. It stipulates regulation in the fields of for example asbestos, noise, and working from home. A number of subjects in the Working Conditions Decree have been elaborated upon in the Working Conditions Regulation (Arboregeling). The Working Conditions Regulation was amended on 1 January 2007. Among other things, the amendments concerned the testing of cranes and working safely with dangerous substances. The social partners are responsible to translate the specific conditions (goals) to sector- or even company specific "catalogues". The Dutch government assumes that social partners are perfectly able to set up these catalogues and only does a general check on them. When the government

approves a catalogue it forms a direct point of departure for the labour inspection in their daily enforcement work of the Dutch health and safety regulations [234].

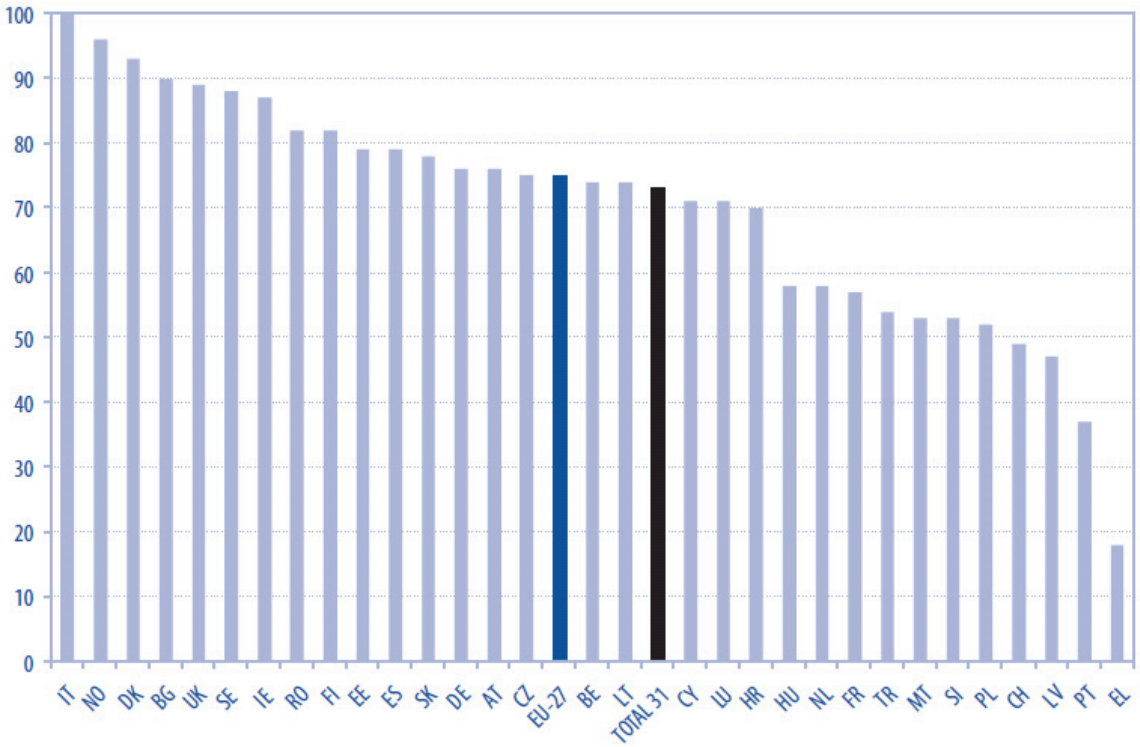
6.3.5 Company level policies and initiatives

As with workplace health promotion (see paragraph 6.3.5) the vast majority of existing workplace health and safety initiatives is carried out at company level. These intitiatives follow the rules as set out in national leglislation which applies to the company which in turn are based on EU guidelines and regulation (see paragraph 6.3.3 and 6.3.4).

Worker participation

As part of the EU Framework Directive (see paragraph 6.3.3), the EU approach to prevent occupational accidents and hazards is based on worker participation. The European Agency for Safety and Health at Work performed an assessment of representation of workers in OSH issues by means of a survey among management of firms (see Figure 6.2).

Figure 6.2 Formal representation of employees by general employee representatives (works council and/or workplace union representation) or specific health and safety representatives (health and safety representatives or health and safety committees), by country (in %).



Source: E.R.I. González, W. Cockburn and X. Irastorza, European Survey of Enterprises on New and Emerging Risks: managing safety and health at work, European Agency for Safety and Health at Work: undated, p. 68.

From the figure it becomes clear that on average 75% of establishments in the EU have at least one form of formal representation in place. There are however quite some differences between countries:

- In Italy, all managers indicated having at least one type of representation in place. This finding is mainly due to the existence of health and safety representatives (98%), whereas health and safety committees (16%) or general bodies of employee representation (40%) are considerably less prevalent;
- Greece has by far the lowest incidences, for both the bodies of general employee representation (10%) and those of specific health and safety representation (15%). In total, just 18% of the Greek establishments with ten or more employees have a type of employee representation in place;
- Portugal is another country where formal representation is clearly below the EU average, with less than four out of ten establishments (37%) having such representation. Especially, general employee representation is weak (9% of the establishments have a works council or trade union representation at the workplace). Specific health and safety representatives are considerably more common and can be found in a third of establishments [179].

The rate of representation does not necessarily imply a high rate of participation since there can be substantial differences in the power that can be exerted by the representative and the extent to which their view is taken into consideration. However, the results show that establishments with formal representation indeed score better on the presence of all of the following health and safety measures: carrying out a risk assessment; existence of an OSH policy, management system or action plan; high involvement of line managers in OSH; regular monitoring of employees' health; support measures for employees returning from long sickness absence; regularly analysing causes of sickness absences, and OSH issues regularly raised in high level management meetings. These results imply a positive effect of representation and participation on workers in safety and health issues [179].

The sectors with the most complete coverage of formal representation relevant for health and safety are health and social services (82%) and education (81%), while the lowest coverage is found in the hotels and restaurants sector (67%). With regard to company size it can be seen that establishments with 250 or more employees have practically full coverage, while 65% of the smallest establishments in the sample have any type of representation [179].

Risk assessment

Risk assessment is one of the way to prevent occupational accidents and hazards (see paragraph 6.3.3). An assessment of work situations and risks helps to formulate appropriate preventive measures which should be permanently ensured, planned from the outset and integrated at the design stage. Both management and employees and sometimes also third parties play an important role in risk assessment.

From the literature we found some key elements that are important for a good of risk assessment policy. This list is not exhaustive but merely indicates the most important elements:

- Risk assessment should be a dynamic process, in which evaluation of undertaken action plays an important role;
- Risk assessment policy should be integrated with other activities of the organisation;

- Appropriate responsibility for risk assessment includes consultative teams consisting of management and employees; in some cases also third party intervention is important;
- Physical and psychological risks should be considered;
- There should be attention for short- as well as long-term effects [235].

In a 2004 communication of the EC the following implementation barriers of risk assessment in the EU were identified to be the following:

- The risk assessment is not universally carried out. A significant number of companies, mainly small and medium enterprises (SMEs), still do not assess risks;
- Risk assessment is often considered a 'one-off ' action and is not sustained;
- There is no integrative approach for the analysis of the conditions in the workplace;
- Superficial risk assessments: the focus is put on identifying obvious and immediate risks; long-term effects such as those caused by chemicals are being neglected;
- Psychosocial risks and work organisation factors are rarely considered in risk assessments; and
- The efficiency of the measures taken is not sufficiently supervised.

As a response, a two-year campaign was launched in 2008 by the European Agency for Safety an Health at Work to promote and improve risk management. The campaign also contained a good practice award to encourage practical solutions at the work place. Below an award-winning practice is described [235].

> **Sct. Hans Mental Health Centre - Denmark**
>
> The Danish Sct. Hans Mental Health Centre distributed an electronic questionnaire among employees to assess workplace risk while challenging them to actively think about their work tasks. Due to a well-functioning IT system minimum resources were used for risk assessment. The response was over 75% and the outcome of the questionnaire has led to useful interventions to tackle musculoskeletal problems. As a result total sick days declined. The total decrease in work-related injuries resulted in savings of €270.000 [235].

Workplace modifications

In the EU Directive (see paragraph 6.3.3) the minimum safety and health requirements to which EU employers must adhere to in the workplace are stipulated in two annexes. The topics covered are among other: electrical installations, windows and doors, lighting, flooring, fire exits, sanitary equipment, escalators, facilities for handicapped people and pregnant women, etc. [236]. There are many workplace modifications possible to further enhance safety and to avoid accidents including for example ensuring a fall protection system including engineering modification or training [231]. Nevertheless, it is mentioned that this is not sufficient to ensure adequate risk prevention. The manner in which tasks are carried out in an enterprise must also be assessed [147].

In a report of the European Agency for Safety and Health monitoring the state of occupational safety and health in the EU, information from 15 national reports indicates that with respect to for example avoiding hearing loss, exposure to noise levels are reduced through a number of factors. These include the introduction of low noise machinery, automation of work processes and remote operation of equipment to isolate the worker from the noise source. These methods are effective in industries with typically

large exposure to noise such as mining, steel, paper and chemical production [237]. The report indicates further that increased use of casual labour can also reduce the risk of hearing loss by reducing individual exposure to noise. Problematic in this case can be that casual labour forces typically receive less information, have less supervision and control in the workplace and thus maybe more vulnerable to noise exposure [237].

Safety devices

In a literature review of good practices, the use of safety devices in the workplace (e.g. tools and equipments) have been identified as fairly or partially effective, especially for musculoskeletal injuries.

Personal safety equipments for skin and eye however are deemed ineffective because usage of them is not widely accepted (due to the lack of regulations, information, training, etc.) [231].

Several scientific studies show that with respect to tackling hearing loss, hearing protection reduces noise exposure of workers [238] and that protection aids are effective to prevent hearing loss on the working floor [239]. If properly inserted, earplugs can provide protection equivalent to earmuffs. Active noise cancellation devices can lead to a moderate additional reduction of noise levels in the lower frequency range [238]. However, six studies show that protected workers still have a much higher risk of hearing loss compared to workers that are not exposed to noise [238]. One high quality study in a systematic review showed that if workers lack proper instructions in the use of earplugs, hearing protection is insufficient [238]. In addition, several factors have been reported to influence the wearing of hearing protection, such as health beliefs, perceived risk, perceived likelihood of risk and comfort of wearing the device [240]. The risk of hearing loss increases exponentially with the amount of time for which protection is not worn. This means that there is a need to develop interventions that are capable of motivating workers in such a way that they will protect themselves continuously [240].

Education and training in health and safety in the workplace

The evidence of the effectiveness of educational interventions on preventing accidental injuries at work is limited and not conclusive. A literature review indicates that an educational programme for a group of frontline employees, who underwent formalised training, and subsequently introduced the information to their colleagues, is an effective measure against work-related skin/eye and hearing injuries [231]. However, a systematic review shows no evidence of a reducing effect of educational interventions focusing on changing behaviour on injuries in the farming industry [229].

Several systematic reviews arrive at the conclusion that educational interventions such as theoretical training (on load handling and other), lift instructions, as well as stress management training and back education do not have a preventive effect on the prevalence of musculoskeletal diseases or associated absences from work [186, 203, 204, 239, 241-243]. A summary report of available scientific literature concludes that training (such as lifting training and back training) can only serve as complementary to working conditions improvements but will most likely remain an ineffective measure [185]. The

traditional back school[18] is considered to have no primary preventive effect [185, 239] but seem to be useful in secondary and tertiary prevention for persons suffering from back pain.

It is mentioned in one systematic review that the effectiveness of training is most rapidly safeguarded by in-house programmes within close workplace vicinity and programmes that incorporate intensive training [185], although the latter is not verified by another source [244].

Interventions specifically aimed at certain risk groups

Young people (15-24) are more at risk of harm from work because they lack experience and maturity, they lack awareness of risks, they lack skills and training, they may be unaware of their rights and employers' duties regarding health and safety, and they may be reluctant to speak about problems and are keen to please their new employer. An EU report identifies several success factors for policies specifically aimed at the prevention of work accidents among young workers. This includes mainstreaming youth into prevention actions, consultation and participation of young workers in preventive policies, taking a holistic approach to combine activities in schools and colleges with support for improved prevention in companies, providing the young workers with suitable jobs for their age, capabilities and experience and ensure proper supervision [245].

6.4 Initiatives to help retain people in work who have a chronic illness

6.4.1 Introduction

We have defined "Initiatives to help retain people in work who have a chronic illness" as retention of workers in employment when they are faced with a chronic illness and have not yet experienced a (long-term) sick-leave but are threatened to drop out of the labour market soon.

The focus of this category of initiatives is not on return to work, but instead on keeping the chronically ill in work (workplace retention). Specific attention is put on initiatives and policies that focus on those persons who have not yet experienced (long-term) absence/sick-leave from work and do not (yet) need rehabilitation and reintegration, but instead need support to retain their current employment. Rehabilitation and reintegration policies and initiatives focus on persons out of employment or on a long-term sick leave. This will be addressed in paragraphs 6.5 and 6.6.

With chronic illness we refer to a long-term health condition, such as musculoskeletal problems, cancer, asthma, migraine, epilepsy, diabetes, irritable bowel syndrome, depression, anxiety, heart problems, HIV/AIDS and hepatitis. Sometimes overlap exists between people with a disability and people with a chronic illness, but more often people

[18] A back school is an educational program that teaches you practical information about back care, posture, body mechanics, back exercises, and preventing long-term back problems.

with a chronic illness are not (yet) recognized as being "disabled"[19] when their illness does not immediately lead to a restriction and they are still able to work. For more information on this, see paragraph 6.4.2.

An employee with a chronic illness often experiences periods of wellness when he is able to fully undertake his work and periods of illness where job participation may be affected and greater flexibility in the workplace is required. If the chronic illness is degenerative, work may only be a viable option for a limited period of time. There might also be psychological issues at play with regard to coping behaviour. Then, other effects are important to take into consideration as well such as pain, medication, fatigue and other [246].

Chronic illness may or may not be caused or made worse by work. However, if chronic illness is not managed well by both the employee and his/her manager, the work of the employee and his/her health may suffer. Without timely and appropriate retention policies employees with a chronic illness are likely to move out of employment when their condition continues or deteriorates.

6.4.2 Overview of EU level policies and initiatives

At EU level chronic illness is not yet specifically mentioned in policy and regulation. For example, the Health Strategy 2008-2013 (also see paragraph 1.1.1) and the European social charter do not specifically refer to chronic illness. Also with respect to the EU initiatives on ageing no emphasis is made of chronic illness in relation to preventing exclusion from the labour market [247].

Chronic illness is often included in regulation and legislation when it leads to a disability. Therefore disability regulation and legislation may apply to chronically ill people but only when it leads to impairment and has already led to loss of employment.

EU Disability Action Plan

In 2003, the year of people with disabilities, the EU introduced the Disability Action Plan (DAP). The main goal of the DAP is mainstreaming of disability issues. That is, disability policy should not be isolated but integrated in all relevant legislation and policies.

There is no official evaluation of the success of the DAP available yet. The EU Disability Strategy 2010-2020 will replace the DAP from this year on [248, 249].

Because employment is important for social inclusion of disabled people, the first phase of the plan targets at the promotion of employment of disabled people. The emphasis here is on making the mainstream labour market more accessible to them.

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[19] The UN defines disability in the following way: "The term persons with disabilities is used to apply to all persons with disabilities including those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various attitudinal and environmental barriers, hinders their full and effective participation in society on an equal basis with others." United Nations. See: http://www.un.org/esa/socdev/enable/faqs.htm.

The main sources of funding for the first phase of the DAP were the European Social Fund mainstream programmes and the Community initiative EQUAL. They financed a range of actions and initiatives aimed at integration of disabled people in the labour market. To improve employment opportunities four fields of interest were identified. These fields are summarised below with an example of key activities in that field.

- **Access to employment and the fight against discrimination**: raising awareness of rights and responsibilities of both disabled people and employers according to the Directive of 2000 (see below) and calling on the Commission, Member States and social partners actively participate in promoting employment of disabled people by removing barriers and enforcing equal treatment measures.

  The ombudsman – Sweden

  To safeguard proper implementation of the Swedish anti-discrimination laws and to promote equal opportunities for everyone, the Equality Ombudsman was introduced. This ombudsman is a government agency which operates independently and without interference of other government institutions. Complaints on discrimination and harassment are registered and investigated. Also victims are represented in court free of charge. In addition to the supervisory role, the ombudsman also plays a key role in raising awareness of rights, duties and providing guidance to for example employers and educational institutions.[20]

- **Life long learning**: integration into mainstream education throughout adolescence is important for acquiring competencies to succeed in the labour market later on. E-learning and new communication technologies play an important role in this.

  European Hearing – Lisbon

  In September 2007 young people with special educational needs from 29 European countries gathered in Lisbon following a project from the European Agency for Development in Special Needs Education. As field experts, these young people talked about their views, experiences and ideas on special needs education. This resulted in the "LISBON DECLARATION - Young People's Views on Inclusive Education". The rights of young disabled people are stated, improvements that can be made are suggested, views on inclusive education are given and challenges and needs are identified. The results of the hearing were presented to national and European policy-makers. Including field experts in the discussion on special needs education gives policy-makers a great opportunity to learn from them and to come up with solid, experience based policies on special needs education.[21]

- **Empowerment of disabled people**: this includes standards, guidelines and support material for the accessibility of information technology.

  FITA – Malta

  In 2001 the Foundation for Information Technology Accessibility (FITA) was established in Malta. The function of the FITA is removing barriers to education and employment for disabled people by means of information technology. Underlying objectives are:

  - Promote equal opportunities in relation to information technology;
  - Providing training in information technology to disabled people;

[20] See http://www.do.se/en/About-the-Equality-Ombudsman

[21] See http://www.european-agency.org/agency-projects/european-hearing-2007/about-the-european-hearing-2007

- Increase awareness of the importance of information technology;
- Active participation in public and private endeavours to create equal opportunities with respect to information technology;
- Offer advice to organisations in information technology and its use by disabled people.

A concrete example of the FITA's activities is the distribution of software packages for disabled people in 2003, 2005 and 2007 in collaboration with the Ministry of infrastructure. The FITA also set up a computer pooling scheme with old, refurbished computers. In some cases these computers better match the needs of disabled people.[22]

- **Access to the public built environment:** this includes improving access to the workplace and leisure- and cultural activities by promoting better design and construction of buildings.

BAS project – EU

The BAS (Building Accessible Services) project was launched in 2004 to improve accessibility to built environment and public services. Special importance was given to accessibility in the workplace. Three main target groups were identified:

- Equip disability organisations with evidence-based approaches to support the process of accessibility improvement;
- introduce such approaches to policy-makers and influence them by incorporate these approaches into legislative instruments; and
- promote contacts with standardisation organisations such that wide standards can be accomplished through a common approach

"The Orange Book" of this project presents a selection of case studies, best practices and state-of-the-art of partner countries. This is a key tool to raise awareness and provides examples and know-how. [23]

To accomplish a significant reduction in each Member State of unemployment gaps for disadvantaged people, key activities to promote employment include encouraging social partners to implement recommendations on employment of disabled people and increasing the awareness of rights of disabled people. Furthermore, ensuring effective implementation of the Employment Equality Directive is of crucial importance.

The **EU Employment Equality Directive** (Council Directive 2000/78/EC of 27 November 2000) established a general framework for equal treatment in employment and occupation and constitutes a major step in the development of anti-discrimination policy. The Directive prohibits any direct or indirect discrimination based on religion or belief, ***disability***, age or sexual orientation with regard to employment and occupation.[24] It includes under Article 5 a requirement to provide reasonable accommodations for people with disabilities. Employers are according to this Directive obliged to accommodate, or make adaptations, to meet the needs of individuals with a disability up to the point that making the accommodation would result in a disproportionate burden.

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22 See http://www.knpd.org/mittsfita/ and http://www.cipmalta.com/partnersearcharticle.aspx?partnersearchid=100

23 http://www.accessible-buildings.eu/index.cfm and http://www.accessible-buildings.eu/index.cfm?cat=missions

24 The Employment Equality Directive. http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/69&format=HTML&aged=1&language.

There are two complications with respect to Article 5 of this Directive. First, the definition of disability under this Directive does not clearly include chronic illness. Disability is defined as "a limitation which results in particular from physical, mental or psychological impairments and which hinders the participation of the person concerned in professional life". "Any type of sickness" is not included in this Directive according the European Court of Justice. Nevertheless the Court argues that adverse treatment in response to sicknesses which lead to long-term or permanent limitations which hinder professional life does fall within the Directive's scope, because such treatment is not based "solely" on sickness. EU Member States have reacted differently on this Directive which led to "confusion" by including different definitions of disability in their legislation. Second, Article 5 has proven to be one of the more challenging provisions of the Directive, in terms of implementation. Specifically, confusion has arisen regarding the concepts of "reasonableness", in the context of a reasonable accommodation, and "disproportionate burden". As a consequence (some) EU Member States have struggled with the implementation of this provision and the result was a variety of different responses and ways of transposing the reasonable accommodation obligation (255). Good examples of EU Member States that have tried to overcome the confusion are the Netherlands, Ireland and France where they defined reasonable accommodation as one that is "effective" or "appropriate" in allowing the covered disabled individual to meet the relevant employment requirements.

6.4.3 Overview of EU Member State policies and initiatives

Focus on chronic illness in national legislation and policy of EU Member States

At national level, legislation, policies and initiatives in the EU Member States focus particularly on the retention of people with disabilities in work and not specifically on people with a chronic illness. This was also mentioned by survey respondents. Many people with a chronic illness are within national policy systems a hidden group. They are often categorised as "not yet disabled" under social protection regulations and discrimination legislation. As a result, people with a chronic illness who are still able to work can fall through the maze of the existing disability schemes and legislation as they often first need to become disabled and/or fall out of the workforce before they are able to receive assistance.

Within the EU Member States national disability discrimination acts include – as required under the EU Employment Equality Directive of 2004 (see paragraph 6.4.2) – references to the need for workplace adjustment and/or redeployment. The UK Disability Discrimination act for example requires employers to accommodate employees with impairment and whose sickness is prolonged or irrecoverable. This refers to adjustments or duties that do not place an undue burden on the employer. These can for example include part-time working, adapted work or adaptation of the work-environment, reduced work demands, redeployment to another position within the company, and home or tele-working. Other employment rights may include statutory time off and flexible arrangements [247].

National employment policies with respect to disabled people

To gain insight on the employment position of people with a disability and (re)integration measures in Europe, the EU's Mutual Information System on Social Protection (MISSOC) asked 30 European countries to draw up a national report on this matter [250]. Table 6.2 below gives an overview of policies in these countries.

Table 6.2 National employment policies with respect to disabled people

Policy	Countries that apply the policy
General measures for (re)integration into work of people with disabilities	
Measures for (re)integration not only for recipients of disability benefits but for those with unemployment or social insurance benefits and health problems in general	Austria, Bulgaria, Czech Republic, Germany, France, Luxembourg, Poland, Portugal, Slovenia and the UK
Specific support schemes to those registered as disabled (reduced capacity to work)	France, Germany, Italy, Luxembourg, Portugal and Romania
Specific support for reintegration of young people with a disability	Austria, Bulgaria, Czech Republic, Liechtenstein and the Netherlands
Early intervention measures to prevent those that receive sickness benefits to become incapable of work on a permanent basis	Austria, Finland, Germany, Iceland, Norway and Hungary
Early intervention measures to keep people with a disability employed in the period during which they receive sickness benefits	Finland, Liechtenstein, Norway, Netherlands, Luxembourg, Switzerland and the UK
Support measures for people with disabilities	**Countries that apply the policy**
Wide range of personalised support to enable disabled people to fully participate in society without discrimination (in accordance with Union's strategy)	Cyprus, Finland, Germany, Italy, Malta, Poland, Portugal, Romania, Slovenia and Spain
Measures to personalise rehabilitation plans	Bulgaria, Czech Republic, Greece, Italy, the Netherlands, Spain, Slovenia and the UK
Measures to bundle know-how on disability issues	Ireland, Iceland and France (regional)
Set up of specialised work centres that focus also on the needs of specific employers	Norway, Austria
Promotion of gradual integration by offering opportunities to improve employmentability and/or personal development or by offering specialised workplaces	Bulgaria, Czech Republic, France, Luxembourg, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Switzerland and UK
Personal guidance, coaching and assistance on the job	Austria, Cyprus, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Norway, Poland, Portugal, Romania, Slovakia, Slovenia and Switzerland
Financial allowances to cover disability-related costs, such as participation in vocational rehabilitation or training programmes	Bulgaria, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Iceland, Italy, Liechtenstein, Lithuania, the Netherlands, Norway, Poland, Slovakia, Slovenia, Spain and the UK
Offer grants to disabled people to start up their own business	Bulgaria, Czech Republic, Greece, Germany, Ireland, Liechtenstein, Lithuania, the Netherlands, Norway, Poland, Portugal, Slovenia and Switzerland

Measure to create incentives to take up work	Countries that apply the policy
Suspension of entitlement of benefits if the recipient does not participate in vocational rehabilitation or other work-related activities	Finland, Germany, Hungary, Liechtenstein, the Netherlands, Slovenia, Spain, Switzerland and the UK
Basing the conditions for claiming invalidity benefits on capabilities to work rather than restrictions to work	Netherlands, Slovenia and UK
Offer temporary benefits to avoid the idea of permanent disability	Austria, Hungary, Iceland and Norway
Offer the possibility to combine work with benefits (with or without a restriction on amount of earnings)	Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, the Netherlands, Norway, Portugal, Romania and Slovakia
Measure to create incentives for employers to recruit or retain disabled workers	**Countries that apply the policy**
Measures to eliminate (part of) the risk involved in hiring disabled workers	Denmark, Finland, Germany, Ireland, Liechtenstein, Malta, the Netherlands, Norway, Portugal, Romania and the UK
Providing grants to compensate the employers for cost related to adapting the workplace to the needs of a persons disability (sometimes requirements in order to be entitled to this grant have to be met)	Austria, Estonia, Finland, France, Germany, Ireland, Hungary, Norway, Poland, Portugal and the UK
Providing grants to compensate the employers for cost related to adapting the workplace to create flexible working arrangements (sometimes requirements in order to be entitled to this grant have to be met)	Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Lithuania, Poland, Romania, Slovenia and Switzerland
Public and/or private companies with over a specific amount of workers are obliged to hire a certain percentage of disabled workers	Ireland, Belgium, Bulgaria, Cyprus, Czech Republic, France, Germany, Greece, Luxembourg, Italy, Poland, Romania, Slovenia, Slovakia and Spain

A brief review of EU Member State government sites shows that most EU governmental and information channels provide information with regard to disability management in general, but not on chronic illness specifically. Nevertheless some examples exist of governments which specifically provide information to employers how they can support employees with a chronic illness and where they can seek support. An example from France and Australia is provided below.

> Functional re-education and rehabilitation – France
>
> The Centre Mutualiste de Rééducation et de Réhabilitation fonctionnelles (CMRRF)'s main objectives are to avoid gaps due to illness in a person's education or training and to provide continuous support during the employment process. In addition, the CMRRF helps people with disabilities to cope with difficulties in terms of accessing and keeping their jobs, since they require greater support than able-bodied people do.
>
> Multidisciplinary teams, including a re-education doctor, a social worker and a paramedical professional are initiated to provide an adequate (re)integration programme. This programme should be followed simultaneously with physical en mental interventions. After an introduction phase, assessment of

integration possibilities and an action plan for obtaining/retaining employment are defined. Thereafter, the participant will receive support from the programme for two years. The main services of the centre include information for and advice to jobseekers; checking eligibility for employment and social inclusion services; onward referral to vocational training; individual career planning; assessment and exploration; job preparation; access to financial subsidies to support employment; advice on reasonable accommodation and workplace reorganisation; advice and support in relation to assistive technology; and provision of vocational rehabilitation. In 2006, 497 people participated in the introductory phase. At least 58% of this group obtained an open-end employment contract [251].

JobAccess – Australia

JobAccess is an organisation set up by the Australian government that provides solutions for workplace and employment issues for disabled people. They have developed a fact sheet to provide information and guidance on how to support job seekers (or employees) with a chronic illness. The fact sheet offers a tool including a database in which work adjustment and solutions that fit a certain chronic illness and are relevant to certain job tasks can be found [246].

The role of occupational health providers in national policy

Within most EU national systems, occupational health providers are involved in the assessment of fitness to work and in assessing levels of disability for insurance purposes. They are within the workplace often the first contact person for employees with a (chronic) illness to offer advice and support. They also act as liaison officer with the employer and offer support and advice to the employer for whom they work. Particularly in EU Member States that joined since 2000 their role is still largely driven by compliance with legislation. In these countries health and safety legislation is drawn up in detail in an attempt to describe almost every procedure needed for appropriate health and safety practice. In other EU Member States the approach is much more on workplace health management which is both driven by legislative requirements and by health targets set on a voluntary basis by the working community within each enterprise. In the latter countries occupational health providers take a much more holistic approach combining their role as assessor with health promotion (and in some cases also environmental health) [224].

A problem is the fact that there is surprisingly little or no communication between occupational health providers and general practitioners (GPs). The crucial role that GPs can play in workplace retention – especially for chronically ill employees – is often ignored while they co-ordinate and provide clinical management and provide sick notes which can trigger or continue period of absence of work. This communication is for example blocked in the UK through the fact that no referral service for GPs exist to occupational health providers within the National Health Service (NHS). Ideally, retention should be achieved by a case manager – which can be the occupational health provider – who leads the assessment and liaises between the (chronically ill) employee, the GPs, and other healthcare providers, the employer (manager, human resources) and unions to advise on the measures required for successful workplace retention of the individual. This can be achieved through training of the GPs and occupational health providers and system changes which enhance communication [252].

6.4.4 Company level policies and initiatives

A brief review of EU sites shows that most EU companies provide information with regard to disability management in general, but not on chronic illness specifically. Nevertheless some examples exist of companies which specifically provide information on how employees with chronic illness can receive support from them.

On the basis of Wynne and McAnaney (2004) good practice in work retention should include three main types of workplace health activity [247]:

- **Meeting statutory requirements on occupational health and safety**- preventing occupational illness and injury (see paragraph 6.3);
- **Undertaking workplace health promotion** – this is not generally a statutory activity. WHP should be targeted at improving the overall health and well-being of the employee (see paragraph 6.2); and
- **Implementing active early intervention policies and practice** – these come into use when an employee is ill and is threatened to become (long-term) absent from work. It aims to avoid long-term sick leave and to retain the employee in work.

Thus, good chronic illness management practice requires a proactive, designed set of policies that focus not only on the activities which must take place when an employee becomes chronically ill, but also on the adoption of preventive and promotion practices in relation to worker's health. These policies should be integrated with general company operations and management. The perspective of good practice is that retention is the norm and worker's health is a mainstream consideration of how the company operates.

Early intervention policies and practices can be roughly distinguished in two important types:

- **Work(place) adjustment** to retain the chronically ill employee in his/her current employment position;
- **Redeployment** of chronically ill employees who can no longer do the same job as a result of their chronic illness within the same company.

Work (place) adjustment measures

Work (place) adjustment measures are often included in the disability management policy of individual companies as a result of national anti-discrimination legislation (see above). Chronic illness often does not officially fall under the remit of national anti-discrimination legislation, giving much responsibility to employers themselves whether work adjustment applies to chronically ill employees.

Work (place) adjustments can be temporary or made on a permanent basis. Adjustments that are regularly mentioned and that may benefit a (chronically) ill or disabled employee are:

- Flexible working hours/location (e.g. working from home);
- Shared responsibility for tasks;
- Arranging working from home (ensuring a safe environment);
- Providing help with transport to and from work;
- Reduced mental or physical demands;
- Frequent breaks;

- Shorter working days;
- Slower work pace;
- Allow a private space to take medication if applicable;
- Adjustment of the workplace (making necessary alterations to work furniture, providing special aids); and
- Allow the employee to take time off to follow interventions aimed at workplace retention [253, 254].

It is also mentioned that work adjustment has more chance of being successful when a chronically ill employee informs their colleagues about their chronic illness and about what they need to help them cope at work.

Work (place) adjustment is often offered to persons suffering from musculoskeletal diseases. It is argued that the focus of interventions should be on keeping-up the highest or desired level of activity and participation, the prevention of chronic complaints and recurrences rather than eradicating the cause of the problem or returning to normal function [255].

Most studies examining the effectiveness of interventions to tackle musculoskeletal diseases deal with interventions aimed at specific musculoskeletal disorders such as (low, chronic, sub-acute, acute) back pain and work-related upper extremity disorders. Low back pain and neck and upper extremity symptoms are related to various individual and work-related factors. Some of these factors may be amendable to change as a part of prevention. These include overweight, physical load at work, and psychosocial risk factors (see Chapter 5).

Work (place) adjustment for employees with musculoskeletal disease mainly focuses on ergonomic interventions, e.g. design of workplace equipment. Specifically for preventing and managing neck/upper extremity musculoskeletal conditions and fibromyalgia there is evidence that some mechanical and modifier interventions (to computer mouse, keyboard, desk, chair) are successful approaches [256]. However, specifically for back pain systematic reviews found that ergonomic interventions such as mechanical lifting aids, lumbar support, back belts and shoe inserts are ineffective to tackle back pain [186, 203, 204, 241, 243, 257]. Van Poppel et al. (2004) argue that compliance with wearing a back belt may be low in general which makes it problematic to be certain of the (lack of) effectiveness of back belts [204].

Overall, no recommendations can be made with regard to ergonomic modifications in keyboard designs and rest [258] and technical auxiliary devices (for lifting) [186] due to lack of evidence of effectiveness (e.g. mainly due to the low number and quality of available studies.

Nevertheless, there is one study that mentions that there is limited but convincing evidence of the effectiveness of work(place) adjustment interventions (referred to as work system interventions) that have combined ergonomic programmes with an organisational dimension and involvement of the workers (participatory approach) [259]. A participatory approach can reduce the physical and psychological stress factors, but is also a way of recognising the individual's creativity at work. Employees have been shown to benefit

from such interventions in the form of improved physical comfort, reduced musculoskeletal complaints and fewer injuries. Interventions following the participatory approach have also shown to contribute to reduced absenteeism and number of compensation claims [186].

A very limited number of studies also examined the effectiveness of other work (place) adjustment interventions. They come to the conclusion that there is no evidence of effectiveness for changes in work organisation (break pattern adjustment) [186] and for preventing and managing neck/upper extremity musculoskeletal conditions and fibromyalgia. This applies specifically to adjusting the production system (changes to material production in factories) and organisational culture [256].

Although the scientific evidence on work (place) adjustment including ergonomic interventions is inconclusive, the following example has been awarded by the European Agency for Safety and Health at Work with a good practice as part of the European campaign for 2007, 'Lighten the Load'. The award is to recognise organisations that have made outstanding and innovative contributions to tackling musculoskeletal diseases.

Savatech - experience from Slovenia

In Slovenia, an in-depth ergonomic analysis of workplaces is part of the annual risk assessment audit carried out by Savatech. To manage occupational safety and health (OSH), the company produced and certified a standardised procedure in line with the international standard. A multidisciplinary team involving management, workers, OSH experts, occupational health doctors, construction designers and other specialists assessed the ergonomic problems, proposed solutions and monitored their implementation. A comprehensive set of workplace measures was implemented to prevent work-related musculoskeletal diseases. These included technical improvements aimed at reducing manual handling, bending and repetitive movements. Guidelines for the “load relocation code” were provided to the heads and planners of production processes, along with practical information on preventing risks when moving a load. A prevention campaign included training courses, the dissemination of relevant information in a bulletin and newspaper, and a drawing competition. A manual, 'With physical activity to better health', offering advice on healthy and balanced nutrition and physical exercises, was issued to all workers. A professional fitness trainer provided practical demonstrations of these exercises. This initiative cut sick leave by 28.8% from 2004 to 2007 and improved workers' satisfaction. Despite operating in the heavy industry sector, sickness absence is below the average for Slovenia. Owing to the size of the company and the complexity of the measures introduced, the costs were high at €4 million. However, direct benefits such as the cut in sickness absence have already saved €1.5 million. In the longer term, it is expected that the benefits will outweigh the costs [260].

Redeployment

Redeployment is often also included in the disability management policy of individual companies as an option to retain a (chronically) ill employee when he or she cannot undertake his/her current employment tasks anymore. The inclusion of redeployment is often not voluntarily made by companies, but part of national legislation. For example, in Sweden human resource departments within companies are obliged to redeploy staff at risk of unemployment as a result of personal illness. This responsibility derives from the Security Foundation Agency which guarantees employees at risk of redundancy that redeployment will be the first option considered [247].

6.5 Initiatives to support people who are on long term sick leave to get back into work

6.5.1 Introduction

We have defined initiatives to support people who are on long term sick leave to get back into work as "the reintegration into work of workers who are on long-term sick leave". It is mainly linked to return-to-work tools (vocational and not vocational) designed to improve the work ability of the employee and to increase the chance of return to work.

Overlap exists with "people in work who have a chronic illness" since these people can be on long term sick leave. For this category, we focus on policies and interventions that help retain workers in employment when they are faced with a chronic illness and have not yet experienced (long-term) sick-leave but are threatened to drop out of the labour market soon. Overlap also exists with the subsequent category "of people who have experienced a serious health event" (see paragraph 6.6) since these people can also be on long term sick leave. We focus in that particular category on specific rehabilitation and reintegration initiatives targeted to serious health events that are related to the diseases that are discussed in Chapter 5 (e.g. stroke due to cardiovascular disease). More general rehabilitation and reintegration initiatives which are not specifically related to a serious health event (e.g. back pain) are discussed in this paragraph.

The description and the definition of "long-term sick leave" is not standardised in the literature. Some authors define long-term sick leave as a period of at least 3 days, while others define it as a period of 6 weeks or even 8 weeks. We consider in this paragraph particularly people who have been on a sick leave for 6 weeks or more and who need support to get back into work. The most frequently occurring causes of sick leave are mental health, musculoskeletal and cardio-respiratory problems.

In this paragraph an overview of reintegration policies and initiatives and their (cost-) effectiveness at the international, EU-level, national-level and company level is given.

6.5.2 Overview of global/leading international policies and initiatives

Internationally, the **ILO Convention No 159 and its accompanying Recommendation No 168** is an important instrument to ensure vocational rehabilitation and employment of disabled people. As with people with a chronic illness, people on (long-term) sick leave are not separately given attention in these documents. People with a chronic illness are categorised as disabled people when their (long-term) sick leave is caused by a disability. The Convention lays down the principles of national policy on vocational rehabilitation and employment of disabled persons for the countries which have signed the Convention. It demands action from the countries which are appropriate to national conditions and consistent with national practice. The Recommendation lists appropriate measures [261]. In the EU, the majority of the EU Member States – excluding Austria, Belgium, Italy, and the UK – have signed the Convention [262].

The term "disabled" is defined as follows: "an individual whose prospects of securing, retaining and advancing in suitable employment are substantially reduced as a result of a duly recognised physical or mental impairment". The purpose of "vocational rehabilitation" is interpreted as: "measures enabling a disabled person to secure, retain and advance in suitable employment and thereby to further such person's integration or reintegration into society" [261].

6.5.3 Overview of EU level policies and initiatives

Also in EU policy and legislation, return-to-work and rehabilitation are particularly linked to people with disabilities, and not specifically to people who are long-term absent from work due to illness (which can but is not necessarily related to disability). This is – as mentioned before (chronic illness) – a flaw as it endangers groups of people who are long-term absent from work due to illness to fall between all safety nets that exist with respect to social inclusion, employment, health, disability, active ageing, and social protection policies [247].

There is, however, a clear commitment in EU disability policies to improve the employment position of disabled people supported by programmes and policies. The EU addresses disability through social inclusion, anti-discrimination, active social protection and labour market measures [247].

An important EU legislative framework is the Council Directive 2000/78/EC of 27 November 2000 – also referred to as the **Employment Equality Directive**. It established a general framework for equal treatment in employment and occupation and constitutes a major step in the development of anti-discrimination policy. The Directive prohibits any direct or indirect discrimination based on religion or belief, ***disability***, age or sexual orientation with regard to employment and occupation [263].

The European Union has played an important role in the development of training and employment policies in favour of the disabled. The '**HELIOS' programme**, the **'Employment Initiative'** and the **'EQUAL'** programme have promoted training and employment creation for people with disabilities, including people on (long-) term sick leave. The extensive exchange of good practices across the EU Member States has led to a certain harmonisation of policies [264]. In relation to the Employment Initiative, the use of **national action plans (NAPs)** is important. In these action plans, EU Member States specify – on the basis of EU strategy, policy, and guidelines – their employment priorities and actions, incorporating themes such as social inclusion, health, etc. A problem is that the focus is solely on those who have already exited the labour market or who are inactive, and not on reintegration of workers who are on long-term sick leave [265].

In 2000, the EC launched the **RETURN project** "Long-term work absences: strategies for a return" which was concerned with how employers' handle employees who become ill or injured, especially those with a long-term absence from work. On the basis of research in six participating EU Member States (Austria, Finland, Germany, Ireland, Italy, and the Netherlands) (national results are provided in paragraph 6.5.4) several guidelines and protocols for policies at different levels were formulated:

- **An Easy Access Guide**, for those recently experiencing illness and injury which might jeopardise their employment, was prepared for each participating country;
- **A Good Practice Guide for employers and worker representatives**, which outlines the policies and management issues in relation to reducing long-term absence;
- **The RETURN Protocol** was developed and revised to ensure that it was relevant across all Member States participating in the project. It was focused on creating a learning tool for employing organisations wishing to improve their response to long-term absence;
- **A Training Programme Specification**, targeted at human resource managers and worker representatives. It draws attention to the issue of long-term absence and promotes more effective responses;
- **A policy document for the European Union**, outlining how a more integrated policy approach can be achieved at European level; and
- **Recommendations for national governments** concerning five areas were presented: leadership and coordination; service provision; attitudes and awareness; research and information and financing of rehabilitation and reintegration (see paragraph 6.5.4) [266].

For the EU-level, the following recommendations were formulated:
- DG Employment: Integrate return to work concerns into the Employment Strategy and National Action Plans;
- DG SANCO: Integrate return to work concerns into quality of work and quality of life policies; integrate return to work concerns into public health policy; and integrate return to work concerns into health and safety policy;
- DG Research: Integrate return to work concerns into research policy and programmes [266].

European social partners

European social partners are included in the debate of social inclusion of people with disabilities through their general involvement in the activities of the EC and the development of the national action plans (NAPS) and the related Open Method of Coordination (OMC). The OMC offers a framework for cooperation between the EU Member States to direct their national policies towards certain common (EU) objectives.

6.5.4 Overview of EU Member State policies and initiatives

Long-term absence from work is an issue of concern of at least three parties. For national governments, social protection expenditure is significant; for employers sick pay and insurance premiums form an important cost in relation to long-term absence; and the long-term ill employee also pays a price through reduced income, reduced social status, and stigma/isolation caused by exclusion from paid work. It is therefore important to reduce the number of workers who are on long-term sick leave [266]. Between 23 and 33 % of our survey respondents claimed that there are national or regional policies or initiatives in place that support employees who are on long-term sick leave to return to work. However, 23% of the respondents also claimed that there are no national or regional policies or initiatives. The remainder of the respondents was not aware if there are such policies or initiatives.

It appears that in most EU Member States return-to-work interventions are not specifically focused on workers who are on long-term sick leave. They are predominantly embedded in the procedures related to a disability benefit claim. Disability benefit systems often take into account the origin of an illness or disability (e.g. whether it is caused by an accident at work, an industrial disease or otherwise). A person generally applies for a disability benefit only after a long period of sick leave when their sickness benefit system is stopped. This means that persons on (long-term) sick leave sometimes only receive support to return to work (if at all relevant) when they fall under the category of persons with a disability.

In each EU Member State different rules exist regarding the period after which workers are transferred from receiving a sickness benefit to an invalidity or incapacity benefit system. A comparative research shows that the shortest period after which an assessment can take place is two weeks (in Belgium); the longest does not specify a fixed time span (Italy, Slovakia, and Slovenia). Most EU Member States use a period of sickness absence of a maximum of one year (Czech Republic, Denmark, Ireland, Sweden); maximum of two years (France, Norway, Netherlands) and five years (Germany) [267].

National return-to-work legislation

In several EU Member States *return-to-work* efforts for people with a disability has a professional element to it. In Spain, legislation stipulates reintegration into the same employment position, or when this is not possible, in an inferior category (but with the same remuneration); and the disabled worker has priority for vacancies at their old employer. In Italy, employers have to assign equivalent tasks to disabled people, or when this is not possible, lower graded tasks but under the same conditions as before. In Austria, a disabled employee may not be assigned to a job below his/her qualifications. The Netherlands is a special case where legislation obliges companies to make more efforts to retain employees who have suffered an illness or disability [264]. See the example and Table 6.3 below.

Sickness benefit system in the Netherlands

In the Netherlands income support for long-term illness consists of 70% of the daily wage and is directly paid by the employer for up to two years. Employers thus carry financially the main responsibility for return-to-work. In addition, they are obliged after 13 weeks of sickness to develop a rehabilitation plan (together with the employee). This system distinguishes the Dutch approach from the common approach in the EU where responsibility for reintegration is primarily located outside the workplace [247].

Table 6.3 Overview of the main reintegration measures for 13 EU Member States

Country	Reintegration measures for ill and disabled people
Belgium	Progressive return to work if possible Training in another job is financed by the health insurance
Denmark	A financial pool helps disabled to maintain their job (funding of training, aids).
Germany	Occupational adaptation according to skills and capabilities Step-wise rehabilitation Preferential selection for in-house and support for external training measures Training allowance, technical aids, and transport assistance Integration grant to employer

Country	Reintegration measures for ill and disabled people
	The retention of an employee who becomes disabled counts for the quota
Spain	Reintegration into the same post, or when this is not possible, to an inferior category with the same remuneration as before and which cannot be reduced by more than 25% if performance was reduced and weak compliance Priority vacancies in the same company Social security subsidies to employers
France	The quota encourages retention and rehabilitation plans Grants for work adaptations
Italy	Employers have to assign the disabled equivalent tasks, or if not possible lower graded tasks but under previous conditions
Ireland	Grants for retaining people who acquire a disability
Netherlands	Replacement budget Legislation which obliges companies to make more efforts for retention Insurance premium differentiation
Austria	An employee may not be assigned to a job below his/her qualification
Portugal	Workplace adaptation Part-time work Leave to train for another job
Finland	Financial support to acquire tools and machinery and to establish or transform an own company Medical rehabilitation to keep current employment Work trials and work adjustments
Sweden	The employer has to provide reasonable accommodation of the work(place) or if possible a different job in the company Rehabilitation benefit to pay education, transport, etc.
United Kingdom	The Disability Discrimination Act provides that disability may not be a reason for dismissal

Source: Grammenos S., Illness, disability and social inclusion. Luxembourg: Office for Official Publications of the European Communities, 2003., based on Brunel University, 'Definitions of Disability in Europe: Comparative Analysis and Assessment of the Policy Implications of Alternative Legal Definitions of Disability on Policies for People with Disabilities', European Commission, 30 June 2002.
Note: the table does not include rehabilitation benefits and pensions.

A problem is that the stated obligations in national legislation are often not enforced. Most of the national regulation contains wording that is open to interpretation and despite the fact that most of the national regulations offer the possibility of imposing sanctions on employers who do not comply, this is hardly carried out in practice [264].

National get-back-to work programs

Several EU Member States offer national get-back-to work initiatives or programmes to claimants of disability benefits. The example of the UK below is well known and often cited. The evaluation results show however how difficult it is for such a large and expensive national programme to be (cost-) effective.

Pathways to Work – United Kingdom

Pathways to Work is a get-back-to-work program to improve reintegration of those claiming incapacity benefits and Employment and Support Allowance (ESA). ESA replaces the incapacity benefits. Workers receive ESA when they are ill or disabled and do not receive a statutory sick pay (anymore) which UK employers pay for the first 28 weeks that a worker is ill. The programme expects participants to take steps and find work or prepare to return to work unless they have a health condition or disability that severely affects their ability to do so.

The programme is based on a tailored approach and early intervention and consists of three main pillars:

- Six obliged work focused interviews with a personal adviser. During these interviews individual needs are assessed and based on that a fitting approach is determined. Typical aspects discussed during the interviews are the focus on work ability and construction of an action plan, information on financial impact of returning to work and different sources for support available;
- The Condition Management Programme offers participants an opportunity to manage their health condition, for example by means of cognitive behavioural therapy;
- A weekly allowance of £40 in the first 12 months of employment is offered to claimants as an incentive for return to work.

A recent evaluation of the National Audit Office (NAO) which assessed the progress of the Department of Work and Pensions (DWP) in reducing the number of incapacity benefit claimants and the effectiveness of the pathways employment programme indicated that the programme has had a limited impact, and has turned out to provide poor value for money.

The NAO report gives credit to the Department for trying to tackle the problem but, the precise contribution of the Pathways to Work programme to a reduction of 125,000 in the number of people claiming incapacity benefits is not clear, but is likely to be limited. The reduction is likely to be due to the earlier medical assessment to determine benefit entitlement. Other elements of Pathways employment support - at an estimated cost of £94 million in 2008-09 - appear to have had no impact on claimants, with new claimants just as likely to move into employment without Pathways support as they are with it. Pathways is led by Jobcentre Plus in some areas but is contracted out to third sector and private organisations in over 60 per cent of the country. The NAO found that there is no evidence that the programme is performing better or costing significantly less in contracted out areas than in those run by Jobcentre Plus. Contractors have universally underperformed against targets set by the Department, the NAO points out, and the Department has had to make concessions as part of contractual renegotiations to support the continuation of businesses and services. The NAO also found that the Department lacked adequate information on the Pathways supply chain. With a third of contracts making a financial loss, the programme's contracted out delivery does not appear to be sustainable.

The report concludes that it is important that the DWP learns from the experience. In the future it should base its programme decisions on a robust and clear evidence base, follow best contracting practice and establish a measurement regime which allows it to understand better what happens to those whom they may have helped." [268].

For the national level, the EU-RETURN project (see paragraph 6.5.3) formulated the following recommendations for national governments to take action on:

- Leadership and coordination;
- Service provision;

- Attitudes and awareness;
- Research and information;
- Financing of rehabilitation and reintegration [266].

Early intervention

Evidence from the literature shows that **early intervention** has a beneficial effect on the severity, impact or progression of diseases (particularly musculoskeletal disease). A delay in diagnosis or treatment can make recovery, job retention or rehabilitation much more difficult. A UK report, for example, calculates that special clinics for those with early features of musculoskeletal disease (also referred to as early clinics) decrease annual healthcare costs (via a reduction in GP visits and in diagnostic tests before referral) and increase the number of people diagnosed within three months from onset of symptoms [255]. Another UK review shows that for employees with low back pain, comprehensive early interventions have been shown not only to return employees to work up to five weeks earlier than under usual care, but also to reduce the recurrence of back pain in the following year by up to 40% [269]. Below an example of early intervention is given for Ireland.

Renaissance project – experience from Ireland

This government-supported project aimed to prevent chronic disability from low back pain. Between January and June 2003, 3,300 new claimants for Disability Benefit and Injury Benefit with GP-certified low back pain were selected for participation in the project. All subjects were aged between 20 and 50 years old. A matched control group of claimants was selected as a comparator. Of the initial 3,300 claimants, the following outcomes were reported:

- 1,700 (51%) returned to work within 4 weeks;
- 1,600 were selected for **early referral** and asked to attend a medical assessment at a point 4–6 weeks after claiming (much earlier than normal);
- Of these 1,600, a total of 1,000 decided to return to work and were not medically assessed;
- The remaining 600 were assessed using a diagnostic triage approach.

The medical assessments placed claimants into one of three categories. Those with simple back pain (95%), those with nerve root pain (3–5%) and those with a potentially serious spinal pathology (1–2 %). Claimants in the simple back pain category were assessed for their work capability, taking into account symptom severity, occupation, potential for work restriction and potential to change the demands of the job. The proportion of claimants progressing from simple back pain to chronic disability fell, with 64% assessed to be capable of work, compared with 20% of claimants assessed during the previous year. There was also a reduction in the number of claimants appealing against their assessment (44% versus 61%). Compared with the control group there was a 40% reduction in claims, which progressed to a long duration and a saving of over €560,000 compared with the previous year. The study was regarded as a success, especially as it demonstrated that targeted early intervention with low back pain could reduce progression to chronic disability, improve the health of claimants and reduce health care costs, reduce absence from work, improve productivity and yield savings for long-term benefits schemes. The project was extended beyond its original scope and has produced further positive results [255].

6.5.5 Company level policies and initiatives

Employers, insurers and workers' groups have expressed a growing interest in return-to-work interventions after injury or illness, especially as disability management is increasingly being integrated into employers' and insurers' mandates.

Importance of early intervention by the employer

Two UK reports suggest that **early interventions** in sickness absence by the employer can help prevent short-term sickness absence from progressing to long-term sickness absence and ultimately unemployment [269, 270]. The longer a person is off work, the greater the obstacles to return to work and the more difficult return becomes. It is simpler, more effective, and cost-effective to prevent people going on long-term sickness absence. One of the UK reports highlighted the importance of three key principles for effective early intervention in sickness absence (improving clinical outcomes and reducing sickness absence):

- Care in line with the 'bio-psychosocial' model – this is care focusing simultaneously on the biological (the disease or condition), the psychological (the impact and perceived impact on mental health and well-being) and the social (wider determinants that can have a negative impact on health and well-being including work, home or family situation) and the links between all three factors;
- Availability of multidisciplinary teams; and
- Case managers or support workers [269].

Other literature also indicates that communication between management or supervisors and the worker (but also health care professionals [270]) is of importance. One study found that frequent communication enhances return to work. However, there was no evidence for improvement in return to work due to communication in the case of depressed workers [271].

Vocational rehabilitation

Vocational rehabilitation is rehabilitation that focuses specifically on return to work. It is sometimes defined as "Whatever helps someone with a health problem to stay at, return to and remain in work [270]."

Successful vocational rehabilitation requires effective communication and active collaboration between health care professionals (in occupational health and in primary care), the workplace and the individual worker [213]. A large UK review of scientific studies and reports concludes that treatment only has little impact on work outcomes. There is strong evidence that proactive company approaches to sickness, together with the temporary provision of modified work and accommodations are (cost-) effective (though this evidence is less substantial for interventions in SMEs) [270].

The UK review also shows that a "stepped-care approach" which starts with simple, low-intensity, low-cost interventions, is adequate for most workers when their sickness absence lasts between three to six weeks. For workers who are sick for a longer period (between one to six months), a more structure rehabilitation approach is needed which provides progressively more intensive and structured interventions.

In relation to specific diseases, the UK review further indicated that there is strong evidence that vocational rehabilitation is effective for tackling musculoskeletal diseases. It also indicated that various medical and psychological treatments for anxiety and depression can improve symptoms and quality of life, but there is limited evidence that they improve work outcomes. Also in relation to "stress" there is little to no evidence on effective vocational rehabilitation interventions for work outcomes.

Below we provide more information with respect to the (cost-) effectiveness of several specific vocational rehabilitation interventions.

An example of a vocational rehabilitation intervention is **training** in work accommodations and feelings of self-confidence and self-efficacy in dealing with work-related problems. There is evidence on the effectiveness of these interventions but no differences were found between group training and individual training [272].

Cognitive behavioural therapy focuses on changing behaviour in certain situations by altering the thoughts that are associated with the particular situation. A review found strong evidence regarding the effectiveness of cognitive behavioural therapy (CBT) on absenteeism of workers with common health problems. An overview of studies stated that CBT reduces the number of sick days in case of chronic lower back pain (back pain that last over 12 weeks) [273]. CBT either delivered face-to-face or via a computer program, appears to be more effective than other interventions such as counselling, medicine or increasing participation or autonomy in the workplace. There is evidence that the effectiveness of CBT is higher for high-control jobs [212]. Evidence on CBT for musculoskeletal problems is, however, limited.

From a scientific review there is also moderate evidence that the work disability duration is reduced by return-to-work interventions which include **ergonomic work site visits**, and presence of a **return-to-work coordinator** [274]. Research in relation to musculoskeletal disorders in the European workforce supports this conclusion [255].

The concept of **adjustment latitude** reflects the possibilities to adjust different work conditions to the health condition of the employee. These conditions can include work tasks, work pace, workplace pace and working-time. In a Swedish study it was investigated whether return-to-work after long-term sickness absence was affected by adjustment latitude. Adjustments that were analysed included postponing work, choosing tasks, getting help, a slower pace, longer breaks, shorter workdays, going home to do work later, no disturbances and working from home. The study comes to the conclusion that for both men and women the likelihood to return-to-work increased with an increasing number of opportunities to adjust. Adjustment latitude increased when returning to part-time [25] as well as full-time work. The study indicates that work organisation is important for return-to-work [275]. For low back pain specifically, the effectiveness of participatory work adjustment - which concerns a step-wise counselling approach where employee and employer set up a work plan for work adjustments needed for a speedy return to work - has been demonstrated in various (Dutch) scientific studies

[25] Employees returning part-time often encounter a chronic illness. These results of this study are thus also relevant for people in work who have a chronic illness.

[239]. Another study found that the possibility of taken unscheduled breaks was found especially beneficial for return-to-work of workers in the first stage of back pain [275].

Work-oriented back pain management programs aim to help people return to work and improve work abilities who suffer from back pain. They include work or physical conditioning, work hardening or functional restoration/exercise programs. Such programs either simulate or duplicate work and/or functional tasks in a safe, supervised environment. In such environments, injured workers learn appropriate job performance skills in addition to improving their physical condition, through an exercise program aimed at increasing strength, endurance, flexibility, and cardiovascular fitness. A systematic review of trials found that programs for chronic back pain patients with positive results all had significant cognitive-behavioural components combined with intensive physical training (specific to the job or not); and were all in some way work-related and given to groups supervised by a physiotherapist of multidisciplinary team [276].

Multidisciplinary rehabilitation concerns physical rehabilitation of workers combined with psychological, behavioural and educational interventions. On the basis of a systematic review of interventions for mental health problems and work-related stress it can be concluded that there is no robust evidence yet on the optimum content of multidisciplinary rehabilitation interventions to remain in or return to work. Nevertheless, it is stated that evidence relating to single component interventions (e.g. exercise, psychological, organisational or educational interventions) may help to inform the likely content of multidisciplinary rehabilitation programmes for mental health problems [213].

One systematic review found moderate evidence of effectiveness from trials of multidisciplinary rehabilitation for working age adults with low back pain with regard to return to work, sick leave and subjective disability [277]. Another scientific review also concludes that the combination of clinical intervention with occupational interventions for low back pain is effective in returning injured workers to regular work and decreases pain and disability [278]. A review of various systematic reviews comes to similar conclusions. There is moderate to strong evidence that multidisciplinary rehabilitation is more effective than usual care or single intervention elements alone for back pain of 4-12 weeks' duration. There is evidence that this approach can help patients return to work sooner; reduce the amount of sick leave taken in the longer-term; decrease pain and restore function; and alleviate the patient's feelings of disability. The review, however, did not find clear evidence about the optimal content of multidisciplinary programmes for low back pain. The review concludes that it is likely that the optimal intervention would have a return to work focus and include:

- An exercise or physical conditioning programme;
- Cognitive-behavioural components (e.g. to correct dysfunctional beliefs);
- Organisational elements (e.g. workplace visits, ergonomic measures, work modification);
- Educational elements (e.g. back school type education).

In the review it is further stated that there is some evidence that more *intensive* multidisciplinary rehabilitation programmes are more effective than less intensive programmes (and usual care) in terms of clinically-relevant outcomes (e.g. restoring

function and reducing pain). There is conflicting evidence regarding the effectiveness of *intensive* multidisciplinary rehabilitation programmes in terms of vocational outcomes (e.g. duration of sickness leave, work readiness) [216].

6.6 Initiatives to promote rehabilitation and reintegration into work following a serious health event

6.6.1 Introduction

We have defined "initiatives that support rehabilitation and reintegration into work following a serious health event" as the rehabilitation and reintegration into work of workers who suffered from a serious health event. It mainly focuses on the recovery of workers so that they can get back to work. With a serious health event we refer to confirmed diagnosis of cancer, organ failure requiring major organ transplant, loss of independent living, functional loss (paralysis) or stroke. It concerns a health event which is unexpected and life threatening, or where there is a significant threat to one's physical and psychological integrity. This category shows much overlap with the previous category of "initiatives to support people who are on long term sick leave to get back into work". We try to avoid overlap by focusing in this paragraph on specific rehabilitation and reintegration initiatives targeted at a serious health event that is related to the diseases under study (e.g. stroke due to cardiovascular disease). More general rehabilitation and reintegration initiatives are discussed in the previous paragraph.

6.6.2 Overview of international, EU level and EU Member State policies and initiatives

At EU and national EU Member State level no specific legislation, policies or initiatives exist that focus explicitly on the promotion of rehabilitation and reintegration into work following a serious health event. As for the previously two discussed categories (chronic illness and long-term sick leave), rehabilitation and reintegration (or return-to-work interventions) of workers who suffered from a serious health event are predominantly embedded in disability legislation, policy, and initiatives. For more information on this, please read paragraphs 6.5.2, 6.5.3, and 6.5.4.

6.6.3 Company level policies and initiatives

Initiatives at company level are limited as rehabilitation and reintegration of workers who specifically suffered from a serious health event (such as cancer or a stroke) are primarily treated in hospitals and rehabilitation centres. The focus is much less on "professional recovery" [270]. Nevertheless, company level initiatives and activities that focus on reintegration of workers who are on long-term sick leave or chronically ill obviously may apply to workers who suffered from a serious health event. For results on these initiatives and activities. In addition, it should not be forgotten that "medical" interventions that focus on treatment and relief of symptoms can lead to a faster return to work, despite the fact that they are not aimed specifically at reintegration into work. In relation to cardiovascular disease (e.g. stroke), return-to-work is for a large part influenced by the

consequences of brain damage, e.g. impaired ADL (activities of daily living) ability or cognitive capacity [279].

Below we provide the limited evidence available on the (cost-) effectiveness of various medical and -when relevant- company level initiatives for workers who suffered from a serious health event.

Return-to-work coordinator. The presence of a return-to-work coordinator in the hospital or in the rehabilitation centre can improve return-to-work by patients that have experienced a serious health event. Scientific studies in Dutch and Belgian rehabilitation centres examined the effect of the presence of a return-to-work coordinator. The effect concerned an increase of 30% of employees who returned to work [239, 280]. Also, a study in New Zealand found that interventions in hospitals that manage the expectations patients of myocardial infarction regarding return to work led to a significant faster return to work [281].

Bio-psychosocial approach. As mentioned in paragraph 6.5.5 bio-psychosocial care for workers who are on long-term sick leave are effective (in terms of reducing sickness absence and improved clinical outcomes). It entails care that is focusing simultaneously on the biological (the disease or condition), the psychological (the impact and perceived impact on mental health and well-being) and the social (wider determinants that can have a negative impact on health and well-being including work, home or family situation) and the links between all three factors.

Specifically in relation to cardiac rehabilitation (often offered after a stroke), a UK study indicates that there is strong evidence that a cardiac rehabilitation programme (in a healthcare setting) which is based on a bio-psychosocial model and consisting of exercise training, educational counselling, risk factor modification, vocational guidance, psychological intervention, relaxation and stress management training improves clinical outcomes for hospital patients after major cardiac events. There is, however, little evidence that it improves vocational outcomes [281]. Also, a Swedish review of studies on combined cardiac programs consisting of patient and family information provision, physical exercise, smoking cessation and regular contact with a coronary nurse, found not sufficient evidence to conclude that such programs are effective [279].

A Dutch review of scientific literature, however, provides evidence that cardiac rehabilitation programs for patients who have had a stroke for the first time was effective with respect to vocational outcomes [239].

Psychological interventions. A review of studies found that sickness duration after a myocardial infarction depends mostly on factors such as depression, self-confidence, low educational level, physically demanding work, or low work satisfaction [279]. This emphasises the importance of psychological interventions for reintegration into the workplace. While there is strong evidence on the effectiveness of (even modest) psychological interventions on clinical outcomes [282], there is little research done one the effects on return to work.

6.7 Other policies and initiatives

In this paragraph we focus on other policies and initiatives that may affect worker's health. We have included policies and initiatives targeted at both individual and societal level (e.g., public health policy). Public health policies which are aimed at the entire population indirectly influence worker's health, sometimes even stronger than specific workplace initiatives. It is noticeable that these interventions are mainly the responsibility and carried out by national (regional- and local-) governments. We particularly flag up interventions that are aimed to tackle the diseases which we selected for closer analysis (see paragraph 2.1)): cardiovascular disease; respiratory disease, alcohol use disorder, road accidents, and unipolar depressive disorder (mental health).

6.7.1 The importance of intersectoral policies to address risk factors

Several risk factors, especially high blood pressure, cholesterol levels, smoking, diet, alcohol, physical activity, and (work-related) stress, are important for the occurrence of several important diseases in the working age population. These risk factors can be addressed by several measures. To address the risk factors at the EU-level and national level, it is important that more attention is given to preventive public policy. Preventive public policy is being defined as: policy which addresses the physical, social and cultural environment in which people live and the way in which people behave. This will influence the state of health and help reduce the numbers of people out of work for health reasons.

Policymakers have recognised that public health issues, such as the rising incidence of obesity, need policies and strategies which are based on sound evidence. A range of (policy) instruments can be used at different levels, including legislation, networking, public-private approaches, and engaging the private sector and civil society. However, to be effective and cost-effective, action is needed from a wide range of organisations, such as the food industry and civil society, statutory and voluntary organisations at a local level, such as schools and community organisations in the area of obesity. Strengthening the links between public health, and other policies, such as food and transport policy is a key challenge in addressing the health of the working age population (integrated approach).

Health in All Policies (HiAP) is an example of an integrated strategy to improve the health of the population. It addresses factors outside the health system that have important health effects. These factors relate to our common life; what we eat and drink, where we live, how we work and how we spend our leisure time may have positive or negative effects on our health. Many of these effects can be influenced by changes in policies, e.g. agricultural, transport, occupational and tax policies. In order to implement HiAP, health systems need to endorse a broad vision of health and reach out to other systems. This implies sustained collaboration with all ministries and the inclusion of health as an important policy concern at all government levels.

The effectiveness of governance tools resides in the ability of such measures and mechanisms to promote a "whole of government approach" and to place health and the

reduction of inequalities high on the government agenda (at the local and national levels). There is not much literature about the effectiveness of HiAP but nevertheless it is possible to draw some lessons. Important elements that are essential for the successful implementation of HiAP include:

- Strong leadership from the health system and strong leadership at the highest government level;
- A clear vision on health, with a well articulated policy that includes objectives and targets;
- A supra-departmental authority/organisation in charge of HiAP;
- The establishment of new, permanent organisational structures supportive of HiAP or a substantial assignment of new responsibilities to an existing structure;
- Legal support of HiAP through revision of public health law;
- Legal support for endorsing specific activities;
- Simultaneous action at different institutional levels; and
- Dedicated Health Impact Assessment (HIA) units with sustainable funding.

The application of a HiAP strategy involves raising the awareness of all decision makers as to their role in influencing health determinants and ensuring the active involvement of these decision makers in efforts to reach health objectives. Intersectoral work is recognized as difficult, especially when it takes place at the central government level. Intersectoral action is effective when it takes place simultaneously on several levels and when work on these levels is integrated through policies or legislation. While central leadership is essential, acting on health determinants also requires significant involvement from local governments. In certain EU Member States (e.g. Finland, Sweden, and the UK), decentralization seems to hamper efforts to implement such action. Faced with these difficulties, Sweden introduced financial incentives and the UK sought the support of existing consensus-building organisations, such as the Local Government Association [210].

Below, we provide a successful example of HiAP.

Population based approach/health in all policies - North Karelia Project – experience from Finland

In the 1970s, Finnish men had the highest Coronary Heart Disease (CHD) mortality in the world. Within Finland, CHD was markedly more common in Eastern parts of the country, particularly in the North Karelia province. The North Karelia Project was started in 1972 and later the activities were spread to other parts of the country. The project was formulated and implemented in cooperation with local and national authorities and experts as well as with WHO.

The major medium-term objectives of the North Karelia Project were to reduce smoking prevalence and lower cholesterol and blood pressure levels among the whole population, but particularly among middle-aged men. The intervention emphasized general lifestyle changes, especially smoking and dietary habits. The implementation of practical interventions was integrated into the existing health service structure and social organisations in close collaboration with other governmental authorities and partners from the private sector. Examples of practical interventions are public awareness campaigns; industry involvement in producing healthier food (less saturated fat and salt, etc.); legislation to ban smoking from public places; legislative changes concerning some foods, e.g. mixing vegetable oil and

butter; special emphasis was placed on lowering salt and changing fat contents in workplace menus, etc.

After the first ten years of the programme, the scope of the North Karelia Project was also enlarged to cover other lifestyle-related chronic diseases and to promote general health in North Karelia. Since the late 1970s the project has worked as a national demonstration and model programme for chronic disease prevention in Finland. The comprehensive evaluation system, which was implemented in the project, was later developed as a national risk factor monitoring system for chronic diseases. The principles of the North Karelia Project have also been adopted in many other countries through international collaboration.

The results show that CHD mortality among working-age men in Finland (2004) had decreased to one-fifth as compared to the situation 30 years earlier. This reduction may be the fastest observed in any country. Coronary heart disease mortality is still higher in Eastern Finland compared to the Western parts of the country, but the difference is only marginal compared to the situation 30 years earlier [283].

Health Impact Assessment is one of the most structured mechanisms for inserting health into all policies. Countries that subscribe to the idea of HiAP generally use or promote this mechanism. It has been shown that the most productive way of reaching the desired goal is to use Health Impact Assessment (HIA) as part of a collective process guided by a spirit of collaboration. Experiences with HIA have shown that incentive measures such as guidance documents and practical guides are not enough. Several studies in this field have shown that departments with an economic vocation (finance, revenue, employment, agriculture, etc.) show more resistance than departments with a social vocation (education, social solidarity, etc.) toward examining the health impacts of their policies. Legal measures seem to provide a lever for overcoming this obstacle. However, laws do not suffice if they are not accompanied by a strategy for supporting intersectoral action. It was found that a dedicated HIA support unit with sustainable funding is one key to success [210].

6.7.2 Altering the lay-out of public spaces/ transport modalities

Our review indicates that the alteration of the lay-out of public spaces and shift in transport modalities can have a beneficial effect on the health of the population (and thus indirectly worker's health) in relation to various risk factors (such as a lack of physical activity) which have an effect on various diseases (coronary heart disease, anxiety, stroke, depression, diabetes, obesity) and road accidents. Below we discuss available policies and initiatives and their (cost-) effectiveness.

Public spaces. A Dutch literature review indicates that the lay out of public space, by for example ensuring sufficient public amenities (e.g. sport facilities, social neighbourhood facilities and meeting places) has a beneficial effect on health of the population and thus also indirectly on worker's health. Due to increased physical activity and less psychological complaints coronary health disease, anxiety, stroke, depression, diabetes, and obesity may be avoided [190]. Also, ensuring that amenities (e.g. grocery store, library, etc.) are reachable by foot and by bike has also been found to be effective in

stimulating physical activity in the Dutch review and an international review undertaken by the Canadian Cancer Society [190, 284].

Traffic interventions. The alteration of the lay-out of public space also has a considerable effect on reducing road accidents. Evidence from systematic reviews indicates that traffic calming interventions such as volume control measures[26] (closures, barriers) and speed control measures[27] (e.g. speed humps, roundabouts) delivered reductions in road traffic injuries, although the evidence for reductions in road user deaths was less robust [192]. A literature review of good practices mentions that for urban environment area-wide urban traffic calming schemes[28] are effective [231]. In addition, pedestrian schemes[29] are mentioned to be effective [231]. Evidence from systematic reviews for the impact of new road building on injuries is inconclusive; while out of town bypasses delivered reductions in injuries, it was not clear whether this was due to the displacement effect of diverting traffic to rural areas. Major new roads did not appear to reduce injury outcomes [192].

Interventions to stimulate transport shift. Evidence of systematic reviews regarding interventions aiming to encourage modal transport shift from driving to walking and cycling show mixed results. Commuter subsidies and alternative provision were successful in reducing the share of journeys made by car. Other interventions had little effect, and several, including car sharing and telecommuting, had negative impacts. There was very limited evidence available on the impact on health outcomes. However, some studies of programmes targeted at motivated individuals delivered small improvements in certain health outcomes [192].

6.7.3 Interventions tackling road accidents

More than half of our respondents of the survey are aware that policies or initiatives targeted at road accidents are in place in their respective countries. The interventions mainly applied at national level are introducing and enforcing seat-belt laws, introducing and enforcing laws on blood alcohol concentration (BAC) limits, introducing and enforcing motorcycle helmet laws and child-passenger restraints. Information on the cost-effectiveness of the interventions under study is not known to the majority of the respondents. Only with regard to introducing and enforcing seat-belt laws, more than half of the respondents believe that this has an effect to help reducing the number of people out of work for health reasons.

According to an assessment of international experts and WHO staff, a systems approach, strong coordination among stakeholders, clearly outlined responsibilities, accountability

[26] Are primarily used to address cut-through traffic problems by blocking certain movements, thereby diverting traffic to streets better able to handle it.

[27] Are primarily used to address speeding problems by changing vertical alignment, changing horizontal alignment, or narrowing the roadway.

[28] These include street closures, guardrails, turning bans at junctions, staggered one-way regulations or street narrowing; speed reducing devices in local roads; installing or upgrading traffic signals at junctions, prohibiting kerb parking or widening the road.

[29] Raised platforms on the road to slow car drivers, two zebra crossings with adjacent railings, creation of parking bays; sidewalks; pedestrian crossing signs; speed limits, and bicycle paths or lanes.

and effective law enforcement are all key factors present in countries that show the best performance in road safety management to reduce the rate of road accidents [285]. In addition, a report of the EC states that the best health protection effects are obtained when legislation is coupled with well targeted information campaigns on safety. An evaluation of a three year Swedish accident prevention programme –combining the above recommendations– saw traffic-related accidents reduce by 28% [286].

Legislative interventions. Legislation is mentioned to be an effective way to discourage risky behaviour and increase road safety. For example, a report including evidence from systematic reviews shows that studies of legislative interventions to curb alcohol-impaired driving found strong evidence for a reduction of fatal and non-fatal crash outcomes [192]. Seat-belt use is the most effective way to reduce the chance of injury or death for both front and rear car occupants. In addition, in a study by RIVM in the Netherlands compulsory cycle helmet use is also identified as an effective intervention to reduce road injuries, especially among young people (aged 0-19) [287]. Also, a Dutch review of international literature indicates that the legislation for mopeds to drive on the main road (instead of bicycle lanes) has led to 15% less bodily injuries [190].

According to the European status report on road safety of the WHO many EU Member States have inadequate legislation to control speed in urban areas, drunk–driving and the use of helmets (for example for riders of motorized two wheelers), seat-belts and child car restraints [285].

Legislative measures alone are not enough to curb non-compliant behaviour. To be more effective, these measures should be well publicized and consistently enforced. Effective enforcement requires ensuring that the perceived risk of punishment for violations remains high by making the penalties sufficiently severe and imposing them quickly and efficiently [285]. A Dutch review of international literature confirms that (regional) law enforcement (with regard to wearing seat belt and speed limits) is effective to reduce road accidents [190].

Campaigns on traffic safety. A Dutch review of international literature shows that campaigns with regard to traffic safety are effective, especially to reduce alcohol consumption, stimulate seat belt use and use more lighting and other safety measures [190].

Policies curbing alcohol-impaired driving. Measures to curb alcohol-impaired driving have a direct effect on reducing the number of road accidents. Paragraph 6.7.6 on alcohol use disorders offers an overview of what policies are effective to tackle alcohol use disorders and alcohol-impaired driving.

The WHO modelled two independent effects on alcohol-related traffic injuries. Drink-driving laws are estimated to reduce traffic fatalities by 7% if widely implemented within a region, adjusted for the current level of implementation; enforcement via random breath testing is estimated to reduce fatalities by 6-10%. The model found that the full implementation of random breath testing (compared to no random breath testing) throughout the EU prevents between 161 and 460 DALYs per million people per year, at an estimated cost of between €43 and €62 per 100 people per year. The model estimated

that unrestricted breath testing in Europe, compared with no breath testing, can avoid 111,000 years of disability and premature death at an estimated cost of €233 million each year [196].

6.7.4 Improving air quality

Measures aimed at improving the air quality indirectly impact worker's health by preventing coronary heart diseases and respiratory diseases such as Chronic Obstructive Pulmonary Disease (COPD). A recent study (2009) performed by the Dutch National Institute for Public Health and the Environment indicated that **measures aimed to reduce traffic emissions**[30] leads to improved air quality [190]. In another study which examined the impact of the creation of a **new road** bypass on respiratory health, there was however little evidence of effectiveness [192].

6.7.5 Tobacco control interventions

Tobacco-control interventions are among the most cost-effective investments in health and indirectly have a strong influence on worker's health. In relation to respiratory disease, our survey results show that the majority of the respondents mentioned that policies or interventions regarding respiratory diseases are applied at the national level, particularly in relation to tobacco control. This includes legislation to create smoke-free worksites and public places, taxation of tobacco products, and health warning labels on tobacco products (mentioned by more than 80% of the respondents). Of these interventions, only legislation is thought to have a considerably or moderate effect on reducing the number of people out of work. The awareness of cost-effectiveness of the interventions studied is limited among the respondents.

EU level

At the EU level, the ASPECT Consortium points out that the EC could act within the field of tobacco control by:

- Creating a European tobacco and nicotine products regulatory agency;
- Creating a nicotine and tobacco product regulation advisory committee;
- Developing a co-ordinated EU research strategy;
- Proposing a Framework Convention on Tobacco Control protocol on illicit trade;
- Implementing a new and comprehensive regulatory framework for all tobacco and nicotine products;
- Introducing a requirement for the reduction and removal of specific harmful ingredients of tobacco and tobacco smoke; and
- Rescinding the requirement for tar, nicotine and carbon monoxide yields to be displayed on cigarette packs [288].

[30] Avoidance of most polluting trucks in the city; the introduction of maximum speeds near cities to 80 km/an hour; and stimulating measures to reduce speed.

National level

At national level, the general consensus is that a **comprehensive approach** is the most effective means of reducing tobacco consumption [194]. A report by the EC states: "For smoking the most cost-effective intervention is where various strands delivering a single message come together — in the workplace, in schools, in the out-of-school youth sector and with elderly people. When a smoker quits, it is because of a combination of factors: the price went up, he was banned from smoking at work, he read an article in a newspaper or his doctor told him the consequences of not stopping" [286].

There is strong consensus among international experts and researchers as to what policy measures are cost-effective and should be included in (sub) national tobacco-control programmes. WHO's Health Evidence Network, the World Bank, the ASPECT research consortium and the EC all point towards **six policy interventions** which are all included in WHO's Framework Convention on Tobacco Control:

- Permanent price increases (scaled to inflation), notably through higher taxes on cigarettes and other tobacco products;
- Comprehensive bans on advertising and promotion of tobacco products, logos and brand names;
- Bans or strong restrictions on smoking in work places and public spaces;
- Good consumer information, education and counter-advertising campaigns;
- Large, direct warning labels on cigarette boxes and other tobacco products; and
- Treatment and help for smokers who wish to quit. This should include good access to counselling, nicotine replacement therapy (NRT) and other cessation therapies [173, 194, 288].

Based on an analysis of effective tobacco control policies in 28 European countries – the EU-25, Switzerland, Norway and Iceland – a 'tobacco control scale' has been drawn up to allocate a relative weighting to the impact of the six policy measures. Most impact was attributed to price and taxation policies. Smoking bans in workplaces and public places were judged to have the second largest impact (also see paragraph 6.2.4). An overall tobacco control budget, advertising bans, health warning labels, and tobacco dependence treatment followed in decreasing order of importance [288]. Interestingly, an economic analysis which generated global and regional cost-effectiveness estimates for the principle approaches to tobacco control, shows that a combination of other (non-price) measures delivers the highest cost-effectiveness in terms of quality-adjusted years of life saved (QALYs) and not a price increase as mentioned above (see Table 6.4).

Table 6.4 Cost per quality-adjusted year of life saved (QALY) for different policies and countries

Policy options	High-income countries including most Western and Northern European countries	Eastern Europe and central Asia
Price increase on tobacco by 10%	161-645 US$	4-15 US$
A combination of other (non-price) measures	1347-5388 US$	64-257 US$
Publicly provided nicotine replacement therapies	746-1160 US$	227-247 US$

Source: Ranson MK et al. Global and regional estimates of the effectiveness and cost-effectiveness of price increases and other tobacco control policies. Nicotine and Tobacco Research 2002, 43:311-319. In: Gilbert A, J. C. Which are the most effective and cost-effective interventions for tobacco control? 2003.

Below each of the six policy interventions – except bans or strong restrictions on smoking in work places and public spaces (see paragraph 6.2.4 instead) are more elaborately explained.

Price increase through higher taxation. An EU study shows that price increases through higher taxation are the most effective and cost-effective tobacco-control strategy, especially for young people and others with low incomes. A price rise of 10% decreases tobacco consumption by about 4% in high-income countries (a Dutch review mentioned 6% [190]) and by about 8% in low-income countries [173, 175].

A synthesis report of the Health Evidence Network states a 2.5%-5% smoking reduction in the short run and possibly up to 10% in the long run, if prices are increased to keep pace with inflation [194]. Given the addictive nature of smoking, the response is expected to be more profound in the long run, when the influence of addiction is relatively more diffuse. Several studies have estimated that the demand for tobacco could be reduced twice as much in the long run as in the short-run, however, only if there is a continuous increase in real price to keep pace with inflation. It should be noted that the elasticity estimates ─ the reduced demand as prices increases ─ are mainly from high-income countries, and that those from lower/middle income countries suggest even larger responses.

The report further shows that young people may reduce their smoking at two to three times the rate of older people. This level of response could result in 500,000 to 2 million fewer deaths from smoking in high-income countries, and in 600,000 to 1.8 million fewer deaths in Eastern Europe. Some countries have raised taxes to 70%–80% of the price of a pack of cigarettes, resulting in significant reductions in smoking, although smaller tax raises have also been successful. Price increases may contribute optimally to the effectiveness of comprehensive tobacco control programmes when a portion of the tobacco tax revenues are earmarked for publicly funded tobacco interventions [194].

The most common concerns about tobacco price increases are that government revenues may fall and jobs may be lost due to reduced tobacco consumption, that smuggling may increase dramatically, and that an increase in price disproportionately burdens lower-income smokers. According to the HEN synthesis report these consequences are either false or overestimated. The economic and health benefits from tobacco price increases appear to outweigh any disadvantages [194].

Comprehensive advertising and promotion bans. Comprehensive advertising and promotion bans have also been shown to reduce smoking. Empirical evidence shows that a fully comprehensive advertising ban covering all media and all forms of direct and indirect advertising reduces tobacco consumption. It lessens the social desirability of smoking, in particular among young people (e.g. adolescents) [173, 175]. Along with the promotion of a smoke-free environment, the regulation of advertising contributes to making non-smoking an accepted social norm. The World Bank estimates that

comprehensive bans can reduce tobacco consumption by around 7%. However as other types of tobacco advertising and promotion are curbed, package displays and adverts at the point of sale have become increasingly important in the marketing strategies of tobacco companies [173].

Below evidence on advertising bans in Norway, Finland and France is provided.

Advertising ban – experience from Norway, Finland and France

Norway, Finland, and France enforced an advertising ban that was part of a comprehensive tobacco-control strategy. Their strategies included price increases and the promotion of smoke-free places. All exhibited substantial falls in per capita sales (up to 1999): Norway experienced a drop in sales of 31% after the advertising ban was put in place on 1 July 1975; Finland experienced a drop in sales of 34% after the advertising ban was put in place on 1 March 1978; and France experienced a drop in sales of 15% after the advertising ban was put in place on 1 January 1993 [173].

Public information campaigns. There is convincing evidence from several countries that sustained and well-funded public information campaigns can reduce smoking prevalence substantially. All such data need however to be interpreted carefully as the factors pushing prevalence reduction are complex and it is not possible to do controlled experiments in the real world [173]. The synthesis report of the Health Evidence Network mentions that public information campaigns can be best included as a component of a comprehensive programme against tobacco. Mass media campaigns can raise awareness and change attitudes about the risks of using tobacco and the benefits of quitting. There is evidence that multimedia campaigns can prevent young people from starting to smoke and increase cessation among youth and adults when combined with other interventions. Mass media campaigns are most likely to succeed if designed according to social marketing theory, with sufficiently large, sustained campaigns, and appropriately targeted messages based on empirical evidence for the intended population.

Health warning labels. Large, direct health warning labels are an effective way both of informing smokers of the hazards of smoking (thus encouraging smokers to stop), and of discouraging non-smokers from starting to smoke. Evaluations of health warnings conclude that they are effective only if they contain multiple strong and direct messages that are prominently displayed, and be very distinct graphically from the rest of the package design [194]. Evidence from Canada, Brazil, Australia, the Netherlands and Belgium shows that the large warnings introduced recently are effective in discouraging smoking and increasing public awareness of the health effects of smoking (see example below) [173].

Health warnings – experience from Belgium

A Belgian study released in May 2004 confirmed the Dutch findings and found that bigger, clearer warnings motivated smokers to stop smoking and made cigarette packs less attractive to youngsters. Warnings on cigarettes have been compulsory in Belgium since 30 September 2003, and cover an average of 55% of the front and back of the package, making them the largest in the world. The Flemish Institute of Public Health, in collaboration with the Belgian Federation against Cancer has conducted research among 608 smokers over 15 years of age in Belgium in December 2003 and January 2004 regarding the effects of the health warnings. .Amongst the findings were the following:

- Warnings were particularly effective amongst young people between 15-24 years of age and amongst those who wished to stop smoking within the year;
- Young people found it easier to remember the messages than other age groups. Fifty-six per cent of the age group 15-24 years agreed with the statement that they had discussed the new health warnings with family or friends. Forty per cent of all smokers felt the packaging was becoming less attractive to youngsters;
- Twenty-nine per cent of all smokers felt that warnings were an additional motivation to stop smoking. Amongst those who declared that they wished to stop smoking within a year, the percentage was even 46%;
- As a result of the new warnings 8% of those questioned smoked less, 2% more and 88% as much as before [173].

Treatment and help for smokers who wish to quit. This should include good access to counselling, nicotine replacement therapy (NRT) and other cessation therapies. According to a WHO report, physician advice to patients to quit smoking has been demonstrated to have a significant effect on reducing smoking. Nicotine replacement therapies (NRT) have been shown to further double the chances of successfully quitting smoking when used in conjunction with physician advice. A recent meta-analysis suggested that NRT effectiveness does not decrease when they are available over-the-counter. Several analyses have also demonstrated these therapies to be cost-effective compared to other common medical interventions for secondary prevention, such as drug therapies for hypertension and high blood cholesterol [194].

The 4 A's program in primary health care (Ask, Advice, Assist, and Arrange follow-up) in patients aged 50 and over has been demonstrated to be efficient [289]. And there is also evidence that individual counselling by a cessation specialist as well as group therapy programmes are effective in helping smokers quit [194].

Buddy support programmes, age-tailored self-help materials, and telephone counselling, are effective measures to stimulate smoking cessation among older smokers [289].

Systematic reviews have been conducted to assess the effectiveness of hypnotherapy, aversive smoking therapy, and acupuncture, and in each case, there was no evidence that these therapies improved quit rates among smokers [194].

According to a Dutch study by the RIVM, 100% financial support to stop smoking leads to more 'stop attempts', more use of support to stop; and a higher success rate of the attempts to stop. Particularly funding of the combination of advice and NRT or drugs has led to good results. The Dutch study mentions a return of 97.500 to 144.300 extra non-smokers each year (in the Netherlands) [190].

6.7.6 Alcohol control interventions

In paragraph 2.1 it is mentioned that alcohol use disorder has a relatively high burden of disease (see also paragraph 5.5.2). For this reason, interventions curbing successfully curbing alcohol consumption can have great effects with respect to the overall health of the population, and thus indirectly worker's health.

National level

An EU study on alcohol in Europe shows that there is evidence from time series analyses, econometric analyses, community studies and randomized controlled trials of interventions on the effectiveness of national alcohol policies and programmes. Although there is a dominance of North American literature in testing the effectiveness of alcohol policy options, the robustness of the evidence is strengthened by a consistency of evidence over time and in different jurisdictions, countries and cultures [196].

Table 6.5 below gives an overview of the effectiveness, breadth of research and cost-effectiveness of alcohol related policies as examined in an EU study on alcohol measures. Below the table we provide more detailed information.

Table 6.5 Overview of the (cost) effectiveness of alcohol related policies

	Effectiveness	Breadth of research	Cost effectiveness
Drink driving policies			
Lowered BAC levels	+++	+++	+++
Random breath testing (RBT)	+++	++	+
License suspension	+++	++	++
Alcohol locks	+	+	+
Low BAC for youth	+++	++	+++
Graduated licensing	++	++	+++
Server training and civil liability	+	++	+
Designated drivers and ride services	0	+	++
School based education sources	?/0	+	+
Community programmes	++	++	+
Education and public awareness			
Public services messages	0	+++	++
Warning labels	0	+	+++
Alcohol education in schools	0/+	+++	+
Pricing and taxation			
Taxes	+++	+++	+++
Restrictions on the availability of alcohol			
Minimum drinking age	+++	+++	++
Government retail outlets	+++	+++	+++
Number of outlets	++	+	+++
Density of outlets	++	++	+++
Hours and days of sale	++	+++	+++
Advertising controls			
Reducing the volume of advertising	+/++	++	+++
Advertising control controls	?	0	++
Policies that reduce harm in drinking and surrounding environments			
Responsible beverage service	+	+++	++
Active enforcement	++	+	+
Server liability	+++	+	+++
Enforcement of on-premise regulations	++	+	+
Public transport	?	+	+

	Effectiveness	Breadth of research	Cost effectiveness
Safer bar environment/containers	?	0	++
Community mobilization			
Community mobilization	++	++	+

Effectiveness: 0 a lack of effectiveness; + limited effectiveness; ++ moderate effectiveness; ++ a high degree of effectiveness; ? No studies have been undertaken or there is insufficient evidence upon which to make a judgment.

Breadth of research: 0 No studies of effectiveness have been undertaken; + Only one well designed study of effectiveness completed; ++ From 2 to 4 studies of effectiveness have been completed; +++ 5 or more studies of effectiveness have been completed; ? There is insufficient evidence on which to make a judgment.

Cost-effectiveness: 0 Very high cost to implement and sustain; + Relatively high cost to implement and sustain; ++ Moderate cost to implement and sustain; +++ Low cost to implement and sustain; ? There is no information about cost or cost is impossible to estimate.

Source: Anderson P, Baumberg B. Alcohol in Europe: A public health perspective. London: Institute of Alcohol Studies; 2006.

Drink driving policies. Drinking-driving policies that are proven to be highly effective include unrestricted (random) breath testing[31], lowered blood alcohol concentration (BAC) levels[32], administrative license suspension, and lower BAC levels and graduated licenses for young drivers [196, 290].

There is no evidence for an effective impact from designated driver and safe drive programmes. [33] Alcohol locks[34] can be effective as a preventive measure, but as a measure with drink driving offenders only work as long as they are fitted to a vehicle [196].

To be effective, drink driving laws must be publicized. If the public is unaware of a change in the law or an increase in its enforcement, it is unlikely that it will affect their drinking and driving. When incorporated as part of community programmes, drink driving measures appear to have increased effectiveness [196].

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[31] Unrestricted or random breath testing means that motorists are stopped with no restrictions by police and required to take a breath test, even if they have not been suspected of having committed an offence or been involved in an accident. Any motorist, at any time, may be required to take a test, and there is nothing that the driver can do to influence the chances of being tested. Testing varies from day to day and from week to week, and refusal to submit to a breath test is equivalent to failing.

[32] BAC (sometimes called BAL, blood alcohol level), represents the amount of ethanol in a given amount of blood, and is noted as "weight by volume." The most commonly used measurements are grams of ethanol per 100 milliliter of blood (g/100ml), sometimes expressed as percentage by volume commonly used in the United States, and milligrams of ethanol per milliliter of blood (mg/ml), equivalent to grams per liter (g/L), used in much of Europe. For example, 0.05 g/100ml=0.05%=0.5 mg/ml=0.5g/L. In this report, g/L is used.

[33] There is no universal definition of a "designated driver." The most common definition requires that the designated driver abstain from all alcohol, be assigned before alcohol consumption, and drive other group members to their homes. Other definitions employ a risk and harm reduction strategy, in which the primary goal is not necessarily abstinence, but to keep the designated driver's blood alcohol content (BAC) at less than the legal limit.

[34] One action to prevent drink driving offenders from driving while impaired is to place interlocks in the ignition to prevent an impaired driver from operating the vehicle. To operate a vehicle equipped with an ignition interlock device, the driver must first provide a breath specimen. If the breath alcohol concentration of the specimen exceeds the predetermined level, the vehicle will not start. As a measure to reduce circumvention of the device (i.e. someone else blows into the mouthpiece), random retests are required while the vehicle is running. Interlocks can also be used as a preventive measure, by being fitted to public service and heavy goods vehicles.

There is little evidence that prison sentences or fines have a specific deterrent effect by promoting avoidance of future offences. Nevertheless, the authority to impose a prison sentence may provide the legal basis for referring offenders to treatment programs, which have been shown to reduce recidivism of drink driving in first and multiple offenders. A meta-analysis of 215 independent evaluations of remedial programs found them to yield an average reduction of 8%-9%, both in recurrence of alcohol-impaired driving offences and in alcohol-related accidents [196].

Although the reach of school-based educational programs to reduce drink driving can be high because of the availability of captive audiences in schools, the population impact of these programs is small due to their current limited or lack of effectiveness [196].

Training programmes for servers and bartenders for preventing impaired driving by identifying impairment, refusing service and providing transportation have been evaluated in North America, Australia, and the Netherlands. These have demonstrated a significant improvement in server knowledge and attitude, as well as discouraging over-consumption and encouraging alternative beverages. This effect is particularly strong when coupled with a change in the serving and sales practices of the licensed place, and with training for managers. Success in reducing the risk of drink-driving has not been found in all studies, even when mandating the training of servers as a condition of licensing. However, when implemented as part of more comprehensive community-based programmes responsible server programmes have been found to be effective, particularly for night time crashes for young people [196].

Below, several best practice examples are provided of drinking policies in Europe.

Lowering of the BAC level – Experience in Sweden and Denmark

Lowering the BAC level from 0.5g/L to 0.2g/L level in Sweden in 1990 led to a reduction of fatal alcohol-related accidents by between 8% and 10%. Denmark reduced its BAC from 0.8g/l to 0.5g/l on 1st March 1998. There was some evidence for a reduction in all motor vehicle injury accidents and in accidents involving a driver with a BAC of greater than 0.5g/L in 1998, compared with 1997, but no change in fatal accidents [196].

Alcolock devices and programmes – Experience in Sweden

Alcolock devices and programs were introduced in Sweden in 1999, with two types of programs. A primary prevention strategy was initiated to prevent alcohol impaired driving in three commercial transport companies (buses, trucks, taxis). A secondary prevention trial was begun as a voluntary 2-year program for drink driving offenders involving strict medical requirements, including counselling and regular checkups by a medical doctor. Alcolocks in commercial vehicles have been well accepted by professional drivers, their employers, and their passengers, and the number of vehicles with alcolocks as a primary prevention measure is rapidly growing in Sweden. Three of 1000 starts in the primary prevention program were blocked by the alcolock after measuring a BAC higher than the legal limit and lock point of 0.2g/L. Only 11% of eligible drink driving offenders took part in the voluntary, secondary prevention program, of which 60% had a diagnosis of alcohol dependence. During the program, alcohol consumption decreased as measured by five biological alcohol markers, and the rate of drink driving offences fell sharply from a yearly rate of approximately 5% to almost zero. However, those dismissed from the program appeared to return to their previous drink driving behaviour [196].

Education and public awareness policies. Public service announcements, public education campaigns, and particularly those that focus on low risk drinking guidelines have limited evidence for effectiveness, although media advocacy approaches are important to gain public support for policy changes.

Although there is limited to no evidence for the impact of warning labels, there is an argument for their use in relation to consumer protection and consumer rights [196, 290, 291]. During the 5th European alcohol and health forum in 2009 it was also mentioned that pictorial warnings could 'demonise' alcohol for responsible consumers [291].

Despite many years of research, the effect sizes for most school based programmes are small and program failures are common. This suggests that, until there is more evidence for effectiveness, it is not a good use of scarce resources to invest heavily in school based education programmes [196, 290].

Taxing alcohol consumption. The impact of price changes on alcohol consumption and alcohol harm has been more extensively investigated than any other potential alcohol policy measure. There is substantial evidence showing that an increase in alcohol prices reduces consumption and the level of alcohol-related problems. The effects of price increases, like the effects of other alcohol control measures, differ among countries, depending on factors such as the prevailing alcohol culture and public support for stricter alcohol controls. However, the effects on alcohol-related harms are definite and the costs low, making it a cost-effective measure [290].

A report on the effectiveness of alcohol policies in Europe (2006) showed that it is possible to estimate the effect of a tax measure that would raise the price of alcohol by 10% in each country. It can be predicted that countries in Southern Europe would experience a drop in consumption of 2%, while the fall in Central Europe would be 5% and that in Northern Europe 8%. If these estimates are combined with the effect of changes in alcohol use on health outcomes, it can be estimated that a 10% price rise would save over 9,000 deaths in the EU15 each year. This would include over 4% fewer deaths from liver disease for men (and 3% for women), 1% fewer deaths among men and women from accidents, and 5% fewer deaths among men due to homicide. Furthermore, in Finland, Sweden and Norway – where the effects of both price (on consumption) and consumption (on harm) are stronger – it is estimated there would be a 6-7% fall in suicide deaths and accidents, together with a 20% decrease in directly alcohol-related deaths for men and a 40% fall in women. A wide range of studies have found that increasing the price of alcohol and beer reduces road traffic accidents and fatalities among people of all ages, but particularly for younger drivers [196].

It can be roughly estimated that a 10% price rise would also give around €13bn of additional excise duty revenues within the EU. This is likely to be something of an overestimation, given that it takes no account of smuggling/cross-border shopping or the effect of price rises on all beverages at the same time (compared to individual beverage elasticity). Even accounting for the former and only looking at one beverage though, a detailed official UK analysis shows that spirits duties could be raised by 40% before the maximum revenue is achieved. The potential for increased tax revenues even in a relatively high-tax country such as the UK was further demonstrated when beer and wine

were examined – the current duties were so much lower than the maximum revenue point that it proved impossible to say exactly where this would be [196].

The WHO modelled the impact of tax on alcohol set at the current level increased by 25%, compared with no tax at all, and adjusted for the observed or expected level of unrecorded use (taken as a close proxy measure for untaxed consumption) due to illicit production and smuggling, using published price elasticity. The model estimated that the current level of taxation plus a 25% increase can prevent between 503 and 1576 DALYs per million people per year, at a cost of between €18 and €38 per 100 people per year. The model estimated that the current level of tax with a 25% increase in the tax rate throughout Europe, compared with no tax on alcohol, can prevent an estimated 656,000 years of disability and premature death at an estimated cost of €159 million each year [196].

A comparative cost-effectiveness analysis shows that population-wide measures, such as taxation, are the most-effective (more than 500 DALYs averted per 1 million population) response only in populations with moderate or high levels of drinking (more than 5%, such as Europe and North America), whereas more targeted strategies are indicated to be more effective in populations with lower rates of hazardous alcohol use. In these populations, intervention strategies at particular subgroups of the drinking population, such as drunk drivers or primary care attendees with already high levels of alcohol consumption appear to be more cost effective than population-wide strategies like taxation [292, 293].

Restriction policies on the availability of alcohol. Stricter controls on the availability of alcohol, raising and implementing a minimum age of purchase for alcohol, reducing the availability of alcohol through retail sales, restrictions on the number and density of outlets and the days and hours of sale all reduce alcohol related harm [196]. The prolongation of opening hours of bars and restaurants for example has shown to lead to more alcohol related incidents [190]. Given the broad reach of all these measures, and the relatively low expense of implementing them, they all are highly cost-effective [290].

> **Rationing – Experience in Sweden, Greenland, and Poland**
>
> Whilst rationing is clearly politically unacceptable in contemporary Europe, there is no doubt that general alcohol rationing schemes, such as the Bratt system in effect in Sweden until 1955 and the system in effect in Greenland from 1979 to 1982 were responsible for reducing liver cirrhosis mortality, violence, and other consequences of heavy drinking. In Poland during the early 1980s, when alcohol rationing limited each adult to half a litre of spirits per month, episodic heavy drinking was reduced, mental hospital admissions for alcoholic psychosis fell by 60%, deaths from liver diseases dropped by 25%, and deaths from injuries by 15% [196].

The WHO modelled reduced access to and availability of alcohol through estimating what would happen if alcohol could not be purchased for a 24-hour period at the weekend (although not politically acceptable across contemporary Europe, this option was chosen by the WHO team, based on Scandinavian data, which has been shown to reduce alcohol consumption and alcohol-related harm). A modest reduction of 1.5-3.0% in the incidence of hazardous drinking and 1.5-4.0% in alcohol-related traffic fatalities was modelled. If implemented throughout the EU, the model estimated that such an intervention can

prevent between 251 and 689 DALYs per million people per year, at a cost of between €12 and €23 per 100 people per year. Although it is not known for how long the effects might last, the model estimated that such an intervention can prevent an estimated 123,000 years of disability and premature death at an estimated cost of €98 million each year [196].

Advertising controls. There is evidence for targeting of alcohol advertisements to underage drinkers, and consistent evidence shows that exposure to television, music videos and sponsorship containing alcohol advertisements predicts onset of youth drinking and increased drinking. Consumer studies have shown that alcohol advertisements lead to positive expectancies and attitudes about alcohol. These studies also show that exposure to tobacco advertising increases smoking initiation amongst young people, exposure to food advertising changes children's food consumption behaviour, and there is increasing evidence that exposure to alcohol advertisements increase initiation of alcohol use amongst adolescents. Despite the difficulties of population-based studies, there is a range of studies including some econometric studies that show a relationship between the volume of advertising and drinking behaviour and outcomes; while other studies do not find this relationship.

Restricting the volume of commercial communications of alcohol products is likely to reduce harm, although this has not been specifically evaluated. To date, self-regulation of commercial communications by the beverage alcohol industry appear not to be effective [196].

The WHO modelled the impact of advertising controls based on a 2%-4% reduction in the incidence of hazardous alcohol use, derived from international time-series analyses of the impact of an advertising ban. Although not politically acceptable in contemporary Europe, the model estimated that a EU-wide advertising ban on alcohol can prevent between 300 and 616 DALYs per million people per year, at a cost of between €12 and €23 per 100 people per year. A ban on advertising implemented throughout the EU could prevent 202,000 years of disability and premature death, at an estimated cost of €95 million each year [196].

Policies to reduce harm in drinking and surrounding environment. Server liability and enforcement of on-premise regulations combined with community mobilization seem to be strategies with some impact without being too costly. However, they do not reach off premise drinking. From a systematic review it can be concluded that server training in responsible beverage service is unlikely to have an effect if it is not backed by the threat of suspending the licenses of those who continue to serve underage drinkers or intoxicated patrons [290, 294]. Such strategies to alter the drinking context are more effective when backed up by community-based prevention programmes [196].

Effectiveness of community mobilisation. Community prevention programmes have the potential to effectively reduce alcohol-related harm [196, 295]. In community prevention programmes several partners work together and different types of prevention measures are combined in one programme within a community (e.g. a city). Some experiments with community prevention programmes show substantial reductions in high-risk drinking and related harm, while others show minimal results [295].

The following interventions do not appear in Table 6.5 but are also relevant alcohol-curbing interventions.

Control mechanisms regarding the quality of alcoholic beverages. A report by the EC concludes that the establishment of effective control mechanisms regarding the quality of alcohol beverages is an effective policy to reduce alcohol related harm [265].

Brief interventions. According to a literature review of good practices and a large EU study on alcohol in Europe brief interventions aimed at individuals who are identified as having a high risk on alcohol-related problems are effective in reducing alcohol consumption [231]. Examples of brief interventions may include screening, assessment, (brief) advice, counselling, motivational interviewing[35] and self help manuals or other forms of written information to address alcohol use. Most of these interventions are carried out in a healthcare setting [231].

Brief advice provided in primary care and brief advice provided in emergency care are shown to be the most effective interventions, especially in the short term. There is no clear evidence of the effectiveness of brief advice in the long term. There is some evidence that brief advice reduces alcohol-related mortality, albeit from a small number of studies [196].

There has been considerable concern about the ability to engage health care providers in delivering brief advice programmes. From international trials and a meta-analysis it can be concluded that education and support programmes are effective and cost-effective in increasing the involvement of primary care providers in delivering brief advice programmes [196].

In the CHOICE model of the WHO (CHOosing Interventions that are Cost Effective) brief interventions such as physician advice provided in primary health care (which involves a small number of educational sessions and psychosocial counselling) were modelled to assess the impact on the prevalence of hazardous drinking. If brief interventions were implemented throughout the European Union, the model estimated that reaching 25% of the population at risk can prevent between 512 and 1056 DALYs per million people per year, at a cost of between €26 and €185 per 100 people per year. This would mean preventing 408,000 years of disability and premature death at an estimated cost of €740 million each year [196].

Behavioural skills training and pharmacotherapy. In addition to brief advice, behavioural skills training (CBT) and pharmacotherapy are effective treatment methods supported by controlled trials [196].

Other interventions. In the large EU study on alcohol, methods such as twelve-step facilitation, group psychotherapy, educational lectures and films, mandatory attendance at

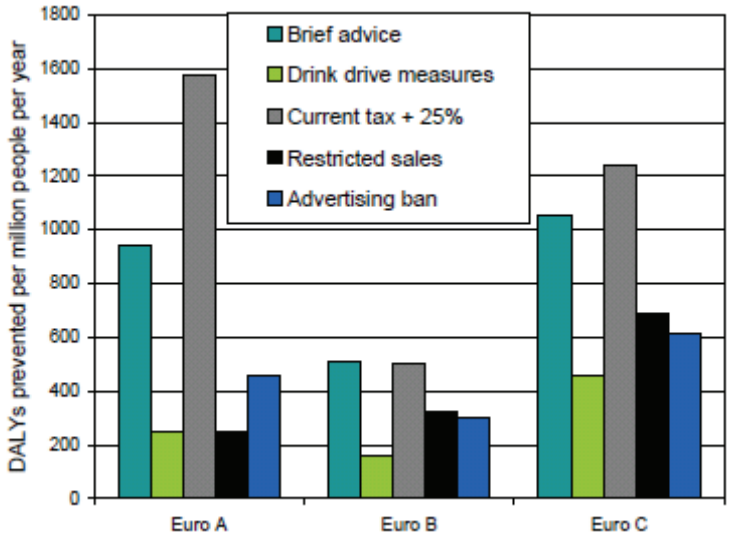
[35] Directive, client-entered counselling style for eliciting behaviour change by helping clients to explore and resolve ambivalence. Compared with nondirective counselling, it is more focused and goal-directed. The examination and resolution of ambivalence is its central purpose, and the counsellor is intentionally directive in pursuing this goal. Source: Rollnick S., & Miller, W.R. (1995). What is motivational interviewing? *Behavioural and Cognitive Psychotherapy*, *23*, 325-334.

A.A. meetings, and relatively unspecified general alcoholism counselling, are found to be ineffective [196].

Figure 6.3 and Figure 6.4 below show that in the EU25, taxation (current tax levels with a 25% increase in tax, compared to no tax) has the greatest impact in reducing alcohol harm, followed by brief interventions delivered by primary care providers to 25% of the at risk population. The three regulatory measures (taxation, restricted sales and advertising controls) are the cheapest in terms of cost to implement. Although brief interventions are the most expensive interventions to implement, it should be noted that compared with other health service interventions, brief interventions for hazardous and harmful alcohol consumption are one of the most cost-effective interventions [196].

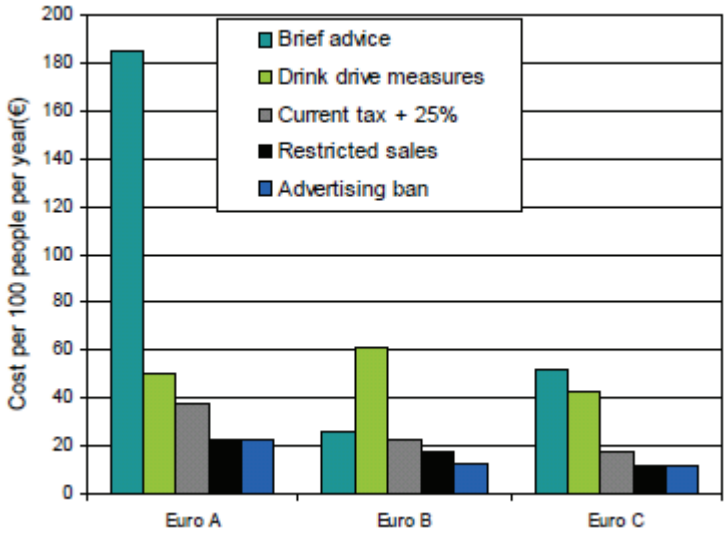
Implementing the above mentioned options is extraordinarily cheap, compared to the social cost of alcohol. Compared with no programme at all, a programme that includes brief physician advice, random breath testing, current taxation plus 25%, restricted access and an advertising ban would cost only €1.3 billion, (about 1% of the total tangible costs of alcohol to society and only about 10% of an estimate of the income gained from a 10% rise in the price of alcohol due to taxes in the EU15 countries) and avert 1.4 million alcohol related DALYs a year [196].

Figure 6.3 The impact of different policy options (DALYS prevented per million people per year) in the three sub-regions of EU25 with respect to alcohol control



EU15 countries are in sub-region EURO-A, while the EU10 countries are split between EURO-A (Cyprus, Malta, Slovenia), EURO-B (Poland and Slovakia) and EURO-C (Estonia, Hungary, Latvia, Lithuania).
Source: Anderson P, Baumberg B. Alcohol in Europe: A public health perspective. London: Institute of Alcohol Studies; 2006.

Figure 6.4 The cost of different policy options to control alcohol (per 100 people per year in €) in the three sub-regions of EU25



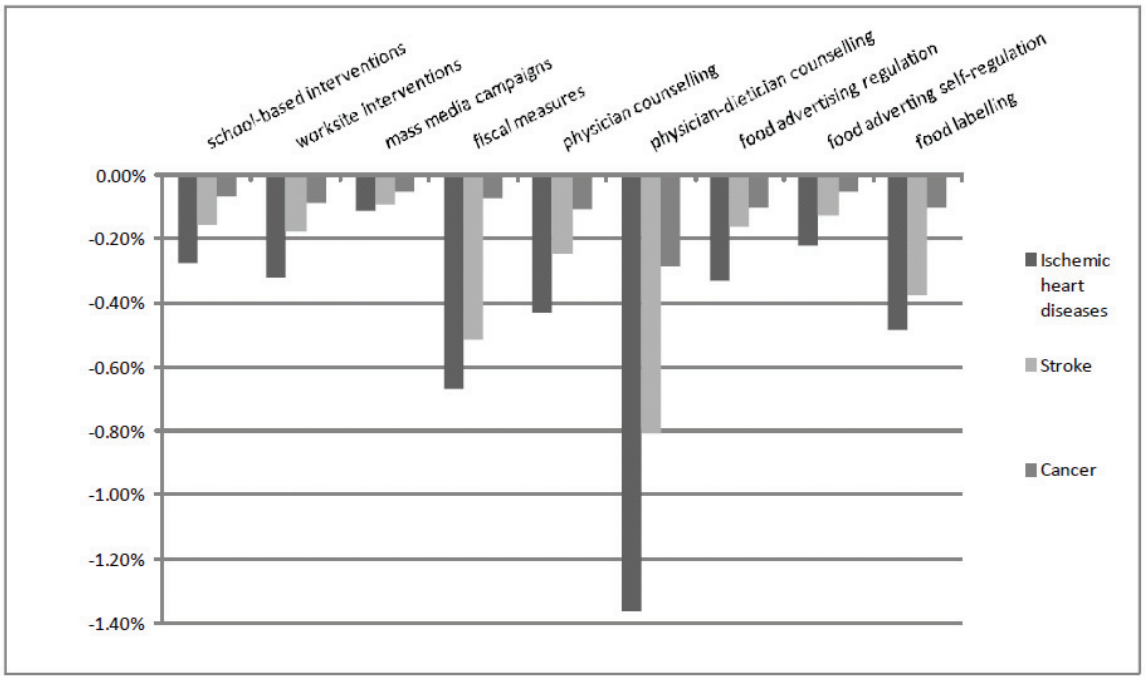
EU15 countries are in sub-region EURO-A, while the EU10 countries are split between EURO-A (Cyprus, Malta, Slovenia), EURO-B (Poland and Slovakia) and EURO-C (Estonia, Hungary, Latvia, Lithuania).
Source: Anderson P, Baumberg B. Alcohol in Europe: A public health perspective. London: Institute of Alcohol Studies; 2006.

6.7.7 Interventions stimulating physical activity and healthy nutrition

Lack of physical activity and unhealthy nutrition are important risk factors for diseases which carry a high burden of disease, particularly cardiovascular diseases such as ischemic heart diseases and stroke. Therefore, interventions which are effective in stimulating physical activity and healthy nutrition are important measures to tackle the general population's health and thus indirectly worker's health.

In 2009 the OECD and the WHO undertook an economic analysis to assess the efficiency of a range of policy options to tackle unhealthy lifestyles and related chronic diseases (e.g. ischemic heart diseases, stroke and cancer). The results of their analysis show that the incidence of three groups of chronic diseases is reduced by several preventive interventions although to a relatively small extent [296] (see Figure 6.5).

Figure 6.5 Decrease in disease incidence at population level



Source: Sassi F, Cecchini M, Lauer J, Chisholm D, 2009, OECD Health Working Paper no.48.

Their analysis (see Figure 6.5) shows that the largest overall effect on the incidence of ischemic heart disease and stroke by diverse preventive interventions is achieved through **physician-dietician counselling**, which has a direct relation to several lifestyle risk factors, including cholesterol and diet. It decreases ischemic heart disease incidence rates by up to 1.36 percentage points (about 3.3 cases averted every year per 100.000 individuals) and stroke by up to 0.80 percentage points. The decrease in percentage points is given in a 100 year time-perspective, between the incidences of the diseases under the no-intervention scenario and with the intervention. A decrease of 0.1% means that an individual experiences a decrease of 0.1% in the yearly probability of developing the disease. Although the decrease can be considered rather limited, one should bear in mind that the effect is given for the whole population, including individuals younger than 40 for whom the probability of developing a disease is naturally very low [296]. Overall, physician-dietician counselling generates a gain of 1 year of life every 12 individuals and 1 year of disability-adjusted life every 10 persons.

The second largest overall effect on the incidence of ischemic heart disease and stroke by diverse preventive interventions to tackle unhealthy diets and sedentary lifestyles is achieved through **fiscal measures**. The effect is somewhat larger on ischemic heart diseases (approximately 0.68 percentage points) than on stroke (approximately 0.50 percentage points) [296].

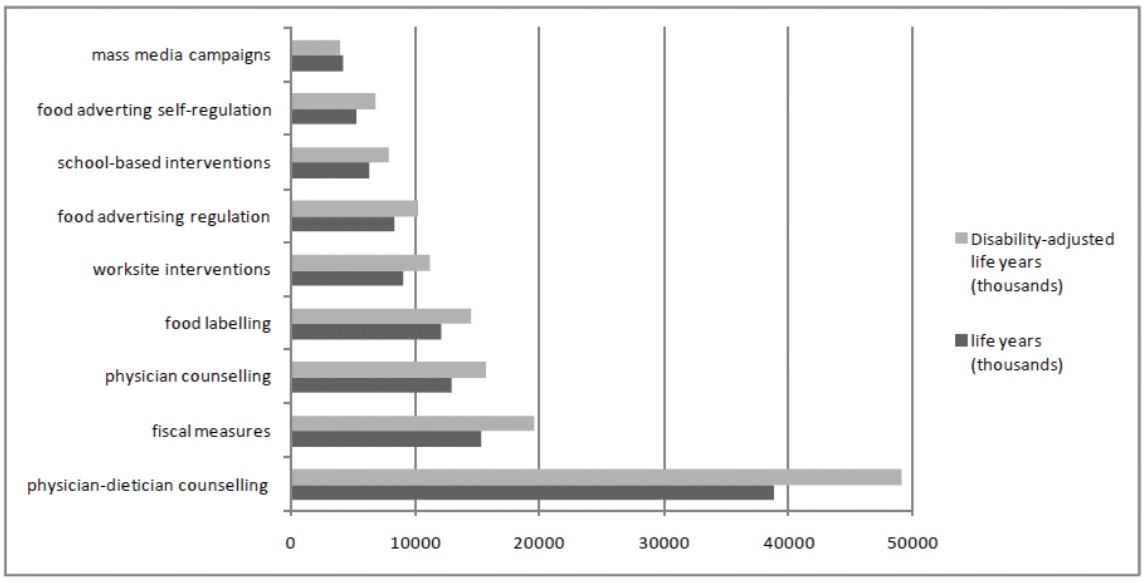
Food labelling, food advertising and food advertising self-regulation appear to have a small (food labelling with 0.49 percentage points on ischemic heart disease and 0.38 percentage points on stroke) to very small effect (below 0.40 percentage points) on the incidence of ischemic heart disease and stroke. The effects are somewhat larger on ischemic heart diseases than on stroke [296].

School-based interventions have a very small effect (below 0.40 percentage points) on the incidence of ischemic heart disease and stroke. The effect is somewhat larger on ischemic heart diseases than on stroke [296].

Mass media campaigns have almost no effect (below 0.10 percentage points) on the incidence of ischemic heart disease and stroke. The effect is somewhat larger on ischemic heart diseases than on stroke [296].

The OECD-WHO analysis (2009) also provides details with respect to which of the above-stated societal level interventions are most effective in terms of disability-adjusted life years and life years won (see Figure 6.6). Their analysis shows that physician-dietician counselling is the most effective intervention (of those examined) both in terms of disability-adjusted life years and life years won - it generates 1 life year every 12 persons and 1 year of disability-adjusted life year every 10 persons. Mass media campaigns rank lowest, generating 1 life year/disability-adjusted life year every 115/121 individuals [296]. Important factors influencing the effectiveness of mass-media campaigns appear to be the education level of the population, the duration of the campaign, the intensity of media programmes, and the credibility of the source of the information given [114].

Figure 6.6 Interventions to tackle obesity that lead to a decrease in disease incidence at the population level

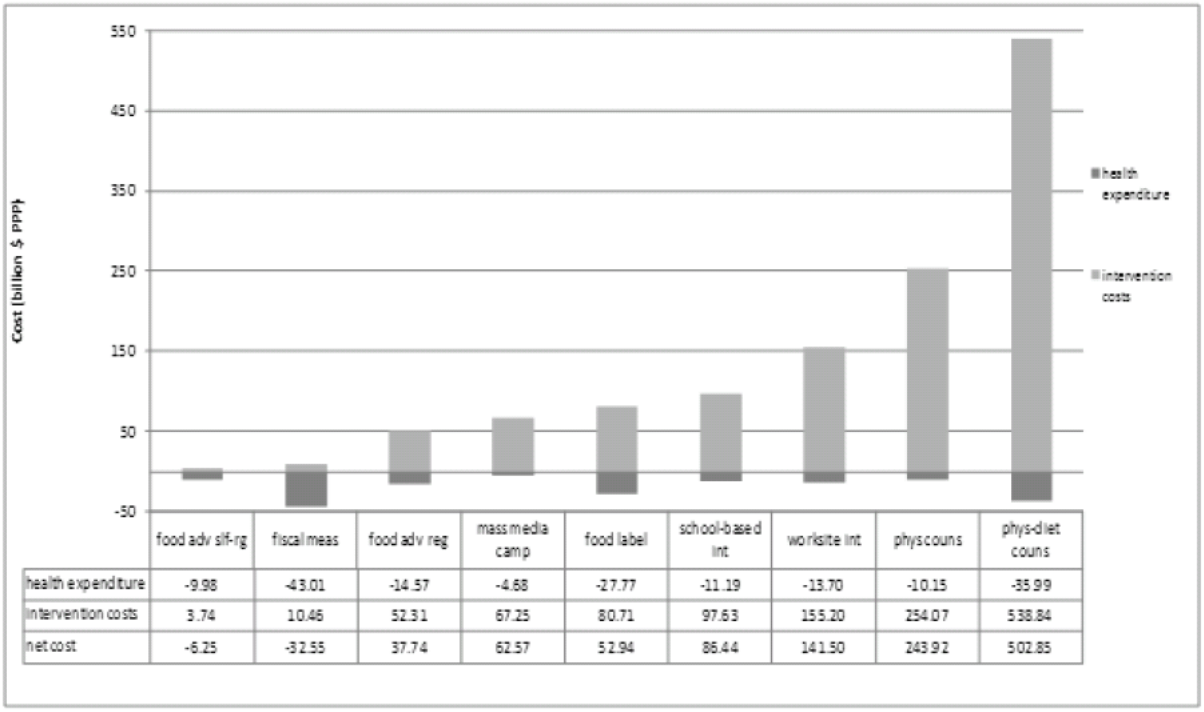


Source: Sassi F, Cecchini M, Lauer J, Chisholm D, 2009, OECD Health Working Paper no.48, Improving lifestyles, tackling obesity: the health and economic impact of prevention strategies.

Figure 6.7 below describes the total financial impact of the examined interventions in the WHO-OECD analysis (2009) over a period of 100 years. All interventions decrease health expenditures for the conditions explicitly included in the model (cancer, ischemic heart disease, stroke, diabetes, high cholesterol, and high systolic blood pressure). Costs reported are expressed, respectively, in billions and millions of dollars. Physician-dietician counselling is the most expensive intervention with expected costs of about $540 billion (before discounting) over 100 years, while self-regulated advertising restrictions is the least expensive intervention, costing about $3.7 billion over 100 years.

Both self-regulation of food advertising and fiscal measures generate reductions in health expenditure which more than offset intervention costs, thus leading to savings of about $6.3 billion and $32.6 billion [296].

Figure 6.7 Economic impact of interventions tackling obesity at the population level



	food adv slf-rg	fiscal meas	food adv reg	mass media camp	food label	school-based int	worksite int	physcouns	phys-diet couns
health expenditure	-9.98	-43.01	-14.57	-4.68	-27.77	-11.19	-13.70	-10.15	-35.99
intervention costs	3.74	10.46	52.31	67.25	80.71	97.63	155.20	254.07	538.84
net cost	-6.25	-32.55	37.74	62.57	52.94	86.44	141.50	243.92	502.85

Source: Sassi F, Cecchini M, Lauer J, Chisholm D, 2009, OECD Health Working Paper no.48, Improving lifestyles, tackling obesity: the health and economic impact of prevention strategies.

The cost-effectiveness ratio for each of the examined preventive interventions was also assessed at different points in time over the period of 100 years of the simulation. Both costs and effectiveness are discounted at a 3% rate. Food labelling, mass media campaigns and physician-dietician counselling appear to have favourable cost-effectiveness ratios from the early years after their implementation. These three interventions are characterized either by a relatively small cost of implementation, about $2 per capita, combined with effects influencing a large share of the population or, as in the case of physician-dietician counselling, very large effectiveness. A second group of interventions, including physician counselling, worksite intervention, self-regulation of food advertising, reaches a cost-effectiveness of $50,000 after about 30 years from the initial implementation. School-based interventions and food advertising regulation need more than 60 years to reach similar values. Fiscal measures generate savings shortly after their implementation, while food advertising self-regulation does so after about 40 years [296].

Below we offer several more details with respect to some of the interventions discussed above.

Counselling. According to a Swedish systematic review of interventions, scientific assessments of treatment methods for obesity show that changes in dietary habits through

counselling can lead to weight reduction in the range of 3 to 10 kg during the first year (or 10% of body weight in children). The long-term effects are though still uncertain [297]. Also, a Finnish study shows that intensive counselling can lead to self-motivated efforts once experts have provided the counselling. In this case, the interventions focused on middle-aged, overweight patients with impaired glucose tolerance and the individual counselling focused on reducing weight, total intake of fat, and intake of saturated fat and increasing intake of fibre and physical activity. The exercise programme included exercises using gym equipment and physical activity in groups, and the patients were also instructed to get as much physical exercise as possible in connection with daily chores. The end result in the intervention group was a reduction of the incidence of new cases of diabetes 58 % lower than in the ordinary counselling group. The observed difference between the groups indicates that the intervention needs to be individualized and continuing, and performed by skilled professionals in order to be effective [289].

Diet. According to a Swedish systematic review of interventions very low calorie diet based on protein formulas for 6 to 12 weeks yields a greater weight reduction than conventional low energy diets. In studies of 1 to 2 years (often periodic), a retained weight loss of a few kilograms more than in treatment using a balanced diet alone was noted [297].

Tax and price policies and subsidies (fiscal measures). Tax and price policies have contributed to prevention and control of tobacco use (see paragraph 6.7.5), and there is considerable data supporting the relationship between pricing and taxing of alcohol products and their consumption (see paragraph 6.7.6). The main point of relevance to the question of the impact of these policies is that large scale interventions on taxes and prices can prompt desired changes in consumer behaviour. Even so, there are differences among the products and consumer behaviours involved that are likely to limit the external validity of the tobacco and alcohol experience to the consumption of energy-dense foods. Among these differences, evidence of price elasticity of foods is far more limited than that of tobacco and alcohol. Also, pricing policies for foods or particular nutrients may be more complex to implement. As suggested by market data and modelling analyses, there may be greater potential in applying tax and price policies to nutrients than to particular types of foods; however, defining, identifying, and assessing special taxes and prices on them may be difficult and costly to implement [298].

In contrast to tobacco and alcohol prevention efforts, efforts to limit consumption of foods high in saturated fats and other energy-dense foods do not involve products that are already widely restricted (though certainly not inaccessible) for youth. These differences mean that it is likely to be more difficult to identify specific food and beverage products on which to impose or lower taxes. Another consideration is the role that addiction has in dampening the effect of economic instruments on consumption. The clinical nature and epidemiology of tobacco addiction differ from those of alcohol addiction, and both differ from any related habitual behaviour associated with consumption of foods high in saturated fats and other energy-dense foods [298].

The synthesis report of the Health Evidence Network found no direct scientific evidence of a causal relationship between policy-related economic instruments and food consumption, including foods high in saturated fats. Indirect evidence suggests that such

a causal relationship is plausible, though the authors of this report state that it remains to be demonstrated by rigorous studies in community settings [298]. Nevertheless, the report does report on various studies that do show an effect on food consumption. One longitudinal study from China indicate that price increases of unhealthy food curbed the consumption of this type of food; and a US study found an association between differences in food prices and BMI of young children. Further a small body of evidence shows that reducing the price of fruits, vegetables and other healthy snacks at the point of purchase (vending machines, cafeterias) increases their consumption and another small body of evidence that includes several RCTs shows that financial incentives may result in temporary weight change [298]. The report also states that there is some evidence that providing subsidies to agricultural producers and consumers can increase consumption of healthful foods [298]. A study of the Canadian Cancer Society further states various American and Canadian studies which indicate that lowering healthy food prices and increasing taxes on unhealthy food does have an effect in altering unhealthy food patents [299].

Interesting to note is that the report also includes the results of four modelling studies which suggest that economic instruments, including taxes, prices and subsidies, could diminish purchasing of foods high in saturated fats and other energy-dense foods in favour of purchasing certain healthful foods. Although such models can provide useful guidance, they do not generate empirical evidence. Their strength as a group is that three of them drew directly on actual data tracking the association between market changes in prices and food purchasing, and that all examined alternative scenarios to gain insights regarding the projected sensitivity of food purchasing to changes in the economic instruments. As the four modelling studies were European-based (two in Denmark and two in the United Kingdom, including three that drew directly on actual market data), they are likely to be more generalizable to Europe than otherwise [298].

In conclusion, from clinical intervention studies and studies of public health programmes, interventions in the area of both nutrition and physical activity have shown to be effective. The effects of nutrition and physical activity can be quite substantial. Public health interventions can lead to savings in terms of direct health care costs as well as indirect savings due to reduced absenteeism that exceed the intervention cost by a factor up to 15. Especially, food labelling, mass media campaigns and physician-dietician counselling appear to have favourable cost-effectiveness ratios from the early years after their implementation.

6.7.8 Interventions tackling mental health

Below we provide information on the (cost-) effectiveness of several interventions/approaches that are most commonly discussed and researched when tackling mental health problems.

The results from our survey show that respondents are aware of national and/or regional policies or initiatives regarding mental health in their respective countries. Often social disadvantaged groups are targeted to reduce socioeconomic disparity with regard to mental health problems. The knowledge of respondents with regard to the use of specific

interventions in their respective countries is scattered. For example, most respondents know that persons with depression are treated in their countries but are not aware of supported employment programmes. Most respondents do not know about the cost-effectiveness of particular interventions. In addition, most respondents do not know whether interventions and policies regarding mental health have an impact on the reduction of number of people out of work for health reasons.

Multisectoral comprehensive prevention programmes. Participants from an EU conference on the prevention of depression and suicide in 2009 mention that depression must be seen in a social and cultural context, and actions should address societal factors as well as individual factors by building partnerships, mobilisation of inter-sectoral local networks, support for community activity and strengthening of family ties.

Stigma of depression needs to be addressed as a major barrier to prevention. Early recognition and treatment and capacity building in primary care to enhance mental health promotion, prevention, and recognition as well as low-threshold psychological and medical treatment of depression are mentioned to be key priorities. European-wide collaboration is needed to develop effective and well-integrated e-health solutions and to bridge the digital divide [300].

Many mental health programmes, specifically focused on suicide prevention have used a multi-level approach, aiming at reducing stigma, improving mental health literacy, and educating gatekeepers. The following example from Germany indicates that this approach is effective in reducing suicidal attempts.

Nuremberg Alliance against Depression (NAD) - experience from Germany

A 2-year community-based intervention program was performed in Nuremberg (480 000 inhabitants) at four levels: training of family doctors through different methods; a public relations campaign informing about depression; cooperation with community facilitators (teachers, priests, local media, etc.); and support for self-help activities and support for high-risk groups. The effects of the 2-year intervention on the number of suicidal acts (completed suicides plus suicide attempts, main outcome criterion) were evaluated with respect to a 1-year baseline and a control region. Compared to the control region, a reduction in frequency of suicidal acts was observed in Nuremberg during the 2-year intervention (2001 v. 2000: -19.4%, p=0.082; 2002 v. 2000:-24%, p=0.004). Considering suicide attempts only (secondary outcome criterion), the same effect was found (2001 v. 2000: -18.3%, p=0.023; 2002 v. 2000: -26.5%, p<0.001). The reduction was most noticeable for high-risk methods (e.g. hanging, jumping, and shooting). Concerning the number of suicides, there were no significant differences compared to the control region. These results indicate that the intervention appeared to be effective in reducing suicide.

Based on the experiences, concepts and materials of the model project in Nuremberg, the European Alliance Against Depression has further refined the intervention concept and implemented 4-level intervention programmes in many European countries. The intervention implemented in Nuremberg has been cited as a best practice model in the European Commission's Green Paper "Improving the mental health of the population: towards a strategy on mental health" [301, 302].

Training of healthcare personnel. Effectiveness of training of healthcare personnel both in ambulatory and hospital settings to better recognize (risk of) depression remains inconclusive [301, 302].

Improved access to psychological therapies. In Dame Carol Black's review of the health of the Britain's working age population (2008) improved access to psychological therapies for people with common mental health problems such as anxiety and depression who require help of mental health services appeared to be effective. The UK example below is illustrative.

> **Improving access to psychological therapies – United Kingdom**
> In 2006, a project comprising two national demonstration sites in Newham and Doncaster was set up, including a national network of local psychological therapy programmes. The project shows that improving the access to psychological therapies helps people to achieve measurable recovery and thereby improving their ability to work: 56% achieved measurable recovery, no matter how long they had been ill, comparing favourably with the National Institute for Health and Clinical Excellence's evidence from clinical trials, and with natural recovery rates. There were more than 4,800 appropriate referrals made to pilot services in 12 months. The savings for the wider economy have been estimated to be a 5% net reduction in patients on Statutory Sick Pay due to return to work, in line with the programme's expectations [269].

Cognitive-behavioural therapy. There is strong evidence that cognitive-behavioural therapy (CBT) interventions are effective for common mental health problems (like depression and anxiety) [301]. There is also some evidence that shorter CBT programmes (up to 8 weeks) may be more effective than longer programmes; that early CBT interventions are effective; that CBT is particularly effective for employees with high control roles; and that CBT plus a focus on increasing potential for enhanced control is useful for employees with low control roles [213].

Brief interventions. There is moderate evidence that brief therapeutic interventions (e.g. counselling) are effective for employees experiencing job-related distress – particularly where these focus on problem identification and solving, rather than on the nature of interpersonal relationships [213].

Internet. The internet may constitute a cost-effective means of combating depression by self-help interventions based on forms of psychotherapy that have proven their effectiveness in the clinical setting such as CBT, brief problem solving therapy and interpersonal therapy. It is recommended that these interventions are offered as a first step in a stepped care approach so that patients can be directed to more intensive therapies when so required. The benefits of the internet are that it reaches a wide population at low costs, is accessible 24/7 anywhere with appropriate technology, and does not require a face-to-face contact, and can even be used anonymous -- which may encourage health service uptake by those who fear stigma or have difficulties travelling to and from health services [303].

Medication (in combination with brief psychotherapy). Antidepressants and psychotherapy are effective in treating more severe forms of depression. Evidence has also recently been provided for their efficacy in milder forms of depression [301]. The WHO CHOICE (CHOosing Interventions that are Cost Effective) project[36] shows that in

[36] The WHO-CHOICE project assesses the impact of a range of primary care based pharmacological and psychological interventions in reducing the burden of depression.

Europe the use of older anti-depressant drugs (tricyclic antidepressants) is the most cost-effective measure for depression followed by a combination of using older anti-depressant drugs (tricyclic antidepressants) with brief psychotherapy [304].

6.8 Summary of policies and initiatives to address workforce health

Workplace health promotion

Workplace health promotion focuses on the promotion of workers health and general wellbeing and goes further than merely legislation on ensuring health and safety. It includes the active pursuit of activities that help employees to improve their own general health and wellbeing.

The EU has provided some support for workplace health promotion including through the European Network for Workplace Health Promotion (ENWHP) that was set up in 1996. The ENWHP has carried out a number of European initiatives which have established workplace health promotion as a field of action for public health at European and national level. The Luxembourg Declaration on Workplace Health Promotion (2007) has been adopted by all members of the ENWHP and outlines a set of aims for the practice of workplace health promotion.

The European Agency for Safety and Health at Work is an important EU agency in relation to workplace health promotion. It helps to meet the information needs in the field of occupational safety and health (OSH) and offers information to employees and employers with regard to how to best tackle workplace health promotion.

At national level, workplace health promotion has become increasingly important. In many Member States, Occupational Safety and Health (OSH) legislation and policies are slowly expanding to include health promotion alongside health and safety. Our survey results indicate that national and regional policies of workplace health promotion are particularly focused on alcohol intake, followed by mental health and musculoskeletal diseases.

One example of national legislation in the field of workplace health promotion is the banning of smoking in public and workplaces. Another example is the increased focus of national bodies in the field of health and safety to stimulate and disseminate workplace health promotion initiatives. These initiatives mainly offer support and information to employers to tackle workplace health promotion in their specific work environment.

Workplace health promotion initiatives are being developed particularly at company level. Sometimes these initiatives take a holistic approach including employee involvement to tackle general wellbeing, include health check-ups or they focus on a specific health issue. Health issues that are most often tackled within the workplace through workplace health promotion are smoking, alcohol abuse, promotion of healthy food and physical activity and ensuring mental health.

There is some evidence that workplace health promotion programs are effective but overall there has been a lack of good quality of research in this area. Work health

promotion programmes have beneficial effects for the employer and employee in the shape of reduced accidents and injuries, increased employee satisfaction, reduced sickness absenteeism, reduced work disability, reduced premature retirement, improved company profile, increased turnover, and increased productivity. On the societal level it reduces medical costs. The impact on health outcomes is, however, inconclusive. Also, the evidence base for cost-effectiveness of workplace health promotion and prevention focusing on work performance is very limited.

Promising effective workplace health promotion policies and initiatives with respect to tackling certain health issues include:

- Workplace health promotion programmes tackling smoking – including smoking bans – lead to reduced smoking, but outcomes with respect to reduced absenteeism, productivity and incapacity to work and subjective outcomes are inconclusive;
- Interventions that have potential to produce beneficial results are brief interventions, life-style checks, psychosocial skills training, peer referral and a method called constructive confrontation strategy involving the employee's supervisor;
- Evidence on the effectiveness of workplace health promotion programmes to tackle alcohol abuse is weak;
- Workplace health promotion programmes in the area of both nutrition and physical activity are effective, although the long-term effects remain unclear. Targeting both individual risk factors and the organisational environment and multi-component interventions (including both nutrition and physical activity) have shown to be more successful than tackling either element in isolation;
- Targeting mental health problems at the worksite through stress management training have a modest or short-term positive effect. Increasing employee control showed mixed effects. Cognitive behavioural interventions seem to be more effective for workers with common mental health problems. In addition, there is evidence that a combination of psychological and physical activity interventions will be most effective for tackling mental health problems at work. Mental health problems due to shift work can be addressed by designing the shift system in an optimal way for employees.

Workplace health and safety

Workplace health and safety initiatives focus on the protection of workers in their employment from risks resulting from work factors adverse to health.

There is a highly developed system of workplace health and safety legislation and activities in the EU based on EU law. In addition the International Labour Organisation (ILO) plays an important role in health and safety of the working age population through the establishment of international standards on labour and social matters.

The international labour standards are formulated as Conventions and Recommendations. Further guidance is provided in Codes of Practice and manuals which are used as reference material by those in charge of formulating detailed regulations or responsible for occupational safety and health.

In addition, the ILO published international guidelines for OSH management. These guidelines are not legally binding and are intended to support the establishment of national OSH management frameworks.

At EU level, the OSH Framework Directive (89/391/ECC) guarantees minimum safety and health requirements throughout Europe while EU Member States are allowed to maintain or establish more stringent measures. In addition, the EC issues European guidelines which are non-binding documents aiming to facilitate the implementation of European directives.

EU legislation has contributed to instilling a culture of prevention throughout the EU and led to the rationalisation and simplification of national legislative systems. The impact has been bigger in those EU Member States who had either less developed legislation or legislation based on corrective principles compared to Member States that had a preventive approach to fight occupational risks. The shift of the EU Directives to move away from a technology-driven approach for accident prevention towards a policy of OSH that would be much more focused on the person's behaviour and organisational structures is recognised as having the biggest impact in the EU Member States.

The Community Strategy on Safety and Health at Work (COM/2007/0062 final) forms the political framework of the European safety and health policy for 2007-2012. It takes a holistic approach towards OSH by combining legislation, regulation with a variety of other instruments, such as social dialogue, good practice, awareness raising, corporate social responsibility, economic incentives and mainstreaming. The Strategy aims to achieve a 25% reduction of occupational accidents and diseases in the EU through a series of actions at EU and national levels in different areas. European social partners are consulted at various stages in the European decision-making process in the field of health and safety at work and have also adopted several autonomous agreements whereby EU social partners have taken up the responsibility for implementing measures at national, sectoral and enterprise level.

National policies of the EU Member States regarding safety and health are primarily based on the implementation of EU legislation and policies. Each EU Member State has developed a national strategy in OSH with regard to the EU Community Strategy on Safety and Health at Work. The national strategies have the aim to provide a clearer focus on the overall national direction and to set OSH priorities.

Throughout the EU, national and regional agencies set -beside legislation- various strategies and guidelines for interventions in the field of OSH. These vary from country to country depending on factors such as the regulatory settings in health and safety and industrial relations models. A literature review of good practices indicates that the formulation and dissemination of strategies in the field of health and safety by both national and local authorities to those who can intervene in the workplace (particularly the employer) is an effective intervention to tackle occupational accidents. Other examples of national initiatives are benchmarking, campaigns and the offering of financial incentives.

As with workplace health promotion the vast majority of existing workplace health and safety initiatives is carried out at company level. These initiatives follow the rules as set out in national legislation which applies to the company and are based on international standards, EU guidelines and regulation. This includes clear rules with respect to worker participation and risk assessment.

Our literature review indicates that workplace modification and the use of safety devices in the workplace show some evidence of effectiveness with respect to certain diseases, especially hearing loss and musculoskeletal diseases.

The evidence of the (cost-) effectiveness of educational interventions on preventing accidental injuries and musculoskeletal diseases at work is limited and not conclusive. Our review indicates that training (such as lifting training and back training) should primarily be used as complementary to working conditions improvements and as in-house programmes within close workplace vicinity and programmes that incorporate intensive training.

Initiatives to help retain people in work who have a chronic illness

With chronic illness we refer to a long-term health condition, such as musculoskeletal problems, cancer, asthma, migraine, epilepsy, diabetes, irritable bowel syndrome, depression, anxiety, heart problems, HIV and hepatitis. The focus of this category of initiatives is not on return to work but on keeping a chronically ill employee in work (workplace retention). Without timely and appropriate retention policies employees with a chronic illness are likely to move out of employment when their condition continues or deteriorates.

At EU level chronic illness is not specifically mentioned in policy and regulation. Chronic illness is included in regulation and legislation when it leads to a disability. An important EU legislative framework is the Council Directive 2000/78/EC of 27 November 2000 – also referred to as the Employment Equality Directive. It established a general framework for equal treatment in employment and occupation and constitutes a major step in the development of anti-discrimination policy. The Directive prohibits any direct or indirect discrimination based on religion or belief, *disability,* age or sexual orientation with regard to employment and occupation. The EU Employment Equality Directive includes a requirement (in Article 5) to provide reasonable accommodations for people with disabilities. There are two complications with respect to this Directive. First, the definition of disability under this Directive does not clearly include chronic illness. Second, with respect to Article 5 (some) EU Member States have struggled with the implementation of this requirement due to interpretation difficulties.

At national level, legislation, policies and initiatives in the EU Member States focus on the retention of people with disabilities in work and not specifically on people with a chronic illness. As a result, people with a chronic illness who are still able to work can fall through the maze of the existing disability schemes and legislation as they often first need to become disabled and/or fall out of the workforce before they are able to receive assistance. Within most EU national systems, occupational health providers are involved in the assessment of fitness to work and in assessing levels of disability for insurance purposes. Particularly in the EU Member States that joined since 2000 their role is still

largely driven by compliance with legislation. In the other EU Member States the approach is much more on workplace health management which is both driven by legislative requirements and by health targets set on a voluntary basis by the working community within each enterprise. In these countries the occupational health providers take a much more holistic approach combining their role as assessor with health promotion. A problem, however, is the fact that there is surprisingly little or no communication between occupational health providers and general practitioners (GPs) to address worker's health. The crucial role that GPs can play in workplace retention – especially for chronically ill employees – is often ignored while they co-ordinate and provide clinical management and provide sick notes which can trigger or continue period of absence of work.

A brief review of websites shows that most companies in the EU provide information with regard to disability management in general, but not on chronic illness specifically. It appears that good chronic illness management practice requires a proactive, designed set of policies that focus not only on the activities which must take place when an employee becomes chronically ill, but also on the adoption of preventive and promotion practices in relation to worker's health (early interventions). These policies should be integrated with the general company operations and management.

Early interventions include either work (place) adjustment to retain the chronically ill employee in his/her current employment position or redeployment of chronically ill employees who can no longer do the same job as a result of their chronic illness within the same company. The evidence with regard to (cost-) effectiveness of work (place) adjustment (often ergonomic interventions focusing on musculoskeletal diseases) is inconclusive. There is some evidence that certain mechanical and interventions that modify workplace tools are effective in preventing and managing neck/upper extremity musculoskeletal conditions. Mechanical lifting aids, lumbar support, back belts and shoe inserts appear to be ineffective to tackle back pain. Good practices show that work adjustment has more chance of being successful when a chronically ill employee informs their colleagues about their chronic illness and about what they need to help them cope at work.

We also found no evidence of effectiveness for preventing and managing neck/upper extremity musculoskeletal conditions specifically with respect to adjusting the production system (changes to material production in factories) and organisational culture.

Redeployment is often included in the disability management policy of individual companies as an option to retain a (chronically) ill employee when he or she cannot undertake his/her current employment tasks anymore. The inclusion of redeployment is part of national legislation.

Initiatives to support people who are on long-term sick leave to get back into work

Initiatives to support people who are on long-term sick leave to get back into work focus on return-to-work or reintegration tools (vocational and not vocational). The definition of long-term sick leave is not standardised. We consider a long-term sick leave to be a period of 6 weeks or more. The most frequently occurring causes of sick leave are mental health, musculoskeletal and cardio-respiratory problems.

International, EU, and national legislation and policies do not specifically focus on people who are on long-term sick leave. As with people with a chronic illness, they are often included in regulation and legislation referring to people with a disability. This is a flaw as it endangers groups of people who are long-term absent from work due to illness (but not disability) to fall between all safety nets that exist with respect to social inclusion, employment, health, disability, active ageing, and social protection policies.

Nevertheless, there is a clear commitment in disability policies to improve the employment position of disabled people. At international level, the ILO Convention No 159 and its accompanying Recommendation No 168 are important instruments to ensure vocational rehabilitation and employment of disabled people. The Convention demands from the countries that ratified the Convention action which are appropriate to national conditions and consistent with national practice. In the EU, the majority of the EU Member States – excluding Austria, Belgium, Italy, and the UK – have signed the Convention.

The EU addresses disability through social inclusion, anti-discrimination, active social protection and labour market measures. As mentioned before, an important EU legislative framework is the Council Directive 2000/78/EC of 27 November 2000 – also referred to as the Employment Equality Directive. The EU also has played an important role in the development of training and employment policies in favour of people with a disability through the 'HELIOS' programme, the 'Employment Initiative' and the 'EQUAL' programme. In addition, the RETURN project (2000) formulated several guidelines and protocols for an effective return to work.

At national level, between 23% and 33% of our survey respondents claimed that there are national or regional policies or initiatives in place that support employees who are on long-term sick leave to return to work. However, 23% of the respondents also claimed that there are no national or regional policies or initiatives. The remainder of the respondents was not aware of such policies or initiatives.

Our review indicates that in most EU Member States return-to-work interventions are predominantly embedded in the procedures related to a disability benefit claim. A person generally applies for a disability benefit only after a long period of sick leave when their sickness benefit system is stopped. This means that persons on (long-term) sick leave sometimes only receive support to return to work (if at all relevant) when they fall under the category of persons with a disability. Not in all EU Member States support for people with a disability have a professional element to it. When it does include a focus on return-to-work, it mainly concerns legislation that a disabled worker should be able to remain in the same employment position as before, or should be given equivalent tasks, or may not be assigned to a job below his/her qualifications. Most of the national regulation contains wording that is open to interpretation and despite the fact that most of the national regulations offer the possibility of imposing sanctions on employers who do not comply, this is hardly carried out in practice. Another example concerns national get-back-to work initiatives or programmes to claimants of disability benefits (who may or not may be on long-term sick leave). The Pathways to Work initiative applied in the United Kingdom is well known and often cited. The evaluation results show however how difficult it is for such a large and expensive national programme to be (cost-) effective.

Employers, insurers and workers' groups have expressed a growing interest in return-to-work interventions after injury or illness, especially as disability management is increasingly being integrated into employers' and insurers' mandates. As mentioned before in relation to chronic illness, evidence from our review shows that early intervention has a beneficial effect on the severity or progression of diseases (particularly musculoskeletal diseases). A delay in diagnosis or treatment can make recovery, job retention or rehabilitation much more difficult. Also, communication between management or supervisors and the worker (but also health care professionals) is of importance.

Treatment only has little impact on work outcomes. There is strong evidence that proactive company approaches to sickness, together with the temporary provision of modified work and accommodations are (cost-) effective (though this evidence is less substantial for interventions in SMEs). A "stepped-care approach" which starts with simple, low-intensity, low-cost interventions, is adequate for most workers when their sickness absence lasts between three to six weeks. For workers who are sick for a longer period (between one to six months), a more structure rehabilitation approach is needed which provides progressively more intensive and structured interventions. Vocational rehabilitation seems to be most effective for tackling musculoskeletal diseases and can improve symptoms and quality life with respect to anxiety and depression, but there is limited evidence that they improve work outcomes. Also in relation to "stress" there is little to no evidence on effective vocational rehabilitation interventions for work outcomes.

There is evidence on the effectiveness of the training element in vocational rehabilitation interventions. No difference could be found between group and individual training. Strong evidence suggests that cognitive behavioural therapy (CBT) is effective in reducing absenteeism of workers with common health problems and specifically chronic low back pain. It also seems to be more successful for people in high-control jobs. CBT either delivered face-to-face or via a computer program, appears to be more effective than other interventions such as counselling, medicine or increasing participation or autonomy in the workplace. Other evidence suggests that long-term sickness absence or work disability duration is reduced by return-to-work interventions, including ergonomic work site visits, presence of a return-to-work coordinator, or the concept of adjustment latitude (adjustment of work tasks, work pace, workplace pace and working-time). For low back pain specifically, the effectiveness of participatory work adjustment - which concerns a step-wise counselling approach where employee and employer set up a work plan for work adjustments needed for a speedy return to work - has been demonstrated. Our review also indicates that the possibility of unscheduled breaks was found especially beneficial for return-to-work of workers in the first stage of back pain. Also, work-oriented programs for chronic back pain patients that showed positive results all had significant cognitive-behavioural components combined with intensive physical training (specific to the job or not); and were all in some way work-related and given to groups supervised by a physiotherapist of multidisciplinary team.

Initiatives to promote rehabilitation and reintegration into work following a serious health event

With a serious health event we refer to confirmed diagnosis of cancer, organ failure requiring major organ transplant, loss of independent living, functional loss (paralysis) or stroke. It concerns a health event which is unexpected and life threatening, or where there is a significant threat to one's physical and psychological integrity. This category shows much overlap with "initiatives to support people who are on long-term sick leave to get back into work". We try to avoid overlap by focusing on specific rehabilitation and reintegration initiatives targeted at a serious health event that is related to the diseases under study (e.g., stroke due to cardiovascular diseases).

At EU and national EU Member State level no specific legislation, policies or initiatives exist that focus explicitly on the promotion of rehabilitation and reintegration into work following a serious health event. As for the previously two discussed categories (chronic illness and long-term sick leave), rehabilitation and reintegration (or return-to-work interventions) of workers who suffered from a serious health event are predominantly embedded in disability legislation, policy, and initiatives.

Initiatives at company level are limited as rehabilitation and reintegration of workers who specifically suffered from a serious health event (such as cancer or a stroke) are primarily treated in hospitals and rehabilitation centres. The focus is much less on "professional recovery". Nevertheless, company level initiatives and activities that focus on reintegration of workers who are on long-term sick leave or chronically ill obviously may apply to workers who suffered from a serious health event. In addition, it should not be forgotten that "medical" interventions that focus on treatment and relief of symptoms can lead to a faster return to work, despite the fact that they are not aimed specifically at reintegration into work.

Evidence from our review suggests that – as mentioned in relation to chronic illness – the presence of a return-to-work coordinator in the hospital or in the rehabilitation centre can improve return-to-work by patients that have experienced a serious health event (specifically patients of myocardial infarction). In relation to cardiac rehabilitation (often offered after a stroke), our review indicates that there is strong evidence that a cardiac rehabilitation programme (in a healthcare setting) which is based on a bio-psychosocial model, consisting of exercise training, educational counselling, risk factor modification, vocational guidance, psychological intervention, relaxation, and stress management training improves clinical outcomes for hospital patients after major cardiac events. There is, however, little evidence that it improves vocational outcomes.

Other policies and initiatives

We have included policies and initiatives targeted at both individual and societal level (e.g., public health policy). Public health policies which are aimed at the entire population indirectly influence worker's health, sometimes even stronger than specific workplace initiatives. Effective public health policies use the whole array of available policy instruments, either at the responsibility of a country's government or involving it.

There is evidence that public health policies are more effective when they are multi-faceted and multi-level, i.e. when there are simultaneous, multi-dimensional efforts at the

national, local and individual levels. Health in All Policies (HiAP) is an example of an integrated strategy to improve the health of the population by integrating health in "all relevant policy fields", e.g. agricultural, transport, occupational and tax policies. In order to implement HiAP, health systems need to endorse a broad vision and reach out to other systems. This implies sustained collaboration with all ministries and the inclusion of health as an important policy concern at all government levels. The effectiveness of governance tools resides in the ability of such measures and mechanisms to promote a "whole of government approach" and to place health and the reduction of inequalities high on the government agenda (at the local and national levels). Health Impact Assessment (HIA) is one of the most structured mechanisms for inserting health into all policies.

There is very little literature about the effectiveness of HiAP. The most promising strategy to stimulate HiAP seems to be combining coercive and incentive measures, but also providing strong and long-term support at each level of implementation of the strategy. Sub-cabinet committees for maintaining high commitment and cohesive policies, interdepartmental arrangements for coordination and mutual understanding, and dedicated units for knowledge development and capacity building also emerge as promising structural tools. Countries that have experienced joined-up processes for elaborating or evaluating their public health strategy found that it fosters a shared ownership for public health targets. Financial issues are certainly a central aspect for getting commitment from sectors other than health and to establish sub-national entities. The integration of health targets with existing financial and accountability mechanisms seem to be successful. Finally, making intersectoral work and HIA mandatory gave powerful levers for public health decision makers and practitioners to break the traditional silo between them and others sectors. More than one country has taken advantage of the renewal of public health law to introduce measures that favour HiAP.

Our review indicates that the alteration of the lay-out of public space can have a beneficial effect on the health of population (and thus indirectly worker's health) in relation to various risk factors (such as lack of physical activity) of diseases (such as coronary heart disease, anxiety, stroke, depression, diabetes, obesity) and road accidents. The following interventions in relation to public space that have shown to be effective are:

- Ensuring sufficient public amenities (e.g., sport facilities, social neighbourhood facilities and meeting places);
- Making amenities (grocery store, library, etc.) reachable by foot and by bike;
- Traffic interventions (e.g., traffic calming interventions, urban traffic calming schemes, pedestrian schemes).

Evidence in relation to interventions stimulating a transport shift to walking and cycling (e.g., by offering commuter subsidies, promoting car sharing and telecommuting) shows mixed results. Also, the impact of new road building and town bypasses on health of the population is inconclusive.

Tobacco-control interventions are among the most cost-effective investments in health and indirectly have a strong influence on worker's health. The following interventions are among the most cost-effective investments in health:

- Permanent price increases (taxation);
- Comprehensive bans on advertising and promotion of tobacco products, logos and brand names;
- Bans or strong restrictions on smoking in work places and public spaces;
- Good consumer information, education and counter-advertising campaigns;
- Large, direct warning labels on cigarette boxes and other tobacco products, and
- Treatment and help for smokers who wish to quit. This should include good access to counselling, nicotine replacement therapy (NRT).

There is also consensus that these measures likely have synergistic effects, and therefore a comprehensive approach is the most effective means of reducing tobacco consumption.

Interventions successfully curbing alcohol consumption can have great effects with respect to the overall health of the population, and thus indirectly worker's health. Taxation (current tax levels with a 25% increase in tax, compared to no tax) has the greatest impact in reducing alcohol harm, followed by brief interventions delivered by primary care providers to 25% of the at risk population. The three regulatory measures (taxation, restricted sales and advertising controls) are the most economic in terms of cost to implement. Although brief interventions are the most expensive interventions to implement, it should be noted that compared with other health service interventions, brief interventions for hazardous and harmful alcohol consumption are one of the most cost-effective interventions. Implementing the above mentioned options is extraordinarily cheap, compared to the social cost of alcohol. Compared with no programme at all, a programme that includes brief physician advice, random breath testing, current taxation plus 25%, restricted access and an advertising ban would cost only €1.3 billion (about 1% of the total tangible costs of alcohol to society and only about 10% of an estimate of the income gained from a 10% rise in the price of alcohol due to taxes in the EU15 countries) and avert 1.4 million alcohol related DALYs a year.

Our review shows that road accidents are pre-dominantly successfully tackled through policies and initiatives targeted at the societal level. The most effective state-level interventions are legislation, together with enforcement; traffic calming interventions, and pedestrian schemes. Interventions with mixed or inconclusive results are new road building and modal transport shift interventions. Evidence with regard to cost-effectiveness was found for drink-driving laws: full implementation of random breath testing (compared to no random breath testing) throughout the EU prevents between 161 and 460 DALYs per million people per year, at an estimated cost of between €43 and €62 per 100 people per year. Unrestricted breath testing can avoid 111,000 years of disability and premature death at an estimated cost of €233 million each year.

Lack of physical activity and unhealthy nutrition are important risk factors for diseases with a high burden of disease, particularly cardiovascular diseases (e.g., ischemic heart diseases and stroke) and cancer. From clinical studies and public health programmes, interventions in the area of both nutrition and physical activity have been shown to be effective. Public health interventions can lead to savings in terms of direct health care costs as well as indirect savings due to reduced absenteeism that exceed the intervention cost by a factor up to 15. Especially, food labelling, mass media campaigns and

physician-dietician counselling appear to have favourable cost-effectiveness ratios from the early years after their implementation.

Our review indicates that several interventions are important in tackling mental health problems, including unipolar depressive disorder. There is consensus that depression must be seen in a social and cultural context, and actions should address societal factors as well as individual factors by building partnerships, mobilisation of inter-sectoral local networks, support for community activity and strengthening of family ties. Such a multi-level approach seems effective, although the evidence base for this is limited.
Evidence was found that the following interventions are effective:

- Improved access to psychological therapies;
- Cognitive-behavioural therapy; and
- Medication such as antidepressants in combination with psychotherapy.

The effectiveness of training of healthcare personnel to better recognize (the risk of) depression remains inconclusive. Internet may constitute a cost-effective means of combating depression by self-help interventions based on psychotherapy that have proven their effectiveness in the clinical setting such as CBT, brief problem solving therapy and interpersonal therapy. It is recommended that these interventions are offered in a stepped care approach to direct patients to more intensive therapies when needed. The benefits of the internet are that it reaches a wide population at low costs, is accessible 24/7, and does not require a face-to-face contact; it can even be used anonymously. This may encourage those who fear stigma or have difficulties travelling to and from health services.

7 Recommendations

There is considerable scope to reduce premature death, illness and disability in people of working age through policies directed at key risk factors

The current figure of 900,000 deaths per year in the working age population could be cut considerably through wider application of policies on key risk factors such as smoking, diet, physical activity and mental stress. Such policies would also reduce the proportion of people on long term invalidity benefit.

Policies to retain people in work who are experiencing chronic illness are likely to prove beneficial against a background of declining population.

Although there is a lack of good quality evaluations the evidence that does exists suggests that policies aimed at rehabilitation and retention of workers with chronic disease contribute both to the health of workers and to the overall productivity of workplaces. Further development of such policies, with careful evaluation of their effects, should be supported.

More attention is needed for health promotion – both at the workplace and in public policy

For a large part, the most important diseases in the working age population share the same risk factors: high blood pressure, cholesterol levels, smoking, diet, alcohol, physical activity, and (work-related) stress. These risk factors are amendable to change, since they are related to behaviour, in particular lifestyle.

This finding strengthens the need for workplace health promotion and preventive public policy. Preventive public policy refers to policy at any level of government which addresses the physical, social and cultural environment in which people live and the way in which people behave. By focusing on preventive public policy there is potential to change conditions that have a long-term health impact and to reach a great number of people. Health promotion in the workplace also offers an excellent structure to reach large groups and can be best embedded in existing programmes aimed at improving working conditions, including workplace design, work organisation and organisation of working time. Our review indicates that the conditions that need to be met for successful workplace health promotion include: tailored-approach; senior management involvement; alignment with overall business aims and goals; communication; optimal use of on-site resources; accessibility; focus on improving of working life and conditions and behaviour of the individual worker; supportive environment; and measurement of outcomes.

To effectively address risk factors intersectoral (integrated) policies are needed

Strengthening the links between public health, and other policies, such as food and transport policy is a key challenge in addressing the health of the working age population.

A range of instruments can be used at different policy levels, including legislation, networking, public-private approaches, and engaging the private sector and civil society. Health in All Policies (HiAP) is an example of an integrated strategy to improve the health of the population. However, for policy to be effective and cost-effective, action is needed from a wide range of organisations. For example, to address obesity, the food industry and civil society, statutory and voluntary organisations at a local level, such as schools and community organisations need to collaborate. A similar approach should be taken to achieve job retention or return to work for people with health problems. For example, to successfully address musculoskeletal diseases by early interventions clinicians (including GPs), employers and health care and social welfare systems need to work together. This is currently rarely the case in the Europe.

Although occupational safety and health is well organised in EU Member States, formal employee representation and risk assessment policies can be enhanced

International standards and EU guidelines and regulation have contributed to clear rules regarding occupational health and safety throughout the EU. Worker participation and risk assessment are important elements in OSH policies.

Although on average 75% of establishments in the EU have at least one form of formal representation of employees in place, there appear to be quite some differences between countries and economic sectors. As companies with formal representation of employees score better on health and safety measures (e.g., carrying out a risk assessment; existence of an OSH policy, management system or action plan; high involvement of line managers in OSH; regular monitoring of employees' health; support measures for employees returning from long sickness absence; regularly analysing causes of sickness absences, and OSH issues regularly raised in high level management meetings) it is recommended that companies, and especially SMEs, in all economic sectors in EU countries aim to achieve complete coverage of formal representation.

With regard to risk assessment policy, our review shows that it is important to take into account the following key elements for a good risk assessment policy:

- Risk assessment should be a dynamic process, in which evaluation of undertaken action plays an important role;
- Risk assessment policy should be integrated in the organisations activities;
- Appropriate responsibility for risk assessment: consultative teams consisting of representatives of management and employees, but in some cases also third party intervention is important;
- Physical and psychological risks should be considered.

There should be attention for short- as well as long-term effects.

The focus should be on proactive policies and initiatives when addressing the health of people with a chronic illness, people who are on long-term sick leave or people who experienced a serious health event

People with a chronic illness who are still able to work, people who are on long-term sick leave and people that experienced a serious health event are not specifically addressed in current legislation, policies and initiatives. These categories of people are often – indirectly – included in regulation and legislation aimed at people with a disability. This

means that they first need to become disabled and/or fall out of the workforce before they receive assistance. However, it is known that good management practice of these categories of people requires a proactive, designed set of policies that focus not only on the activities which must take place when an employee becomes ill, but also on the adoption of preventive and promotion practices in relation to worker's health (early interventions). These policies should be integrated with the general company operations and management. At EU level, return to work needs to be better integrated in EU policy at various levels (in relation to employment, quality of work and quality of life, public health policy, health and safety policy; and research policy and programmes). The extensive exchange of good practices across the EU Member States through EU programmes and policies has already led to a certain harmonisation of policies.

Collaboration between occupational health and curative health should be stimulated to effectively address workforce health

Ideally, retention should be achieved through better assessment, referral and liaison between the (chronically ill) employee, the general practitioners (GPs), and other healthcare providers, the employer (manager, human resources) and unions. A problem encountered in current practice is that occupational health providers and general practitioners (GPs) do not communicate (well). The crucial role that GPs can play in workplace retention – especially for chronically ill employees – is often ignored while they co-ordinate and provide clinical management. In addition, they provide sick notes which can trigger or continue period of absence of work. Improved communication and collaboration between the occupational health provider and GP can be achieved through training and system changes which enhance communication

Retention and return to work interventions should follow a step-wise multidisciplinary approach

Overall, our review indicates that optimal return-to-work interventions should be multi-disciplinary by focusing on:

- The physical aspect in relation to the specific health problem;
- Cognitive-behaviour of the worker experiencing a specific health problem;
- The organisational structure (e.g., how can the workplace or work tasks be adjusted); and
- Education (of the employee experiencing the health problem).

In addition, return-to-work interventions should start with simple, low-intensity, low-cost interventions, which are adequate for most workers with a limited health problem. For workers who have a more substantial health problem a more structured approach is needed which provides progressively more intensive and structured interventions.

Poor health in the work force and it consequences should be monitored

To gain insight into the health problems of the working age population and the consequences of poor health on work, it is necessary to monitor poor health and its consequences for work performance and productivity loss. We detected some data gaps in the present European monitors. For the monitoring of health problems in the working age population, we recommend to include also non-working people and to assess all important health problems, not only the main health problem. It is also advised to include measures of work performance and productivity loss, since these measures are almost

absent in the current databases. Finally, on the condition that age-specific data are available, we recommend the use of summary health measures (e.g., DALYs or healthy-life years) for the monitoring of health problems in the working age population, as they combine data on mortality, morbidity and accidental injuries.

There is a need to measure the (cost-) effectiveness of interventions

The evidence base of the (cost-) effectiveness of (preventive) interventions is limited. There is evidence available on the effectiveness of interventions focusing on particular risk factors (e.g., tobacco and alcohol use) and some evidence on specific (workplace) interventions. However, the interventions are often limited in terms of assessing impact on changes in health behaviour or health status (i.e., excluding work outcomes). Evidence of the (cost-) effectiveness of policy initiatives at national and European levels is even more limited.

Future research in the area of preventive policies and initiatives to tackle the important health determinants should predominantly focus on developing an appropriate and common evaluation approach for evaluation, focusing specifically on cataloguing the long-term impact. As cost-effectiveness studies of public health and work-related interventions are still in their infancy, future research should also focus on how the capacity to undertake independent evaluations could increase.

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Annexes

List of Acronyms

CBA	Cost-benefit Analysis
CEA	Cost-effectiveness Analysis
CRD	Centre for Reviews and Dissemination
CUA	Cost-utility Analysis
CVD	Cardiovascular Diseases
DALY	Disability Adjusted Life Years
DARE	Database of Abstracts of Reviews of Effects
DG	Directorate-General
DG EMPL	Directorate-General for Employment, Social Affairs and Equal Opportunities
DG SANCO	Health and Consumers Directorate-General
EBM	European Background Module
EC	European Commission
ECHI	European Community Health Indicators
ECHIS	European Core Health Interview Survey
ECHP	European Community Household Panel
ECMHS	European Module on Health Status
EHCM	European Health Care Module
EHDM	European Health Determinants Module
EHIS	European Health Interview Survey
EHSS	European Health Survey System
EMHS	European Module on Health Status
EODS	European Occupational Diseases Statistics
ESAW	European Statistics on Accidents at Work
ESEMed	European Study of the Epidemiology of Mental Disorders
ESHIS	European Special Health Interview Survey
ESMC	European Survey Module on Care
ESMD	European Survey Module on Determinants of Health
ESS	European Statistical System
EU	European Union
EU-SILC	European Statistics on Income and Living Conditions
EUPHIX	European Union Public Health Information & Knowledge System
Eurofound	European Foundation for the Improvement of Living and Working Conditions
EWCO	European Working Conditions Observatory
EWCS	European Working Conditions Survey
FIOH	Finnish Institute of Occupational Health
GBD	Global Burden of Disease
HES	Health Examination Surveys

HFA-DB	European health-for-all database
HIS	Health Interview Surveys
HISHES	European Health Interview & Health Examination Surveys Database
HLY	Healthy Life Years
HTA	Health Technology Assessment
LFS	Labour Force Survey
LYG	Life Years Gained
MDB	European Mortality Database
MEHM	Mini European Health Module
MS	Member States
NHS EED	NHS Economic Evaluation Database
OECD	Organisation for Economic Co-operation and Development
OSHA	European Agency for Safety and Health at Work
PHP	Public Health Programme
QALY	Quality Adjusted Life Years
RCT	Randomized Controlled Trials
RTA	Road Traffic Accidents
SDR	Standardised Death Rate
UNECE	United Nations Economic Commission for Europe
WHO	World Health Organization

Country codes

AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LI	Liechtenstein
LT	Lithuania
LU	Luxembourg
LV	Latvia
MK	FYROM
MT	Malta
NL	NL
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovak Republic
TR	Turkey
UK	United Kingdom

Introduction

This document contains the Annexes of the technical report of the assignment “health of people of working age” commissioned by the European Commission (EC), Health and Consumers Directorate-General (DG SANCO).

Annex 1 Search protocol for literature review: Review and evaluation of policies and initiatives aiming to address workforce health

In this annex we describe our search protocol used for the literature review of "Review and evaluation of policies and initiatives aiming to address workforce health." This annex should be read in conjunction with paragraph 2.3 of the final technical report (separate report).

8.1 Review Question

Since it was not possible to describe all policies and initiatives aiming to address workforce health –considering time and budget constraints– the review focused particularly on a short and long list of the most important health problems (see for more information paragraph 2.1 of the final technical report which is a separate document).

Our review question has been the following:

What is the (cost-) effectiveness of policies and/or initiatives aimed at prevention, rehabilitation and reintegration of workforce health, especially with regard to:

- **Cardiovascular disease;**
- **Unipolar depressive disorders;**
- **Musculoskeletal disease;**
- **Accidents at work;**
- Respiratory disease;
- Alcohol use disorder;
- Hearing loss;
- Lung cancer;
- Road accidents.

8.2 Inclusion criteria

Intervention/policies (object of study)

The European Commission requested to specifically review the following categories of policies and initiatives:

A. Workplace health and safety initiatives;
B. Initiatives to help retain people in work who have chronic illness;
C. Workplace health promotion initiatives;

D. Initiatives to promote rehabilitation and reintegration into work following a serious health event;
E. Initiatives to support people who are on long term sick leave to get back into work;
F. Other categories of initiatives to be suggested.

See for more information on how we defined these categories annex 1 B Definitions and paragraph 2.3.1 (table 2.5) of the final technical report (separate document).

Type of disease (MESH headings):

- Cardiovascular diseases;
- Depressive disorder;
- Musculoskeletal diseases;
- Occupational accidents;
- Respiratory disease;
- Alcohol use disorder;
- Hearing loss;
- Lung cancer;
- Road accidents.

Outcome or effect

Improved health (Physical activity and/or psychosocial health and/or quality of life).

Type of study (study design)

RCT, controlled before and after study, interrupted time series, cost-effectiveness analysis, cost-benefit analysis, cost-utility analysis, case study, evaluation, (systematic) review, survey.

Publication

Academic journal (peer reviewed); grey literature (external/internal or non-reviewed reports).

Population

Working age population – 16-64 years.

Publications date

From 1-1-2000 until 31-12-2009 (some studies with a publication date in 2010 have also been included).

Language

English, Dutch (some studies in other languages have also been included).

Geographical zone

EU 27, Croatia, Liechtenstein, Norway, Iceland, FRYOM, Turkey. We included information from the USA, Canada and other non-EU countries when it merited our report and concerned particular good/best practice cases.

8.3 Search strategy

8.3.1 Examined sources to retrieve relevant peer-reviewed (scientific) and grey literature

The subsequent tables offer an overview of the electronic databases which we searched for relevant peer-reviewed (scientific) literature and the web portals which we searched for relevant grey literature.

Examined electronic databases to retrieve relevant peer-reviewed (scientific) literature	
Pubmed/Medline	http://www.ncbi.nlm.nih.gov/pubmed/
DARE	http://www.crd.york.ac.uk/crdweb/Home.aspx?DB=DARE
NHS EED	http://www.crd.york.ac.uk/crdweb/Home.aspx?DB=NHS%20EED&SessionID=&SearchID=&E=0&D=0&H=0&SearchFor=
HTA Database	http://www.crd.york.ac.uk/crdweb/Home.aspx?DB=HTA&SessionID=&SearchID=&E=0&D=0&H=0&SearchFor=
National Bureau of Economic Research	http://www.nber.org/s/search/
Cochrane library	http://www.mrw.interscience.wiley.com/cochrane/cochrane_search_fs.html

Examined web portals to retrieve relevant grey literature	
EU Health Portal	http://ec.europa.eu/health-eu/index_en.htm
EU Public Health Programme	http://ec.europa.eu/health/index_en.htm
FP6	http://cordis.europa.eu/fp6/dc/index.cfm?fuseaction=UserSite.FP6HomePage
FP7	http://cordis.europa.eu/fp7/
WHO-Europe	http://www.euro.who.int/
	World Health Organization Library Information System (WHOLIS) (http://dosei.who.int/uhtbin/cgisirsi/Tue+May+12+11:04:42+MEST+2009/0/49)
WHO nutrition policy database	http://data.euro.who.int/nutrition/
WHO physical activity policy database	http://data.euro.who.int/PhysicalActivity/
OECD	http://www.oecd.org/topic/0,3373,en_2649_37407_1_1_1_1_37407,00.html
DG SANCO	http://ec.europa.eu/dgs/health_consumer/index_en.htm
DG EMPL	http://ec.europa.eu/social/home.jsp?langId=en
European Agency for Safety and Health at Work	http://osha.europa.eu/en/front-page/view

Examined websites of ministries of health to retrieve relevant grey literature	
Austria	http://www.bmgfj.gv.at/
Belgium	https://portal.health.fgov.be/portal/page?_pageid=56,512460&_dad=portal&_schema=PORTAL
Bulgaria	http://www.mh.government.bg
Cyprus	http://www.moh.gov.cy/moh/moh.nsf/index_en/index_en
Czech Republic	http://www.mzcr.cz/

Examined websites of ministries of health to retrieve relevant grey literature	
Denmark	http://www.im.dk/im/site.aspx?p=34
Estonia	http://www.sm.ee/eng/
Finland	http://www.stm.fi/en/frontpage
France	http://www.sante-jeunesse-sports.gouv.fr/
Germany	http://www.bmg.bund.de/EN/Ministerium/ministry__node.html?__nnn=true
Greece	http://www.mohaw.gr/
Hungary	http://www.eum.hu/english
Ireland	http://www.dohc.ie/
Italy	http://www.ministerosalute.it/
Latvia	http://www.vm.gov.lv/index.php?setlang=en
Lithuania	http://www.sam.lt/go.php/lit/English
Luxemburg	http://www.ms.public.lu/fr/
Malta	http://www.sahha.gov.mt/
NL	http://www.minvws.nl/
Poland	http://www.mz.gov.pl/wwwmzold/index?mr=m0&ms=&ml=en&mi=535&mx=6&ma=239
Portugal	http://www.dgs.pt/
Romania	http://www.ms.ro/
Slovakia	http://www.health.gov.sk/
Slovenia	http://www.mz.gov.si/en/
Spain	http://www.msc.es/en/home.htm
Sweden	http://www.regeringen.se/sb/d/2061
UK	http://www.dh.gov.uk/en/index.htm
Croatia	http://www.mzss.hr/
Norway	http://www.regjeringen.no/en/dep/hod.html?id=421
Iceland	http://eng.heilbrigdisraduneyti.is/
Liechtenstein	http://www.spmd.llv.li/amtsstellen/llv-ag-home.htm
FYROM	http://www.moh.gov.mk/eng/
Turkey	http://www.saglik.gov.tr/EN

Examined websites of ministries of social affairs/employment and social affairs to retrieve relevant grey literature	
Austria	http://www.bmsk.gv.at/cms/siteEN/
Belgium	http://www.werk.belgie.be/defaultTab.aspx?id=622
Bulgaria	http://www.mlsp.government.bg/
Cyprus	http://www.mlsi.gov.cy/mlsi/mlsi.nsf/dmlindex_en/dmlindex_en
Czech Republic	http://www.mpsv.cz/cs/
Denmark	http://www.bm.dk/sw33337.asp
Estonia	http://www.sm.ee/eng.html
Finland	http://www.stm.fi/en/frontpage
France	http://www.travail-solidarite.gouv.fr/espaces/social/
Germany	http://www.bmas.de/portal/16702/startseite.html
Greece	http://www.ypergka.gr/
Hungary	http://www.szmm.gov.hu/

Examined websites of ministries of social affairs/employment and social affairs to retrieve relevant grey literature	
Ireland	http://www.welfare.ie/EN/Pages/default.aspx
Italy	http://www.lavoro.gov.it/lavoro/istituzionale/ministero/
Latvia	http://www.vm.gov.lv/index.php?id=492&top=492
Lithuania	http://www.socmin.lt/index.php?879686114
Luxemburg	http://www.mss.public.lu/
Malta	http://www.msp.gov.mt/
NL	http://home.szw.nl/index.cfm
Poland	http://www.mpips.gov.pl/index.php?lang=2
Portugal	http://www.mtss.gov.pt/english.asp
Romania	http://www.mmuncii.ro/en/
Slovakia	http://www.employment.gov.sk/index.php?SMC=1&lg=en
Slovenia	http://www.mddsz.gov.si/en/
Spain	http://www.mtas.es/en/index.htm
Sweden	http://www.sweden.gov.se/sb/d/2061
UK	http://www.dwp.gov.uk/
Croatia	http://www.mzss.hr/
Norway	http://www.regjeringen.no/en/dep/aid.html?id=165
Iceland	http://eng.felagsmalaraduneyti.is/
Liechtenstein	http://www.liechtenstein.li/en/eliechtenstein_main_sites/portal_fuerstentum_liechtenstein/fl-staat-staat/fl-staat-regierung/fl-staat-regierung-verteilung/fl-staat-regierung-verteilung-gesundheit.htm
FYROM	http://www.mtsp.gov.mk/
Turkey	http://www.calisma.gov.tr/en/

8.3.2 Search strategy Step 1: Focus on type of intervention

Below we offer an overview of the used key-words and search combinations [MESH headings] in our search for both scientific and grey literature:

1. employ* or workplace or worksite AND interventions OR polic* AND health;
2. employ* or workplace or worksite AND safety AND interventions OR polic* AND health;
3. employ* or workplace or worksite AND health promotion AND interventions OR polic* AND health;
4. employ* or workplace or worksite AND rehabilitation AND interventions OR polic* AND health;
5. employ* or workplace or worksite AND reintegration AND interventions OR polic* AND health;
6. interventions OR polic* AND health AND 16-64 years.

For Cochrane and PubMed also:

7. employ* or workplace or worksite AND interventions OR polic* AND cost-effectiveness;
8. interventions OR polic* AND cost-effectiveness AND 16-64 years.

8.3.3 Search strategy Step 2: Focus on selected diseases

Below we offer an overview of the used key-words and search combinations [MESH headings] in our search for both scientific and grey literature:

9. employ* or workplace or worksite AND interventions OR polic* AND Cardiovascular diseases OR Depressive disorder OR Musculoskeletal Diseases OR Occupational Accidents;
10. employ* or workplace or worksite AND safety AND interventions OR polic* AND Cardiovascular diseases OR Depressive disorder OR Musculoskeletal Diseases OR Occupational Accidents;
11. employ* or workplace or worksite AND health promotion AND interventions OR polic* AND Cardiovascular diseases OR Depressive disorder OR Musculoskeletal Diseases OR Occupational Accidents;
12. employ* or workplace or worksite AND rehabilitation AND interventions OR polic* AND Cardiovascular diseases OR Depressive disorder OR Musculoskeletal Diseases OR Occupational Accidents;
13. employ* or workplace or worksite AND reintegration AND interventions OR polic* AND Cardiovascular diseases OR Depressive disorder OR Musculoskeletal Diseases OR Occupational Accidents.

For Cochrane and Pubmed also:

14. employ* or workplace or worksite AND interventions OR polic* AND Cardiovascular diseases OR Depressive disorder OR Musculoskeletal Diseases OR Occupational Accidents AND cost-effectiveness.

8.3.4 Search strategy Step 3: Identifying existing systematic reviews on the topic at hand

The third stage of our search strategy applies only to the scientific literature. In this stage, we specifically focused on identifying relevant systematic reviews by using an additional search term AND “review” OR “systematic review” ([MESH].

8.3.5 Search strategy Step 4: Further selection of individual studies based on Title and Abstract

In fourth stage, we examined the titles and abstracts of the identified relevant scientific and grey literature to assess their relevance for our review.

8.3.6 Search strategy Step 5: Critical appraisal of the evidence

In the fifth and last stage, we assessed the level of evidence/quality of the relevant scientific and grey literature. The assessment of the relevant literature is based on a number of key questions that focus on those aspects of the study design that have a significant influence on the validity of the results reported and conclusions drawn. These are related to:

- Study quality (methodological quality);
- Bias (systematic error);

- Internal validity (validity);
- External validity (generalisability, applicability).

The methodological quality of the included literature are assessed on the basis of a standardised set of criteria that were adapted from criteria lists of appraising qualitative or quantitative (economic) research.[37] This includes different methodology checklists for different types of studies (e.g., for health economics studies the Drummond checklist is used).[38]

The table below offers a more detailed overview of the checklist which we used to appraise the relevant literature of our review.

Checklist for quality assessment		
Item	**Specification**	**Level of evidence**
1. Type of publication	(i) How is the study published?	Peer-reviewed journal Other (grey) literature
2. Research question	(i) Was a well-defined question posed in answerable form?	Fully Partial Not at all
3. Concepts	(i) Does the study clearly define concepts including the interventions studied and outcome measures?	Fully Partial Not at all
	(ii) Did the study examine both cost and effects of the service(s) or programme(s)? Only effectiveness =1	Fully Partial Not at all
4. Methods	(i) Does the study clearly describe the methodology used?	Fully Partial Not at all
	(ii) What type of study is used? (see Annex 1A for description)	(C)RCT/Meta-analysis/systematic review Quasi-experimental (CEA) Observational / expert opinion
	(iii) What type of analysis is used in the study?	Regression Statistical Descriptive Descriptive analysis
	(iv) Does the study take potential sources of bias taken into account, e.g. selection bias, allocation bias, publication bias?	Fully Partial Not at all
	(v) Is a viewpoint for the analysis stated (societal, medical, third party) and was the study placed in any particular decision-making context?	Fully Partial Not at all

[37] National Institute for Health and Clinical Excellence. Methods for development of NICE public health guidance. London: NICE, 2006. Available at: http://www.nice.org.uk/media/69E/BD/CPHEMethodsManual.pdf.

[38] Drummond MF, O'Brien B, Stoddart GL et al. Critical assessment of economic evaluation. In: Methods for the economic evaluation of health care programmes. 2nd edition. Oxford: Oxford Medical Publications, 1997.

Checklist for quality assessment		
	(vi) Does the study use any kind of control or alternative comparisons?	Fully Partial Not at all
5. Data	(i) Is the type of information used in the study in terms of source, sample size, competing alternatives, time period, discounting rates etc clearly described	Fully Partial Not at all
	(ii) Are all the important and relevant costs and effects (consequences) for each alternative intervention/policy identified?	Fully Partial Not at all
	(iii) Are costs and effects measured accurately in appropriate physical units (e.g. lost work-days, gained life years, improved functional health)?	Fully Partial Not at all
6. Goal achievement	(i) Does the study answer (all of) the research (sub-)questions?	Fully Partial Not at all
7. Findings	(i) Are results based on evidence derived from the data analysis of the study?	Fully Partial Not at all
	(ii) Are the results credible given the methods and analysis used? (E.g. is a sensitivity analysis used?)	Fully Partial Not at all
8. Discussion/conclusions	(i) Does the study critically discuss the robustness of findings, potential sources of bias, and possible limitations of the approaches of choice?	Fully Partial Not at all
	(ii) Does the study discuss findings discussed within context of existing evidence base?	Fully Partial Not at all
9. Generalisability	(i) Are the results generalisable given size of the sample and the country of study?	Fully Partial Not at all

We did not assign scores to each individual criteria from the checklist; we assessed them qualitatively using methods (type of study) and type of publication as leading concepts for classifying studies/reports. Any disagreement was resolved in a consensus meeting and with help of another reviewer if necessary.

Only for the grey literature, we did include a total scoring of the quality and evidence base which can be found back in Annex 1 D Overview of included grey literature.

8.4 Literature analysis

The analysis of the identified relevant scientific and grey literature has been done with the use of a data extraction sheet, provided below.

Data extraction sheet	
Database	PubMed, Cochrane
Title	
Author(s)	Ablas, 2000; Ablas, 2000a; Ablas 2000b
Year of publication	
Journal name	
Volume	
Issue	
Pages	
Type of publication	Academic journal (peer reviewed); grey literature (external/internal or non-reviewed reports)
Country of origin	EU-27 EFTA: Liechtenstein, Norway, Iceland Accessing country: Croatia, FRYOM, Turkey
Overall Assessment Of The Study	
Description of the study	
Type of study (study design)	Systematic review (= review has a systematic approach, e.g. use of protocol, searches are made in several databases, use of clear definitions) Review Other:
Method – data eliciting (see Annex 1B for definitions)	RCT Before-after study (quasi exp) Interrupted time-series (quasi exp) Observational study Case study Focus Group Discussions Interview key stakeholders Review key documents Other:
Method – data analysis	Qualitative Descriptive statistics Regression Other:
Data type	Cost data Patient level data Primary data Provider level data Secondary data Survey Time series Utilization data

Data extraction sheet	
	Other:
Type of intervention (see Annex 1B for definitions)	workplace health and safety initiatives; initiatives to help retain people in work who have chronic illness; workplace health promotion initiatives; initiatives to promote rehabilitation and reintegration into work following a serious health event; initiatives to support people who are on long term sick leave to get back into work; and other initiatives – i.e., a comment on what the potential scope is for initiatives and activities to reduce mortality and morbidity amongst people of working age – regardless of whether these activities have a work connection or not (for example, car accidents may be a reason why people are no longer able to work).
Focus of intervention	Individual oriented Company level National level EC level International level
Type of disease (see Annex 1B for definitions)	Cardiovascular disease Unipolar depressive disorders Musculoskeletal disease Accidents at work Respiratory disease Alcohol use disorder Hearing loss Lung cancer Road accidents Other:
Outcome	Cost-effectiveness (specify outcome measure) Cost-benefit Cost per QALY Physical activity Psychosocial health Quality of life Return to work Other:…
Objective of study	Short description of aims and objectives of the study
Geographic area	Region (e.g. MS-15, EU-27) or country
Target group / population	Age group (16-64, part of age group) Men Women Adolescents Minority group (e.g. Roma) Other: ….

Data extraction sheet	
Results/conclusions	
Results/Conclusion (what are the most important conclusions reported by the author(s)) (Report article's page number where you have found the information)	The intervention/policy is (in comparison with the alternative(s)): (Cost)-effective Not (Cost)-effective Inconclusive Not reported Other….
a) Strengths of interventions (Report article's page number where you have found the information)	What worked well and why?
b) Weaknesses of interventions (Report article's page number where you have found the information)	What did not work well and why?
c) Potential of interventions (Report article's page number where you have found the information)	Description of good practice / innovative ideas / methods contributing to success / improvements to current study
Snowballing	Insert any details of useful references, interventions to follow-up, and any useful contacts for consultation (Check if they are not included or excluded before)

Annex 1A Methods – data eliciting

This annex provides the definitions of relevant methods for data eliciting.

(Source: Centre for Reviews and Dissemination. Core principles and methods for conducting a systematic review of health interventions. University of York, 2009. Available at: http://www.york.ac.uk/inst/crd/pdf/Systematic_Reviews_.pdf).

Randomized Controlled Trials (RCT)

The simplest form of RCT is known as the parallel group trail which randomizes eligible participants to tow or more groups, treats according to assignment, and compared the groups with respect to outcomes of interest. Participants are allocated to groups using both randomization (allocation involves the play of chance) and concealment (ensures that the intervention that will be allocated cannot be known in advance).

There are different types of randomized study designs, such as:

- **Randomized cross-over trials.** Where all participants receive all the interventions; for example in a two arm cross-over trial, on group receives intervention A before intervention B, and the other group receive intervention B before intervention A. It is the sequence of interventions that is randomized;
- **Cluster randomized trials.** A cluster randomized trial is a trail where clusters of people rather than single individuals are randomized to different interventions. For example, whole clinics or geographical locations may be randomized to receive particular interventions, rather than individuals.

Quasi-experimental

The main distinction between randomized and quasi-experimental studies is the way in which participants are allocated to the intervention and control groups; quasi-experimental studies do not use random assignment to create the comparison groups:

- **Non-randomized controlled studies.** Individuals are allocated to a concurrent comparison group, using methods other than randomization. The lack of concealed randomized allocation increases the risk of selection bias;
- **Before-and-after study.** Comparison of outcomes in study participants before and after the introduction of an intervention. The before-and-after comparisons may be in the same sample of participants or in different samples;
- **Interrupted time series.** Interrupted time series designs are multiple observations over time that is ‘interrupted’, usually by an intervention or treatment.

Observational studies

A study in which natural variation in interventions or exposure among participants (i.e. not allocated by an investigator) is investigated to explore the effect of the interventions or exposure on health outcomes:

- **Cohort study.** A defined group of participants is followed over time and comparison is made between those who did and did not receive an intervention;
- **Case-control study.** Groups from the same population with (cases) and without (controls) a specific outcome of interest, are compared to evaluate the association between exposure to an intervention and the outcome;
- **Case series.** Description of a number of cases of an intervention and the outcome (without comparison with a control group). These are not comparative studies.

Economic evaluation:

- **Cost-effectiveness analysis.** A CEA measures the consequences of an intervention in the most appropriate natural effects or physical units, such as 'life years gained' (LYG) or 'cases prevented'. No attempt is made to value the consequences, so implicitly it is assumed that the output concerned is in some sense 'worth having'. The intervention with the lowest cost per additional outcome is the most efficient intervention. CEAs use physical units as outcome measures which can not easily be compared with each other. Another disadvantage is the need to focus on a single outcome even when an intervention generates a number of distinct benefits;
- **Cost-utility analysis.** A CUA measures the consequences of an intervention adjusted by health state preference scores or utility weights. These are the preferences individuals or society may have for any particular set of health outcomes. In a CUA, states of health associated with the outcomes are valued relative to one another. This means that the consequences are measured in a common unit that strives to include both the quantity and quality of health effects associated with the intervention under study. Common outcome measures used in a CUA are the Quality Adjusted Life Years (QALYs) and the Disability Adjusted Life Years (DALY). The most efficient intervention is the one that has the lowest cost per additional QALY or DALY generated. CUA is a broader form of analysis than CEA, but is a variant of that approach. Compared to CEA, a key disadvantage of the CUA is the considerable increase in the complexity of outcomes assessment;
- **Cost-benefit analysis.** A third method of economic evaluation of health interventions is a CBA. A CBA measures all consequences in monetary terms. Therefore, potentially this is the broadest form of analysis, where one can ascertain whether the beneficial consequences of an intervention justify the costs. The results are usually reported in terms of the net benefit of an intervention (benefit minus costs) or the ratio of benefits to costs. However, measurements problems often mean that the range of benefits valued in money terms is fairly limited. CBAs published to date are more restricted than CUA or CEA. Moreover, a CBA used in the health care field is limited to a comparison of those costs and consequences that can easily be expressed in monetary terms.

Annex 1B Definitions

This annex provides an overview of how we defined the most important terms used throughout our review. These definitions are based on our interpretation of provided information from a multitude of reliable sources (see below).

More information with regard to our definitions of the categories set by the European Commission can be found in paragraph 2.3.1 of the technical report (separate document).

Table A.1B.1 Definitions used and typology of interventions

Category	Definition	Main type of interventions
Workplace health promotion initiatives	The **promotion** of workers' health and general wellbeing. This goes further than merely legislation on ensuring health and safety of workers. It focuses on the active pursuit of activities that help employees to improve their own general health and wellbeing.	• Workplace health promotion networks such as the European Network for Workplace Health Promotion • National legislation (e.g., banning of smoking) • National health promotion initiatives to support and inform employers • Health check-ups • Initiatives tackling smoking and alcohol abuse in the workplace (e.g. support to stop smoking) • Initiatives stimulating healthy food and physical activity (e.g. adjustment of food in the canteen and physical activity programmes) • Initiatives tackling mental health (e.g. stress management)
Workplace health and safety initiatives	The **protection** of workers in their employment from risks resulting from work factors adverse to health. It is mainly linked to legislation ensuring the health and safety of workers (e.g., prevention of accidents).	• International, EU- and national health and safety standards, legislation and regulation • Health and safety guidelines • National promotion campaigns • Financial support and incentives • Risk assessment • Worker involvement • Workplace modifications • Safety devices

Category	Definition	Main type of interventions
		• Education and training
Initiatives to help retain people in work who have chronic illness	The **retention** of workers in employment when they are faced with a chronic illness. It is mainly linked to initiatives that offer support to people with a chronic illness to remain in work. Focus is specifically put on employees with a chronic illness who have not yet experienced a long-term sick-leave. In the latter case, the category "Initiatives to support people who are on long term sick leave to get back to work applies."	• EU- and national **disability** legislation and regulation • Work (place) adjustment • Redeployment
Initiatives to support people who are on long term sick leave to get back into work	The **reintegration into work** of workers who are on long-term sick leave (i.e., six weeks or more). Initiatives are mainly linked to return-to-work tools (vocational and not vocational) designed to improve the work ability of the employee and to increase the chance of return to work. Focus is put on more general rehabilitation and reintegration initiatives which are not specifically related to a serious health event (e.g., back pain). Rehabilitation and reintegration initiatives specifically focused on serious health events are tackled under the category "Initiatives to promote rehabilitation and reintegration into work following a serious health event"	• EU- and national **disability** legislation and regulation • National reintegration programmes • Vocational rehabilitation (e.g., training, cognitive behavioural therapy, adjustment latitude)
Initiatives to promote rehabilitation and reintegration into work following a serious health event	The **rehabilitation and reintegration into work** of workers who suffered from a serious health event (i.e., a confirmed diagnosis of cancer, organ failure requiring major organ transplant, loss of independent living, functional loss (paralysis) or stroke). It mainly focuses on the recovery of workers so that they can get back to work. The category "Initiatives to support people who are on long term sick leave to get back to work" includes general rehabilitation and reintegration initiatives not	• EU- and national **disability** legislation and regulation • Return-to-work coordinator • Cardiac and other rehabilitation programmes

Category	Definition	Main type of interventions
	specifically targeted at serious health events.	
Other policies and initiatives	Both **public health policies,** which are aimed at the entire population and therefore indirectly influences worker's health and **individually targeted policies and initiatives (not in the workplace)** affecting the health of an individual.	• Intersectoral policy addressing health risk factors (e.g., Health in All Policies) • Alteration of public space and transport modalities • Interventions tackling road accidents (e.g., legislation, traffic calming measures, safety campaigns) • Tobacco control interventions (e.g., taxation, bans, warnings, treatment) • Alcohol control interventions (e.g., taxation, brief interventions, advertising controls) • Interventions stimulating physical activity and healthy nutrition (e.g., counselling, campaigns) • Interventions tackling mental health (e.g., cognitive-behavioural therapies, medication, Internet self-help)

Table A.1B.2 Other definitions of terms commonly used throughout our review

	Definitions	Consulted sources
Accidents at work	An accident at work is defined as "a discrete occurrence in the course of work which leads to physical or mental harm". This includes cases of acute poisoning and wilful acts of other persons as well as accidents occurring during work but off the company's premises, even those caused by third parties. It excludes deliberate self-inflicted injuries, accidents on the way to and from work and accidents having only a medical origin and occupationa diseases. The phrase "in the course of work" means whilst engaged in an occupational activity or during the time spent at work. This includes cases of road traffic accidents in the course o work.	Eurostat (2002). European statistics n accidents at work (ESAW) - Methodology, 2001 Edition. Office for Official Publications of the European Communities, 2002.
Alcohol use disorder	Disorders associated with alcohol are caused by the ingestion of alcohol over a period of time and in ways that leads to problems with health, personal relationships, school, or work. Alcohol use disorders include alcohol dependence, alcohol abuse, alcohol intoxication, and alcohol withdrawal. Alcoholism or alcohol dependence is a diagnosable disease characterized by several factors, including a strong craving for alcohol, continued use despite harm or personal injury, the inability to limit drinking, physical illness when drinking stops, and the need to increase the amount drunk to feel the effects. Alcohol abuse is a pattern of drinking that result in harm to one's health, interpersonal relationships, or ability to work. Certain manifestations of alcohol abuse include failure to fulfil responsibilities at work, school or home; drinking in dangerous situations, such as while driving; legal problems associated with alcohol use; and continued drinking despite problems that are caused or worsened by drinking. Alcohol abuse can lead to alcohol dependence.	American Psychiatric Association (2000). Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), 4th edition, Text Revision. Washington, DC.
	Alcohol dependence and alcohol abuse or harmful use cause substantial morbidity and mortality. Alcohol-use disorders are associated with depressive episodes, severe anxiety, insomnia, suicide, and abuse of other drugs. Continued heavy alcohol use also shortens the onset of heart disease, stroke, cancers, and liver cirrhosis, by affecting the cardiovascular, gastrointestinal, and immune systems. Heavy drinking can also cause mild anterograde amnesias, temporary cognitive deficits, sleep problems, and peripheral neuropathy; cause gastrointestinal problems; decrease bone density and production of blood cells; and cause fatal alcohol syndrome. Alcohol-use disorders complicate assessment and treatment of other medical and psychiatric problems.	MA Schuckit (2009). Alcohol use disorders. Lancet, 2009; 7;373(9662):492-501.
Cardiovascular diseases	Cardiovascular diseases are characterised by pathological changes in the circulatory system of the body, i.e. the heart muscle and the blood vessels. This group of diseases includes	EUPHIX project; WHO website

	Definitions	Consulted sources
	hypertension (elevated blood pressure); ischemic heart disease, including myocardial infarction; cerebrovascular disease, including stroke; peripheral vascular disease; rheumatic heart disease; congenital heart disease; and cardiomyopathies. The major causes of cardiovascular disease are tobacco use, physical inactivity, and an unhealthy diet.	
Chronic illness	A chronic illness is a long-term health condition. Examples include musculoskeletal problems, cancer, asthma, migraine, epilepsy, diabetes, irritable bowel syndrome, depression, anxiety, and heart problems.	European Public Health Alliance (2004)
Disability	The UN defines disability in the following way: "The term persons with disabilities is used to apply to all persons with disabilities including those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various attitudinal and environmental barriers, hinders their full and effective participation in society on an equal basis with others." United Nations.	United Nations
Early retirement	A situation when an individual decides to retire earlier and draw the pension benefits earlier than their normal retirement age.	OECD Private Pensions: OECD Classification and Glossary, 2005
Health determinants	A force or element that affects health, either positively or negatively. Health is determined by both intrinsic forces, such as genetics, behaviour, culture, habits and lifestyles, and extrinsic forces such as preventative, curative and promotional aspects of the health sector, as well as elements outside the health sector including: economic factors, social factors, environmental factors, technical factors.	EC (2007). Expert Group on Social Determinants and Health Inequalities. Health Inequalities glossary
Hearing loss	Hearing impairment is a broad term used to describe the loss of hearing in one or both ears. There are different levels of hearing impairment: Hearing impairment refers to complete or partial loss of the ability to hear from one or both ears (WHO); Hearing loss may be conductive, sensorineural, or mixed. Hearing loss ranges from slight to profound. Typically the classes of hearing loss are based on the average hearing loss at 500 Hz, 1000 Hz and 2000 Hz. Here is one commonly used classification: Normal hearing: -10 to 15 dB Slight loss: 16 to 25 dB Mild loss: 26 to 40 dB Moderate loss: 41 to 55 dB Moderately severe loss: 56 to 70 dB Severe loss: 71 to 90 dB Profound loss: 91 to 120 dB	WHO; European Group on genetics of hearing impairment (1996). Martini A (Ed.), European Commission Directorate, Biomedical and Health Research Programme (HEAR) Info letter 2, November, 8.
Incapacity for work	Incapacity for work refers to the inability of the victim, due to an occupational injury, to perform the normal duties of work in the job or post occupied at the time of the occupational accident	OECD Private Pensions: OECD Classification and

	Definitions	Consulted sources
	(ILO).	Glossary, 2005
Long term sick leave to get back into work	The description and the definition of ‘‘long-term sick leave’’ is not standardised. Some authors define long-term sick leave as a period of at least 3 days, while others define it as a period of 6 weeks or even 8 weeks.	P M Dekkers-Sánchez, J L Hoving, J K Sluiter, M H W Frings-Dresen (2008). Factors associated with long-term sick leave in sick-listed employees: a systematic review. Occupational and Environmental Medicine 2008;65:153-157.
Lung cancer	Lung cancer is the uncontrolled growth of abnormal cells in one or both of the lungs, causing lump (tumour) growth and disrupting the normal functioning of the organ.	EUPHIX project
	Approximately 90% of lung cancers are smoking-related. Passive exposure to tobacco smoke or environmental tobacco smoke (ETS), increases the risk of lung cancer by 15-25%. Occupational exposure to substances such as asbestos, radon, tar, soot and metals, such as arsenic, cadmium and nickel, and to ionising radiation is known to increase the risk of lung cancer. The effects of asbestos, radon and arsenic on lung cancer development are synergistic with smoking. In general, the contribution of environmental factors, except for cigarette smoke, to the risk of lung cancer is small.	EUPHIX project
Morbidity rate	Morbidity rates are the number of cases of an illness, injury or condition within a given time, usually one year. It is also the ratio of sick persons to well persons in a defined population; Mortality is The proportion of deaths in a defined population.	EC (2007). Expert Group on Social Determinants and Health Inequalities. Health Inequalities glossary; EUPHIX, 2009
Musculoskeletal disorders	Musculoskeletal disorders (MSDs) are characterised by pain and loss of physical function in the body, which limits a person’s activities and restricts their participation in society. Musculoskeletal disorders cover a broad range of illnesses, including disorders of the bones, joints, tendons, muscles and nerves controlling the muscular system.	EUROFOUND, 2007
	Ergonomic risks, including repetitive and violent movements, strained or forced body positions due to unsuitable equipment or workplaces, manual handling of heavy cargos, manual jobs requiring force, vibrations, unsuitable temperature conditions, etc. may cause work-related MSD. Ergonomic risks also include work organisation factors, such as work at a rapid pace within tight deadlines, insufficient breaks or rest periods, monotonous work, etc. Various psychosocial factors also appear to increase the risk musculoskeletal disorders, such as the type of tasks workers perform, the manner in which they	

	Definitions	Consulted sources
	are monitored, social relations among workers, feelings of job dissatisfaction, etc.	
Physical activity	Any bodily movement produced by skeletal muscles that requires energy expenditure. Regular physical activity – such as walking, cycling, or dancing – has significant benefits for health. For instance, it can reduce the risk of cardiovascular disease, diabetes and osteoporosis, help control weight, and promote psychological well-being. Everyone should engage in at least 30 minutes of moderate physical activity every day. More activity may be required for weight control.	WHO; EUPHIX, 2008
Psychosocial health	The roots of 'psychosocial health' lie in the World Health Organization's (WHO) definition of health as 'a state of complete physical mental and social well-being, and not merely the absence of disease and infirmity'. Psychosocial health involving both psychological and social aspects of one's life, and relating the social conditions to mental and emotional health.	Martikainen, P; Bartley M, Lahelma, E. International Journal of Epidemiology 2002;31:1091-1093
Quality of life	We use here health related quality of life: Measurements of how people are feeling, or the value they place on their health state. Such measurements can be disease specific or generic.	JAMA evidence Glossary - Users' Guides to the Medical Literature: A Manual for Evidence-Based Practice, 2nd Edition and The Rational Clinical Examination: Evidence-Based Clinical Diagnosis. Updated September 2009.
Respiratory disease	Chronic respiratory diseases are a group of chronic diseases affecting the airways and the other structures of the lungs (asthma, COPD etc).	WHO
	A wide range of pathologies comes under the heading of 'diseases of the respiratory system'. In addition to cancerous diseases, a distinction is made between infectious and acute respiratory diseases (influenza, pneumonia) and chronic obstructive diseases. The borderline between the two is not, however, clear-cut, and when respiratory infections are recurrent or are accompanied by complications, they can cause chronic complaints. These respiratory diseases together with respiratory cancers are a major cause of mortality in a number of Member States.	EC, Public Health website
Road accidents	An accident which occurred or originated on a way or street open to public traffic; resulted in one or more persons being killed or injured, and at least one moving vehicle was involved. These accidents therefore include collisions between vehicles, between vehicles and pedestrians and between vehicles and animals or fixed obstacles. Single vehicle accidents in which	Injuries in road traffic accidents. ECO-SANTÉ OCDE 2009, June

	Definitions	Consulted sources
	one vehicle alone (and no other road user) was involved are included. Multi-vehicle collisions are counted only as one accident provided that the successive collisions happened at very short intervals.	
Serious health event	Confirmed diagnosis of cancer, organ failure requiring major organ transplant, loss of independent living, functional loss (paralysis) or stroke; Traumatic events are usually defined as unexpected situations that are life threatening, or where there is a significant threat to one's physical and psychological integrity.	Creating Healthier Workplaces
Unemployment	A situation when a person is available to work and seeking work but currently without work. In accordance with the ILO standards adopted by the 13th and 14th International Conference of Labour Statisticians (ICLS), for the purposes of the Community labour force sample survey, unemployed persons comprise persons aged 15 to 74 who were: a. without work during the reference week, i.e. neither had a job nor were at work (for one hour or more) in paid employment or self-employment; b. currently available for work, i.e. were available for paid employment or self-employment before the end of the two weeks following the reference week; c. actively seeking work, i.e. had taken specific steps in the four week period ending with the reference week to seek paid employment or self-employment or who found a job to start later, i.e. within a period of at most three months.	ILO
Unipolar depressive disorders	Unipolar depression is another name for major depressive disorder. It is a mood disorder characterized by a depressed mood, a lack of interest in activities normally enjoyed, changes in weight and sleep, fatigue, feelings of worthlessness and guilt, difficulty concentrating and thoughts of death and suicide. If a person experiences the majority of these symptoms for longer than a two-week period they may be diagnosed with major depressive disorder. The term unipolar depression is used to distinguish it from depression which occurs within the context of bipolar disorder, a disorder in which a person experiences alternating periods of depression and mania.	EUPHIX
Working age population	The total population in a region, within a set range of ages that is considered to be able and likely to work. The working-age population measure is used to give an estimate of the total number of potential workers within an economy. Each region may have a different range of ages. In our study we use the population aged between 16-64 years old, in accordance to the EU legislation for the minimum required age (16) and 64 as the limit in most EU countries for retirement.	LFS

Annex 1C Overview of included scientific literature

The table below offers an overview of included scientific literature. For more information about the search protocol see annex 1 and section 2.3 of the technical report (separate document). After comments of the European Commission and the peer reviewers we have included additional scientific literature. These documents do not appear in this overview, but are included – where relevant – in the technical report as source and at the end of the technical report in the reference list.

Table A.1C.1 Overview of relevant scientific literature included in our review

	Title	Authors/ publishing institute	Year
1	Workplace-based return-to-work interventions: a systematic review of the quantitative literature.	Franche RL, Cullen K, Clarke J, Irvin E, Sinclair S, Frank J.	2005
2	Rehabilitation and work ability: a systematic literature review.	Kuoppala J, Lamminpaa A.	2008
3	How can we help employees with chronic diseases to stay at work: a review of interventions aimed at job retention and based on an empowerment perspective.	Varekamp I, Verbeek JH, van Dijk FJ.	2006
4	Mini-intervention for subacute low back pain: a randomized controlled trial.	Karjalainen K, Malmivaara A, Pohjolainen T, Hurri H, Mutanen P, Rissanen P, et al.	2003
5	Effectiveness of workplace rehabilitation interventions in the treatment of work-related low back pain: a systematic review.	Williams RM, Westmorland MG, Lin CA, Schmuck G, Creen M.	2007

	Title	Authors/ publishing institute	Year
6	Return to work after sickness absence due to back disorders: a systematic review on intervention strategies.	Elders LA, van der Beek AJ, Burdorf A.	2000
7	Effectiveness of workplace rehabilitation interventions in the treatment of work-related upper extremity disorders: a systematic review.	Williams RM, Westmorland MG, Schmuck G, MacDermid JC.	2004
8	Effectiveness of physical activity programs at worksites with respect to work-related outcomes.	Proper KI, Staal BJ, Hildebrandt VH, van der Beek AJ, van Mechelen W.	2002
9	Interventions for preventing injuries in the construction industry.	van der Molen H, Lehtola MM, Lappalainen J, Hoonakker PLT, Hsiao H, Haslam RA, Hale AR, Verbeek JH.	2007
10	Interventions for preventing injuries in the agricultural industry.	Rautiainen R, Lehtola Marika M, Day Lesley M, Schonstein E, Suutarinen J, Salminen S, et al.	2008
11	A systematic review of the interventions to promote the wearing of hearing protection.	El Dib RP, Atallah AN, Andriolo RB, Soares BG, Verbeek J.	2007
12	Interventions to prevent occupational noise induced hearing loss.	Verbeek Jos H, Kateman E, Morata Thais C, Dreschler W, Sorgdrager B.	2009
13	Alcohol and drug screening of occupational drivers for	Cashman CM, Ruotsalainen JH,	2009

	Title	Authors/ publishing institute	Year
	preventing injury (Review).	Greiner BA, Beirne PV, Verbeek JH	
14	Work Health Promotion, Job Well-Being, and Sickness Absences—A Systematic Review and Meta-Analysis	Kuoppala J, Lamminpää A, Husman P.	2008
15	A systematic review of preventive interventions regarding mental health issues in organizations.	Corbière M, Shenb J, Rouleauc M and Dewa CS.	2009
16	Preventing occupational stress in healthcare workers.	Marine A, Ruotsalainen JH, Serra C, Verbeek JH.	2006
17	The effectiveness of current approaches to workplace stress management in the nursing profession: an evidence based literature review.	Mimura C, Griffiths P	2003
18	Back belt use for prevention of occupational low back pain: a systematic review.	Ammendolia C, Kerr MS, and Bombardier C.	2005
19	Low back pain interventions at the workplace: a systematic literature review.	Tveito TH, Hysing M, Eriksen HR.	2004
20	High-quality controlled trials on preventing episodes of back problems: systematic literature review in working-age adults.	Bigos SJ, Holland J, Holland C, Webster JS, Battie M, Malmgren JA.	2009
21	Manual material handling advice and assistive devices for preventing and treating back pain in workers.	Martimo K-P, Verbeek Jos H, Karppinen J, Furlan Andrea D, Kuijer PPFM, Viikari-Juntura E, et al.	2007

	Title	Authors/ publishing institute	Year
22	Exercise for the primary, secondary and tertiary prevention of low back pain in the workplace: a systematic review.	Bell JA, Burnett A.	2009
23	Multidisciplinary rehabilitation for chronic low back pain: systematic review.	Guzmán J, Esmail R, Karjalainen K, Malmivaara A, Irvin E, Bombardier C.	2001
24	An update of a systematic review of controlled clinical trials on the primary prevention of back pain at the workplace.	van Poppel MN, Hooftman WE, Koes BW.	2004
25	The effectiveness of worksite physical activity programs on physical activity, physical fitness, and health.	Proper KI, Koning M, van der Beek AJ, Hildebrandt VH, Bosscher RJ, van Mechelen W.	2003
26	A systematic review of workplace interventions to prevent low back pain.	Maher CG.	2000
27	Cost effectiveness of interventions based on physical exercise in the treatment of various diseases: A systematic literature review.	Roine E, Roine RP, Räsämen P, Vuori I, Sintonen H, Saarto T.	2009
28	Interventions for the prevention and management of neck/upper extremity musculoskeletal conditions: a systematic review.	Boocock MG, McNair PJ, Larmer PJ, Armstrong B, Collier J, Simmonds M, et al.	2007
29	A systematic review of work-place interventions for alcohol-related problems.	Webb G, Shakeshaft A, Sanson-Fisher R, Havard A.	2009
30	Workplace interventions for	Cahill K, Moher M,	2008

	Title	Authors/ publishing institute	Year
	smoking cessation.	Lancaster T.	
31	Effect of smoke-free workplaces on smoking behaviour: systematic review.	Fichtenberg CM, Glantz SA.	2002
32	The effectiveness of worksite nutrition and physical activity interventions for controlling employee overweight and obesity: a systematic review.	Anderson LM, Quinn TA, Glanz K, Ramirez G, Kahwati LC, Johnson DB, et al.	2009
33	Worksite health promotion programs with environmental changes: a systematic review.	Engbers LH, van Poppel MN, Chin APMJ, van Mechelen W.	2005
34	Interventions designed to increase adult fruit and vegetable intake can be effective: a systematic review of the literature.	Pomerleau J, Lock K, Knai C, McKee M.	2005
35	Workplace Physical Activity Interventions: a Systematic Review.	Dugdill L, Brettle A, Hulme C, McCluskey S, Long AF.	2008
36	Interventions in the alcohol server setting for preventing injuries.	Ker K, Chinnock P	2008
37	The economics of primary prevention of cardiovascular disease – a systematic review of economic evaluations.	Schwappach DLB, Boluarte TA and Suhrcke M	2007
38	Multi-disciplinary rehabilitation for acquired brain injury in adults of working age.	Turner-Stokes L, Nair A, Sedki I, Disler PB, Wade DT.	2005
39	A Systematic Review of the Economic Burden of Chronic Angina.	Reynolds MW, Frame D, Scheye R, Rose ME, George S, Watson JB, and Hlatky MA.	2004

	Title	Authors/ publishing institute	Year
40	Psychosocial interventions for prevention of psychological disorders in law enforcement officers.	Peñalba V, McGuire H, Leite JR.	2008
41	Interventions for helping people recognise early signs of recurrence in bipolar disorder.	Morriss R, Faizal MA, Jones AP, Williamson PR, Bolton CA, McCarthy JP	2007
42	Systematic reviews of the effectiveness of day care for people with severe mental disorders: (1) Acute day hospital versus admission; (2) Vocational rehabilitation; (3) Day hospital versus outpatient care.	Marshall M, Crowther R, Almaraz-Serrano A, Creed F, Sledge W, Kluiter H, *et al.*	2001
43	Intervention practices in musculoskeletal disorder prevention: A critical literature review.	Denis D, St-Vincent M, Imbeau D, Jetté C, Nastasia I.	2008
44	Workplace interventions to prevent musculoskeletal and visual symptoms and disorders among computer users: A systematic review.	Brewer S, Van Eerd D, Amick III BC, Irvin E, Daum KM, Gerr F, Moore JS, Cullen, K, Rempel D.	2006
45	Interventions to promote the wearing of hearing protection.	ElDib RP,Mathew JL.	2009
46	Return to work of breast cancer survivors: a systematic review of intervention studies.	Hoving JL, Broekhuizen MLA and Frings-Dresen MHW	2009
47	Workplace interventions for preventing work disability.	van Oostrom SH, DriessenMT, de Vet HCW, Franche RL, Schonstein E,	2009

	Title	Authors/ publishing institute	Year
		Loisel P, van MechelenW, Anema JR.	
48	A Systematic Review of Disability Management Interventions with Economic Evaluations.	Tompa E, de Oliveira C, Dolinschi R, Irvin E.	2008
49	Printed patient education interventions to facilitate shared management of chronic disease: a literature review.	Harris M, Smith B, and Veale A.	2005
50	Workplace stress in nursing: a literature review.	McVicar A.	2003
51	Biopsychosocial rehabilitation for upper limb repetitive strain injuries in working age adults.	Karjalainen KA, Malmivaara A, van Tulder MW, Roine R, Jauhiainen M, Hurri H, Koes BW.	2009
52	Occupational therapy for rheumatoid arthritis.	Steultjens EEMJ, Dekker JJ, Bouter LM, Schaardenburg DD, Kuyk MAMAH, Van den Ende ECHM.	2004

Annex 1D Overview of included grey literature

The table below offers an overview of included grey literature. For more information about the search protocol see annex 1 and section 2.3 of the technical report (separate document). After comments of the European Commission and the peer reviewers we have included additional grey literature. These documents do not appear in this overview, but are included – where relevant – in the technical report as source and at the end of the technical report in the reference list.

The second column shows the databases in which we searched for relevant grey literature. The following four columns provide more information with regard to the found relevant literature source (title, authors, geographical focus and publication year) and the last columns provide details with respect to the type and focus of interventions that are discussed in the source; the type of disease or risk factor that are discussed in the source and how we scored the level of evidence/quality of the source.

We used the following scoring methodology to score each source on the level of evidence and quality:

+++	Reports from the European Commission, OECD, WHO which are often based on synthesized information from multiple (scientific) sources. These sources often have a large geographical scope covering the EU, the OECD countries, or the world;
++	Reports from research and consultancy agencies and national state sources which are often based on synthesized information from multiple (scientific) sources and reports from academic (scientific) institutes. These sources often focus on a particular country or compare a limited number of countries;
+	Other sources like seminar notes, Power Point slides, and other information retrieved from websites from reliable sources (which are all of the above). These sources often lack details with regard to the use of the methodology and provide interesting information on particular issues/subjects without giving an overview of the larger context. They are therefore to be seen as supportive documentation.

Table A.1D.1 Overview of relevant grey literature included in our review

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
1	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	Towards a Longer WorkLife! Ageing and the quality of work life in the European Union	Ilmarinen, J., Finnish Institute of Occupational Health Ministry of Social Affairs and Health Helsinki	Finland	2005	Other: age management	General health and well being Focus on musculoskeletal disease	++
2	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	Avoiding long-term incapacity for work: Developing an early intervention in primary care	Campbell, J., Wright, C., Moseley, A., Chilvers, R., Richards, S. & Stabb, L. (Peninsula Medical School, Primary Care Research Group)	UK	2007	Initiatives to support people who are on long term sick leave to get back into work	Musculoskeletal disease: back pain	++
2bis	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein,	Avoiding long-term incapacity for work: Developing an early intervention in primary care	Campbell, J., Wright, C., Moseley, A., Chilvers, R., Richards, S. & Stabb, L. (Peninsula Medical School, Primary Care Research Group)	UK	2007	Initiatives to support people who are on long term sick leave to get back into work	Musculoskeletal disease: other than back pain	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
	Norway, Turkey)							
2bis	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	Avoiding long-term incapacity for work: Developing an early intervention in primary care	Campbell, J., Wright, C., Moseley, A., Chilvers, R., Richards, S. & Stabb, L. (Peninsula Medical School, Primary Care Research Group)	UK	2007	Initiatives to support people who are on long term sick leave to get back into work	Other: mental health problems and stress	++
2bis	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	Avoiding long-term incapacity for work: Developing an early intervention in primary care	Campbell, J., Wright, C., Moseley, A., Chilvers, R., Richards, S. & Stabb, L. (Peninsula Medical School, Primary Care Research Group)	UK	2007	Initiatives to support people who are on long term sick leave to get back into work	Cardiovascular disease Respiratory disease	++
2bis	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	Avoiding long-term incapacity for work: Developing an early intervention in primary care	Campbell, J., Wright, C., Moseley, A., Chilvers, R., Richards, S. & Stabb, L. (Peninsula Medical School, Primary Care Research Group)	UK	2007	Initiatives to support people who are on long term sick leave to get back into work	Musculoskeletal disease: chronic rheumatic disease Other: (work-related) injuries Other: brain injury	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
3	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	Building the case for wellness*	PriceWaterhouseCoopers	UK	2008	Workplace health and safety initiatives; workplace wellness programmes including health and safety, managing of ill health, and prevention and promotion	General heal and well being Particular emphasis is put on the growing occurrence of chronic disease (as opposed to communicable diseases) Return on investment specifically stated for musculoskeletal disease	++
4	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	The economic consequences of ill-health in Estonia	World Health Organization Regional Office for Europe Ministry of Social Affairs PRAXIS Center for Policy Studies	Estonia	2006	Other: initiatives that increase the health status of the entire population	General health and well being	++
5	Websites of Ministries of Health and Social Affairs	Dame Carol Black's Review of the Health of Britain's working-age population – Working for a healthier tomorrow *	C. Black	UK	2008	Other: initiatives to improve the health of the working-age population	General health and well being Evidence specifically	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
	(EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)					Evidence specifically in relation to initiatives to support people who are on long term sick leave to get back into work.	in relation to musculoskeletal disease: lower back pain; mental health conditions (among other: unipolar depressive disorders)	
6	DG EMPL	Causes and circumstances of accidents at work in the EU	European Commission	EU	2009	Workplace health and safety initiatives	Accidents at work Road accidents Other: stress; psychological harassment, aggression at the workplace	+++
7	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	Health in the World of Work: Workplace Health Promotion as a Tool for Improving and Extending Work Life	Finnish Ministry of Social Affairs and Health Finnish Institute of Occupational health	Finland	2006	Workplace health promotion initiatives	General health and wellbeing	++
8	Websites of Ministries of Health and Social Affairs	'Workplace Health Promotion in Europe – the role of national health policies and strategies'	Riitta-Maija Hämäläinen Finnish Institute of Occupational Health	Finland	2007	Workplace health promotion initiative	General health and well being	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
	(EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)							
9	Other	Health-related and economic benefits of workplace health promotion and prevention – summary of the scientific evidence*	Kreis, J., & Bödeker, W. (The Initiative Gesundheit und Arbeit) The Initiative Gesundheit und Arbeit (Initiative for Health and Work) is a collaborative project between German statutory health and accident insurance institutions	World	2004	Workplace health promotion initiatives	General health and well-being at the workplace	++
10	Other	Effectiveness and economic benefits of workplace health promotion and prevention - Summary of the scientific evidence 2000 to 2006*	Sockoll, I., Kramer, I., & Bödeker, W. (The Initiative Gesundheit und Arbeit) The Initiative Gesundheit und Arbeit (Initiative for Health and Work) is a collaborative project between German statutory health and accident insurance institutions	World	2009	Workplace health promotion initiatives	General health and well-being at the workplace Specific attention is this time also put on: • musculoskeletal disease; • other: mental illness.	++
11	Other	Move Europe - a Campaign for the Improvement of Lifestyle-related Workplace Health	University of Perugia/Italy: Giuseppe Masanotti Members:	EU	2009	Workplace health promotion initiative	Not specified	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
		Promotion in Europe – business report *	BKK Bundesverband/Germany: Gregor Breucker, Reinhold Sochert Oberösterreichische Gebietskrankenkasse/Austria: Elfriede Kiesewetter Prevent/Belgium: Karla Van den Broek TNO/The NL: Robert Gründemann, Anja Dijkman The Romtens Foundation/Romania: Theodor Haratau					
12	DG SANCO	Alcohol in Europe – A public health perspective *	Anderson, P., & Baumberg, B. (Institute of Alcohol Policies, UK)	EU	2006	Other initiatives: alcohol policies	Alcohol use disorder	++
13	DG SANCO	Tobacco or health in the European Union – Past, present and future *	ASPECT Consortium/ European Commission	EU	2004	Other: tobacco-control policy	Other: tobacco use	+++
14	Other	Tackling the wider social determinants of health and health inequalities: evidence from systematic reviews *	Bambra, C., Gibson, M., Petticrew, M., Sowden, A., Whitehead, M., Wright, K.	Not specificied	Not specified	Other: adjustment of the work environment Other: housing and regeneration Other: initiatives to	General health and well being Specific attention on: • other: mental health; • accidents at work; fall	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
						promote rehabilitation and reintegration into work following a serious health event (e.g. incapacity) Other; change in health care access and social care Other: transport	related injuries; • road accidents (e.g. road injury); • respiratory disease (in relation to transport).	
15	Other	Report on the theories and methodologies for the prevention of obesity at the workplace*	Technische Universität Dresden	World	(>2008)	Workplace health promotion initiative	Other: obesity	++
16	OECD	Sickness and Disability Schemes in the NL – Country memo as a background paper for the OECD disability review	OECD	NL	2007	Initiatives to support people who are on long term sick leave to get back into work Initiatives to promote rehabilitation and reintegration into work following a serious health event (e.g. occupational	Other: disability Other: sickness	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
						disability)		
17	DG SANCO	Prevention of depression and suicide. Consensus Paper.	Wahlbeck K., & Mäkinen M. European Commission	EU	2008	Internet e-mental health interventions promotion of good mental health and well-being through health services multi-level approach including training of healthcare professionals, reducing stigma; improving mental health literacy	Depression (and suicide as an outcome of untreated depressive illness and associated with alcohol and drug misuse)	+++
18	Other	Fit For Work? Musculoskeletal Disorders in the European Workforce	Bevan, S., Quadrello, T., McGee, R. Mahdon, M., Vavrovsky, A., Barham, L., The Work Foundation – consultancy charity organisation	23 European countries, Canada and Israel	Not specified	Other: **early** intervention	Musculoskeletal disease	**++**
19	Other	Systematic literature review of good practices for four injury	Center for Research & Prevention of Injuries, Athens	World	2006	**In relation to alcohol related**	Alcohol use disorder	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
		priorities: alcohol-related injuries, road traffic injuries, occupational injuries and drowning	University			**injuries** Other: legislation education brief interventions **In relation to road injuries** Other: Engineering Legislation Education **In relation to occupational injuries** Other: Education Awareness raising Safety devices Assessment of workplace Prevention campaigns and more	Occupational accidents e.g. musculoskeletal disease,; work related skin, eye and hearing injuries; fall related injuries Road accidents	

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
20	Other	Evidence-based nutrition policies	Canadian Cancer Society	World	2008	Other: Price control Taxes Cafeteria meal modification Legislation Education Industry policy	Other: Unhealthy food consumption	++
21	Other	Managing musculoskeletal disorders	Eurofound	EU-27 and Norway	? (>2007)	Workplace health and safety initiative	Musculoskeletal disorder	+++
22	Other	Dare to Compare! Benchmarking Dutch health with the European Community Health Indicators (ECHI).	Harbers, M.M., Wilk, E.A. van der, Kramers, P.G.N., Kuunders, M.M.A.P., Verschuuren, M., Eliyahu, H., & Achterberg, P.W. (RIVM) RIVM– Dutch knowledge and research institute focusing on the promotion of public health	NL compared to EU	2008	Other: non-work related interventions and policy such as: • increase of price of cigarettes, smoking restrictions, cigarette advertising bans, legislation prohibiting sale of tobacco products and accessible replacement therapies;	Other: smoking Other: injury (general) Other: mental health problems	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
						• injury prevention (various); • early interventions and treatment; • under-standing prevalence.		
23	Other	Implications of demographic ageing in the enlarged EU in the domains of quality of life, health promotion and health care	Grammenos, S. Centre for European Social and Economic Policy (CESEP)	EU	2005	Other: non-work related interventions (e.g. particularly general national and local policy and health promotion initiatives)	Other: smoking Other: cancer Other: breast cancer prevention Cardiovascular disease Other: general well-being Other: diabetes	++
24	WHO-Europe	Gaining health - Analysis of policy development in European countries for tackling non-communicable diseases	Ritsatakis, A., & Makara, P. WHO Europe	EU countries	2009	Other: non-work related national health policy	Other; non-communicative diseases (NCD)	+++
25	WHO-Europe	What are the most effective and cost-effective interventions in	Őesterberg, E.	Europe Region	2004	Other: regulation and legislation	Alcohol use disorder	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
		alcohol control?	WHO Europe			Other: education and persuasion Other: drunk drive counter measures		
26	WHO-Europe	For which strategies of suicide prevention is there evidence of effectiveness?	Guo, B., & Harstall, C. WHO Europe	EuropeRegion	2004	Other: several types of therapy Other: medication Other: emergency contact card provision	Other: suicide	+++
27	WHO-Europe	What is known about the effectiveness of economic instruments to reduce consumption of foods high in saturated fats and other energy-dense foods for preventing and treating obesity? *	Goodman, C., & Anise, A. WHO Europe	Europe Region	2006	Other: economic instruments (taxes, pricing policy, incentives) to reduce the consumption of foods high in saturated fats and other energy-dense foods	Obesity	+++
28	WHO-Europe	Which are the most effective and cost-effective interventions for tobacco control?*	Gilbert, A., & Cornuz J. WHO Europe	Europe Region	2003	Other: taxes Other: consumer education	Other: smoking	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
						Other: nicotine replacement therapy and other therapies Other: regulation (restriction, bans on advertisement)		
29	DG SANCO	The state of the drugs problem in Europe. Annual Report 2008*	European Monitoring Centre for Drugs and Drug Addiction	EU	2008	Other: (universal) school-based prevention Other: indicated prevention Other: social integration (includes **employment**) Other: medication treatment	Other: drug abuse	+++
30	Websites of Ministries of Health and Social Affairs (EU27 + Croatia, FYROM, Iceland, Liechtenstein, Norway, Turkey)	Health in all policies – prospects and potentials*	Ståhl, T., Wismar, M., Ollila, E., Lahtinen, E., & Leppo, K. This volume was produced as a part of a project entitled "Europe for Health and Wealth", which was supported by funding from the European Union Public	Finland (focus EU wide)	2006	Other: community-based cardiovascular disease prevention programme	Cardiovascular disease	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
			Health Programme. It was published by the Finnish Ministry of Social Affairs and Health, under the auspices of the European Observatory on Health Systems and Policies					
31	DG SANCO	Status report on the European Commission's work in the field of nutrition in Europe	European Commission	EU	2003	Other: population-based approach	Other: unhealthy nutrition intake	+++
32	OECD	Sickness, disability and work: keeping on track in the economic downturn	OECD	OECD	2009	Other: get beneficiaries with incapacity benefit back to work	Not specified	+++
33	OSHA	Occupational skin diseases and dermal exposure in the European Union (EU-25): policy and practice overview	De Craecker, W., Roskams, N., & Op de Beeck, R. European Agency for Safety and Health at Work	EU	2008	Workplace health and safety initiatives	Accidents at work	+++
34	OSHA	Preventing risks to young workers: policy, programmes and workplace practices*	European Agency for Safety and Health at Work	EU	2009	Workplace health and safety initiatives Other: mainstream occupational health and safety into education	Accidents at work (in relation to young workers 15-24 years)	**+++**
35	OSHA	Prevention of work related MDSs in practice. Lighten the load - A European campaign on	European Agency for Safety and Health at Work	EU	2009	Workplace health and safety initiatives	Musculoskeletal disease (disorder)	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
		musculoskeletal disorders						
36	OSHA	Occupational safety and health and economic performance in small and medium-sized enterprises: a review*	Gervais, R.L., Pawlowska, Z., Bojanowski, R., Pracy, O., Kouvonen, A., Karanika-Murray, M., Van den Broek, K., & De Greef, M. European Agency for Safety and Health at Work	EU	2009	Workplace health and safety initiatives **In SMEs**	Not specified	+++
37	OSHA	Small, Healthy and competitive – New strategies for improved health in small and medium enterprises	Federal Association of Company Health Insurance Funds (BKK Bundesverband) European Information Centre	EU	2001	Workplace health promotion initiatives **In SMEs**	Not specified	++
38	Other	Evidence-based physical activity policies	Canadian Cancer Society	World	2008	Workplace health and safety initiatives Other: Education Legislation Industry policy	Other: to stimulate physical activity	++
39	Other	Hearts and minds at work in Europe	Boedeker, W., & Klindworth, H. BKK Bundesverband Federal Association of Company Health Insurance Funds	EU	2007	Workplace health promotion initiatives Other: Workplace stress intervention (can be seen as part of the above I guess)	Cardiovascular disease Other: mental health	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
40	Other	Evidence-based tobacco control policies	Canadian Cancer society	World	2008	Other: legislation Other: price control	Other: smoking	++
41	Other	The cost-effectiveness of indicated prevention - the case of alcohol interventions	Arentshorst, M.E.	World	2008	Other: (brief) interventions by specialists Taxation And other non-work related interventions	Alcohol use disorder	++
42	Other	Employment and disability: Back to work strategies (EUROFOUND)*	Wynne, R., & Ananey, D. Eurofound	Seven EU Member States – Finland, Germany, Ireland, Italy, the NL, Sweden and the UK	2004	Other: back to work strategies	Other: chronic illness Other: work-related stress Other: stress and burn out	+++
43	Other	The contribution of health to the economy in the European Union	Suhrcke, M., McKee, M., Sauto Arce, R., Tsolova, S., & Mortensen, J. European Commission	EU	2005	Not clearly specified Other: investment in health Other: health promotion	EU examples only (Australia excluded): Other: smoking Alcohol use disorder Other: Infectious	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
							disease control Other: injury prevention	
44	Other	A Review of Workplace Interventions that Promote Mental Wellbeing in the Workplace*	Graveling RA, Crawford JO, Cowie H, Amati C, Vohra S Institute of Occupational Medicine, Edinburgh, The Keil Centre, Edinburgh	World	2008	Workplace health and safety initiatives	Other: mental wellbeing	++
45	DG SANCO	The health status of the European Union - Narrowing the health gap	European Commission	EU	2003	Other: health protection Other: accident prevention (at work, home and on the road) Workplace health promotion initiatives	Other: accidents Other: smoking Other: consumption of saturated fats	+++
46	DG SANCO	Closing the health gap in European Union	Witold Zatoński in collaboration with Marta Mańczuk, Urszula Sulkowska and the HEM project team European Commission	EU, especially Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania,	2008	Various not related to the workplace directly	Other: accidents Alcohol use disorder Other: smoking	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
				Poland, Romania, Slovakia, Slovenia				
47	EUPHIX, EUphact	Alcohol use – Interventions*	Kuunders, M. (RIVM). EUPHIX.org is developed by the EUPHIX project team and is funded by DG SANCO and RIVM.	EU	2009	Other: drink driving counter measures Other: education and public awareness Other: pricing and taxation Other: restrictions on the availability of alcohol Other: advertising control Other: drinking environment Other: community mobilisation **Other: interventions**	Alcohol use disorder	+

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
						(including work based programmes)		
48	EUPHIX, EUphact	Depression – interventions*	Hegerl, U., Wittenburg, L., & Bramesfeld, A. EUPHIX.org is developed by the EUPHIX project team and is funded by DG SANCO and RIVM.	EU	2009	Other: cognitive behaviour group intervention and other intervention programmes Other: depression screening Other: training primary care physicians in treating depression Other: antidepressants and psychotherapy	Other: depression	+
49	EUPHIX, EUphact	Overweight – interventions*	Wilk, E.A. (RIVM) EUPHIX.org is developed by the EUPHIX project team and is funded by DG SANCO and RIVM.	EU	2007	Various not related to the workplace e.g. counselling, behavioural therapy, pharmacological treatment, etc.	Obesity	+
50	Other	Organisation Case Studies - examples of organisations who	Health, Work and Well-being is a UK Government-led	United UK	Not specified	Workplace health promotion initiatives	Other: well being of the employee	+

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
		have taken action to improve the health and well-being of their employees with measurable results (working for health – UK government)	initiative to improve the health and well-being of working age people					
51	Other	The prevention of musculoskeletal disorders within the telecommunications sector, a systematic review of the scientific literature	Joanne O Crawford Elpiniki Laiou Anne Spurgeon Grant McMillan Antonia Ieromnimon University of Birmingham	World- not clearly specified but can be deducted from the search strategy	Not specified	Workplace health and safety initiatives	Musculoskeletal disease (specifically in relation to employees in the telecommunication sector)	++
52	Added later on	WHO CHOICE (CHOosing Interventions that are Cost Effective) project (mentioned in source 43)*	Not specified	WHO region	Not specified	Various	Other: depression Alcohol use disorder Other: smoking	+++
53	Added later on	Informative website of the European Agency for Safety and Health at work	Not specified	EU	Not specified	Workplace health promotion	Not specified	+
54	In Dutch	KvL/B&G 2008.064 Bedrijfsbewegingsprogramma's: Wie doet er mee, hoe frequent en hoe lang?*	C.M. Bernaards L.H. Engbers V.H. Hildebrandt TNO Arbeid	NL	2008	Workplace health promotion initiative (company organised fitness)	Other: lack of physical activity	++
55	In Dutch	Een kwestie van gezond verstand*	SER- Dutch Social Economic Council	NL	2009	Initiative to promote rehabilitation and reintegration into work following a	Not specified	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
						serious health event Other: absence management (verzuimbeleid) Other: stress reduction/work pressure prevention in the workplace		
56	In Dutch	Effecten van beleidsmaatregelen buiten het volksgezondheidsdomein op de gezondheid een verkennende studie*	I. Storm J. Jansen A.J. Schuit RIVM– Dutch knowledge and research institute focusing on the promotion of public health	NL	2009	Various (all outside the health policy setting) Other: set up of public space	Other: Smoking Other: lack of physical activity Other: obesity (indirect: focus on healthy food) Long cancer (indirect, focus on clean air) Other: accidents (focus on safety) Other: stress and work pressure	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
							Cardiovascular disease (indirect through focus on social support) Unipolar depressive disorder (indirect through focus on social support)	
57	In Dutch	Leefstijl en arbeid in balans- een literatuur studie naar de invloed van leefstijlfactoren en (sub) cultuur op gezondheid, ziekteverzuim, arbeidsongeschiktheid, en productiviteit*	P.E.D. Eysink | H.H. Hamberg-van Reenen | M.S. Lambooij RIVM– Dutch knowledge and research institute focusing on the promotion of public health and a safe living environment	NL	2008	Workplace health and safety initiatives Other: Workplace health and safety initiative for specific gender and age groups in the workplace Workplace health promotion initiative Other: regulation/legislation	Other: smoking Cardio-vascular disease Other: obesity Other: prediabetes Other: Health food intake Musculoskeletal disease Other: depression Other: alcohol use disorder	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
							Other: drug use	
58	In Dutch	Strategische verkenningen 1- Mentaal vermogen en welbevinden	Trimbos Institute -- Dutch centre of expertise on mental health and addiction	Not specified	2008	Workplace health and safety initiative Other: interactive self-help via internet	Other: mental health	++
59	In Dutch	ONTWERPADVIES Preventie en Gezondheid	Ad-hoc commissie Preventie en Gezondheid SER- Dutch Social Economic Council	Not specified	2009	Workplace health and safety initiatives Initiatives to promote rehabilitation and reintegration into work following a serious health event (only reintegration is mentioned) Initiatives to support people who are on long term sick leave to get back into work	Musculoskeletal disease (back complaints) Cardiovascular disease (Ischemische hart ziektes) Other: depression Hearing loss Respiratory disease (asthma) Other: Skin disease (contact eczema) Other: stress	++
60	Other	POLICY PAPER ON THE HEALTH AND WELL BEING	Youth Forum Jeunesse	EU	2008	Legislation, policy and regulation	Obesity	+

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
		OF YOUNG PEOPLE				General health promotion	Smoking Alcohol use	
61		EU Database of policies and good practices on mental health and well-being/ EU-Compass for Action on Mental Health and Well being	European Commission	EU	Not specified	Workplace health promotion General health promotion	Mental health	+
62	Other	REPORT ON THE CONSULTATION FOR THE COMMISSION COMMUNICATION ON HEALTH INEQUALITIES	European Commission	EU	2009	Legislation, policy and regulation Workplace health and safety initiatives General health promotion	Smoking General well being Alcohol use	+
63	In Dutch	Zon MW onderwerpen	ZonMW - NL Organisation for Health Research and Development	NL	2009	Education General health promotion	Obesity Musculoskeletal disease Depression Cardiovascular disease Alcohol use	+

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
							Workplace health and safety initiative	
64	Other	The European health report 2005 Public health action for healthier children and populations	WHO Regional office for Europe	EU	2005?	General health promotion initiatives	Overall health	+++
65	Other	Governance tools and framework for health in all policies	Louise St-Pierre, National Collaborating centre for Healthy Public Policy	UK, Finland, New Zealand, Norway, Sweden and Quebec	Not specified	Other: Health in All Policies (HiAP) is a strategy to improve the health of the population. It addresses factors outside the health system that have important health effects	Overall health	++
66	In Dutch	Strategische verkenningen 3-Beroepsvermogen	Trimbos Institute- Dutch centre of expertise on mental health and addiction	Not specified	2009	Workplace health and safety initiatives Initiatives to promote rehabilitation and reintegration into work following a serious health event	Mental health	++
67	In Dutch	Strategische verkenningen 2-Mentaal vermogen jongeren	Trimbos -Institute - - Dutch centre of expertise on mental health and addiction	Not specified	2009	General health promotion	Mental health	++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
68	In Dutch	Platformbijeenkomst Beyaert-preventie in de eerstelijns zorg-State of the art van geïndiceerde preventie	Jan Verduijn & Lejo van der Heiden Dutch Ministry of Health	NL	2009	Not work related interventions	Obesity Physical activity	+
69	Other	Monitoring - The State of Occupational Safety and Health in the European Union – Pilot Study Summary Report	European Agency for Safety and Health	EU	2000	Workplace health and safety initiatives	Hearing loss Accidents at work	+++
70	Other	COMMISSION STAFF WORKING DOCUMENT accompanying document to the COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Youth - Investing and Empowering EU YOUTH REPORT	European Commission	EU	2009	Not work related initiatives	Not specified	+
71	Other	Eurofound_Integrating people at risk of exclusion into the labour market	Eurofound	EU	Not specified	Workplace health promotion	Not specified	+++
72	Other	European status report on road safety- towards safer roads and healthier transport choices	WHO Europe	EU	2009	Legislation, policy and regulation	Road accidents Respiratory disease	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
73	Other	European alcohol and health forum – 5th planning meeting	DGHealth	EU	2009	Legislation, policy and regulation School-based prevention	Alcohol use disorder	+
74	Other	"Prevention of Depression and Suicide – Making it happen"	Thematic Conference on Prevention of Depression and Suicide, Organised jointly by the Ministry of Health of the Republic of Hungary and the European Commissions' Directorate of Health and Consumers, with the support of the Swedish EU Presidency and in collaboration with the WHO Regional Office for Europe	EU	2009	Legislation, policy and regulation Adapting training of health care professionals Brief interventions Online prevention	Mental health	+
75	Other	Evidence-Based Guidelines on Health Promotion for Older People	Lis, K., Reichert, M., Cosack, A., Billings, J. & Brown, P. (Ed.) Austrian red cross	EU	2008	General health promotion	Not specified	++
76	EUPHIX, EUphact	Smoking policies - Evidence: effective policy measures	Tamsma, N. (RIVM) EUPHIX.org is developed by the EUPHIX project team and is funded by DG SANCO and RIVM.	EU	2009	Other: pricing and taxation Other: smoking bans in workplaces and public places	Other: smoking	+

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
						Other: advertising bans Other: health warning labels Other: tobacco dependence treatment		
77	Later added for specific information	The impact of Pathways to Work on work, earnings and self-reported health in the April 2006 expansion areas	Helen Bewley, Richard Dorsett and Sergio Salis Department for work and pensions	UK	2009	Initiatives to promote rehabilitation and reintegration into work following a serious health event Initiatives to support people who are on long term sick leave to get back into work	Not specified	++
78	Later added for specific information	Effectiviteit van arbocuratieve zorg tegen het licht Onderzoek naar de invloed en werkwijze van arbocuratieve zorg	BS Health Consultancy – Consultancy firm	NL	2008	Health and safety	Not specified	++
79	Later added for specific	Health Working Papers OECD HEALTH WORKING	Franco Sassi, Michele Cecchini, Jeremy Lauer* and	OECD	2009	General health promotion	Obesity	+++

	Database	Title	Authors/publishing institute	Focus	Year	Type and focus of intervention	Type of disease or risk factor	Scoring
	information	PAPERS No. 48 IMPROVING LIFESTYLES, TACKLING OBESITY: THE HEALTH AND ECONOMIC IMPACT OF PREVENTION STRATEGIES	Dan Chisholm* OECD			Workplace health promotion		
80	Later added for specific information	Effecten van beleidsmaatregelen buiten het volksgezondheidsdomein op de Gezondheid Een verkennende studie	I. Storm | J. Jansen | A.J. Schuit/ RIVM – Dutch knowledge and research institute focusing on the promotion of public health and a safe living environment	NL	2009	General health promotion	General well being	++
81	Later added for specific information	What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach?	Not specified	EU	2006	General health promotion **In schools**	General health promotion	+

Annex 2 Survey

Dear Madam/Sir,

Investing wisely in health is vital if we are to ensure that future populations do not spend their increased lifespan burdened with disabilities that diminish their contribution to society and quality of life. In addition, it is becoming increasingly clear that implementing cost-effective interventions and policies to improve the health status will result in economic benefits for society and improvements in future productivity and competitiveness.

The EU Health Strategy (2008–2013) stresses the importance of improving the health of people of working age. To develop strategies to help reduce the numbers of people out of work for health reasons, the European Commission (EC), DG SANCO has commissioned a state-of-the-art review. The review is being conducted by a consortium of ECORYS NL, TNO Quality of Life and Erasmus MC, University Medical Centre Rotterdam. One specific task of the review is to assess the (cost-) effectiveness of policies and interventions aimed at prevention, rehabilitation and reintegration of people of working age.

We would highly appreciate your co-operation in completing a web-based survey, which is addressed to the following stakeholders in the EU-27 and Norway, Iceland, Liechtenstein, Croatia, Former Yugoslav Republic of Macedonia and Turkey:

- representatives of different EC Directorates-General and the European Parliament;
- representatives of health and other ministries involved in health-related issues;
- representatives from companies in various economic sectors.

As an involved stakeholder, your opinions and views will be an important contribution to the review for the EC.

What are we asking from you?

The survey focuses on your awareness of policies and initiatives that address workforce health. We particularly focus on policies and initiatives that address high burden diseases including cardiovascular diseases, musculoskeletal conditions, respiratory diseases, mental health and injuries:

- workplace health and safety initiatives;
- health promotion initiatives;
- initiatives to help retain people in work who suffer from a chronic disease;
- initiatives to promote rehabilitation and reintegration into work following a serious health event;
- initiatives to support people who are on long term sick leave to get back into work;

- other initiatives.

Also, we would like you to indicate the direct suitability and utility of the policies and initiatives you are familiar with. This will support us in identifying good practices in the EU.

Completion of the survey will take about 20 minutes of your time. We would greatly appreciate your responses before April 1st.

We very much look forward to your response.

» Start Survey

For questions about the survey, please contact Emmy Nelissen (+31 10 4538613; Emmy.Nelissen@ecorys.com) or Judith Mathijssen (+31 10 4538577; Judith.Mathijssen@ecorys.com).

Thank you for your time and effort.
Yours faithfully,

Wija Oortwijn
Project leader, ECORYS NL

Health of People of Working Age

GENERAL INFORMATION

Please note that all answers will be treated with confidentiality and that no attribution will be made to specific persons.

1. Title of respondent

Professor
Doctor
Mr
Ms

2. Name of respondent

3. Position of respondent

4. Organisation / Department

5. Country

Austria
Belgium
Bulgaria
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece

Additional options (question 5)

> Order Responses: alphabetically

6. Telephone number

7. Email address

8. Representing

Employment and Social Affairs Committee (ESAC)
European Network for Workplace Health Promotion (ENWHP)
Eurofound Governing Board
High Level Committee on Public Health (HLCPH)
National Focal Point OSHA
National Focal Point Programme of Community action in the field of health (2008-2013)
Social Protection Committee (SPC)
The Employment Committee
Other, please specify

Additional options (question 8)

> Order Responses: alphabetically

AWARENESS OF POLICIES AND INITIATIVES TO HELP REDUCE THE NUMBERS OF PEOPLE OUT OF WORK FOR HEALTH REASONS

9. Is an overall national and/or regional policy or initiative in place in your country that addresses the following diseases?

	Yes	No	Don't know
Cardiovascular diseases	0	0	0
Mental health	0	0	0
Musculoskeletal diseases	0	0	0
Accidental injuries at work	0	0	0
Respiratory diseases	0	0	0
Alcohol use disorder	0	0	0
Hearing loss	0	0	0
Lung cancer	0	0	0
Road accidents	0	0	0

10. If you have answered yes, please specify which national and/or regional policies or initiatives are in place:

11. Have any policy or intervention targeting specific groups been introduced in your country to reduce socioeconomic disparity in the following disease categories?

	Yes	No	Don't know
A. Cardiovascular diseases	0	0	0
B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

12. Please specify for each disease which of the following groups are targeted (multiple answers possible):

	Social disadvantaged	Ethnic minorities	Other groups in general
A. Cardiovascular diseases	0	0	0
B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

13. If you have answered other, please specify which groups have been targeted by the policy or intervention in your country:

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WORKPLACE HEALTH AND SAFETY POLICY AND INITIATIVES

Health and safety policies and initiatives include minimum standards to protect all aspects of the worker's wellbeing (e.g., avoidance of accidents and prevention of disease).

14. Has any national or regional policy or initiative on workplace health and safety been introduced in your country that is aimed at:

	Yes	No	Don't know
A. Cardiovascular diseases	0	0	0
B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

15. If you have answered yes, please provide relevant references to policy or programme documentation:

Characters left: 2000

WORKPLACE HEALTH PROMOTION INITIATIVES

Workplace health promotion is the combined efforts of employers, workers, and society to improve the health and well-being of people at work. This can be achieved through a combination of improving work organisation and the working environment, promoting active participation and encouraging personal development.

16. Has any national or regional policy or initiative on health promotion been introduced in your country that is aimed at:

	Yes	No	Don't know
A. Cardiovascular diseases	0	0	0
B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

17. If you have answered yes, please provide relevant references to policy or programme documentation:

INITIATIVES TO HELP RETAIN PEOPLE IN WORK WHO SUFFER FROM A CHRONIC DISEASE

Here the initiative lies on policies and initiatives to prevent employees leaving their jobs due to a chronic disease (i.e. a long-term health condition, such as musculoskeletal problems, asthma, diabetes, depression, anxiety and heart problems).

18. Has any national or regional policy or initiative been introduced in your country to help retain people in work who suffer from a chronic disease aimed at:

	Yes	No	Don't know
A. Cardiovascular diseases	0	0	0
B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

19. If you have answered yes, please provide relevant references to policy and programme documentation:

Characters left: 2000

INITIATIVES TO PROMOTE REHABILITATION AND REINTEGRATION INTO WORK FOLLOWING A SERIOUSHEALTH EVENT

A serious health event is defined as a significant threat to one's physical and psychological integrity (e.g. cancer, organ failure requiring major organ transplant, accident).

20. Has any <u>national or regional policy or initiative been introduced in your country to promote rehabilitation and reintegration into work following a serious health event</u> that is aimed at:

	Yes	No	Don't know
A. Cardiovascular diseases	0	0	0
B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

21. If you have answered yes, please provide relevant references to policy and programme documentation:

Characters left: 2000

INITIATIVES TO SUPPORT PEOPLE WHO ARE ON LONG TERM SICK LEAVE TO GET BACK INTO WORK

Long-term sick leave is defined as a period of being on sick leave for at least 6 weeks.

22. Has any <u>national or regional policy or initiative been introduced in your country</u> to support people who are on long term sick leave to get back into work aimed at:

	Yes	No	Don't know
A. Cardiovascular diseases	0	0	0
B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

23. If you have answered yes, please provide relevant references to policy and programme documentation:

Characters left: 2000

USE OF POLICIES AND INITIATIVES TO HELP REDUCE THE NUMBERS OF PEOPLE OUT OF WORK FOR HEALTH REASONS

24. Which of the following <u>policies or interventions regarding cardiovascular disease are used</u> in your country?

	My organization only	More organizations	Nationally	No	Don't know
Promotion of increased fruit and vegetable intake	0	0	0	0	0
Community-based health promotion	0	0	0	0	0
Computer-tailored nutrition education	0	0	0	0	0
Legislation to reduce salt content in processed food	0	0	0	0	0
Health promotion by a combination of behavioural therapy, physical exercise and diet	0	0	0	0	0
Cardiac rehabilitation (medically supervised programme focusing on physical, mental and social functioning)	0	0	0	0	0
Mass media campaigns to tackle unhealthy diets and sedentary lifestyle	0	0	0	0	0
Physician counselling to tackle unhealthy diets and sedentary lifestyle	0	0	0	0	0

School-based interventions focusing on healthy eating and physical exercise

	0	0	0	0	0
Food advertising regulation	0	0	0	0	0
Food labelling	0	0	0	0	0
Fiscal measures	0	0	0	0	0

25. Which of the following <u>policies or interventions regarding mental health are used</u> in your country?

	My organization only	**More organizations**	**Nationally**	**No**	**Don't know**
Treating depression (e.g. cognitive-behavioural therapy, counselling, pharmacotherapy)	0	0	0	0	0
Preventing depression (e.g. skills training, preventive screening)	0	0	0	0	0
Health promotion targeted at both physical and psychosocial environments at work	0	0	0	0	0
Supported employment programmes (e.g. training to cope with work pressure and stress)	0	0	0	0	0
Training to improve communication skills and feedback	0	0	0	0	0
Regular training of health professionals in recognizing symptoms of depression	0	0	0	0	0

26. Which of the following <u>policies or interventions regarding musculoskeletal diseases are used</u> in your country?

	My organization only	**More organizations**	**Nationally**	**No**	**Don't know**
Ergonomic workplace support	0	0	0	0	0
Educational interventions/training (back schools, instructions in proper lifting techniques)	0	0	0	0	0
Physical exercise (strengthening back muscles, increasing flexibility, strength or fitness in general, with or without supervision)	0	0	0	0	0
Personal appliances (back belts, shoe inserts)	0	0	0	0	0
Administrative interventions (work policies)	0	0	0	0	0
Ergonomic equipment (assistive devices, e.g. lifts for moving patients)	0	0	0	0	0
Multidisciplinary rehabilitation interventions (often including a mix of education, cognitive behavioural components, organisational elements and exercise)	0	0	0	0	0
Mechanical exposure interventions (focus on changing the design of tools, such as the computer mouse or keyboard)	0	0	0	0	0

27. Which of the following <u>policies or interventions regarding accidental injuries at work are used</u> in your country?

	My organization only	More organizations	Nationally	No	Don't know
Multi-component safety campaign	0	0	0	0	0
Drug-free workplace programme	0	0	0	0	0
Legislation/enforcement to ban pesticides	0	0	0	0	0
European safety standards for protective equipment at work	0	0	0	0	0
Educational safety and prevention programmes	0	0	0	0	0
Safety devices (e.g. tools, equipment)	0	0	0	0	0
Creation of awareness and responsibility towards healthy behaviour among the employees	0	0	0	0	0
Comprehensive workplace health promotion programmes	0	0	0	0	0

28. Which of the following <u>policies or interventions regarding respiratory diseases/lung cancer are used</u> in your country?

	My organization only	More organizations	Nationally	No	Don't know
Legislation to create smoke-free worksites	0	0	0	0	0
Legislation to create smoke-free public places	0	0	0	0	0
Individual and group counselling to quit smoking	0	0	0	0	0
Pharmacological treatment to quit smoking	0	0	0	0	0
Taxation of tobacco products	0	0	0	0	0
Financial support to quit smoking	0	0	0	0	0
Combination of advice and nicotine replacement therapy and/or pharmacotherapy	0	0	0	0	0
Comprehensive advertising and promotion bans of tobacco products, logos and brand names	0	0	0	0	0
Public information campaigns	0	0	0	0	0
Health warning labels on tobacco products	0	0	0	0	0

29. Which of the following <u>policies or interventions regarding alcohol use disorders are used</u> in your country?

	My organization only	More organizations	Nationally	No	Don't know
Treating alcohol substance abuse (e.g. brief interventions, behavioural skill training)	0	0	0	0	0
Preventing alcohol and substance abuse (e.g. testing at worksite)	0	0	0	0	0
Regular training of health professionals in screening and brief interventions	0	0	0	0	0
Physician counselling in emergency rooms for adolescents with injuries	0	0	0	0	0
Screening and brief counselling interventions in primary care	0	0	0	0	0
National rules to prevent illegal production and sales of home- or informally produced alcoholic beverages	0	0	0	0	0
Policies aiming to control public alcohol sales in pubs and clubs (e.g. denying alcohol service to those that are already intoxicated or underage)	0	0	0	0	0
Restrictions on alcohol sales at specific events (e.g. football games)	0	0	0	0	0
Measures reducing the number of retail outlets	0	0	0	0	0
Fiscal measures, such as increasing taxes	0	0	0	0	0
Laws limiting time periods for off-licensed sales (e.g. shop selling)	0	0	0	0	0
Laws limiting time periods for on-licensed sales (e.g. bars)	0	0	0	0	0
Minimum drinking age	0	0	0	0	0
Recommendations by government restricting sales to adolescents	0	0	0	0	0
Law restricting sales to adolescents	0	0	0	0	0
Legally binding regulations on alcohol advertising	0	0	0	0	0

30. Which of the following <u>policies or interventions regarding hearing loss are used</u> in your country?

	My organization only	More organizations	Nationally	No	Don't know
Mandatory hearing loss prevention programmes (e.g. personal noise protection devices, workplace layout)	0	0	0	0	0

31. Which of the following <u>policies or interventions regarding road accidents are used</u> in your country?

	My organization only	More organizations	Nationally	No	Don't know
Separating different types of road users	0	0	0	0	0
Increasing the minimum legal drinking age	0	0	0	0	0
Sobriety checkpoints	0	0	0	0	0
Greater use of safer modes of transport	0	0	0	0	0
Introducing and enforcing motorcycle helmet laws	0	0	0	0	0
Child-passenger restraints	0	0	0	0	0
Enforcing seat-belt laws	0	0	0	0	0
Introducing seat-belt laws	0	0	0	0	0
Daytime running lights on motorcycles	0	0	0	0	0
Graduated driver licensing systems	0	0	0	0	0
Enforcing laws on Blood Alcohol Content (BAC) limits	0	0	0	0	0
Introducing laws on Blood Alcohol Content (BAC) limits	0	0	0	0	0
Increase legal age of car drivers from 16 to 18 years	0	0	0	0	0
Increase legal age of motorcyclists from 16 to 18 years	0	0	0	0	0

32. Which of the following <u>policies or interventions regarding the combination of diseases are used</u> in your country?

	My organization only	More organizations	Nationally	No	Don't know
Worksite nutrition programmes (e.g. modification of cafeteria offerings or vending machine content, health information)	0	0	0	0	0
Physical activity programmes	0	0	0	0	0
Speed-reduction measures	0	0	0	0	0
Traffic-calming measures	0	0	0	0	0
Bio-psychosocial interventions	0	0	0	0	0
Relocate responsibilities towards the workplace stakeholders	0	0	0	0	0
Disability management approach linking the workplace and external interventions for proactive reintegration strategies	0	0	0	0	0
Vocational interventions	0	0	0	0	0
Financial incentives/support for individuals or companies	0	0	0	0	0
Early return to work interventions (e.g. return to work coordinator, adapted work)	0	0	0	0	0

Subsidies for workplace adaptations	0	0	0	0	0
Layout of public space ensuring sufficient services (e.g. sport facilities, meeting places)	0	0	0	0	0
Measures to reduce traffic emissions (e.g. transport vehicle management, sufficient safe cycle paths, subsidies for the use of carbon filters)	0	0	0	0	0
Health in all policies	0	0	0	0	0
Health promotion campaign	0	0	0	0	0

33. Please provide information on any other policies or interventions in place that are not listed in the previous questions:

(COST-)EFFECTIVENESS OF POLICIES AND INITIATIVES TO HELP REDUCE THE NUMBERS OF PEOPLE OUT OF WORK FOR HEALTH REASONS

34. Are you aware of the (cost-)effectiveness of any of the above mentioned disease category related policies or interventions in your country or organization?

	Yes	No	Don't know
A. Cardiovascular diseases	0	0	0
B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

35. If you have answered yes, please specify for which policies or interventions:

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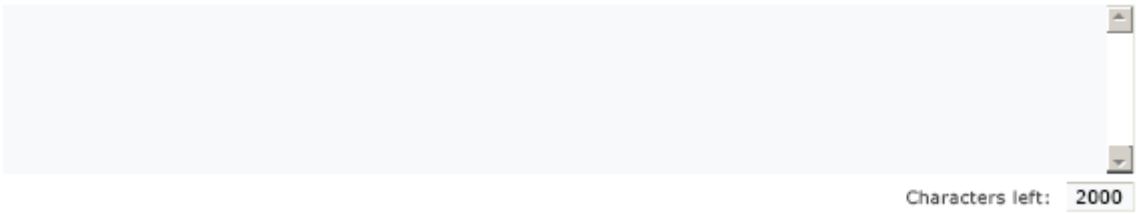
MONITORING (COST-)EFFECTIVENESS OF POLICIES AND INITIATIVES TO HELP REDUCE THE NUMBERS OF PEOPLE OUT OF WORK FOR HEALTH REASONS

36. Is the (cost-)effectiveness of any of the above mentioned disease category related policies or interventions monitored and/or measured in your country or organization?

	Yes	No	Don't know
A. Cardiovascular diseases	0	0	0

B. Mental health	0	0	0
C. Musculoskeletal diseases	0	0	0
D. Accidental injuries at work	0	0	0
E. Respiratory diseases	0	0	0
F. Alcohol use disorder	0	0	0
G. Hearing loss	0	0	0
H. Lung cancer	0	0	0
I. Road accidents	0	0	0

37. Please specify by which organization:



38. Do the following <u>policies or interventions regarding cardiovascular disease help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	Moderate	A little	No	Don't know
Promotion of increased fruit and vegetable intake	0	0	0	0	0
Community-based health promotion	0	0	0	0	0
Computer-tailored nutrition education	0	0	0	0	0
Legislation to reduce salt content in processed food	0	0	0	0	0
Health promotion by a combination of behavioural therapy, physical exercise and diet	0	0	0	0	0
Cardiac rehabilitation (medically supervised programme focusing on physical, mental and social functioning)	0	0	0	0	0
Mass media campaigns to tackle unhealthy diets and sedentary lifestyle	0	0	0	0	0
Physician counselling to tackle unhealthy diets and sedentary lifestyle	0	0	0	0	0
School-based interventions focusing on healthy eating and physical exercise	0	0	0	0	0
Food advertising regulation	0	0	0	0	0
Food labelling	0	0	0	0	0
Fiscal measures	0	0	0	0	0

39. Do the following <u>policies or interventions regarding mental health help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	Moderate	A little	No	Don't know
Treating depression (e.g. cognitive-behavioural therapy, counselling, pharmacotherapy)	0	0	0	0	0
Preventing depression (e.g. skills training, preventive screening)	0	0	0	0	0
Health promotion targeted at both physical and psychosocial environments at work	0	0	0	0	0
Supported employment programmes (e.g. training to cope with work pressure and stress)	0	0	0	0	0
Training to improve communication skills and feedback	0	0	0	0	0
Regular training of health professionals in recognizing symptoms of depression	0	0	0	0	0

40. Do the following <u>policies or interventions regarding musculoskeletal diseases help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	Moderate	A little	No	Don't know
Ergonomic workplace support	0	0	0	0	0
Educational interventions/training (back schools, instructions in proper lifting techniques)	0	0	0	0	0
Physical exercise (strengthening back muscles, increasing flexibility, strength or fitness in general, with or without supervision)	0	0	0	0	0
Personal appliances (back belts, shoe inserts)	0	0	0	0	0
Administrative interventions (work policies)	0	0	0	0	0
Ergonomic equipment (assistive devices, e.g. lifts for moving patients)	0	0	0	0	0
Multidisciplinary rehabilitation interventions (often including a mix of education, cognitive behavioural components, organisational elements and exercise)	0	0	0	0	0
Mechanical exposure interventions (focus on changing the design of tools, such as the computer mouse or keyboard)	0	0	0	0	0

41. Do the following <u>policies or interventions regarding accidental injuries at work help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	Moderate	A little	No	Don't know
Multi-component safety campaign	0	0	0	0	0

Drug-free workplace programme	0	0	0	0	0
Legislation/enforcement to ban pesticides	0	0	0	0	0
European safety standards for protective equipment at work	0	0	0	0	0
Educational safety and prevention programmes	0	0	0	0	0
Safety devices (e.g. tools, equipment)	0	0	0	0	0
Creation of awareness and responsibility towards healthy behaviour among the employees	0	0	0	0	0
Comprehensive workplace health promotion programmes	0	0	0	0	0

42. Do the following <u>policies or interventions regarding respiratory diseases/lung cancer help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	Moderate	A little	No	Don't know
Legislation to create smoke-free worksites	0	0	0	0	0
Legislation to create smoke-free public places	0	0	0	0	0
Individual and group counselling to quit smoking	0	0	0	0	0
Pharmacological treatment to quit smoking	0	0	0	0	0
Taxation of tobacco products	0	0	0	0	0
Financial support to quit smoking	0	0	0	0	0
Combination of advice and nicotine replacement therapy and/or pharmacotherapy	0	0	0	0	0
Comprehensive advertising and promotion bans of tobacco products, logos and brand names	0	0	0	0	0
Public information campaigns	0	0	0	0	0
Health warning labels on tobacco products	0	0	0	0	0

43. Do the following <u>policies or interventions regarding alcohol use disorder help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	Moderate	A little	No	Don't know
Treating alcohol substance abuse (e.g. brief interventions, behavioural skill training)	0	0	0	0	0
Preventing alcohol and substance abuse (e.g. testing at worksite)	0	0	0	0	0
Regular training of health professionals in screening and brief interventions	0	0	0	0	0
Physician counselling in emergency rooms for adolescents with injuries	0	0	0	0	0
Screening and brief counselling interventions in primary care					

	0	0	0	0	0
National rules to prevent illegal production and sales of home- or informally produced alcoholic beverages	0	0	0	0	0
Policies aiming to control public alcohol sales in pubs and clubs (e.g. denying alcohol service to those that are already intoxicated or underage)	0	0	0	0	0
Restrictions on alcohol sales at specific events (e.g. football games)	0	0	0	0	0
Measures reducing the number of retail outlets	0	0	0	0	0
Fiscal measures, such as increasing taxes	0	0	0	0	0
Laws limiting time periods for off-licensed sales (e.g. shop selling)	0	0	0	0	0
Laws limiting time periods for on-licensed sales (e.g. bars)	0	0	0	0	0
Minimum drinking age	0	0	0	0	0
Recommendations by government restricting sales to adolescents	0	0	0	0	0
Law restricting sales to adolescents	0	0	0	0	0
Legally binding regulations on alcohol advertising	0	0	0	0	0

44. Do the following <u>policies or interventions regarding hearing loss help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	**Moderate**	**A little**	**No**	**Don't know**
Mandatory hearing loss prevention programmes (e.g. personal noise protection devices, workplace layout)	0	0	0	0	0

45. Do the following <u>policies or interventions regarding road accidents help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	**Moderate**	**A little**	**No**	**Don't know**
Separating different types of road users	0	0	0	0	0
Increasing the minimum legal drinking age	0	0	0	0	0
Sobriety checkpoints	0	0	0	0	0
Greater use of safer modes of transport	0	0	0	0	0
Introducing and enforcing motorcycle helmet laws	0	0	0	0	0

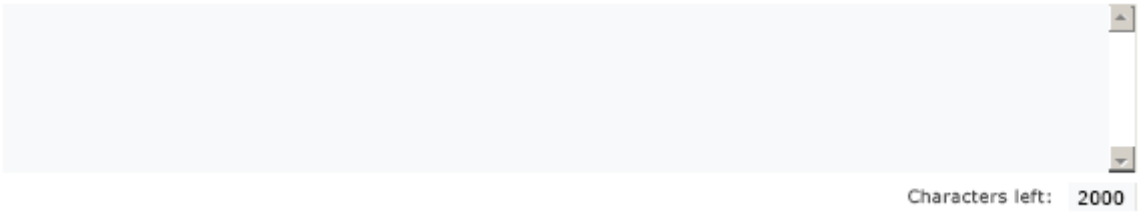
Child-passenger restraints	0	0	0	0	0
Enforcing seat-belt laws	0	0	0	0	0
Introducing seat-belt laws	0	0	0	0	0
Daytime running lights on motorcycles	0	0	0	0	0
Graduated driver licensing systems	0	0	0	0	0
Enforcing laws on Blood Alcohol Content (BAC) limits	0	0	0	0	0
Introducing laws on Blood Alcohol Content (BAC) limits	0	0	0	0	0
Increase legal age of car drivers from 16 to 18 years	0	0	0	0	0
Increase legal age of motorcyclists from 16 to 18 years	0	0	0	0	0

46. Do the following <u>policies or interventions regarding the combination of diseases help reducing</u> the number of people out of work for health reasons in your country?

	Considerably	**Moderate**	**A little**	**No**	**Don't know**
Worksite nutrition programmes (e.g. modification of cafeteria offerings or vending machine content, health information)	0	0	0	0	0
Physical activity programmes	0	0	0	0	0
Speed-reduction measures	0	0	0	0	0
Traffic-calming measures	0	0	0	0	0
Bio-psychosocial interventions	0	0	0	0	0
Relocate responsibilities towards the workplace stakeholders	0	0	0	0	0
Disability management approach linking the workplace and external interventions for proactive reintegration strategies	0	0	0	0	0
Vocational interventions	0	0	0	0	0
Financial incentives/support for individuals or companies	0	0	0	0	0
Early return to work interventions (e.g. return to work coordinator, adapted work)	0	0	0	0	0
Subsidies for workplace adaptations	0	0	0	0	0
Layout of public space ensuring sufficient services (e.g. sport facilities, meeting places)	0	0	0	0	0
Measures to reduce traffic emissions (e.g. transport vehicle management, sufficient safe cycle paths, subsidies for the use of carbon filters)	0	0	0	0	0
Health in all policies	0	0	0	0	0
Health promotion campaign	0	0	0	0	0

47. Please provide information on any other policies or interventions in place that are not listed in the previous questions:

48. If you wish to further elaborate on your answers to the questions above or if you have any comments on the survey, please use the space provided below:



Annex 3 Survey results

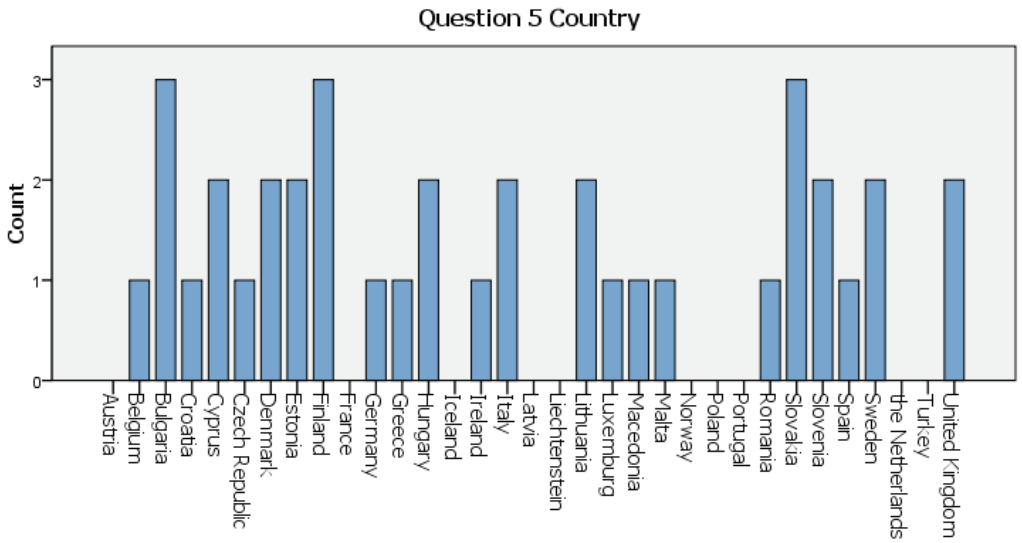
Response

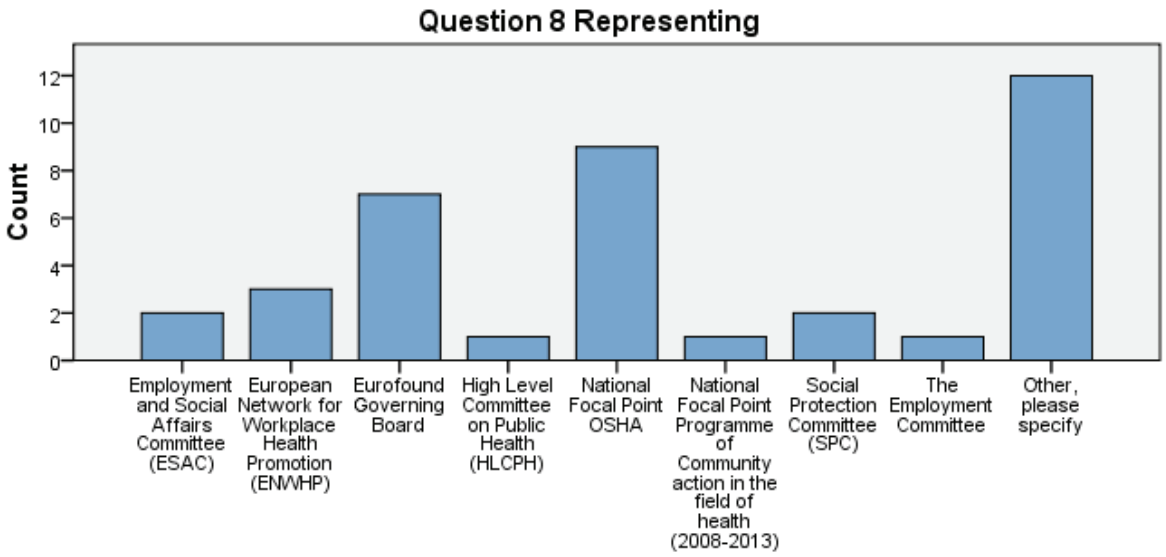
The response to the survey is summarized in the following table.

Number of invitations sent	Total answers	Complete answers	Partial answers	Invalid answers	Total valid answers
475	58	29	9	20	**38**

Those respondents who are labelled as invalid, didn't fill in the survey (n=15), did not provide meaningful answers (n=3), completed the survey twice (n=1) or requested that their answers were disregarded (n=1).

The following charts show the distribution of respondents in account to the country and the Committee or Board they represent.





Respondents that answered they represented an organization that was not mentioned, represented:

- Ministry of Labour (3);
- Ministry of Health (3);
- ex member of Eurofound Governing Board (1);
- Member of Advisory Committee on Safety and Health at Work, ETUC REHS - HESA Department (1);
- Public Research Institution (1);
- National level (1);
- Private Enterprise (1);
- Not clear (1).

Results

In this paragraph, responses to questions of the survey are presented in custom tables.

AWARENESS OF POLICIES AND INITIATIVES TO HELP REDUCE THE NUMBERS OF PEOPLE OUT OF WORK FOR HEALTH REASONS

Question 9 Is an overall national and/or regional policy or initiative in place in your country that addresses the following diseases?

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	21	55,3%	5	13,2%	12	31,6%	38	100,0%
Mental health	26	68,4%	4	10,5%	8	21,1%	38	100,0%
Musculoskeletal disease	17	44,7%	7	18,4%	14	36,8%	38	100,0%
Accidental injuries at work	29	76,3%	5	13,2%	4	10,5%	38	100,0%
Respiratory disease	13	34,2%	7	18,4%	18	47,4%	38	100,0%
Alcohol use disorder	22	57,9%	8	21,1%	8	21,1%	38	100,0%
Hearing loss	11	28,9%	8	21,1%	19	50,0%	38	100,0%
Lung cancer	16	42,1%	6	15,8%	16	42,1%	38	100,0%
Road accidents	21	55,3%	5	13,2%	12	31,6%	38	100,0%

Question 10 National and/or regional policies or initiatives that are in place

A szív és érrendszeri betegségek megelozésének és gyógyításának nemzeti programja, Selye János Lelki Egészség Program, Csont és Izület Évtizede 2000-2010, Nemzeti Rákellenes Program

At national level: Social Security Authorities, Ministry of Labour and Immigration, Ministry of Health and Social policy, National Institute for Occupational Safety and Health at Work, National Commission on Health and Safety at Work, Insurance Company of (…? Not complete)

Cardiovascular disease and musculoskeletal disease as part of National Health Programme ; Mental Health special Government Program 2007-2011 MASTO; Accidental injuries as part of general work injury programs; Alcohol use : Alcohol Program 2008-2011

Compensation for industrial injuries and diseases

Framework Agreement on Work Related Stress, Framework Agreement on Violence and Harassment, Common Policy signed between Social Partners (trade unions, employers organisations, government) for reducing accidents in the construction sector

http://www.mz.gov.si/si/delovna_podrocja/ http://www.ivz.si/

Law of July 31 the 2006 (code du travail), paragraph : incapacity of workers and the professional reintegration

law of the well being and the royal decree's transposing the European directives regarding safety and health at work

Masto-project (2007-2011) to tackle the effects of depression at work, Accident prevention and MSDs are part of the National Forum for Well-being at work, Alcohol programme 2008-2011, Team to prevent all accidents (road, work, home and leisure)

national and regional health programmes

National Health Strategy (2009-2020) - covers mental health etc. Strategy of injury prevention (2008) ; National Cancer Strategy (2007-2015);National Strategy on prevention of Cardiovascular Diseases (2005-2020); National Alc0ohol Policy (2009)

National program for cardiovascular diseases; Noninfection diseases prophylaxis 2007-2013; National Mental Health Policy; and etc.

National Programme for Health and Safety at Work

National programme for prevention of cardiovascular diseases, National programme of mental health, National health promotion programme, National action plan for alcohol related problems for the years 2006 - 2010

National Public Health Programme, Prevention and Curing of Heart and Cardiovascular Diseases National

Programme

national strategy on health and safety at work

Pathways to Work (Incapacity Benefits Reforms), Mental Health and Employment Strategy, Health and Safety at Work Act

separate strategic plans from either Government Departments or tripartite agencies such as the Occupational Health and Safety Authority

Strumenti del collocamento mirato L.68/99, Convenzioni ex Articolo 14 D.lgs.276, Tutela del posto di lavoro 3 anni per alcooldipendenti e tossicodipendenti DPR 309/90, D.lgs.81/08 Salute e sicurezza sul lavoro, Diritto al part time reversibile per roncolo

the Danish working environmental strategy 2006-2010 set priority to reduce musculoskeletal diseases, psychosocial risk factors, accidental injuries and noise at work

There are several National and regional policies and initiatives: National health Plan, Regional Health Plans, etc.

There is approved by Government of the Republic of Lithuania OSH Strategy 2009-2012 with measures implementation plan (25 06 2009 No.669)

Question 11 Have any policy or intervention targeting specific groups been introduced in your country to reduce socioeconomic disparity in the following disease categories?

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	11	28,9%	8	21,1%	19	50,0%	38	100,0%
Mental health	17	44,7%	9	23,7%	12	31,6%	38	100,0%
Musculoskeletal disease	9	23,7%	12	31,6%	17	44,7%	38	100,0%
Accidents and injuries at work	16	42,1%	9	23,7%	13	34,2%	38	100,0%
Respiratory disease	6	15,8%	11	28,9%	21	55,3%	38	100,0%
Alcohol use disorder	13	34,2%	11	28,9%	14	36,8%	38	100,0%
Hearing loss	10	26,3%	9	23,7%	19	50,0%	38	100,0%
Lung cancer	8	21,1%	11	28,9%	19	50,0%	38	100,0%
Road accidents	14	36,8%	9	23,7%	15	39,5%	38	100,0%

Question 12 Please specify for each disease which of the following groups are targeted (multiple answers possible)

	Social disadvantaged groups in general		Ethnic minorities		Other	
	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	8	72,7%	2	18,2%	5	45,5%
Mental health	12	70,6%	1	5,9%	8	47,1%
Musculoskeletal disease	7	77,8%	1	11,1%	4	44,4%
Accidents and injuries at work	9	56,3%	3	18,8%	9	56,3%
Respiratory disease	5	83,3%	1	16,7%	2	33,3%
Alcohol use disorder	7	53,8%	2	15,4%	8	61,5%
Hearing loss	7	70,0%	0	0,0%	4	40,0%
Lung cancer	6	75,0%	2	25,0%	4	50,0%
Road accidents	8	57,1%	2	14,3%	9	64,3%

People were asked to specify which other groups have been targeted if they answered other on the question above. The following groups were mentioned:

- Employees;
- Young People do a specific job;
- the general public (2 cases);
- the work-related accidents and road accidents are covered by the Association of Assurance Companies. When the worker has a permanent disability related to the accident, the Assurance company will give to the worker a certain amount of money,(every month until the retirement by age) related to the percentage of the permanent disability;
- for the whole population;

- Sectors and professions in the highest risk. Young persons (alcohol);
- Estonian Population, especially young people;
- workers 40+, workers 50+, women, men, young people.

WORKPLACE HEALTH AND SAFETY POLICY AND INITIATIVES

Question 14 Has any national or regional policy or initiative on workplace health and safety been introduced in your country that is aimed at

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	14	40,0%	10	28,6%	11	31,4%	35	100,0%
Mental health	19	54,3%	8	22,9%	8	22,9%	35	100,0%
Musculoskeletal disease	18	51,4%	6	17,1%	11	31,4%	35	100,0%
Accidental injuries at work	27	77,1%	2	5,7%	6	17,1%	35	100,0%
Respiratory disease	14	40,0%	6	17,1%	15	42,9%	35	100,0%
Alcohol use disorder	19	54,3%	7	20,0%	9	25,7%	35	100,0%
Hearing loss	14	40,0%	6	17,1%	15	42,9%	35	100,0%
Lung cancer	15	42,9%	6	17,1%	14	40,0%	35	100,0%
Road accidents	15	42,9%	7	20,0%	13	37,1%	35	100,0%

Question 15 Relevant references to policy or programme documentation – workplace health and safety

The health and safety executive cooperating with bipartite safety and health council organised according to business branches focus on prevention of specific injuries and diseases with high prevalence within their branch of industry.

It is impossible to list them all. The Italian laws, since 1978 National Health System and all laws on health and safety include all these and many others. The new Law also indicates clearly that the systems not only must protect but must improve the health and wellbeing of the workers (WHP).

Concerning Mental Factors: Framework Agreement on Work Related Stress Framework Agreement on Violence and Harassment Concerning Accidents at Work: Common Policy signed between Social Partners (trade unions, employers organisations, government) for reducing accidents in the construction sector We also have sign the National Strategy on Health and Safety at Work for 2007-2012 amongst all social Partners.

The Code of the Social Assurances

Prevention of musculoskeletal diseases is enforced through the mandatory actions which employer is obliged to perform in workplace. The requirements related to musculoskeletal diseases prevention are listed in Health and Safety at Work Law, Regulation on manual handling of loads and Regulation on work with display screen equipment. Supervision of activities are performed by inspection. Activities related to prevention of injuries at work are listed in National Programme for Health and Safety at Work. Activities regarding hearing loss prevention are defined by Regulation on health and safety at noise exposure at work and include measures for technical noise reduction, noise level limits at work, personal protective devices, health surveillance.

National Public Health Programme, Prevention and Curing of Heart and Cardiovascular Diseases National Programme The Hungarian Labour Inspectorate (OMMF) is entitled to check any work in the territory of Hungary, regardless of residence and nationality or the title by which the job is being performed in Hungary. The procedures of the OMMF are governed by Act LXXV of 1996 on Labour Inspections and Act CXL of 2004 on the General Rules of the Public Administration Authority Procedure and Services. In performing inspections, the supervisor is especially entitled to: -enter to perform an inspection at all workplaces and resort to police contribution when prevented from it. -inspect registers necessary for the inspection make Xerox copies and to seize these for eight days, -make sound and image recordings with regard to the inspection, -ask for information from persons at the workplace and establish their identities, -use the employee's social security number. Its legal status, duties and competence are defined by the Government Decree No 295/2006 (XII.23). on the Hungarian Labour Inspectorate

In 2005-2011 the Danish Working Environment Authority makes screening visits to every enterprise in Denmark to check that their health and safety conditions are in order (http://www.at.dk/REGLER/Love/SAM-268-Arbejdsmiljoloven.aspx).

Health and Safety Authority's Strategy Statement 2010 - 2012, also sectoral plans

All these are covered by the Health and Safety at Work Act

law of the well being 4/08/1996 code of the well-being national strategy 2008-2012 collective agreement regarding stress collective agreement regarding alcohol and drugs prohibition of tobacco in the horeca

Safety and health at work place law no 90/2006 - see the portal of Labour Inspection

European and National Information and Inspection Campaigns on Musculoskeletal Disorders, Hearing Loss, Asbestos National OSH Strategy 2009-2012

Long term Programme on improvement of Health of population of the Czech republic (Health 21) National policy for safety and health at work + its action plan projects on improvement of occupational health in general

Several national programmes on accidents, coping at work, well-being at work, including reducing physical and mental stress at work. Legislation and good practices to reduce smoking. Reducing radon at workplaces

Detailed information from key organisations and OHS programmes and campaigns at national or regional levels can be obtained at http://osha.europa.eu/fop/spain/es/index.stm

Health and Safety ant Work Strategy and related subprograms

National Policy on Occupational Health and Safety (2010-2013)

Implementazione del sistema di salute e sicurezza nei luoghi di lavoro ex D.lgs 81/08 integrato con D.lgs 106/09

1. Prophylactic health check-ups, primary and secondary health care services are provided, following Order of the Minister of Health of the Republic of Lithuania No 301 of May 31, 2000 "On Prophylactic Health Check-ups in Health Care institutions" (Valstybės Žinios (Official Gazette), Nr. 47-1365, 2000). 2. Alcohol use – State Alcohol Control programme (approved by the Government of the Republic of Lithuania on February 25,

1999) 3. Road accidents – The State Programme for Road Safety 2005-2010 (approved by the Government of the Republic of Lithuania on 8 July 2005). 4. Accidental injuries at work – Occupational Safety and Health Strategy for 2009-2012 year (approved by the Government of the Republic of Lithuania on June 25, 2009) 5. Republic of Lithuania law on safety and health at work (1 July 2003 no IX-1672) (as last amended on 7 June 2007 – no. x-1169) 6. Republic of Lithuania law on social insurance of occupational accidents and occupational diseases (December 23, 1999, no.VIII-1509, (last amended on 22 December 2009 – no. xi-640) 7. The procedure for occupational risk assessment in companies is established in the Occupational Risk Assessment Regulations. Occupational risk assessment is carried out with the help of the occupational safety and health service of the company, bodies measuring the risk factors certified by the State Public Health Service and licensed occupational safety and health experts. The assessment includes measurement of risks to employees posed by every factor (chemical, physic, biological, ergonomic, psychosocial, physical) of the work environment. When the risks are assessed, Occupational Risk Assessment Cards are completed for each risk assessment object. Information in the Occupational Risk Assessment Cards must be summarised and the Document of Occupational Safety and Health Status in the Company must be completed in the established form.

http://www.mddsz.gov.si/si/ http://osha.europa.eu/fop/slovenia/sl http://www.cilizadelo.si/

A link to Strategy of Cyprus on health and Safety at work for the period of 2007-2012 and an action plan can be found in our English website in the home page, http://www.mlsi.gov.cy/dli Study on the establishment and operation of health surveillance system of employed person in Cyprus can be also found in our English website under research and studies, http://www.mlsi.gov.cy/dli.

National programme of security of health and safety of work, National cardiovascular programme, cancer programmes

WORKPLACE HEALTH PROMOTION INITIATIVES

Question 16 Has any national or regional policy or initiative on health promotion been introduced in your country that is aimed at

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	14	41,2%	3	8,8%	17	50,0%	34	100,0%
Mental health	16	47,1%	4	11,8%	14	41,2%	34	100,0%
Musculoskeletal disease	16	47,1%	4	11,8%	14	41,2%	34	100,0%
Accidental injuries at work	14	41,2%	5	14,7%	15	44,1%	34	100,0%
Respiratory disease	7	20,6%	8	23,5%	19	55,9%	34	100,0%
Alcohol use disorder	17	50,0%	5	14,7%	12	35,3%	34	100,0%
Hearing loss	8	23,5%	8	23,5%	18	52,9%	34	100,0%
Lung cancer	10	29,4%	6	17,6%	18	52,9%	34	100,0%
Road accidents	11	32,4%	6	17,6%	17	50,0%	34	100,0%

Question 17 Relevant references to policy or programme documentation – health promotion

Education to improve the psychological working environment within the public sector

I can not tell the names of all documents but I can tell you were you can find them: web sites of the regional governments of: Veneto, Bolzano, Trento, Emilia Romagna, Toscana and Piemonte.

Musculoskeletal disease: national back-school programme done operated by the biggest occupational health service Cardiovascular disease: national programme for fitness and balanced diet

During last few years several activities were performed by Croatian Institute for Health Protection and Safety at Work, Trade Unions and Associations of safety experts and occupational physicians. Several meetings, workshops, symposium and leaflets related to musculoskeletal diseases and noise at work were performed.

National Public Health Programme, National Strategy of Injury Prevention, MOVE Europe by National Institute for Health Development

http://www.forebyggelsesfonden.dk/english/

Business Action on Health campaigns Flourishing People Connected Communities (Department of Health March 2010) Scottish and Welsh Backs campaigns

National Inspection and information campaigns

Long term Programme on improvement of Health of population of the Czech republic (Health 21) + involvement activities of European network for workplace health promotion

Health Promotion at company level is promoted through the Spanish Network of Work place Health Promotion, additional campaigns on the mass media have been developed by associations of employers, workers and Ministry of Labour, more information can be found at: http://www.insht.es/portal/site/Insht/menuitem.

1f1a3bc79ab34c578c2e8884060961ca/?vgnextoid=d35fec2b5bae3110Vgn

VCM100000dc0ca8c0RCRD&vgnextchannel=e92946e1de6d1110VgnVCM100000dc0ca8c0RCRD http://www.ugt.es/saludlaboral/ http://www.ccoo.es/csccoo/menu.do?Areas:Salud_laboral:Campanas

National Health Development Plan (2010-2013)

Campagne pubblicitarie sulla sicurezza nelle strade, Patente e punti, Formazione e Informazione aziendale sulle conseguenze dell'abuso di alcool (Es. Alcool SOS Est-Ovest della Regione Lazio), Materiale informativo sui diritti di congedi e supporto in caso di tumore.

1. National program for cardiovascular diseases 2. LAW ON MENTAL HEALTH CARE IN LITHUANIA 3. LAW ON THE CONTROL OF NARCOTIC AND PSYCHOTROPIC SUBSTANCES 4. STATE PROGRAMME ON MENTAL DISEASE PREVENTION 5. SUICIDE PREVENTION PROGRAMME 6. STATE TOBACCO CONTROL PROGRAMME 7. The State Programme for Road Safety 2005-2010 8. Occupational Safety and Health Strategy for 2009-2012 year 9. Law on social insurance of occupational accidents and occupational diseases 10. State Alcohol Control programme 11. National Tuberculosis Prevention and Control Program and etc.

The Department of Labour Inspection is the national focal point of the European Network of Workplace Health Promotion and is participating in various projects of the above Network. These projects aim to track down those ways of life and behaviour which promote good health in workplace and which focus on the sectors of physical exercise, quitting smoking, nutrition and mental health. A link with more information can be found in our Greek website on the main home page, http://www.mlsi.gov.cy/dli. Some documents listed there are in English language.

http://www.szivbaratmunkahely.hu/ http://www.oefi.hu/lelekrehangolva/index.html

INITIATIVES TO HELP RETAIN PEOPLE IN WORK WHO SUFFER FROM A CHRONIC DISEASE

Question 18 Has any national or regional policy or initiative been introduced in your country to help retain people in work who suffer from a chronic disease aimed at

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	9	30,0%	6	20,0%	15	50,0%	30	100,0%
Mental health	13	43,3%	5	16,7%	12	40,0%	30	100,0%
Musculoskeletal disease	10	33,3%	6	20,0%	14	46,7%	30	100,0%
Accidental injuries at work	11	36,7%	5	16,7%	14	46,7%	30	100,0%
Respiratory disease	7	23,3%	6	20,0%	17	56,7%	30	100,0%
Alcohol use disorder	10	33,3%	7	23,3%	13	43,3%	30	100,0%
Hearing loss	6	20,0%	7	23,3%	17	56,7%	30	100,0%
Lung cancer	8	26,7%	6	20,0%	16	53,3%	30	100,0%
Road accidents	10	33,3%	5	16,7%	15	50,0%	30	100,0%

Question 19 Relevant references to policy or programme documentation – help retain people in work who suffer from a chronic disease

New tripartite policy to promote "return to work" programmes based on legislation from 2008

In general the answer would be yes to all, but in specific the answer would be NO to all. There is a general policy, laws, principles, etc... but in practice not much is done.

Public health objectives Eleven objectives have been defined for all work in the field of public health: 1.Participation and influence in society 2.Economic and social prerequisites 3.Conditions during childhood and adolescence 4.Health in working life 5.Environments and products 6.Health-promoting health services 7.Protection against communicable diseases 8.Sexuality and reproductive health 9.Physical activity 10.Eating habits and food 11.Tobacco, alcohol, illicit drugs, doping and gambling

The law of July 31st 2006 (code du travail) paragraph : incapacity of workers and the professional reintegration allows to help workers with medical problems to stay in their job with economic help for employers if necessary

National Institute for Rehabilitation and Social Expert proceeds in the matters of the relevant legislation within the competence of the country-wide jurisdiction. The 213/2007. (VIII.7) Government Regulation established the status and procedure for the detailed rules of the National Institute for Rehabilitation and Social Expert.

http://www.forebyggelsesfonden.dk/english/

http://www.bm.dk/Beskaeftigelsesomraadet/Et%20godt%20arbejdsliv/

~/media/BEM/Files/Dokumenter/Beskaeftigelsesomraadet/Sygefravaer/

trepartsaftale_nedbringe_sygefravaer.ashx

Improved Access to Psychological Therapies (IAPT) Employment Advisers Various pilots on lower back pain

specific program of the Fund for Occupational Diseases

Long term Programme on improvement of Health of population of the Czech republic (Health 21) etc. relevant projects and activities on healthy ageing

Partial sick leave -legislation. Good practice on making the return from long sick leave smoother. Agreements by social partners on the procedures in case of alcohol abuse at work.

See programs above For Mental disorders Masto In general programs are not links to a particular disease but cover health disorders and reduced work ability in general

Ex legem: diritto all'assenza per malattia, diritto a permessi e congedi ex L.104 a motivo di handicap, ... Contrattazione nazionale: superamento dei periodi di comporto, flessibilità orarie aggiuntive (Es. Banca delle ore), diritto al part-time reversibile, ... Contrattazione di secondo livello: elementi aggiuntivi. Adesione volontaria delle imprese nell'ottica della CSR: Codice etico dei lavoratori affetti da patologie oncologiche, Diversity Management

1. Order of the Minister of Health on Medical rehabilitation and recurrence treatment organisation 2. Standards of Addictive Disorders medical treatment and rehabilitation. 3. NGO Association of musculoskeletal diseases and Disability and Working Capacity Assessment Office under the Ministry of Social security and labour are cooperating with vocational rehabilitation institutions and Agency for employment. 4. Every employee must be provided with secure and healthy working environment irrespective of the activities of the company, type of employment contract, number of employees, profitability of the company, work place, working environment, nature of work, duration of the working day or shift, citizenship, race, nationality, gender, sexual orientation, age, social background, political or religious beliefs of the employee. Creation of secure and healthy working conditions in all work-related aspects is the duty of the employer. Occupational safety and health measures in the company are funded by the employer.

INITIATIVES TO PROMOTE REHABILITATION AND REINTEGRATION INTO WORK FOLLOWING A SERIOUS HEALTH EVENT

Question 20 Has any national or regional policy or initiative been introduced in your country to promote rehabilitation and reintegration into work following a serious health event that is aimed at

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	8	26,7%	8	26,7%	14	46,7%	30	100,0%
Mental health	10	33,3%	8	26,7%	12	40,0%	30	100,0%
Musculoskeletal disease	7	23,3%	10	33,3%	13	43,3%	30	100,0%
Accidental injuries at work	9	30,0%	7	23,3%	14	46,7%	30	100,0%
Respiratory disease	4	13,3%	10	33,3%	16	53,3%	30	100,0%
Alcohol use disorder	7	23,3%	9	30,0%	14	46,7%	30	100,0%
Hearing loss	7	23,3%	8	26,7%	15	50,0%	30	100,0%
Lung cancer	4	13,3%	10	33,3%	16	53,3%	30	100,0%
Road accidents	5	16,7%	10	33,3%	15	50,0%	30	100,0%

Question 21 Relevant references to policy or programme documentation – promote rehabilitation and reintegration into work following a serious health event

Municipal job centres are required to have discussion with employees due to sickness absence of more than 8 weeks

National Institute for Rehabilitation and Social Expert proceeds in the matters of the relevant legislation within the competence of the country-wide jurisdiction. The 213/2007. (VIII.7) Government Regulation established the status and procedure for the detailed rules of the National Institute for Rehabilitation and Social Expert.

http://www.forebyggelsesfonden.dk/english/

Pathways to Work

See answer above not targeting on particular diseases in general

National Health Strategy (2009-2020)

1. Order of the Minister of Health on medical rehabilitation and recurrence treatment organisation 2. Law of Health insurance gives possibility for treatment and rehabilitation with support for patient till 120 (144) days. 3. Standards of Addictive Disorders medical treatment and rehabilitation.

INITIATIVES TO SUPPORT PEOPLE WHO ARE ON LONG TERM SICK LEAVE TO GET BACK INTO WORK

Question 22 Has any national or regional policy or initiative been introduced in your country to support people who are on long term sick leave to get back into work aimed at

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	9	30,0%	7	23,3%	14	46,7%	30	100,0%
Mental health	9	30,0%	7	23,3%	14	46,7%	30	100,0%
Musculoskeletal disease	7	23,3%	7	23,3%	16	53,3%	30	100,0%
Accidental injuries at work	10	33,3%	7	23,3%	13	43,3%	30	100,0%
Respiratory disease	8	26,7%	7	23,3%	15	50,0%	30	100,0%
Alcohol use disorder	9	30,0%	8	26,7%	13	43,3%	30	100,0%
Hearing loss	9	30,0%	7	23,3%	14	46,7%	30	100,0%
Lung cancer	8	26,7%	7	23,3%	15	50,0%	30	100,0%
Road accidents	8	26,7%	7	23,3%	15	50,0%	30	100,0%

Question 23 Relevant references to policy or programme documentation – support people who are on long term sick leave to get back into work

The companies will be subsidised to establish flex-jobs for employees with reduced workability

law of 31 the 2006 about the disability and the professional reintegration

Ministry of Social Affairs and Labour Government regulation about the employment of disabled persons (177/2005. (IX. 02) § 9.)

http://www.bm.dk/Beskaeftigelsesomraadet/Et%20godt%20arbejdsliv/~/media/BEM/

Files/Dokumenter/Beskaeftigelsesomraadet/Sygefravaer/trepartsaftale_nedbringe_sygefravaer.ashx

Improved Access to Psychological Therapies Employment Advisers Fit for work teams in Primary Care - see Working our way to better health (Black Report)

See previous answers

1. Order of the Minister of Health on medical rehabilitation and recurrence treatment organisation 2. Law of Health insurance gives possibility for treatment and rehabilitation with support for patient till 120 (144) days. 3. Standards of Addictive Disorders medical treatment and rehabilitation. 4. Republic of Lithuania law on safety and health at work 5. Republic of Lithuania law on social insurance of occupational accidents and occupational diseases

USE OF POLICIES AND INITIATIVES TO HELP REDUCE THE NUMBERS OF PEOPLE OUT OF WORK FOR HEALTH REASONS

Question 24 Which of the following policies or interventions regarding cardiovascular disease are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Promotion of increased fruit and vegetable intake	0	,0%	6	20,0%	14	46,7%	1	3,3%	9	30,0%	30	100,0%
Community-based health promotion	0	,0%	8	26,7%	11	36,7%	2	6,7%	9	30,0%	30	100,0%
Computer-tailored nutrition education	0	,0%	6	20,0%	2	6,7%	6	20,0%	16	53,3%	30	100,0%
Legislation to reduce salt content in processed food	0	,0%	1	3,3%	10	33,3%	6	20,0%	13	43,3%	30	100,0%
Health promotion by a combination of behavioural therapy, physical exercise and diet	0	,0%	7	23,3%	7	23,3%	1	3,3%	15	50,0%	30	100,0%
Cardiac rehabilitation (medically supervised programme focusing on physical, mental and social functioning)	0	,0%	5	16,7%	9	30,0%	1	3,3%	15	50,0%	30	100,0%
Mass media campaigns to tackle unhealthy diets and sedentary lifestyle	0	,0%	5	16,7%	17	56,7%	1	3,3%	7	23,3%	30	100,0%
Physician counselling to tackle unhealthy diets and sedentary lifestyle	0	,0%	6	20,0%	11	36,7%	1	3,3%	12	40,0%	30	100,0%
School-based interventions focusing on healthy eating and physical exercise	0	,0%	8	26,7%	11	36,7%	0	,0%	11	36,7%	30	100,0%
Food advertising regulation	0	,0%	2	6,7%	9	30,0%	3	10,0%	16	53,3%	30	100,0%
Food labelling	0	,0%	3	10,0%	16	53,3%	1	3,3%	10	33,3%	30	100,0%
Fiscal measures	0	,0%	0	,0%	6	20,0%	4	13,3%	20	66,7%	30	100,0%

Question 25 Which of the following policies or interventions regarding mental health are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Treating depression (e.g. cognitive-behavioural therapy, counselling, pharmacotherapy)	0	,0%	6	20,0%	15	50,0%	2	6,7%	7	23,3%	30	100,0%
Preventing depression (e.g. skills training, preventive screening)	0	,0%	6	20,0%	8	26,7%	6	20,0%	10	33,3%	30	100,0%
Health promotion targeted at both physical and psychosocial environments at work	0	,0%	8	26,7%	11	36,7%	4	13,3%	7	23,3%	30	100,0%
Supported employment programmes (e.g. training to cope with work pressure and stress)	0	,0%	10	33,3%	6	20,0%	4	13,3%	10	33,3%	30	100,0%
Training to improve communication skills and feedback	0	,0%	13	43,3%	3	10,0%	3	10,0%	11	36,7%	30	100,0%
Regular training of health professionals in recognizing symptoms of depression	0	,0%	6	20,0%	10	33,3%	3	10,0%	11	36,7%	30	100,0%

Question 26 Which of the following policies or interventions regarding musculoskeletal diseases are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Ergonomic workplace support	1	3,3%	11	36,7%	11	36,7%	1	3,3%	6	20,0%	30	100,0%
Educational interventions/training (back schools, instructions in proper lifting techniques)	0	,0%	13	43,3%	5	16,7%	1	3,3%	11	36,7%	30	100,0%
Physical exercise (strengthening back muscles, increasing flexibility, strength or fitness in general, with or with	0	,0%	13	43,3%	6	20,0%	1	3,3%	10	33,3%	30	100,0%
Personal appliances (back belts, shoe inserts)	0	,0%	9	30,0%	9	30,0%	2	6,7%	10	33,3%	30	100,0%
Administrative interventions (work policies)	0	,0%	7	23,3%	12	40,0%	2	6,7%	9	30,0%	30	100,0%
Ergonomic equipment (assistive devices, e.g. lifts for moving patients)	0	,0%	14	46,7%	8	26,7%	0	,0%	8	26,7%	30	100,0%
Multidisciplinary rehabilitation interventions (often including a mix of education, cognitive behavioural component	0	,0%	7	23,3%	5	16,7%	3	10,0%	15	50,0%	30	100,0%
Mechanical exposure interventions (focus on changing the design of tools, such as the computer mouse or keyboard)	0	,0%	12	40,0%	6	20,0%	0	,0%	12	40,0%	30	100,0%

Question 27 Which of the following policies or interventions regarding accidental injuries at work are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Multi-component safety campaign	0	,0%	6	20,0%	16	53,3%	1	3,3%	7	23,3%	30	100,0%
Drug-free workplace programme	0	,0%	7	23,3%	9	30,0%	3	10,0%	11	36,7%	30	100,0%
Legislation/enforcement to ban pesticides	0	,0%	1	3,3%	15	50,0%	2	6,7%	12	40,0%	30	100,0%
European safety standards for protective equipment at work	0	,0%	4	13,3%	20	66,7%	1	3,3%	5	16,7%	30	100,0%
Educational safety and prevention programmes	1	3,3%	7	23,3%	15	50,0%	0	,0%	7	23,3%	30	100,0%
Safety devices (e.g. tools, equipment)	1	3,3%	6	20,0%	16	53,3%	0	,0%	7	23,3%	30	100,0%
Creation of awareness and responsibility towards healthy behaviour among the employees	0	,0%	8	26,7%	15	50,0%	1	3,3%	6	20,0%	30	100,0%
Comprehensive workplace health promotion programmes	2	6,7%	11	36,7%	11	36,7%	1	3,3%	5	16,7%	30	100,0%

Question 28 Which of the following policies or interventions regarding respiratory diseases/lung cancer are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Legislation to create smoke-free worksites	0	,0%	2	6,7%	25	83,3%	1	3,3%	2	6,7%	30	100,0%
Legislation to create smoke-free public places	0	,0%	2	6,7%	26	86,7%	0	,0%	2	6,7%	30	100,0%
Individual and group counselling to quit smoking	0	,0%	16	53,3%	6	20,0%	1	3,3%	7	23,3%	30	100,0%
Pharmacological treatment to quit smoking	0	,0%	13	43,3%	7	23,3%	0	,0%	10	33,3%	30	100,0%
Taxation of tobacco products	0	,0%	0	,0%	26	86,7%	0	,0%	4	13,3%	30	100,0%
Financial support to quit smoking	0	,0%	5	16,7%	1	3,3%	11	36,7%	13	43,3%	30	100,0%
Combination of advice and nicotine replacement therapy and/or pharmacotherapy	0	,0%	11	36,7%	6	20,0%	1	3,3%	12	40,0%	30	100,0%
Comprehensive advertising and promotion bans of tobacco products, logos and brand names	0	,0%	1	3,3%	18	60,0%	2	6,7%	9	30,0%	30	100,0%
Public information campaigns	0	,0%	4	13,3%	21	70,0%	0	,0%	5	16,7%	30	100,0%
Health warning labels on tobacco products	0	,0%	1	3,3%	26	86,7%	0	,0%	3	10,0%	30	100,0%

Question 29 Which of the following policies or interventions regarding alcohol use disorders are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Treating alcohol substance abuse	0	,0%	10	33,3%	10	33,3%	2	6,7%	8	26,7%	30	100,0%
Preventing alcohol and substance abuse	0	,0%	12	40,0%	10	33,3%	1	3,3%	7	23,3%	30	100,0%
Regular training of health professionals in screening and brief interventions	1	3,3%	7	23,3%	6	20,0%	2	6,7%	14	46,7%	30	100,0%
Physician counselling in emergency rooms for adolescents with injuries	0	,0%	4	13,3%	6	20,0%	2	6,7%	18	60,0%	30	100,0%
Screening and brief counselling interventions in primary care	1	3,3%	3	10,0%	7	23,3%	4	13,3%	15	50,0%	30	100,0%
National rules to prevent illegal production and sales of home- or informally produced alcoholic beverages	0	,0%	0	,0%	21	70,0%	1	3,3%	8	26,7%	30	100,0%
Policies aiming to control public alcohol sales in pubs and clubs	0	,0%	3	10,0%	19	63,3%	2	6,7%	6	20,0%	30	100,0%
Restrictions on alcohol sales at specific events	0	,0%	2	6,7%	16	53,3%	4	13,3%	8	26,7%	30	100,0%
Measures reducing the number of retail outlets	0	,0%	1	3,3%	10	33,3%	4	13,3%	15	50,0%	30	100,0%
Fiscal measures, such as increasing taxes	0	,0%	0	,0%	20	66,7%	1	3,3%	9	30,0%	30	100,0%
Laws limiting time periods for off-licensed sales	0	,0%	1	3,3%	13	43,3%	4	13,3%	12	40,0%	30	100,0%
Laws limiting time periods for on-licensed sales	0	,0%	0	,0%	14	46,7%	6	20,0%	10	33,3%	30	100,0%
Minimum drinking age	0	,0%	1	3,3%	26	86,7%	1	3,3%	2	6,7%	30	100,0%
Recommendations by government restricting sales to adolescents	0	,0%	2	6,7%	21	70,0%	1	3,3%	6	20,0%	30	100,0%
Law restricting sales to adolescents	0	,0%	1	3,3%	24	80,0%	2	6,7%	3	10,0%	30	100,0%
Legally binding regulations on alcohol advertising	0	,0%	1	3,3%	20	66,7%	3	10,0%	6	20,0%	30	100,0%

Question 30 Which of the following policies or interventions regarding hearing loss are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Mandatory hearing loss prevention programmes (e.g. personal noise protection devices, workplace layout)	0	,0%	7	23,3%	16	53,3%	1	3,3%	6	20,0%	30	100,0%

Question 31 Which of the following policies or interventions regarding road accidents are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Separating different types of road users	0	,0%	0	,0%	16	53,3%	1	3,3%	13	43,3%	30	100,0%
Increasing the minimum legal drinking age	0	,0%	0	,0%	15	50,0%	7	23,3%	8	26,7%	30	100,0%
Sobriety checkpoints	0	,0%	3	10,0%	13	43,3%	2	6,7%	12	40,0%	30	100,0%
Greater use of safer modes of transport	0	,0%	0	,0%	14	46,7%	3	10,0%	13	43,3%	30	100,0%
Introducing and enforcing motorcycle helmet laws	0	,0%	1	3,3%	24	80,0%	0	,0%	5	16,7%	30	100,0%
Child-passenger restraints	0	,0%	1	3,3%	21	70,0%	1	3,3%	7	23,3%	30	100,0%
Enforcing seat-belt laws	0	,0%	1	3,3%	24	80,0%	0	,0%	5	16,7%	30	100,0%
Introducing seat-belt laws	0	,0%	0	,0%	26	86,7%	0	,0%	4	13,3%	30	100,0%
Daytime running lights on motorcycles	0	,0%	0	,0%	19	63,3%	3	10,0%	8	26,7%	30	100,0%
Graduated driver licensing systems	0	,0%	0	,0%	21	70,0%	4	13,3%	5	16,7%	30	100,0%
Enforcing laws on Blood Alcohol Content (BAC) limits	0	,0%	1	3,3%	25	83,3%	0	,0%	4	13,3%	30	100,0%
Introducing laws on Blood Alcohol Content (BAC) limits	0	,0%	1	3,3%	24	80,0%	0	,0%	5	16,7%	30	100,0%
Increase legal age of car drivers from 16 to 18 years	0	,0%	0	,0%	18	60,0%	5	16,7%	7	23,3%	30	100,0%
Increase legal age of motorcyclists from 16 to 18 years	0	,0%	0	,0%	13	43,3%	7	23,3%	10	33,3%	30	100,0%

Question 32 Which of the following policies or interventions regarding the combination of diseases are used in your country

	My organization only		More organizations		Nationally		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Worksite nutrition programmes	0	,0%	12	40,0%	5	16,7%	3	10,0%	10	33,3%	30	100,0%
Physical activity programmes	0	,0%	13	43,3%	6	20,0%	1	3,3%	10	33,3%	30	100,0%
Speed-reduction measures	0	,0%	4	13,3%	17	56,7%	0	,0%	9	30,0%	30	100,0%
Traffic-calming measures	0	,0%	4	13,3%	15	50,0%	1	3,3%	10	33,3%	30	100,0%
Bio-psychosocial interventions	0	,0%	8	26,7%	3	10,0%	2	6,7%	17	56,7%	30	100,0%
Relocate responsibilities towards the workplace stakeholders	0	,0%	9	30,0%	4	13,3%	2	6,7%	15	50,0%	30	100,0%
Disability management approach linking the workplace and external interventions for proactive reintegration strategies	0	,0%	4	13,3%	9	30,0%	5	16,7%	12	40,0%	30	100,0%
Vocational interventions	0	,0%	6	20,0%	8	26,7%	0	,0%	16	53,3%	30	100,0%
Financial incentives/support for individuals or companies	0	,0%	3	10,0%	7	23,3%	5	16,7%	15	50,0%	30	100,0%
Early return to work interventions	0	,0%	6	20,0%	7	23,3%	5	16,7%	12	40,0%	30	100,0%
Subsidies for workplace adaptations	0	,0%	4	13,3%	11	36,7%	5	16,7%	10	33,3%	30	100,0%
Layout of public space ensuring sufficient services	0	,0%	7	23,3%	7	23,3%	1	3,3%	15	50,0%	30	100,0%
Measures to reduce traffic emissions	0	,0%	1	3,3%	22	73,3%	0	,0%	7	23,3%	30	100,0%
Health in all policies	0	,0%	1	3,3%	16	53,3%	3	10,0%	10	33,3%	30	100,0%
Health promotion campaign	0	,0%	4	13,3%	20	66,7%	1	3,3%	5	16,7%	30	100,0%

The following information on other policies or interventions that are in place and which were not stated above was provided by respondents:

- Some are strange e.g. driving licence age has always been 18; Alcohol legislation has been in place since 1930's;
- The questions are only answered in relation to occupational safety and health including health promotion at work. Other questions are answered "don't know";
- workplace stress, violence and discrimination, occupational dermatosis, management of toxic substances, reconciling work and family life.

(COST-)EFFECTIVENESS OF POLICIES AND INITIATIVES TO HELP REDUCE THE NUMBERS OF PEOPLE OUT OF WORK FOR HEALTH REASONS

Question 34 Are you aware of the (cost-)effectiveness of any of the above mentioned disease category related policies or interventions in your country or organization

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	2	6,7%	8	26,7%	20	66,7%	30	100,0%
Mental health	5	16,7%	7	23,3%	18	60,0%	30	100,0%
Musculoskeletal disease	2	6,7%	9	30,0%	19	63,3%	30	100,0%
Accidental injuries at work	7	23,3%	6	20,0%	17	56,7%	30	100,0%
Respiratory disease	2	6,7%	8	26,7%	20	66,7%	30	100,0%
Alcohol use disorder	3	10,0%	8	26,7%	19	63,3%	30	100,0%
Hearing loss	3	10,0%	8	26,7%	19	63,3%	30	100,0%
Lung cancer	3	10,0%	8	26,7%	19	63,3%	30	100,0%
Road accidents	5	16,7%	8	26,7%	17	56,7%	30	100,0%

Question 35 Policies or interventions for which respondents are aware of the (cost)effectiveness

Calculations attached to reduction of road accidents by building high ways Reduction of Industrial injury by preventive measures Reduction of hospital care costs and roads accidents by reducing alcoholism/alcohol consumption

Framework Agreement on Work Related Stress, Framework Agreement on Violence and Harassment, Common Policy signed between Social Partners (trade unions, employers organisations, government) for reducing accidents in the construction sector

Reformed sick listing process for a higher rate of return to work. The Bill covers the rehabilitation chain, extended sickness benefit and a time limit on sickness benefit. Effective from 1 July 2008. Total expenditure on social insurance per year is about SEK 445 billion (EUR 1 = approx. SEK 9.40), which is equivalent to 15 per cent of the gross domestic product (GDP). Every day the Swedish Social Insurance Agency makes over 40 000 decisions and pays out about SEK 1.2 billion (2007). Social insurance comprises sickness insurance, family benefits and pensions.

All the national policies and strategies were created to keep cost-effectiveness as an important view.

Data is from National Insurance fond and National Health Insurance fond and Ministry of Health. Policies are developed and established nationally including many NGOs .

Several research findings on costs and benefits.

Work accidents cost was estimated at national level in 3% of National Production Index. Cost effectiveness analysis may be developed at company level

MONITORING (COST-)EFFECTIVENESS OF POLICIES AND INITIATIVES TO HELP REDUCE THE NUMBERS OF PEOPLE OUT OF WORK FOR HEALTH REASONS

Question 36 Is the (cost-)effectiveness of any of the above mentioned disease category related policies or interventions monitored and/or measured in your country or organization

	Yes		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Cardiovascular disease	2	6,7%	7	23,3%	21	70,0%	30	100,0%
Mental health	3	10,0%	7	23,3%	20	66,7%	30	100,0%
Musculoskeletal disease	1	3,3%	7	23,3%	22	73,3%	30	100,0%
Accidental injuries at work	6	20,0%	6	20,0%	18	60,0%	30	100,0%
Respiratory disease	2	6,7%	7	23,3%	21	70,0%	30	100,0%
Alcohol use disorder	3	10,0%	7	23,3%	20	66,7%	30	100,0%
Hearing loss	3	10,0%	7	23,3%	20	66,7%	30	100,0%
Lung cancer	4	13,3%	7	23,3%	19	63,3%	30	100,0%
Road accidents	4	13,3%	7	23,3%	19	63,3%	30	100,0%

Respondents were asked to specify which organizations monitor and/or measure policies or interventions. The following was mentioned:

- Assessment of the costs of accidents at work notified to Labour Inspectorate for the year 1997. Submitted study by the University of Cyprus;

- In case of all the health reasons monitoring and annual reporting is compulsory for the comprehensive organisations and institutes;
- National Labour Inspectorate & Danish Working Environment Board;
- Nationally we have specific organizations.

EFFECT OF POLICIES AND INTERVENTIONS ON REDUCTION OF NUMBER OF PEOPLE OUT OF WORK FOR HEALTH REASONS

Question 38 Do the following policies or interventions regarding cardiovascular disease help reducing the number of people out of work for health reasons in your country?

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Promotion of increased fruit and vegetable intake	4	13,3%	2	6,7%	6	20,0%	1	3,3%	17	56,7%	30	100,0%
Community-based health promotion	5	16,7%	6	20,0%	1	3,3%	1	3,3%	17	56,7%	30	100,0%
Computer-tailored nutrition education	0	,0%	2	6,7%	6	20,0%	1	3,3%	21	70,0%	30	100,0%
Legislation to reduce salt content in processed food	1	3,3%	4	13,3%	5	16,7%	1	3,3%	19	63,3%	30	100,0%
Health promotion by a combination of behavioural therapy, physical exercise and diet	3	10,0%	6	20,0%	1	3,3%	1	3,3%	19	63,3%	30	100,0%
Cardiac rehabilitation (medically supervised programme focusing on physical, mental and social functioning)	5	16,7%	3	10,0%	0	,0%	1	3,3%	21	70,0%	30	100,0%
Mass media campaigns to tackle unhealthy diets and sedentary lifestyle	3	10,0%	5	16,7%	6	20,0%	0	,0%	16	53,3%	30	100,0%
Physician counselling to tackle unhealthy diets and sedentary lifestyle	5	16,7%	5	16,7%	3	10,0%	1	3,3%	16	53,3%	30	100,0%
School-based interventions focusing on healthy eating and physical exercise	6	20,0%	5	16,7%	5	16,7%	0	,0%	14	46,7%	30	100,0%
Food advertising regulation	1	3,3%	6	20,0%	4	13,3%	0	,0%	19	63,3%	30	100,0%
Food labelling	5	16,7%	3	10,0%	3	10,0%	0	,0%	19	63,3%	30	100,0%
Fiscal measures	2	6,7%	3	10,0%	4	13,3%	2	6,7%	19	63,3%	30	100,0%

Question 39 Do the following policies or interventions regarding mental health help reducing the number of people out of work for health reasons in your country

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Treating depression	8	26,7%	2	6,7%	4	13,3%	0	,0%	16	53,3%	30	100,0%
Preventing depression	2	6,7%	8	26,7%	3	10,0%	0	,0%	17	56,7%	30	100,0%
Health promotion targeted at both physical and psychosocial environments at work	4	13,3%	5	16,7%	5	16,7%	0	,0%	16	53,3%	30	100,0%
Supported employment programmes	4	13,3%	2	6,7%	5	16,7%	0	,0%	19	63,3%	30	100,0%
Training to improve communication skills and feedback	4	13,3%	5	16,7%	3	10,0%	0	,0%	18	60,0%	30	100,0%
Regular training of health professionals in recognizing symptoms of depression	5	16,7%	3	10,0%	4	13,3%	0	,0%	18	60,0%	30	100,0%

Question 40 Do the following policies or interventions regarding musculoskeletal diseases help reducing the number of people out of work for health reasons in your country

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Ergonomic workplace support	10	33,3%	4	13,3%	4	13,3%	0	,0%	12	40,0%	30	100,0%
Educational interventions/training (back schools, instructions in proper lifting techniques)	3	10,0%	8	26,7%	5	16,7%	0	,0%	14	46,7%	30	100,0%
Physical exercise (strengthening back muscles, increasing flexibility, strength or fitness in general, with or with	4	13,3%	6	20,0%	7	23,3%	0	,0%	13	43,3%	30	100,0%
Personal appliances (back belts, shoe inserts)	5	16,7%	6	20,0%	6	20,0%	0	,0%	13	43,3%	30	100,0%
Administrative interventions (work policies)	3	10,0%	7	23,3%	6	20,0%	0	,0%	14	46,7%	30	100,0%
Ergonomic equipment (assistive devices, e.g. lifts for moving patients)	9	30,0%	4	13,3%	5	16,7%	0	,0%	12	40,0%	30	100,0%
Multidisciplinary rehabilitation interventions (often including a mix of education, cognitive behavioural component	4	13,3%	5	16,7%	5	16,7%	0	,0%	16	53,3%	30	100,0%
Mechanical exposure interventions (focus on changing the design of tools, such as the computer mouse or keyboard)	6	20,0%	7	23,3%	4	13,3%	0	,0%	13	43,3%	30	100,0%

Question 41 Do the following policies or interventions regarding accidental injuries at work help reducing the number of people out of work for health reasons in your country

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Multi-component safety campaign	7	23,3%	7	23,3%	5	16,7%	0	,0%	11	36,7%	30	100,0%
Drug-free workplace programme	5	16,7%	4	13,3%	2	6,7%	2	6,7%	17	56,7%	30	100,0%
Legislation/enforcement to ban pesticides	4	13,3%	4	13,3%	4	13,3%	1	3,3%	17	56,7%	30	100,0%
European safety standards for protective equipment at work	8	26,7%	8	26,7%	3	10,0%	0	,0%	11	36,7%	30	100,0%
Educational safety and prevention programmes	6	20,0%	11	36,7%	3	10,0%	0	,0%	10	33,3%	30	100,0%
Safety devices (e.g. tools, equipment)	9	30,0%	9	30,0%	2	6,7%	0	,0%	10	33,3%	30	100,0%
Creation of awareness and responsibility towards healthy behaviour among the employees	9	30,0%	6	20,0%	4	13,3%	0	,0%	11	36,7%	30	100,0%
Comprehensive workplace health promotion programmes	7	23,3%	5	16,7%	5	16,7%	0	,0%	13	43,3%	30	100,0%

Question 42 Do the following policies or interventions regarding respiratory diseases/lung cancer help reducing the number of people out of work for health reasons in your country

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Legislation to create smoke-free worksites	12	40,0%	4	13,3%	2	6,7%	0	,0%	12	40,0%	30	100,0%
Legislation to create smoke-free public places	12	40,0%	4	13,3%	3	10,0%	0	,0%	11	36,7%	30	100,0%
Individual and group counselling to quit smoking	4	13,3%	6	20,0%	6	20,0%	0	,0%	14	46,7%	30	100,0%
Pharmacological treatment to quit smoking	5	16,7%	5	16,7%	5	16,7%	0	,0%	15	50,0%	30	100,0%
Taxation of tobacco products	7	23,3%	7	23,3%	3	10,0%	0	,0%	13	43,3%	30	100,0%
Financial support to quit smoking	1	3,3%	3	10,0%	5	16,7%	1	3,3%	20	66,7%	30	100,0%
Combination of advice and nicotine replacement therapy and/or pharmacotherapy	4	13,3%	4	13,3%	5	16,7%	0	,0%	17	56,7%	30	100,0%
Comprehensive advertising and promotion bans of tobacco products, logos and brand names	3	10,0%	6	20,0%	5	16,7%	1	3,3%	15	50,0%	30	100,0%
Public information campaigns	6	20,0%	5	16,7%	6	20,0%	0	,0%	13	43,3%	30	100,0%
Health warning labels on tobacco products	7	23,3%	4	13,3%	5	16,7%	2	6,7%	12	40,0%	30	100,0%

Question 43 Do the following policies or interventions regarding alcohol use disorder help reducing the number of people out of work for health reasons in your country

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Treating alcohol substance abuse	6	20,0%	4	13,3%	4	13,3%	1	3,3%	15	50,0%	30	100,0%
Preventing alcohol and substance abuse	5	16,7%	4	13,3%	4	13,3%	1	3,3%	16	53,3%	30	100,0%
Regular training of health professionals in screening and brief interventions	3	10,0%	5	16,7%	5	16,7%	0	,0%	17	56,7%	30	100,0%
Physician counselling in emergency rooms for adolescents with injuries	3	10,0%	4	13,3%	5	16,7%	0	,0%	18	60,0%	30	100,0%
Screening and brief counselling interventions in primary care	1	3,3%	9	30,0%	4	13,3%	0	,0%	16	53,3%	30	100,0%
National rules to prevent illegal production and sales of home- or informally produced alcoholic beverages	7	23,3%	3	10,0%	2	6,7%	0	,0%	18	60,0%	30	100,0%
Policies aiming to control public alcohol sales in pubs and clubs	7	23,3%	2	6,7%	3	10,0%	3	10,0%	15	50,0%	30	100,0%
Restrictions on alcohol sales at specific events	8	26,7%	2	6,7%	2	6,7%	1	3,3%	17	56,7%	30	100,0%
Measures reducing the number of retail outlets	4	13,3%	2	6,7%	5	16,7%	2	6,7%	17	56,7%	30	100,0%
Fiscal measure, such as increasing taxes	6	20,0%	3	10,0%	6	20,0%	1	3,3%	14	46,7%	30	100,0%
Laws limiting time periods for off-licensed sales	5	16,7%	4	13,3%	1	3,3%	2	6,7%	18	60,0%	30	100,0%
Laws limiting time periods for on-licensed sales	5	16,7%	6	20,0%	1	3,3%	2	6,7%	16	53,3%	30	100,0%
Minimum drinking age	6	20,0%	3	10,0%	7	23,3%	1	3,3%	13	43,3%	30	100,0%
Recommendations by government restricting sales to adolescents	5	16,7%	5	16,7%	4	13,3%	0	,0%	16	53,3%	30	100,0%
Law restricting sales to adolescents	6	20,0%	5	16,7%	4	13,3%	1	3,3%	14	46,7%	30	100,0%
Legally binding regulations on alcohol advertising	4	13,3%	4	13,3%	5	16,7%	2	6,7%	15	50,0%	30	100,0%

Question 44 Do the following policies or interventions regarding hearing loss help reducing the number of people out of work for health reasons in your country

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Mandatory hearing loss prevention programmes (e.g. personal noise protection devices, workplace layout)	9	30,0%	5	16,7%	2	6,7%	0	,0%	14	46,7%	30	100,0%

Question 45 Do the following policies or interventions regarding road accidents help reducing the number of people out of work for health reasons in your country

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Separating different types of road users	8	26,7%	3	10,0%	4	13,3%	0	,0%	15	50,0%	30	100,0%
Increasing the minimum legal drinking age	7	23,3%	2	6,7%	4	13,3%	3	10,0%	14	46,7%	30	100,0%
Sobriety checkpoints	6	20,0%	8	26,7%	2	6,7%	0	,0%	14	46,7%	30	100,0%
Greater use of safer modes of transport	9	30,0%	4	13,3%	4	13,3%	0	,0%	13	43,3%	30	100,0%
Introducing and enforcing motorcycle helmet laws	13	43,3%	4	13,3%	0	,0%	0	,0%	13	43,3%	30	100,0%
Child-passenger restraints	12	40,0%	2	6,7%	0	,0%	0	,0%	16	53,3%	30	100,0%
Enforcing seat-belt laws	13	43,3%	5	16,7%	1	3,3%	0	,0%	11	36,7%	30	100,0%
Introducing seat-belt laws	14	46,7%	4	13,3%	1	3,3%	0	,0%	11	36,7%	30	100,0%
Daytime running lights on motorcycles	8	26,7%	3	10,0%	3	10,0%	1	3,3%	15	50,0%	30	100,0%
Graduated driver licensing systems	10	33,3%	3	10,0%	2	6,7%	1	3,3%	14	46,7%	30	100,0%
Enforcing laws on Blood Alcohol Content (BAC) limits	10	33,3%	6	20,0%	1	3,3%	0	,0%	13	43,3%	30	100,0%
Introducing laws on Blood Alcohol Content (BAC) limits	11	36,7%	5	16,7%	1	3,3%	0	,0%	13	43,3%	30	100,0%
Increase legal age of car drivers from 16 to 18 years	6	20,0%	3	10,0%	2	6,7%	3	10,0%	16	53,3%	30	100,0%
Increase legal age of motorcyclists from 16 to 18 years	5	16,7%	2	6,7%	3	10,0%	4	13,3%	16	53,3%	30	100,0%

Question 46 Do the following policies or interventions regarding the combination of diseases help reducing the number of people out of work for health reasons in your country

	Considerably		Moderate		A little		No		Don't know		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Worksite nutrition programmes	1	3,3%	9	30,0%	4	13,3%	0	,0%	16	53,3%	30	100,0%
Physical activity programmes	4	13,3%	8	26,7%	3	10,0%	0	,0%	15	50,0%	30	100,0%
Speed-reduction measures	7	23,3%	6	20,0%	3	10,0%	1	3,3%	13	43,3%	30	100,0%
Traffic-calming measures	6	20,0%	4	13,3%	4	13,3%	1	3,3%	15	50,0%	30	100,0%
Bio-psychosocial interventions	0	,0%	5	16,7%	5	16,7%	0	,0%	20	66,7%	30	100,0%
Relocate responsibilities towards the workplace stakeholders	3	10,0%	7	23,3%	4	13,3%	0	,0%	16	53,3%	30	100,0%
Disability management approach linking the workplace and external interventions for proactive reintegration strategies	8	26,7%	5	16,7%	1	3,3%	0	,0%	16	53,3%	30	100,0%
Vocational interventions	5	16,7%	4	13,3%	4	13,3%	0	,0%	17	56,7%	30	100,0%
Financial incentives/support for individuals or companies	4	13,3%	4	13,3%	4	13,3%	0	,0%	18	60,0%	30	100,0%
Early return to work interventions	6	20,0%	4	13,3%	3	10,0%	0	,0%	17	56,7%	30	100,0%
Subsidies for workplace adaptations	4	13,3%	9	30,0%	3	10,0%	1	3,3%	13	43,3%	30	100,0%
Layout of public space ensuring sufficient public services	5	16,7%	6	20,0%	3	10,0%	0	,0%	16	53,3%	30	100,0%
Measures to reduce traffic emissions	7	23,3%	4	13,3%	3	10,0%	1	3,3%	15	50,0%	30	100,0%
Health in all policies	8	26,7%	4	13,3%	4	13,3%	0	,0%	14	46,7%	30	100,0%
Health promotion campaign	6	20,0%	7	23,3%	3	10,0%	0	,0%	14	46,7%	30	100,0%

Question 47 policies or interventions regarding the combination of diseases help reducing the number of people out of work for health reasons not listed in previous paragraphs

Ban on drugs at work places.

The questions are only answered in relation to occupational safety and health including health promotion at work.

Enforcing workers participation, work stress management, Company Social responsibility policies.

I am not an expert on health programs and do not know details about the follow-up on success Generally difficult to measure anyhow.

Some additional information: National Health prevention programs are financed by State Patient fund additionally. Prevention measures are included into GP norm. The order of MoH for prophylactic work is requiring for GP in detail all prophylactic measures: *Cardiovascular diseases screening *Cervix uteri cancer diseases screening *Brest cancer early diagnostic and screening *Prostate cancer screening *Diabetes early diagnostics (since 2007) *Caries prophylactic for children. Legal acts: Narcotic and Psychotropic Substances Control Act (1998) State Programme on Mental Disease Prevention (1999) National Drug Control and Drug Use Prevention Programme (approved in 1999) State Alcohol Control Programme (approved in 1999) Suicide prevention programme LAW ON MENTAL HEALTH CARE IN LITHUANIA REPUBLIC OF LITHUANIA LAW ON THE CONTROL OF NARCOTIC AND PSYCHOTROPIC SUBSTANCES STATE PROGRAMME ON MENTAL DISEASE PREVENTION STATE TOBACCO CONTROL PROGRAMME State Food and Nutrition Strategy and Action plan for 2003-2010.

Question 48 Further elaboration on answers or comments on the survey

Far too long - 20 mins!!!!

There is significant variability in the development of programs and campaigns in companies, these practices vary by region, the insurance companies and the companies themselves.

We would like to pay your attention that occupational safety and health is under the competencies of the Ministry of Social Security and Labour.

The questionnaire would need days of various experts to fill properly, even for a small country like Hungary. This was considerably beyond the capacities of the Focal Point.

Information provided by myself is my quite narrow personal view on this broad issue. To take an overall Slovak picture on this issue it would need another form of survey - collection the data from quite large number of relevant public or NGO stakeholders.

Annex 4 Perceived health

Table A.4.1 Percentage of the persons aged 15-64 years experiencing 'very bad' or 'bad' health

	% persons reporting very bad/bad health					
	15-24 yr	25-34 yr	35-44 yr	45-54 yr	55-64 yr	15-64 yr
BE	1,9	2,9	5,5	9,4	9,7	6.0
BG	1,5	2,4	5,4	9,3	20,8	7.2
CZ	1,2 (u)	2,2	5,3	12,0	17,1	7.9
DK	1,3	2,8	6,6	7,1	11,4	6.2
DE	1,0	2,7	3,8	7,9	12,8	5.7
EE	1,2 (u)	1,9	5,0	10,4	20,4	7.6
GR	0,5	2,0	3,3	5,1	11,7	4.4
ES	0,4	1,0	3,2	6,0	11,0	4.1
FR	1,2	1,8	3,6	7,0	10,4	4.8
IE	0,3	0,8	1,4	3,0	5,3	2.0
IT	1,8	2,7	3,4	6,5	11,5	5.2
CY	0,6	1,1	2,1	5,7	12,9	4.0
LV	1,9	3,5	7,5	15,3	27,6	10.5
LT	1,1 (u)	2,8 (u)	6,3	12,9	26,4	9.6
LU	1,5	1,7	4,1	7,7	11,0	5.1
HU	1,9	4,2	8,9	19,9	29,3	13.0
MT	:	:	1,7	2,8	4,9	2.1
NL	2,2	2,3	4,4	4,9	6,7	4.3
AT	1,3	2,5	4,7	8,5	12,3	5.9
PL	2,1	3,1	6,0	14,7	26,6	9.9
PT	2,5	4,2	7,2	16,1	28,1	11.3
RO	1,5	1,7	2,2	7,7	13,8	5.0
SI	1,6	3,5	6,8	15,5	20,3	9.6
SK	1,7	2,7	5,1	11,4	25,7	8.8
FI	:	1,0	2,7	5,2	11,9	4.8
SE	0,4	2,5	3,8	6,7	7,2	4.2
UK	0,9	1,8	2,8	5,2	7,2	3.6
Other countries						
IS	1,6	1,5	2,6	3,8	8,2	3.3
NO	1,8	3,2	5,5	8,8	13,8	6.7

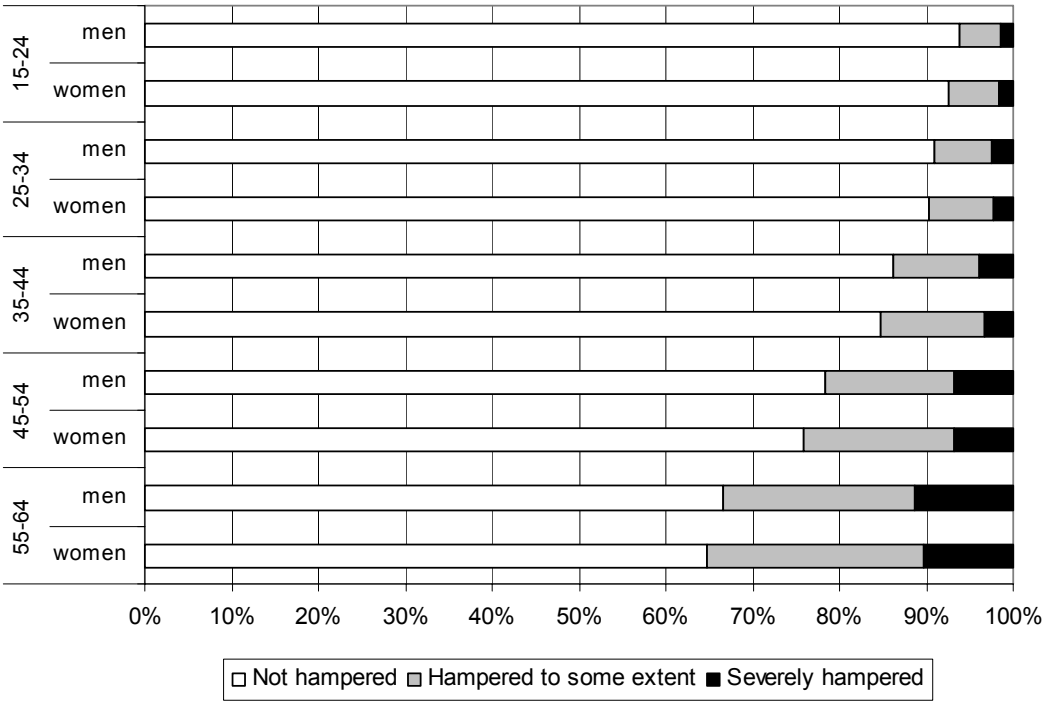
: not available.

(u): not reliable.

Source: EU-SILC 2008, Eurostat.

Annex 5 Limitations in daily activities – men/women

Table A.5.1 Occurrence of activity restrictions in the past 6 months in the EU-27 in 2008



Source: EU-SILC 2008, Eurostat.

Annex 6 Longstanding illness

Table A.6.1 Percentage of persons aged 15-64 years with a longstanding illness or health problem in Europe in 2008

	% Persons with longstanding illness of health problem					
	15-24	25-34	35-44	45-54	55-64	15-64
BE	10.0	11.8	18.9	27.0	31.7	20.1
BG	3.6	5.8	13.3	21.0	41.0	15.6
CZ	6.9 (u)	9.9	15.1	26.9	39.4	20.4
DK	14.9	15.8	18.3	26.3	32.8	22.0
DE	11.3	18.5	24.2	35.6	51.2	28.6
EE	11.0	14.6	22.1	37.7	57.8	27.5
GR	2.1	5.3	9.6	16.5	32.2	12.9
ES	9.9	12.7	20.7	29.5	44.3	22.6
FR	14.0	19.8	26.2	35.4	48.9	29.2
IE	12.0	12.3	15.2	23.0	37.7	19.3
IT	6.3	9.5	11.8	18.0	26.8	14.6
CY	4.6	8.2	16.1	28.4	42.5	18.5
LV	10.4	13.6	22.7	33.8	51.1	25.3
LT	6.1	11.2	15.9	24.9	47.5	19.9
LU	10.2	14.7	16.8	24.9	36.5	20.3
HU	8.8	15.0	24.8	42.0	58.4	30.1
MT	4.3	5.7	10.7	21.4	41.7	17.2
NL	16.2	18.0	27.2	31.6	41.6	27.9
AT	11.1	15.5	23.7	32.7	46.9	26.0
PL	7.6	10.6	16.9	32.4	51.8	22.9
PT	10.9	14.3	19.9	33.1	47.6	24.8
RO	2.7	3.8	6.4	18.4	36.4	12.5
SI	18.0	18.7	29.9	42.3	54.5	32.9
SK	9.7	11.4	17.8	28.6	45.9	21.9
FI	16.0	19.8	26.4	37.9	57.0	33.1
SE	18.7	22.1	23.0	34.7	43.3	28.4
UK	13.4	16.4	22.3	33.1	43.5	25.8
Other countries						
IS	14.7	19.0	20.2	27.1	35.8	22.7
NO	23.8	20.5	29.2	33.8	41.3	29.8

: not available.

(u): not reliable.

Source: EU-SILC 2008, Eurostat.

Annex 7 Main health problems by country

Table A.7.1 Main health problem among persons aged 15-64 year with a health problem in the EU-25 in 2002 (Source: LFS AHM 2002, Eurostat)

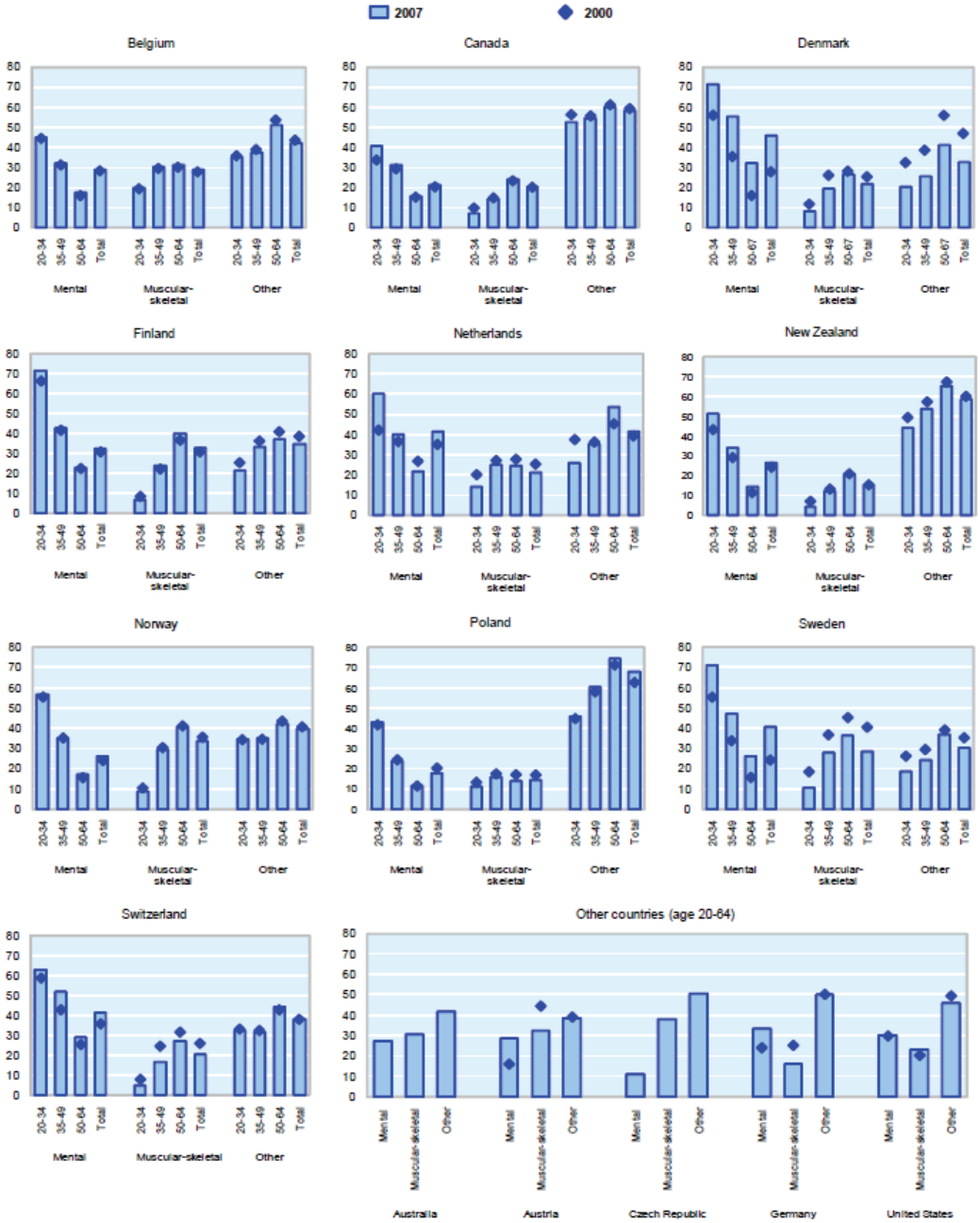
	Problems with arms or hands (which includes arthritis or rheumatism)	Problems with legs or feet (which includes arthritis or rheumatism)	Problems with back or neck (which includes arthritis or rheumatism)	Difficulty in seeing (with glasses or contact lenses if worn)	Difficulties in hearing (with hearing aids or grommets, if used)	Speech impediment	Skin conditions, including severe dis-figurement, allergies	Chest or breathing problems, includes asthma and bronchitis	Heart, blood pressure or circulation problems	Stomach, liver, kidney or digestive problems	Diabetes	Epilepsy (include fits)	Mental, nervous or emotional problems	Other progressive illnesses
BE	5.6	9.5	27.7	4.8	1.5	0.7	2.4	6.1	9.6	5.2	3.5	0.9	7.3	4.2
CZ	4.5	13.2	18.3	6.2	1.2	0.4	6.3	6.9	18.1	7.6	4.7	1.1	4.0	:
DK	6.7	10.3	27.9	2.1	1.8	0.4	4.6	7.2	9.6	5.2	4.1	1.5	9.0	3.0
EE	7.0	12.9	16.2	6.9	:	:	5.0	4.7	20.9	9.4	2.7	:	5.4	:
GR	3.1	11.4	8.2	5.2	1.0	0.6	2.8	5.3	28.4	5.6	5.6	0.7	9.2	3.9
ES	6.2	13.3	19.6	3.5	1.7	0.5	1.0	6.1	11.0	4.8	3.6	1.1	15.3	4.8
FR	6.9	10.5	21.3	9.7	2.6	0.5	3.1	7.3	10.6	4.0	3.9	0.7	9.1	3.8
IE	5.5	7.8	14.1	1.7	2.0	:	1.7	14.9	14.6	4.3	4.5	2.2	10.5	5.7
IT	8.0	13.7	16.7	3.5	1.7	0.7	2.2	4.5	14.6	5.8	4.0	0.8	10.3	3.6
CY	5.2	11.2	21.3	3.4	1.1	:	:	5.3	20.7	7.5	7.3	:	10.2	3.8
LT	:	9.9	9.3	:	:	:	:	5.9	23.7	5.1	5.9	:	14.5	7.3
LU	9.4	13.5	31.0	5.8	:	:	2.3	5.6	7.9	4.5	3.1	:	4.0	2.6
HU	1.7	18.0	11.3	1.8	1.0	0.4	0.5	4.6	26.9	7.6	3.9	1.0	13.7	3.7
MT	7.7	9.9	19.1	:	:	:	:	9.9	17.3	:	9.9	:	13.3	:
NL	10.0	10.3	25.2	2.0	1.9	0.5	1.3	8.9	5.6	4.7	1.4	1.2	10.1	2.4
AT	7.0	16.3	26.5	3.3	2.5	0.7	2.4	6.5	10.4	3.8	4.3	0.9	5.2	3.7
PT	5.7	13.0	20.1	5.5	1.4	:	1.7	7.3	9.1	5.9	4.5	1.4	13.0	3.4
SI	4.7	10.9	26.8	3.4	1.2	:	2.0	5.7	14.1	5.6	5.4	0.8	5.3	2.4
SK	3.6	14.6	21.4	2.6	1.5	:	1.6	6.6	20.2	4.9	4.9	1.9	9.3	3.4

	Problems with arms or hands (which includes arthritis or rheumatism)	Problems with legs or feet (which includes arthritis or rheumatism)	Problems with back or neck (which includes arthritis or rheumatism)	Difficulty in seeing (with glasses or contact lenses if worn)	Difficulties in hearing (with hearing aids or grommets, if used)	Speech impediment	Skin conditions, including severe dis-figurement, allergies	Chest or breathing problems, includes asthma and bronchitis	Heart, blood pressure or circulation problems	Stomach, liver, kidney or digestive problems	Diabetes	Epilepsy (include fits)	Mental, nervous or emotional problems	Other progressive illnesses
FI	7.9	9.0	15.4	1.4	1.0	:	4.1	15.2	18.3	3.7	3.8	0.9	5.3	2.2
SE	8.8	8.8	25.1	1.8	3.6	:	7.0	7.0	5.8	5.2	4.3	0.9	8.2	2.1
UK	5.4	10.7	15.8	1.7	2.4	0.1	2.7	15.0	14.0	5.1	4.6	1.8	8.7	3.2
RO	5.0	11.6	5.9	2.9	1.0	0.9	0.8	8.3	31.6	10.0	4.2	1.7	10.3	2.0
NO	17.5	9.9	20.7	3.7	3.4	0.3	1.8	4.7	4.2	1.7	1.6	1.0	10.5	2.3

Annex 8 Inflows into disability by health condition 2000-2007

Derived from: Organisation for Economic Co-operation and Development (OECD). Sickness, disability and work. Keeping on track in the economic downturn. Background paper. High-Level Forum, Stockholm, 14-15 May 2009.

Inflows into disability by health condition as a percentage of all inflows by age group, 2000-2007[a]



a) Data for Canada refer to 2001 and 2006; data for the United States refer to 2006 and (contrary to data in previous figures) do not account for the overlap in contributory and non-contributory benefit receipt.

Source: Data supplied by national authorities.

Annex 9 Main work-related health problems by country

Table A.9.1 Main work-related health problems in persons that work or ever worked (15-64 yr) in Europe in 2007 per country

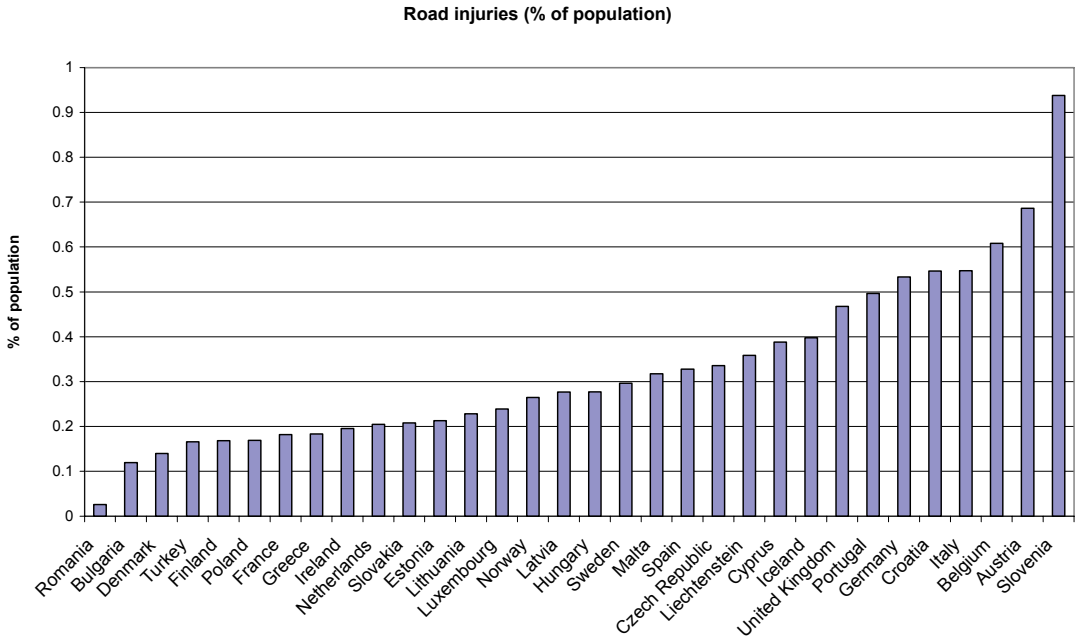
	Musculoskeletal problems	Stress, anxiety or depression	Other health problems
EU-27	59.8%	13.7%	26.5%
BE	57.6%	15.2%	27.2%
BG	38.2%	5.8%	56.1%
CZ	46.2%	2.3%	51.5%
DK	60.2%	22.2%	17.6%
DE	75.5%	9.4%	15.2%
EE	55.8%	4.7%	39.5%
GR	57.6%	4.1%	38.3%
ES	63.0%	14.0%	23.0%
FR	50.3%	24.2%	25.5%
IE	54.3%	15.2%	30.4%
IT	51.2%	16.2%	32.5%
CY	58.3%	2.1%	39.6%
LV	u	u	u
LT	u	u	u
LU	64.3%	21.4%	14.3%
HU	61.0%	6.3%	32.7%
MT	u	u	u
NL	55.7%	14.4%	29.9%
AT	67.3%	5.3%	27.5%
PL	62.0%	5.3%	32.6%
PT	61.0%	14.9%	24.1%
RO	42.9%	4.9%	52.2%
SI	62.2%	23.1%	14.7%
SK	61.4%	4.2%	34.3%
FI	67.6%	9.0%	23.5%
SE	60.3%	26.4%	13.3%
UK	52.2%	23.9%	23.8%
Other countries			
HR	56.7%	10.4%	33.0%
NO	68.4%	9.1%	22.4%

Source: LFS AHM 2007, Eurostat.

u: not reliable.

Annex 10 Road accidents

Figure A.10.1 Percentage of the population injured in road accidents by country in 2004



Source: UNECE.

Annex 11 Accidents at work by country

Table A.11.1 Accidents at work in the past 12 months

	Accidents at work	Road accidents
	%	% of accidents
EU-27	3.2	9.6
BE	3.2	13.3
BG	0.6	u
CZ	2.6	6.4
DK	4.9	(4.6)
DE	2.9	17.1
EE	2.3	u
IE	1.5	u
EL	1.9	17.1
ES	3.9	7.6
FR	5.4	(3.1)
IT	2.7	13.5
CY	3.0	(10.7)
LV	2.2	u
LT	(1.0)	u
LU	3.4	(12.8)
HU	1.0	(9.1)
MT	3.4	u
NL	2.5	16.2
AT	5.1	6.9
PL	1.1	28.5
PT	3.0	8.1
RO	2.3	8.5
SI	3.9	(12.6)
SK	1.6	(8.3)
FI	6.3	7.2
SE	5.1	8.6
UK	3.2	7.7
Other countries		
HR	2.0	(19.9)
NO	3.2	3.5

Source: LFS AHM 2007, Eurostat.

( ): limited reliability due to small sample size.

u: not available or sample size below publication limit.

Annex 12 Premature mortality for men and women by country

Table A.12.1 Premature mortality in the working age population (15-64 years) as a percentage of total number of deaths in men and women (2007 or most recent data)

	Premature death (15-64 year) as % of total deaths		
	Men	Women	total
EU-27	26%	13%	19%
BE	23%	12%	18%
BG	31%	15%	23%
CZ	34%	15%	25%
DK	25%	15%	20%
DE	23%	10%	16%
EE	40%	15%	28%
GR	21%	9%	15%
ES	22%	10%	16%
FR	27%	13%	20%
IE	26%	15%	21%
IT	18%	9%	13%
CY	23%	11%	18%
LV	43%	16%	30%
LT	46%	19%	33%
LU	25%	15%	19%
HU	38%	18%	28%
MT	23%	15%	19%
NL	22%	14%	18%
AT	25%	11%	17%
PL	40%	18%	30%
PT	24%	11%	18%
RO	34%	17%	26%
SI	33%	13%	23%
SK	39%	17%	28%
FI	31%	13%	22%
SE	18%	10%	14%
UK	22%	12%	17%
Other countries			
HR	28%	12%	20%
IS	21%	14%	18%
MK	29%	18%	24%
NO	20%	11%	15%

Source: Eurostat Mortality (hlth_cd_anr).

Annex 13 Premature mortality in different age groups by country

Table A.13.1 Premature mortality in the working age population (15-64 years) as a percentage of total number of deaths in different age groups (2007 or most recent data)

	Premature mortality as % of total deaths										
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	15-64
EU-27	0.2	0.4	0.4	0.5	0.8	1.3	2.2	3.3	4.6	5.5	19
BE	0.3	0.4	0.4	0.6	0.8	1.3	2.1	3.1	4.1	4.6	18
BG	0.2	0.4	0.4	0.6	0.8	1.3	2.3	3.9	6.0	7.3	23
CZ	0.2	0.4	0.5	0.6	0.8	1.2	1.9	3.9	6.5	8.5	25
DK	0.2	0.2	0.3	0.4	0.7	1.3	1.8	3.2	4.8	7.0	20
DE	0.2	0.2	0.3	0.3	0.6	1.2	2.0	2.8	3.9	4.8	16
EE	0.3	0.9	1.1	0.9	1.2	1.9	3.5	4.9	6.6	6.6	28
GR	0.2	0.4	0.6	0.6	0.8	1.1	1.7	2.3	3.3	4.4	15
ES	0.2	0.3	0.4	0.6	0.9	1.4	1.9	2.6	3.4	4.6	16
FR	0.3	0.4	0.5	0.5	0.9	1.5	2.4	3.6	5.0	5.2	20
IE	0.5	0.7	0.9	0.9	1.0	1.4	2.2	2.9	4.5	6.0	21
IT	0.2	0.3	0.3	0.4	0.6	1.0	1.4	1.9	3.0	4.3	13
CY	0.4	1.0	0.6	0.7	0.9	1.2	1.6	2.9	3.6	4.6	18
LV	0.4	0.5	0.8	1.1	1.7	2.4	4.0	5.1	6.4	7.4	30
LT	0.5	0.7	1.0	1.3	2.2	3.1	4.9	5.4	6.7	7.6	33
LU	0.3	0.4	0.5	0.8	0.9	1.2	2.4	3.1	4.3	5.5	19
HU	0.2	0.3	0.4	0.6	0.9	1.7	3.3	6.1	7.2	7.9	28
MT	0.3	0.5	0.5	0.6	0.6	1.1	1.2	2.9	4.7	6.6	19
NL	0.2	0.3	0.3	0.4	0.7	1.1	1.9	2.8	4.5	6.0	18
AT	0.3	0.4	0.3	0.4	0.7	1.2	2.0	2.7	4.1	5.2	17
PL	0.4	0.6	0.6	0.8	1.1	1.9	3.7	6.1	7.8	6.8	30
PT	0.2	0.4	0.5	0.7	1.1	1.5	2.2	2.9	3.7	4.8	18
RO	0.4	0.4	0.5	0.7	1.3	1.5	3.0	5.1	6.3	6.6	26
SI	0.3	0.6	0.6	0.6	0.8	1.5	2.6	4.3	5.6	6.2	23
SK	0.3	0.5	0.5	0.8	1.1	1.9	3.4	5.3	7.2	7.5	28
FI	0.3	0.5	0.5	0.6	0.8	1.4	2.2	3.7	5.7	6.5	22
SE	0.2	0.3	0.3	0.3	0.5	0.8	1.2	1.9	3.1	5.2	14
UK	0.2	0.4	0.4	0.5	0.8	1.2	1.7	2.4	3.8	5.5	17
Other countries											
HR	0.2	0.4	0.4	0.5	0.6	1.1	2.2	3.9	5.1	5.6	20
IS	0.2	0.8	0.6	0.6	0.8	1.3	1.8	2.7	3.9	5.0	18
MK	0.3	0.5	0.5	0.6	0.8	1.4	2.6	4.3	6.2	7.0	24
NO	0.2	0.4	0.5	0.4	0.7	0.9	1.5	2.3	3.4	5.2	15

Source: Eurostat Mortality ((hlth_cd_anr).

Annex 14 Standardised death rates for men and women by country

Table A.14.1 Standardised death rates by 100 000 inhabitants for men and women aged 15-64 years (2007 or most recent data)

Country	SDRs for the age group 15-64 per country		
	Men	Women	Total
EU-27	371.7	171.2	269.9
BE	295.2	150.5	221.7
BG	597.4	246.1	410.9
CZ	413.7	181.4	292.7
DK	304.8	187.7	246.1
DE	283.1	142.1	211.7
EE	766.2	231.5	466.4
GR	280.5	115.4	195.4
ES	270.0	108.5	187.3
FR	300.3	129.8	212.6
IE	257.3	147.2	202.4
IT	226.8	115.0	169.4
CY	238.7	107.3	171.6
LV	849.0	289.4	536.9
LT	921.7	281.3	566.3
LU	265.7	165.4	215.4
HU	663.0	271.5	450.1
MT	237.1	127.7	181.2
NL	227.5	150.8	189.0
AT	277.5	134.4	204.1
PL	557.5	207.6	371.6
PT	325.1	135.3	225.9
RO	584.6	250.5	407.7
SI	377.1	150.7	262.2
SK	556.5	214.5	372.8
FI	337.2	142.7	238.7
SE	217.1	133.8	175.6
UK	265.7	162.9	213.4
Other countries			
HR	454.1	180.0	310.2
IS	186.0	133.2	160.4
MK	440.0	254.1	344.7
NO	229.8	140.2	185.0

Data for 2007, except for BG, DK, FR, DE, IE, IT, LU (most recent data from 2006) and BE and PT (most recent data from 2004).
Source: Eurostat Mortality (hlth_cd_asdr).

Annex 15 Number of deaths and standardized death rates of 65 causes of death

Table A.15.1 Absolute number of deaths and standardized death rates of diseases included in the European short list of 65 causes of death among persons aged 15-64 years in Europe (2007 or most recent data)

Cause of death (ICD-10 code)	Absolute number of deaths			Standardized death rates (per 100.000 persons)		
	men	women	total	men	women	total
Certain infectious and parasitic diseases (A00-B99)	**12300**	**4936**	**17236**	**4.5**	**1.7**	**3.1**
Tuberculosis	2640	530	3170	1.0	0.2	0.6
Meningococcal infection	71	64	135	0.0	0.0	0.0
Viral hepatitis	1485	548	2033	0.5	0.2	0.4
Human immunodeficiency virus [HIV] disease	3822	1076	4898	1.4	0.4	0.9
Neoplasms	**205135**	**147108**	**352243**	**74.2**	**49.9**	**61.5**
Malignant neoplasms (C00-C97)	**201745**	**144820**	**346565**	**72.9**	**49.2**	**60.5**
Malignant neoplasm of lip, oral cavity, pharynx	12436	2414	14850	4.5	0.8	2.6
Malignant neoplasm of oesophagus	8934	1700	10634	3.2	0.6	1.8
Malignant neoplasm of stomach	10430	5031	15461	3.8	1.7	2.7
Malignant neoplasm of colon	11456	8409	19865	4.1	2.8	3.4
Malignant neoplasm of rectosigmoid junction, rectum, anus and anal canal	6848	3972	10820	2.5	1.3	1.9
Malignant neoplasm of liver and intrahepatic bile ducts	8548	2679	11227	3.1	0.9	1.9
Malignant neoplasm of pancreas	11510	6908	18418	4.1	2.3	3.2
Malignant neoplasm of larynx, trachea, bronchus and lung	66608	24360	90968	24.0	8.2	15.7
Malignant melanoma of skin	3548	2474	6022	1.3	0.9	1.1
Malignant neoplasm of breast	344	32971	33315	0.1	11.3	5.9
Malignant neoplasm of cervix uteri	0	6402	6402	0.0	2.2	1.1
Malignant neoplasm of other parts of uterus	0	4082	4082	0.0	1.4	0.7
Malignant neoplasm of ovary	0	9999	9999	0.0	3.4	1.7
Malignant neoplasm of prostate	5314	0	5314	1.9	0.0	0.9
Malignant neoplasm of kidney, except renal pelvis	5263	1995	7258	1.9	0.7	1.3
Malignant neoplasm of bladder	4559	1172	5731	1.6	0.4	1.0

Cause of death (ICD-10 code)	Absolute number of deaths			Standardized death rates (per 100.000 persons)		
	men	women	total	men	women	total
Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue	13024	8619	21643	4.8	3.0	3.9
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	**1170**	**900**	**2070**	**0.4**	**0.3**	**0.4**
Endocrine, nutritional and metabolic diseases (E00-E90)	**12255**	**6757**	**19012**	**4.5**	**2.3**	**3.3**
Diabetes mellitus	8858	4436	13294	3.2	1.5	2.3
Mental and behavioural disorders (F00-F99)	**12742**	**3501**	**16243**	**4.7**	**1.2**	**2.9**
Mental and behavioural disorders due to use of alcohol	9014	2024	11038	3.3	0.7	2.0
Drug dependence, toxicomania (F11-F16, F18-F19)	2210	417	2627	0.8	0.2	0.5
Diseases of the nervous system and the sense organs (G00-H95)	**12885**	**8529**	**21414**	**4.8**	**3.0**	**3.9**
Meningitis	412	239	651	0.2	0.1	0.1
Diseases of the circulatory system (I00-I99)	**166684**	**59500**	**226184**	**60.3**	**19.9**	**39.4**
Ischaemic heart diseases	81136	20097	101233	29.3	6.6	17.6
Other heart diseases (I30-I33, I39-I52)	30490	10046	40536	11.1	3.4	7.2
Cerebrovascular diseases	28845	16786	45631	10.4	5.7	7.9
Diseases of the respiratory system (J00-J99)	**25325**	**12097**	**37422**	**9.2**	**4.1**	**6.5**
Influenza	90	43	133	0.0	0.0	0.0
Pneumonia	8400	3380	11780	3.1	1.2	2.1
Chronic lower respiratory diseases	10719	5801	16520	3.8	1.9	2.8
Asthma and status asthmaticus	879	906	1785	0.3	0.3	0.3
Diseases of the digestive system (K00-K93)	**52051**	**21621**	**73672**	**19.0**	**7.4**	**13.1**
Ulcer of stomach, duodenum and jejunum	2317	870	3187	0.8	0.3	0.6
Chronic liver disease	35510	13969	49479	13.0	4.8	8.8
Diseases of the skin and subcutaneous tissue (L00-L99)	**340**	**304**	**644**	**0.1**	**0.1**	**0.1**
Diseases of the musculoskeletal system and connective tissue (M00-M99)	**1147**	**1477**	**2624**	**0.4**	**0.5**	**0.5**
Rheumatoid arthritis and arthrosis (M05-M06,M15-M19)	157	313	470	0.1	0.1	0.1
Diseases of the genitourinary system (N00-N99)	**4226**	**2773**	**6999**	**1.5**	**0.9**	**1.2**
Diseases of kidney and ureter	3692	2292	5984	1.3	0.8	1.0

Cause of death (ICD-10 code)	Absolute number of deaths			Standardized death rates (per 100.000 persons)		
	men	women	total	men	women	total
Pregnancy, childbirth and the puerperium (O00-O99)	**0**	**293**	**293**	**0.0**	**0.1**	**0.1**
Certain conditions originating in the perinatal period (P00-P96)	**49**	**32**	**81**	**0.0**	**0.0**	**0.0**
Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)	**2108**	**1703**	**3811**	**0.8**	**0.7**	**0.8**
Congenital malformations of the nervous system	215	158	373	0.1	0.1	0.1
Congenital malformations of the circulatory system	782	562	1344	0.3	0.2	0.3
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	**29239**	**9041**	**38280**	**10.8**	**3.2**	**6.9**
Sudden infant death syndrome	0	0	0	0.0	0.0	0.0
Ill-defined and unknown causes of mortality	**25528**	**7630**	**33158**	**9.4**	**2.7**	**6.0**
External causes of morbidity and mortality (V01-Y89)	**105833**	**26753**	**132586**	**39.7**	**9.9**	**24.7**
Accidents	63371	14469	77840	23.9	5.4	14.6
Transport accidents (V01-V99)	29395	6834	36229	11.2	2.6	6.9
Falls	7976	1760	9736	2.9	0.6	1.8
Accidental poisoning by and exposure to noxious substances	8230	2014	10244	3.1	0.7	1.9
Intentional self-harm	31945	8947	40892	11.9	3.2	7.5
Assault	2931	1172	4103	1.1	0.4	0.8
Event of undetermined intent	6541	1728	8269	2.4	0.6	1.5

Annex 16 Global burden of disease and ICD codes

Table A.16.1 GBD cause categories and ICD codes

	GBD cause name	ICD-10 code
I.	*Communicable, maternal, perinatal and nutritional conditions*[a]	*A00-B99, G00-G04, N70-N73, J00-J06, J10-J18, J20-J22, H65-H66, O00-O99, P00-P96, E00-E02, E40-E46, E50, D50-D53, D64.9, E51-64*
	A. Infectious and parasitic diseases	A00-B99, G00, G03-G04, N70-N73
	1. Tuberculosis	A15-A19, B90
	2. Sexually transmitted diseases excluding HIV	A50-A64, N70-N73
	a. Syphilis	A50-A53
	b. Chlamydia	A55-A56
	c. Gonorrhoea	A54
	Other STDs	A57-A64, N70-N73
	3. HIV/AIDS	B20-B24
	4. Diarrhoeal diseases	A00, A01, A03, A04, A06-A09
	5. Childhood-cluster diseases	A33-A37, A80, B05, B91
	a. Pertussis	A37
	b. Poliomyelitis	A80, B91
	c. Diphtheria	A36
	d. Measles	B05
	e. Tetanus	A33-A35
	6. Meningitis	A39, G00, G03
	7. Hepatitis B	B16-B19 (minus B17.1, B18.2)
	Hepatitis C	B17.1, B18.2
	8. Malaria	B50-B54
	9. Tropical-cluster diseases	B55-B57, B65, B73, B74.0-B74.2
	a. Trypanosomiasis	B56
	b. Chagas disease	B57
	c. Schistosomiasis	B65
	d. Leishmaniasis	B55
	e. Lymphatic filariasis	B74.0-B74.2
	f. Onchocerciasis	B73
	10. Leprosy	A30
	11. Dengue	A90-A91
	12. Japanese encephalitis	A83.0
	13. Trachoma	A71
	14. Intestinal nematode infections	B76-B81
	a. Ascariasis	B77
	b. Trichuriasis	B79
	c. Hookworm disease (ancylostomiasis and necatoriasis)	B76
	Other intestinal infections	B78, B80, B81
	Other infectious diseases	A02, A05, A20-A28, A31, A32, A38, A40-A49, A65-A70, A74-A79, A81, A82, A83.1-A83.9, A84-A89, A92-A99, B00-B04, B06-B15, B25-B49, B58-B60, B64, B66-B72, B74.3-B74.9, B75, B82-B89, B92-B99, G04
	B. Respiratory infections	J00-J06, J10-J18, J20-J22, H65-H66
	1. Lower respiratory infections	J10-J18, J20-J22
	2. Upper respiratory infections	J00-J06
	3. Otitis media	H65-H66
	C. Maternal conditions	O00-O99
	1. Maternal haemorrhage	O44-O46, O67, O72
	2. Maternal sepsis	O85-O86
	3. Hypertensive disorders of pregnancy	O10-O16
	4. Obstructed labour	O64-O66
	5. Abortion	O00-O07
	Other maternal conditions	O20-O43, O47-O63, O68-O71, O73-O75, O87-O99

Source: The Global Burden of Disease. 2004 update. World Health Organization 2008.

	GBD cause name	ICD-10 code
	D. Conditions arising during the perinatal period	**P00-P96**
	1. Prematurity and low birth weight	P05, P07, P22, P27-P28
	2. Birth asphyxia and birth trauma	P03, P10-P15, P20-P21, P24-P26, P29
	Neonatal infections and other conditions	P00-P02, P04, P08, P23, P35-P96
	E. Nutritional deficiencies	**E00-E02, E40-E46, E50, D50-D53, D64.9, E51-E64**
	1. Protein-energy malnutrition	E40-E46
	2. Iodine deficiency	E00-E02
	3. Vitamin A deficiency	E50
	4. Iron-deficiency anaemia	D50, D64.9
	Other nutritional disorders	D51-D53, E51-E64
II.	***Noncommunicable diseases[a]***	***C00-C97, D00-D48, D55-D64 (minus D 64.9), D65-D89, E03-E07, E10-E16, E20-E34, E65-E88, F01-F99, G06-G98, H00-H61, H68-H93, I00-I99, J30-J98, K00-K92, N00-N64, N75-N98, L00-L98, M00-M99, Q00-Q99***
	A. Malignant neoplasms	**C00-C97**
	1. Mouth and oropharynx cancers[b]	C00-C14
	2. Oesophagus cancer[b]	C15
	3. Stomach cancer[b]	C16
	4. Colon and rectum cancers[b]	C18-C21
	5. Liver cancer	C22
	6. Pancreas cancer	C25
	7. Trachea, bronchus and lung cancers	C33-C34
	8. Melanoma and other skin cancers[b]	C43-C44
	9. Breast cancer[b]	C50
	10. Cervix uteri cancer[b]	C53
	11. Corpus uteri cancer[b]	C54-C55
	12. Ovary cancer	C56
	13. Prostate cancer[b]	C61
	14. Bladder cancer[b]	C67
	15. Lymphomas and multiple myeloma[b]	C81-C90, C96
	16. Leukaemia[b]	C91-C95
	Other malignant neoplasms[b]	C17, C23, C24, C26-C32, C37-C41, C45-C49, C51, C52,C57-C60, C62-C66, C68-C80, C97
	B. Other neoplasms	**D00-D48**
	C. Diabetes mellitus	**E10-E14**
	D. Endocrine disorders	**D55-D64 (minus D64.9), D65-D89, E03-E07, E15-E16, E20-E34, E65-E88**
	E. Neuropsychiatric conditions	**F01-F99, G06-G98**
	1. Unipolar depressive disorders	F32-F33
	2. Bipolar affective disorder	F30-F31
	3. Schizophrenia	F20-F29
	4. Epilepsy	G40-G41
	5. Alcohol use disorders	F10
	6. Alzheimer and other dementias	F01, F03, G30-G31
	7. Parkinson disease	G20-G21
	8. Multiple sclerosis	G35
	9. Drug use disorders	F11-F16, F18-F19
	10. Post-traumatic stress disorder	F43.1
	11. Obsessive-compulsive disorder	F42
	12. Panic disorder	F40.0, F41.0
	13. Insomnia (primary)	F51
	14. Migraine	G43
	Mental retardation attributable to lead exposure	F70-F79
	Other neuropsychiatric disorders	F04-F09, F17, F34-F39, F401-F409, F411-F419, F43(minus F43.1), F44-F50, F52-F69, F80-F99, G06-G12, G23-G25, G36, G37, G44-G98

Source: The Global Burden of Disease. 2004 update. World Health Organization 2008.

GBD cause name	ICD-10 code
F. Sense organ diseases	**H00-H61, H68-H93**
1. Glaucoma	H40
2. Cataracts	H25-H26
3. Refractive errors	H524
4. Hearing loss, adult onset	H90-H91
Macular degeneration and other	H00-H21, H27-H35, H43-H61(minus H524), H68-H83, H92-H93
G. Cardiovascular diseases	**I00-I99**
1. Rheumatic heart disease	I01-I09
2. Hypertensive heart disease	I10-I13
3. Ischaemic heart disease[c]	I20-I25
4. Cerebrovascular disease	I60-I69
5. Inflammatory heart diseases	I30-I33, I38, I40, I42
Other cardiovascular diseases[c]	I00, I26-I28, I34-I37, I44-I51, I70-I99
H. Respiratory diseases	**J30-J98**
1. Chronic obstructive pulmonary disease	J40-J44
2. Asthma	J45-J46
Other respiratory diseases	J30-J39, J47-J98
I. Digestive diseases	**K20-K92**
1. Peptic ulcer disease	K25-K27
2. Cirrhosis of the liver	K70, K74
3. Appendicitis	K35-K37
Other digestive diseases	K20-K22, K28-K31, K38, K40-K66, K71-K73, K75-K92
J. Genitourinary diseases	**N00-N64, N75-N98**
1. Nephritis and nephrosis	N00-N19
2. Benign prostatic hypertrophy	N40
Other genitourinary system diseases	N20-N39, N41-N64, N75-N98
K. Skin diseases	**L00-L98**
L. Musculoskeletal diseases	**M00-M99**
1. Rheumatoid arthritis	M05-M06
2. Osteoarthritis	M15-M19
3. Gout	M10
4. Low back pain	M45-M48, M54 (minus M54.2)
Other musculoskeletal disorders	M00-M02, M08, M11-M13, M20-M43, M50-M53, M54.2, M55-M99
M. Congenital anomalies	**Q00-Q99**
1. Abdominal wall defect	Q79.2-Q79.5
2. Anencephaly	Q00
3. Anorectal atresia	Q42
4. Cleft lip	Q36
5. Cleft palate	Q35, Q37
6. Oesophageal atresia	Q39.0-Q39.1
7. Renal agenesis	Q60
8. Down syndrome	Q90
9. Congenital heart anomalies	Q20-Q28
10. Spina bifida	Q05
Other congenital anomalies	Q01-Q04, Q06-Q18, Q30-Q34, Q38, Q392-Q399, Q40-Q41, Q43-Q56, Q61-Q78, Q790, Q791, Q796, Q798, Q799, Q80-Q89, Q91-Q99

Source: The Global Burden of Disease. 2004 update. World Health Organization 2008.

	GBD cause name	ICD-10 code
	N. Oral conditions	**K00-K14**
	1. Dental caries	K02
	2. Periodontal disease	K05
	3. Edentulism	—
	Other oral diseases	K00, K01, K03, K04, K06-K14
III.	*Injuries*	V01-Y89
	A. Unintentional injuries[d]	**V01-X59, Y40-Y86, Y88, Y89**
	1. Road traffic accidents[e]	
	2. Poisonings	X40-X49
	3. Falls	W00-W19
	4. Fires	X00-X09
	5. Drownings	W65-W74
	6. Other unintentional injuries	Rest of V, W20-W64, W75-W99, X10-X39, X50-X59, Y40-Y86, Y88, Y89
	B. Intentional injuries[d]	**X60-Y09, Y35-Y36, Y870, Y871**
	1. Self-inflicted injuries	X60-X84, Y870
	2. Violence	X85-Y09, Y871
	3. War and conflict	Y36
	Other intentional injuries	Y35

—, not available; STD, sexually transmitted diseases.

[a] Deaths coded to "Symptoms, signs and ill-defined conditions" (780-799 in ICD-9 and R00-R99 in ICD-10) are distributed proportionately to all causes within Group I and Group II.

[b] Cancer deaths coded to ICD categories for malignant neoplasms of other and unspecified sites including those whose point of origin cannot be determined, and secondary and unspecified neoplasms (ICD-10 C76, C80, C97 or ICD-9 195, 199) were redistributed pro-rata across the footnoted malignant neoplasm categories within each age–sex group, so that the category "Other malignant neoplasms" includes only malignant neoplasms of other specified sites *(94)*.

[c] Ischaemic heart disease deaths may be miscoded to a number of so-called cardiovascular "garbage" codes. These include heart failure, ventricular dysrhythmias, generalized atherosclerosis and ill-defined descriptions and complications of heart disease. Proportions of deaths coded to these causes were redistributed to ischaemic heart disease as described in *(23)*. Relevant ICD-9 codes are 427.1, 427.4, 427.5, 428, 429.0, 429.1, 429.2, 429.9, 440.9, and relevant ICD-10 codes are I47.2, I49.0, I46, I50, I51.4, I51.5, I51.6, I51.9 and I70.9.

[d] Injury deaths where the intent is not determined (E980-989 of ICD-9 and Y10-Y34, Y872 in ICD-10) are distributed proportionately to all causes below the group level for injuries.

[e] For countries with 3-digit ICD10 data, for "Road traffic accidents" use: V01-V04, V06, V09-V80, V87, V89 and V99.
For countries with 4-digit ICD10 data, for "Road traffic accidents" use:
V01.1-V01.9, V02.1-V02.9, V03.1-V03.9, V04.1-V04.9, V06.1-V06.9, V09.2, V09.3, V10.3-V10.9, V11.3-V11.9, V12.3-V12.9, V13.3-V13.9, V14.3-V14.9, V15.4-V15.9, V16.4-V16.9, V17.4-V17.9, V18.4-V18.9, V19.4-V19.9, V20.3-V20.9, V21.3-V21.9, V22.3-V22.9, V23.3-V23.9, V24.3-V24.9, V25.3-V25.9, V26.3-V26.9, V27.3-V27.9, V28.3-V28.9, V29.4-V29.9, V30.4.V30.9, V31.4-V31.9, V32.4-V32.9, V33.4-V33.9, V34.4-V34.9, V35.4-V35.9, V36.4-V36.9, V37.4-V37.9, V38.4-V38.9, V39.4-V39.9, V40.4-V40.9, V41.4-V41.9, V42.4-V42.9, V43.4-V43.9, V44.4-V44.9, V45.4-V45.9, V46.4-V46.9, V47.4-V47.9, V48.4-V48.9, V49.4-V49.9, V50.4-V50.9, V51.4-V51.9, V52.4-V52.9, V53.4-V53.9, V54.4-V54.9, V55.4-V55.9, V56.4-V56.9, V57.4-V57.9, V58.4-V58.9, V59.4-V59.9, V60.4-V60.9, V61.4-V61.9, V62.4-V62.9, V63.4-V63.9, V64.4-V64.9, V65.4-V65.9, V66.4-V66.9, V67.4-V67.9, V68.4-V68.9, V69.4-V69.9, V70.4-V70.9, V71.4-V71.9, V72.4-V72.9, V73.4-V73.9, V74.4-V74.9, V75.4-V75.9, V76.4-V76.9, V77.4-V77.9, V78.4-V78.9, V79.4-V79.9, V80.3-V80.5, V81.1, V82.1, V82.8-V82.9, V83.0-V83.3, V84.0-V84.3, V85.0-V85.3, V86.0-V86.3, V87.0-V87.9, V89.2-V89.3, V89.9, V99 and Y850.

Source: The Global Burden of Disease. 2004 update. World Health Organization 2008.

Annex 17 Burden of disease in percentage of total DALYs

Table A.17.1 Burden of disease in percentage of total DALYs for Europe and % of DALYs attributable to age group 15-59 years for all high and middle income countries worldwide

GBD cause	Europe* all age groups % of total Burden of Disease	World % of Burden of Disease attributable to age group 15-59 years	
		High income countries	Middle income countries
All causes	100.00	57	59
I. Communicable, maternal, perinatal and nutritional conditions	**6.92**	**43**	**39**
A. Infectious and parasitic diseases	**2.24**	**62**	**57**
Tuberculosis	0.26	61	79
STDs excluding HIV:	0.22	96	85
• Syphilis	0.01	57	42
• Chlamydia	0.15	98	98
• Gonorrhoea	0.06	96	83
HIV/AIDS	0.29	97	87
Diarrhoeal diseases	0.52	39	19
Childhood-cluster diseases:	0.06	4	8
• Pertussis	0.04	0	0
• Poliomyelitis	0.00	25	75
• Diphtheria	0.00	0	9
• Measles	0.01	0	10
• Tetanus	0.00	0	13
Meningitis	0.20	37	25
Hepatitis B	0.07	65	79
Hepatitis C	0.05	64	78
Malaria	0.00	40	12
Tropical-cluster diseases:	0.00	60	73
• Trypanosomiasis	0.00	0	50
• Chagas disease	0.00	100	89
• Schistosomiasis	0.00	56	49
• Leishmaniasis	0.00	50	59
• Lymphatic filariasis	0.00	0	78
• Onchocerciasis	0.00	0	75
Leprosy	0.00	0	59

GBD cause	Europe* all age groups % of total Burden of Disease	World % of Burden of Disease attributable to age group 15-59 years	
		High income countries	Middle income countries
Dengue	0.00	0	7
Japanese encephalitis	0.00	0	16
Trachoma	0.00	0	63
Intestinal nematode infections:	0.00	42	31
• Ascariasis	0.00	0	0
• Trichuriasis	0.00	0	0
• Hookworm disease	0.00	83	79
B. Respiratory infections	**1.39**	**23**	**22**
Lower respiratory infections	1.25	23	22
Upper respiratory infections	0.07	57	33
Otitis media	0.07	0	3
C. Maternal conditions	**0.42**	**100**	**99**
Maternal haemorrhage		100	100
Maternal sepsis		100	100
Hypertensive disorders of pregnancy		100	98
Obstructed labour		100	100
Abortion		94	94
D. Perinatal conditions	**1.82**	**0**	**0**
Prematurity and low birth weight	0.81	0	0
Birth asphyxia and birth trauma	0.53	0	0
Neonatal infections and other conditions	0.48	0	0
E. Nutritional deficiencies	**1.05**	**56**	**35**
Protein-energy malnutrition	0.12	8	6
Iodine deficiency	0.26	0	0
Vitamin A deficiency	0.00	0	2
Iron-deficiency anaemia	0.64	65	66
II. Non-communicable conditions	**84.74**	**55**	**62**
A. Malignant neoplasms	**14.90**	**43**	**59**
Mouth and oropharynx cancers	0.49	58	69
Oesophagus cancer	0.38	43	52
Stomach cancer	0.81	40	57
Colon and rectum cancer	1.72	38	55
Liver cancer	0.47	42	66
Pancreas cancer	0.66	37	53
Trachea, bronchus and lung cancers	3.03	37	52
Melanoma and other skin cancers	0.26	58	66
Breast cancer	1.50	61	73
Cervix uteri cancer	0.32	71	75
Corpus uteri cancer	0.22	47	65
Ovary cancer	0.40	52	69
Prostate cancer	0.58	13	19
Bladder cancer	0.41	28	42

GBD cause	Europe* all age groups % of total Burden of Disease	World % of Burden of Disease attributable to age group 15-59 years	
		High income countries	Middle income countries
Lymphomas and multiple myeloma	0.72	42	66
Leukaemia	0.64	46	65
B. Other neoplasms	**0.27**	**37**	**64**
C. Diabetes mellitus	**2.41**	**56**	**66**
D. Endocrine disorders	**1.05**	**60**	**52**
E. Neuropsychiatric disorders	**23.25**	**74**	**78**
Unipolar depressive disorders	7.19	87	86
Bipolar affective disorder	1.22	96	95
Schizophrenia	1.26	83	89
Epilepsy	0.48	69	70
Alcohol use disorders	2.97	96	94
Alzheimer and other dementias	3.17	6	15
Parkinson disease	0.46	23	44
Multiple sclerosis	0.27	83	87
Drug use disorders	1.05	98	96
Post-traumatic stress disorder	0.39	97	98
Obsessive-compulsive disorder	0.59	96	89
Panic disorder	0.64	96	97
Insomnia (primary)	0.59	80	86
Migraine	1.16	74	67
F. Sense organ disorders	**6.94**	**56**	**65**
Glaucoma	0.33	52	61
Cataracts	0.28	64	63
Refractive errors	2.11	56	59
Hearing loss, adult onset	3.18	56	75
Macular degeneration and other	1.04	55	61
G. Cardiovascular diseases	**19.00**	**38**	**46**
Rheumatic heart disease	0.29	36	69
Hypertensive heart disease	0.81	33	39
Ischemic heart disease	8.23	36	47
Cerebrovascular disease	5.19	40	41
Inflammatory heart diseases	0.68	53	59
H. Respiratory diseases	**5.28**	**52**	**49**
Chronic obstructive pulmonary disease	2.54	56	42
Asthma	1.19	52	55
I. Digestive diseases	**4.45**	**63**	**68**
Peptic ulcer disease	0.32	56	70
Cirrhosis of the liver	1.72	71	76
Appendicitis	0.03	66	69
J. Dis. of the genitourinary system	**0.94**	**41**	**69**
Nephritis and nephrosis	0.48	32	62
Benign prostatic hypertrophy	0.22	58	86

GBD cause	Europe* all age groups % of total Burden of Disease	World % of Burden of Disease attributable to age group 15-59 years	
		High income countries	Middle income countries
K. Skin diseases	**0.17**	**41**	**68**
L. Musculoskeletal diseases	**4.38**	**59**	**77**
Rheumatoid arthritis	0.86	68	78
Osteoarthritis	2.48	49	76
M. Congenital abnormalities	**1.03**	**10**	**6**
N. Oral diseases	**0.67**	**54**	**48**
Dental caries	0.41	49	43
Periodontal disease	0.03	95	91
Edentulism	0.23	59	54
III. Injuries	**8.34**	**78**	**74**
A. Unintentional	**6.19**	**74**	**68**
Road traffic accidents	2.14	84	81
Poisonings	0.32	95	85
Falls	1.28	58	62
Fires	0.17	61	61
Drownings	0.22	64	50
Other unintentional injuries	2.06	64	63
B. Intentional	**2.15**	**88**	**90**
Self-inflicted injuries	1.70	87	86
Violence	0.39	89	93
War and conflict	0.06	99	89

* EU-27 + Croatia, Iceland, Norway, Switzerland, Macedonia, Turkey.

Source: The Global Burden of Disease. 2004 update. World Health Organization 2008.

Annex 18 Age-standardised DALYs per country

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	NL	Portugal	Spain	Sweden	United Kingdom	Bulgaria	Cyprus
All Causes	10.223	10.750	11.286	11.347	10.644	10.081	9.605	10.813	8.985	10.898	9.948	11.419	9.474	9.564	11.012	15.218	10.963
Communicable, maternal, perinatal and nutritional conditions	**610**	**559**	**538**	**551**	**603**	**556**	**555**	**650**	**601**	**705**	**603**	**942**	**660**	**514**	**701**	**1.336**	**883**
Infectious and parasitic diseases	**188**	**173**	**162**	**124**	**225**	**173**	**154**	**154**	**193**	**195**	**174**	**466**	**277**	**152**	**187**	**300**	**386**
Tuberculosis	7	8	6	7	8	5	8	8	5	6	5	40	13	4	9	51	8
STDs excluding HIV	23	22	24	22	23	22	22	23	23	22	22	24	22	22	23	54	86
HIV/AIDS	31	25	19	7	60	19	16	30	64	19	20	193	103	27	36	8	11
Diarrhoeal diseases	31	31	35	30	35	33	29	32	29	42	31	32	31	31	33	45	136
Childhood-cluster diseases	8	6	7	6	9	7	9	8	3	5	11	5	12	7	9	6	9
Meningitis	22	17	20	13	14	16	26	13	13	9	16	21	16	10	17	29	47
Hepatitis B	4	6	5	0	3	3	8	6	21	2	2	4	4	1	1	9	-
Hepatitis C	24	-	2	3	8	7	-	-	-	10	1	6	17	7	3	4	-
Respiratory infections	**56**	**95**	**60**	**93**	**61**	**75**	**115**	**170**	**60**	**123**	**102**	**136**	**63**	**75**	**137**	**306**	**217**
Lower respiratory infections	35	78	40	75	43	57	41	153	42	106	84	119	46	56	119	283	194
Upper respiratory infections	8	4	5	5	4	4	61	4	4	4	4	4	4	5	4	10	4

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	NL	Portugal	Spain	Sweden	United Kingdom	Bulgaria	Cyprus
Otitis media	13	13	15	13	14	13	13	13	14	13	14	13	13	13	14	13	20
Maternal conditions	**43**	**45**	**43**	**78**	**67**	**43**	**39**	**16**	**34**	**71**	**44**	**66**	**39**	**43**	**64**	**56**	**120**
Perinatal conditions	**244**	**170**	**201**	**183**	**187**	**195**	**174**	**229**	**220**	**232**	**204**	**195**	**199**	**179**	**265**	**321**	**71**
Prematurity and low birth weight	166	62	105	67	52	106	110	93	74	116	67	88	66	53	150	152	34
Birth asphyxia and birth trauma	51	61	49	55	59	45	37	56	98	55	68	55	51	60	69	97	28
Neonatal infections and other conditions	28	47	47	61	76	44	27	80	48	61	69	52	83	66	47	71	10
Nutritional deficiencies	**79**	**76**	**71**	**72**	**64**	**70**	**74**	**80**	**94**	**84**	**79**	**78**	**81**	**64**	**48**	**353**	**89**
Protein-energy malnutrition	10	10	1	0	15	10	-	1	22	1	11	1	1	1	1	30	0
Iodine deficiency	-	1	2	-	0	2	4	-	2	-	-	3	2	-	0	199	-
Iron-deficiency anaemia	68	63	66	71	48	57	69	78	69	83	67	73	77	62	46	111	89

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	NL	Portugal	Spain	Sweden	United Kingdom	Bulgaria	Cyprus
II. Non-communicable conditions	**8.606**	**8.975**	**9.740**	**9.055**	**8.857**	**8.768**	**8.083**	**9.288**	**7.575**	**8.936**	**8.719**	**9.345**	**7.951**	**8.196**	**9.576**	**12.478**	**9.149**
Malignant neoplasms	**1.303**	**1.496**	**1.622**	**1.092**	**1.623**	**1.350**	**1.255**	**1.477**	**1.302**	**1.327**	**1.540**	**1.451**	**1.346**	**1.118**	**1.403**	**1.540**	**794**
Mouth and oropharynx cancers	53	56	43	18	85	48	20	26	33	66	30	63	50	18	28	38	14
Oesophagus cancer	24	38	49	20	55	37	11	58	17	35	55	39	33	19	65	17	6
Stomach cancer	66	46	45	52	50	67	66	52	76	51	55	145	74	40	46	120	48
Colon and rectum cancer	142	153	209	101	165	161	99	173	139	135	175	182	164	131	152	164	63
Liver cancer	48	28	27	34	66	34	58	28	67	38	20	39	49	27	24	62	40
Pancreas cancer	73	54	69	79	66	68	51	58	58	66	63	50	53	64	55	73	31
Trachea, bronchus and lung cancers	241	341	335	167	327	254	281	259	244	278	344	200	275	166	261	282	142
Melanoma and other skin cancers	29	24	46	22	31	24	20	37	26	39	42	22	21	34	31	18	9
Breast cancer	135	200	202	126	182	161	142	182	144	152	195	144	122	117	182	128	120
Cervix uteri cancer	25	24	33	12	24	29	18	35	16	16	19	33	21	21	29	91	18
Corpus uteri cancer	16	31	21	24	32	14	20	24	22	24	23	35	19	23	19	32	11

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	NL	Portugal	Spain	Sweden	United Kingdom	Bulgaria	Cyprus
Ovary cancer	42	50	57	41	38	37	30	56	31	47	40	26	30	45	49	51	25
Prostate cancer	45	55	80	53	55	46	41	60	31	33	57	51	41	66	59	39	23
Bladder cancer	26	36	51	21	43	26	38	26	33	27	34	30	49	27	34	34	37
Lymphomas and multiple myeloma	59	61	73	70	78	59	50	78	70	67	79	78	64	59	75	47	58
Leukaemia	58	62	55	45	69	54	70	60	65	38	61	75	59	48	54	75	48
Other neoplasms	**21**	**7**	**40**	**19**	**49**	**21**	**0**	**12**	**43**	**10**	**44**	**28**	**37**	**18**	**24**	**10**	**11**
Diabetes mellitus	**261**	**182**	**226**	**190**	**184**	**213**	**256**	**146**	**276**	**162**	**195**	**324**	**243**	**204**	**168**	**349**	**528**
Endocrine disorders	**287**	**142**	**200**	**85**	**258**	**138**	**103**	**190**	**150**	**184**	**135**	**224**	**156**	**81**	**172**	**74**	**89**
Neuropsychiatric disorders	**3.231**	**3.156**	**3.252**	**3.697**	**3.408**	**3.120**	**2.574**	**3.196**	**2.505**	**3.311**	**3.064**	**2.922**	**2.599**	**3.409**	**3.461**	**3.226**	**2.648**
Unipolar depressive disorders	1.108	1.244	1.111	1.344	1.234	955	632	959	776	1.110	862	722	621	1.060	961	1.041	937
Bipolar affective disorder	184	184	185	184	185	184	184	184	184	185	184	184	184	184	184	198	218
Schizophrenia	185	186	188	188	189	186	185	186	186	185	186	186	186	186	185	238	273
Epilepsy	68	58	64	69	70	69	47	78	47	63	59	56	50	59	72	63	52
Alcohol use disorders	426	265	515	687	520	519	365	469	80	485	499	413	106	766	663	368	200
Alzheimer and other dementias	231	275	254	319	264	235	233	244	250	251	272	254	268	268	259	168	122
Parkinson disease	48	41	49	60	42	43	25	43	37	53	49	44	40	35	48	46	12

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	NL	Portugal	Spain	Sweden	United Kingdom	Bulgaria	Cyprus
Multiple sclerosis	34	38	47	37	36	38	37	42	33	43	38	32	32	37	44	30	22
Drug use disorders	210	126	98	62	90	159	149	236	178	189	165	267	364	84	295	262	72
Post-traumatic stress disorder	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	55	57
Obsessive-compulsive disorder	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	120	119
Panic disorder	97	97	97	97	97	97	96	97	97	97	97	97	97	97	97	104	107
Insomnia (primary)	77	77	77	77	78	77	77	77	78	77	77	78	77	77	78	60	33
Migraine	236	237	237	236	236	236	234	237	236	236	237	237	235	236	237	111	72
Sense organ disorders	**743**	**743**	**744**	**743**	**743**	**743**	**743**	**744**	**743**	**743**	**744**	**743**	**743**	**743**	**743**	**804**	**1.731**
Glaucoma	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	48	110
Cataracts	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	88	558
Refractive errors	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262	246	274
Hearing loss, adult onset	338	338	338	338	337	338	338	338	338	338	338	337	338	338	337	314	605
Macular degeneration and other	105	105	106	105	105	105	105	107	105	105	106	106	105	105	105	108	183
Cardiovascular diseases	**1.074**	**1.299**	**1.312**	**1.474**	**911**	**1.371**	**1.668**	**1.408**	**1.077**	**1.386**	**1.161**	**1.526**	**974**	**1.122**	**1.334**	**4.478**	**1.690**
Rheumatic heart disease	10	2	1	4	12	9	0	4	12	1	1	15	16	4	10	26	2

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	NL	Portugal	Spain	Sweden	United Kingdom	Bulgaria	Cyprus
Hypertensive heart disease	31	14	40	29	29	49	27	32	67	27	20	30	25	16	20	243	5
Ischemic heart disease	520	596	551	730	279	593	727	701	426	513	417	507	401	543	674	1.525	707
Cerebrovascular disease	242	350	358	394	242	289	522	280	287	376	291	681	276	281	348	1.149	247
Inflammatory heart diseases	49	34	44	107	47	67	5	73	38	66	49	47	57	49	53	58	3
Respiratory diseases	**505**	**766**	**1.016**	**474**	**497**	**578**	**496**	**858**	**447**	**688**	**685**	**733**	**680**	**498**	**921**	**320**	**487**
Chronic obstructive pulmonary disease	307	431	727	190	142	307	127	326	172	335	347	276	218	239	393	127	21
Asthma	165	184	217	229	210	183	113	337	153	211	255	215	157	177	327	119	138
Digestive diseases	**408**	**417**	**521**	**518**	**434**	**488**	**213**	**318**	**291**	**445**	**334**	**584**	**409**	**242**	**538**	**441**	**155**
Peptic ulcer disease	17	20	65	41	10	22	15	33	11	20	12	22	8	23	40	17	5
Cirrhosis of the liver	220	153	206	244	161	215	54	72	126	184	59	208	114	53	174	205	37
Appendicitis	3	4	6	4	3	4	3	3	3	4	4	5	4	4	4	4	2

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	NL	Portugal	Spain	Sweden	United Kingdom	Bulgaria	Cyprus
Diseases of the genitourinary system	**58**	**64**	**67**	**39**	**59**	**67**	**63**	**100**	**60**	**44**	**77**	**102**	**73**	**63**	**80**	**129**	**113**
Nephritis and nephrosis	28	29	25	14	25	29	35	34	22	15	20	63	32	14	22	78	49
Benign prostatic hypertrophy	20	21	22	21	20	20	20	21	20	21	21	20	20	21	21	23	61
Skin diseases	**12**	**15**	**11**	**11**	**13**	**11**	**11**	**18**	**11**	**11**	**13**	**12**	**13**	**11**	**16**	**25**	**49**
Musculoskeletal diseases	**394**	**397**	**404**	**401**	**401**	**393**	**395**	**400**	**396**	**396**	**401**	**408**	**400**	**397**	**408**	**666**	**429**
Rheumatoid arthritis	82	83	84	86	82	81	81	84	82	82	82	85	82	83	85	136	79
Osteoarthritis	198	198	198	199	198	198	198	198	198	198	198	199	198	198	198	414	205
Congenital abnormalities	**228**	**209**	**243**	**230**	**194**	**192**	**224**	**338**	**192**	**148**	**243**	**205**	**196**	**208**	**224**	**305**	**200**
Oral diseases	**82**	**83**	**82**	**83**	**83**	**83**	**82**	**82**	**83**	**82**	**83**	**83**	**83**	**83**	**83**	**112**	**226**
Dental caries	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	72	138
Periodontal disease	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4
Edentulism	21	21	20	21	21	21	21	20	21	21	20	21	21	20	20	34	83
III. Injuries	**1.007**	**1.216**	**1.009**	**1.741**	**1.183**	**757**	**967**	**875**	**809**	**1.257**	**626**	**1.132**	**863**	**854**	**735**	**1.404**	**931**
Unintentional	**678**	**785**	**736**	**1.216**	**817**	**509**	**890**	**536**	**668**	**942**	**406**	**930**	**672**	**555**	**501**	**1.120**	**911**
Road traffic accidents	292	387	254	275	323	229	447	226	345	384	163	487	314	206	203	319	612
Poisonings	10	37	86	216	23	21	89	10	10	85	22	19	38	56	47	49	6

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	NL	Portugal	Spain	Sweden	United Kingdom	Bulgaria	Cyprus
Falls	151	148	134	266	160	103	136	120	130	183	90	154	109	107	97	199	67
Fires	9	19	17	29	18	11	10	16	8	14	6	16	10	16	14	46	27
Drownings	18	14	22	44	30	11	48	31	19	18	15	37	28	23	9	44	63
Other unintentional injuries	198	180	221	385	264	134	159	134	157	258	109	217	173	146	131	463	136
Intentional	**329**	**431**	**273**	**526**	**366**	**248**	**77**	**339**	**141**	**315**	**220**	**202**	**191**	**299**	**234**	**284**	**21**
Self-inflicted injuries	298	372	237	450	332	220	55	307	113	267	180	155	137	255	169	186	11
Violence	29	56	34	72	32	27	21	30	27	46	37	45	41	42	61	88	10
War and conflict	2	2	2	3	2	2	0	2	1	2	2	1	13	2	3	9	0

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	Croatia	Iceland	Norway	Switzerland	FYROM	Turkey
All Causes	11.812	16.212	15.002	16.822	16.454	9.657	13.209	15.651	13.844	11.636	12.531	9.042	10.351	9.277	15.775	16.307
Communicable, maternal, perinatal and nutritional conditions	**634**	**1.350**	**914**	**1.397**	**1.331**	**652**	**836**	**1.873**	**900**	**605**	**736**	**450**	**409**	**552**	**1.151**	**2.843**
Infectious and parasitic diseases	**131**	**538**	**234**	**485**	**394**	**203**	**220**	**520**	**178**	**129**	**167**	**157**	**138**	**182**	**304**	**822**
Tuberculosis	8	136	41	149	157	3	33	201	17	11	45	4	4	3	65	108
STDs excluding HIV	23	53	53	52	53	22	51	53	51	22	22	22	23	22	51	54
HIV/AIDS	5	207	6	124	28	15	14	58	3	4	1	38	15	66	6	5
Diarrhoeal diseases	32	33	34	33	40	29	33	57	35	33	32	30	32	31	67	345
Childhood-cluster diseases	10	9	7	2	9	8	8	12	7	11	10	4	6	7	6	29
Meningitis	15	17	37	21	19	76	9	52	8	5	7	17	9	9	3	117
Hepatitis B	1	5	1	7	2	4	3	4	2	2	5	0	1	1	6	29
Hepatitis C	1	2	-	3	2	3	3	1	1	1	6	1	3	2	6	-
Respiratory infections	**132**	**242**	**94**	**222**	**211**	**151**	**128**	**525**	**239**	**149**	**135**	**58**	**59**	**58**	**97**	**484**
Lower respiratory infections	114	220	74	204	186	132	109	505	222	130	118	40	42	39	80	444

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	Croatia	Iceland	Norway	Switzerland	FYROM	Turkey
Upper respiratory infections	5	3	6	4	11	6	5	6	4	6	4	4	4	5	4	26
Otitis media	13	19	14	14	14	13	13	13	13	13	13	14	14	15	13	13
Maternal conditions	**43**	**119**	**64**	**81**	**103**	**42**	**54**	**68**	**51**	**46**	**44**	**42**	**16**	**44**	**46**	**120**
Perinatal conditions	**224**	**272**	**330**	**423**	**220**	**177**	**252**	**503**	**234**	**172**	**286**	**128**	**135**	**212**	**563**	**942**
Prematurity and low birth weight	101	90	195	49	86	90	126	127	158	93	107	53	28	77	372	440
Birth asphyxia and birth trauma	63	74	77	159	66	48	51	91	46	35	66	46	33	54	115	290
Neonatal infections and other conditions	60	109	59	215	68	40	75	284	31	44	113	29	74	81	76	212
Nutritional deficiencies	**104**	**178**	**192**	**186**	**403**	**79**	**183**	**256**	**198**	**108**	**103**	**65**	**60**	**57**	**141**	**475**
Protein-energy malnutrition	19	5	25	1	0	-	32	55	32	33	7	0	-	0	44	61
Iodine deficiency	0	59	61	59	286	-	32	62	46	2	3	-	-	-	-	212
Iron-deficiency anaemia	84	102	93	111	104	78	107	127	109	73	91	63	58	56	85	187

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	Croatia	Iceland	Norway	Switzerland	FYROM	Turkey
II. Non-communicable conditions	**9.784**	**11.795**	**12.581**	**12.302**	**11.693**	**8.341**	**10.615**	**11.925**	**11.363**	**9.565**	**10.483**	**7.633**	**8.747**	**7.858**	**12.057**	**12.089**
Malignant neoplasms	**1.799**	**1.638**	**2.167**	**1.662**	**1.656**	**1.268**	**1.822**	**1.640**	**1.732**	**1.699**	**1.761**	**1.184**	**1.371**	**1.225**	**1.826**	**1.233**
Mouth and oropharynx cancers	59	56	176	59	70	26	55	87	129	57	75	22	19	35	28	37
Oesophagus cancer	33	29	56	32	39	18	35	22	49	40	30	24	24	28	14	23
Stomach cancer	73	162	100	149	152	62	114	122	104	109	117	44	46	37	162	111
Colon and rectum cancer	269	146	253	159	141	159	180	138	234	208	207	128	183	121	149	92
Liver cancer	51	31	55	41	31	22	34	67	47	43	51	6	12	38	113	25
Pancreas cancer	91	81	91	83	71	73	71	70	70	66	62	55	72	52	61	26
Trachea, bronchus and lung cancers	338	296	548	267	261	186	405	301	283	334	351	253	247	226	344	327
Melanoma and other skin cancers	34	38	35	33	25	15	37	31	33	57	49	18	52	35	47	8
Breast cancer	141	146	166	169	154	161	138	135	134	157	165	148	152	153	153	98
Cervix uteri cancer	53	64	60	56	97	39	75	132	46	46	31	19	25	13	54	20
Corpus uteri cancer	39	30	30	55	33	32	24	17	36	45	30	27	25	23	39	11

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	Croatia	Iceland	Norway	Switzerland	FYROM	Turkey
Ovary cancer	53	67	47	55	67	50	60	41	48	53	50	39	56	42	40	28
Prostate cancer	61	53	43	56	52	38	47	30	40	58	51	71	88	53	52	26
Bladder cancer	37	30	41	34	27	32	48	32	27	34	33	20	37	29	44	43
Lymphomas and multiple myeloma	64	80	67	53	56	72	76	56	62	54	74	33	70	60	61	100
Leukaemia	62	78	79	66	71	73	73	67	67	51	56	23	51	58	89	140
Other neoplasms	**7**	**23**	**25**	**19**	**20**	**28**	**32**	**13**	**14**	**18**	**12**	**18**	**13**	**21**	**49**	**0**
Diabetes mellitus	**194**	**280**	**269**	**239**	**218**	**368**	**251**	**258**	**250**	**234**	**172**	**96**	**175**	**181**	**289**	**364**
Endocrine disorders	**56**	**132**	**85**	**79**	**55**	**115**	**122**	**76**	**106**	**57**	**77**	**127**	**154**	**127**	**83**	**27**
Neuropsychiatric disorders	**2.894**	**3.501**	**3.705**	**3.452**	**3.498**	**2.610**	**3.183**	**3.123**	**3.604**	**3.200**	**3.370**	**2.943**	**3.587**	**3.254**	**3.082**	**2.768**
Unipolar depressive disorders	934	857	847	855	855	764	1.043	1.042	1.043	1.248	1.142	956	997	1.114	1.038	1.038
Bipolar affective disorder	184	197	197	197	197	184	197	197	197	184	184	184	185	184	197	197
Schizophrenia	186	202	207	204	206	185	234	237	234	187	188	185	187	189	234	234
Epilepsy	65	115	61	94	92	53	63	70	76	56	66	69	65	52	64	73
Alcohol use disorders	415	1.003	1.242	917	1.030	251	458	529	727	398	523	291	969	399	316	158
Alzheimer and other dementias	241	179	169	169	154	246	181	170	178	230	233	274	261	264	168	177
Parkinson disease	35	52	38	38	37	56	31	31	24	39	38	63	44	45	55	12

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	Croatia	Iceland	Norway	Switzerland	FYROM	Turkey
Multiple sclerosis	36	37	29	40	36	31	33	27	30	37	36	45	42	38	41	24
Drug use disorders	29	26	75	73	50	47	130	12	244	70	232	137	97	223	151	8
Post-traumatic stress disorder	54	54	54	54	54	54	56	55	55	54	54	54	54	54	55	55
Obsessive-compulsive disorder	70	120	120	120	120	70	120	120	120	70	70	70	70	70	120	120
Panic disorder	97	104	104	104	104	97	104	104	104	97	97	97	97	97	104	104
Insomnia (primary)	78	61	60	61	61	77	60	60	60	77	78	77	77	78	60	60
Migraine	236	109	109	109	109	235	111	111	111	235	236	236	236	237	110	111
Sense organ disorders	**743**	**881**	**881**	**880**	**881**	**743**	**805**	**804**	**805**	**743**	**744**	**743**	**743**	**743**	**803**	**804**
Glaucoma	29	57	57	57	57	29	48	48	48	29	29	29	29	29	47	47
Cataracts	9	64	64	64	64	9	89	88	89	9	9	9	9	9	88	88
Refractive errors	262	234	234	234	234	262	246	246	246	262	262	262	262	262	246	246
Hearing loss, adult onset	337	426	426	426	426	338	313	313	313	337	337	338	338	338	314	314
Macular degeneration and other	105	100	100	100	100	105	109	109	109	105	106	105	105	105	108	109
Cardiovascular diseases	**2.187**	**3.045**	**2.721**	**3.756**	**3.030**	**1.398**	**2.379**	**3.484**	**2.616**	**1.602**	**2.373**	**1.080**	**1.063**	**866**	**3.836**	**4.082**
Rheumatic heart disease	12	36	21	36	39	13	23	28	20	17	3	3	4	4	25	188

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	Croatia	Iceland	Norway	Switzerland	FYROM	Turkey
Hypertensive heart disease	48	219	143	52	72	24	62	300	291	68	52	18	23	36	132	177
Ischemic heart disease	1.088	1.538	1.367	1.729	1.682	793	1.063	1.412	1.332	602	1.013	576	482	368	1.189	1.848
Cerebrovascular disease	557	719	702	1.047	645	356	616	1.239	442	493	837	239	283	184	1.364	1.232
Inflammatory heart diseases	32	294	145	645	272	37	91	118	81	148	74	47	36	46	785	142
Respiratory diseases	**577**	**399**	**576**	**275**	**352**	**555**	**338**	**368**	**389**	**528**	**596**	**516**	**608**	**415**	**466**	**1.091**
Chronic obstructive pulmonary disease	269	111	428	91	235	195	120	202	135	258	332	323	343	175	190	423
Asthma	201	199	82	137	75	243	159	67	120	207	202	133	205	173	134	200
Digestive diseases	**652**	**652**	**998**	**582**	**673**	**326**	**549**	**911**	**710**	**685**	**563**	**214**	**239**	**246**	**310**	**549**
Peptic ulcer disease	44	53	61	73	67	15	32	25	43	44	40	19	28	10	31	132
Cirrhosis of the liver	221	354	695	225	362	68	232	538	325	390	272	19	65	91	110	83
Appendicitis	4	4	5	4	5	3	4	4	3	3	4	3	3	3	6	7

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	Croatia	Iceland	Norway	Switzerland	FYROM	Turkey
Diseases of the genitourinary system	**90**	**83**	**66**	**112**	**83**	**77**	**88**	**101**	**119**	**58**	**76**	**54**	**54**	**46**	**196**	**241**
Nephritis and nephrosis	61	45	29	52	41	40	60	72	88	24	40	19	16	14	163	145
Benign prostatic hypertrophy	20	23	23	24	23	20	23	26	23	21	20	21	21	21	30	30
Skin diseases	**10**	**63**	**54**	**60**	**65**	**31**	**22**	**25**	**21**	**16**	**10**	**11**	**11**	**11**	**21**	**23**
Musculoskeletal diseases	**387**	**649**	**633**	**646**	**643**	**403**	**674**	**666**	**671**	**402**	**396**	**394**	**398**	**403**	**665**	**663**
Rheumatoid arthritis	80	143	135	137	142	83	140	135	137	84	84	82	83	83	135	135
Osteoarthritis	199	372	370	372	372	200	415	414	415	199	199	197	199	199	412	412
Congenital abnormalities	**106**	**338**	**290**	**429**	**406**	**337**	**239**	**345**	**213**	**242**	**252**	**172**	**248**	**236**	**320**	**134**
Oral diseases	**82**	**111**	**111**	**111**	**114**	**82**	**112**	**112**	**111**	**83**	**82**	**82**	**83**	**83**	**111**	**111**
Dental caries	58	72	72	72	72	58	72	72	72	58	58	58	58	58	72	72
Periodontal disease	4	5	5	5	5	4	5	5	5	4	4	4	4	4	5	5
Edentulism	21	33	33	33	33	21	34	34	34	21	21	20	20	21	34	34
III. Injuries	**1.393**	**3.068**	**1.506**	**3.122**	**3.430**	**664**	**1.758**	**1.853**	**1.581**	**1.465**	**1.312**	**959**	**1.195**	**867**	**2.567**	**1.374**
Unintentional	**1.052**	**2.314**	**950**	**2.325**	**2.228**	**533**	**1.366**	**1.535**	**1.258**	**938**	**964**	**653**	**906**	**548**	**1.092**	**1.181**
Road traffic accidents	315	422	375	615	607	139	396	312	357	404	430	230	227	205	267	336
Poisonings	57	555	24	276	328	57	83	91	49	32	44	55	197	7	40	17

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	Croatia	Iceland	Norway	Switzerland	FYROM	Turkey
Falls	236	287	232	337	337	144	273	300	273	215	194	134	157	139	163	235
Fires	16	179	41	168	102	9	52	60	45	11	12	21	25	9	36	42
Drownings	36	126	38	221	203	19	56	112	63	19	34	17	40	15	36	23
Other unintentional injuries	390	745	241	708	652	164	506	659	470	258	251	196	261	173	551	527
Intentional	**342**	**754**	**556**	**797**	**1.202**	**131**	**392**	**319**	**323**	**527**	**348**	**306**	**289**	**319**	**1.475**	**193**
Self-inflicted injuries	300	465	409	455	826	103	319	221	247	455	290	273	256	281	181	102
Violence	39	261	129	316	342	24	60	88	65	67	51	32	31	36	221	87
War and conflict	2	28	18	25	33	1	11	8	10	3	7	1	1	2	1.068	4

Annex 19 Burden of Disease for each disease or injury in all countries

Table A.19.1 Percentage of total Burden of Disease for each disease or injury for the age group 15-59 years in all countries. If the percentage was less than 1% in all subgroups, the figures are not presented in the table

GBD	% of total Burden of Disease in age group 15-59 years (worldwide)			
	High income countries		Middle income countries	
	men	women	men	women
I. Communicable, maternal, perinatal and nutritional conditions	**3.41**	**5.85**	**11.99**	**18.91**
A. Infectious and parasitic diseases	**2.60**	**2.33**	**9.82**	**10.02**
B. Respiratory infections	**0.51**	**0.38**	**1.29**	**0.94**
Lower respiratory infections	0.47	0.34	1.22	0.88
C. Maternal conditions	**0.00**	**2.11**	**0.00**	**6.36**
D. Nutritional deficiencies	**0.29**	**1.02**	**0.88**	**1.59**
II. Non-communicable conditions	**79.21**	**87.04**	**62.55**	**68.64**
A. Malignant neoplasms	**10.28**	**12.22**	**6.99**	**7.58**
Colon and rectum cancer	1.18	1.11	0.47	0.50
Trachea, bronchus and lung cancers	2.31	1.51	1.29	0.68
Breast cancer	0.01	3.58	0.00	1.60
B. Diabetes mellitus	**2.82**	**3.08**	**1.57**	**2.50**
C. Endocrine disorders	**1.30**	**2.10**	**0.54**	**1.02**
D. Neuropsychiatric disorders	**30.07**	**37.68**	**20.16**	**24.82**
Unipolar depressive disorders	7.97	18.13	4.78	11.05
Bipolar affective disorder	1.99	2.33	1.74	2.34
Schizophrenia	1.72	2.03	1.88	2.71
Alcohol use disorders	8.53	2.54	6.59	0.88
Drug use disorders	3.72	1.44	1.43	0.53
Migraine	0.58	2.67	0.31	1.22
E. Sense organ disorders	**6.84**	**8.27**	**7.12**	**9.32**
Hearing loss, adult onset	3.36	3.49	2.57	2.93
F. Cardiovascular diseases	**12.11**	**7.15**	**11.55**	**8.97**
Ischemic heart disease	5.73	1.95	4.94	2.79
Cerebrovascular disease	2.77	2.68	3.41	3.26
G. Respiratory diseases	**5.33**	**5.70**	**4.66**	**3.60**
Chronic obstructive pulmonary disease	2.62	3.35	2.31	1.59
Asthma	1.60	1.27	1.19	1.03

GBD	% of total Burden of Disease in age group 15-59 years (worldwide)			
	High income countries		Middle income countries	
	men	women	men	women
H. Digestive diseases	**4.73**	**3.70**	**4.44**	**3.15**
Cirrhosis of the liver	2.25	1.01	1.91	1.02
I. Diseases of the genitourinary system	**0.90**	**0.52**	**1.51**	**1.36**
J. Skin diseases	**0.12**	**0.16**	**0.30**	**0.46**
K. Musculoskeletal diseases	**3.65**	**5.36**	**2.90**	**4.86**
Rheumatoid arthritis	0.46	1.50	0.29	1.06
Osteoarthritis	1.67	2.33	1.28	2.77
L. Congenital abnormalities	**0.24**	**0.23**	**0.16**	**0.16**
M. Oral diseases	**0.61**	**0.72**	**0.49**	**0.67**
III. Injuries	**17.38**	**7.10**	**25.46**	**12.45**
A. Unintentional	**10.88**	**4.77**	**16.52**	**9.29**
Road traffic accidents	5.20	2.12	6.73	3.00
Poisonings	1.22	0.63	1.18	0.59
Falls	1.47	0.62	1.93	1.14
Drownings	0.44	0.09	1.08	0.50
Other unintentional injuries	2.36	1.18	5.24	3.62
B. Intentional	**6.50**	**2.34**	**8.94**	**3.16**
Self-inflicted injuries	4.54	1.78	2.28	2.05
Violence	1.74	0.54	5.05	0.97
War and conflict	0.17	0.01	1.52	0.12

Source: The Global Burden of Disease. 2004 update. World Health Organization 2008.

Annex 20 People out of work for health reasons

Table A.20.1 Percentage of people leaving their job and percentage of people not searching employment for health reasons

Country	Left last job for health reasons	Reasons for not searching employment		
		Employed, found a job, or searching a job	Not searching for health reasons	Not searching for other reasons
BE	15%	68%	4%	28%
BG	9%	68%	5%	28%
CZ	13%	70%	1%	29%
DK	22%	81%	6%	13%
DE	11%	78%	2%	20%
EE	12%	74%	5%	21%
IE	10%	95%	1%	4%
EL	6%	68%	2%	30%
ES	10%	74%	5%	22%
FR	2%	94%	<1%	5%
IT	5%	63%	2%	35%
CY	13%	74%	3%	23%
LV	9%	74%	4%	22%
LT	12%	70%	5%	24%
LU	14%	69%	3%	28%
HU	3%	62%	6%	33%
MT	10%	59%	3%	38%
NL	21%	81%	6%	14%
AT	18%	76%	2%	22%
PL	12%	65%	6%	29%
PT	13%	74%	3%	23%
RO	15%	63%	4%	33%
SI	5%	72%	4%	24%
SK	12%	69%	5%	27%
FI	12%	77%	4%	19%
SE	15%	80%	6%	14%
UK	17%	76%	6%	18%
IS	12%	87%	4%	10%
NO	41%	84%	7%	9%
HR	3%	64%	3%	34%
MK	2%	64%	2%	34%

TR	7%	52%	3%	45%
Total	**10%**	**74%**	**4%**	**22%**

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