

**TNO Quality of Life**



**TNO report**

**Future Working Environment Challenges in the  
Netherlands**

**Work and Employment**

Polarisavenue 151  
P.O. Box 718  
2130 AS Hoofddorp  
The Netherlands

[www.tno.nl](http://www.tno.nl)

T +31 23 554 93 93

F +31 23 554 93 94

[info-arbeid@tno.nl](mailto:info-arbeid@tno.nl)

Date September 2009

Author(s) Joost van Genabeek

## Contents

	<b>List of tables and figures .....</b>	<b>3</b>
<b>1</b>	<b>Introduction.....</b>	<b>4</b>
<b>2</b>	<b>New technologies .....</b>	<b>5</b>
2.1	Specification of the trend .....	5
2.2	Implications for the working environment.....	6
<b>3</b>	<b>Dominance of the service sector.....</b>	<b>9</b>
3.1	Specification of the trend .....	9
3.2	Implications for the working environment.....	9
<b>4</b>	<b>Upgrading and downgrading .....</b>	<b>12</b>
4.1	Specification of the trend .....	12
4.2	Implications for the working environment.....	14
<b>5</b>	<b>Occupational Safety and Health.....</b>	<b>16</b>
5.1	The general health of the working population .....	16
5.2	Occupational safety and health of Dutch workers .....	17
<b>6</b>	<b>Knowledge gaps.....</b>	<b>19</b>
<b>7</b>	<b>Overview of national strategies and policy priorities in the Netherlands.....</b>	<b>20</b>
<b>8</b>	<b>Literature.....</b>	<b>22</b>

## List of tables and figures

### Tables

Table 1: 'Upgrading' per educational level, 2007-2011

Table 2: Complexity of work (percentage often/always)

Table 3: Working conditions by level of education in percentages

Table 4: Overview of national strategies and policy priorities in the Netherlands

### Figures

Figure 1: Share in employment, CPB 'transatlantic market' scenario

Figure 2: Pressure of work in the Netherlands 1994-2020

Figure 3: Upgrading, 1996-2009 and forecast for 2010-2020

# 1 Introduction

This paper examines the challenges facing working conditions in the Netherlands over the coming decade (2010-2020). I will investigate the following trends that have an influence on work in general and on working conditions in particular:

- new technologies;
- the dominance of the service sector;
- upgrading of the labour market.

These are trends that are currently emerging whose development over the next ten years it is therefore already possible to envisage. I also considered including climate change as an issue because of the major impact that rising sea levels are likely to have on the low-lying Netherlands. However, since the effect of rising sea levels will only fully emerge in the long term, I decided to exclude this issue.

In writing this paper, I referred extensively to the various studies published on the future of work in recent years (Huizinga and Smid 2004, Wevers et al 2005, Fouarge et al 2006, Research Centre for Education and the Labour Market [ROA] 2007, Genabeek et al 2007 II, Genabeek et al 2009). Unfortunately, these investigations fail to fully account for several recent events that have had a significant impact on society. For example, most of them make no reference to the credit crunch and its repercussions on the real economy and labour market. I have therefore found it necessary to make substantial adjustments to forecasts and expectations from earlier investigations.

This paper is structured as follows. I start by examining the three trends mentioned above and the implications these are likely to have for working conditions. I then discuss the future of occupational safety and health in the Netherlands. I examine the general health of the Dutch working population, focusing specifically on health issues that have no causal connection with employment. I then investigate the changes expected to occur in employment-related health issues. In my brief conclusion, I outline several gaps in knowledge and areas identified as requiring further research. I conclude my paper with an overview of relevant national strategies and policy priorities in the Netherlands.

## 2 New technologies

### 2.1 Specification of the trend

In the Netherlands there is broad consensus on the far-reaching influence that technological developments will have in the coming years both in terms of the content of work and the conditions in which it is carried out. Developments in ICT and telecommunications, automation and robotics, biotechnology and nanotechnology in particular are proceeding at such a pace that it is difficult to predict their consequences on working conditions in concrete terms. Since so much remains unclear and unknown, there is a tendency to focus on the risks involved in new technological developments. But technology does not only present threats; it can also help enhance safe and healthy working conditions. In this paragraph, I shall briefly examine several technological trends that are expected to have a significant impact on work in the coming years.

#### *ICT and telecommunications*

ICT and telecommunications involve information and communication technology. Their impact is most significant when both these technologies are applied in combination. This includes data storage and data connections, computer networks, modern telecommunications and satellite communication. These hardware technologies enable the development of even more advanced software and lead to a far-reaching virtualization of social processes and therefore also of work. Virtualization involves people working together remotely in virtual teams, mobile working, shared services or virtual networks. It has major consequences for the content, organization and execution of work. Virtualization can enable an employee, team or organization to work independently of place or time and coordinate with clients, colleagues, teams and other organizations. All kinds of creative and design processes also increasingly take place virtually. In addition, virtualization makes new forms of education and learning possible, including E-learning, gaming and communities. The more time people spend in the virtual world, the more this is expected to have an impact on the real, tangible world. For example, the recent credit crisis has clearly demonstrated that the virtual financial economy has a direct impact on the real economy (Van Genabeek et al 2009).

#### *Automation and robotics*

Automation involves replacing human labour by automated systems and processes, using computers and computer programs. It is driven by an economic imperative: automation allows a reduction in the total labour and raw materials required. Automation also takes various forms and can be applied in offices, industry and in graphics. It is expected that corporate processes will be subject to even further automation in the years to come. The use of robots is also predicted to increase, especially in industry and transport. In robotics, tasks originally carried out by humans are completely achieved by machines. The first visible uses of robotics occurred in the automobile industry and were especially employed in welding. In the coming years, robots will be increasingly deployed in the logistics sector (warehouse management and container transfer), an area crucial for the Dutch economy, as well as in transport (unmanned vehicles).

### *Biotechnology*

Biotechnology is technology that applies biological knowledge for practical purposes and covers a wide spectrum ranging from cheese production to high-tech laboratory work. One area of biotechnology currently in the spotlight is genetic manipulation. This involves deliberately changing the DNA in the genes of an organism in order to modify the phenotype (the traits of an organism, as distinct from the genes inherited from parents) without resorting exclusively to using the organism's normal reproductive process. The resulting organisms are known as genetically modified organisms.

### *Nanotechnology*

Nanotechnology makes it possible to manipulate particles as small as one billionth of a metre, at the scale of atoms and molecules. The idea behind nanotechnology is that knowing the chemical composition and the three-dimensional structure of a substance should make it possible to create a substance by adding the right building blocks in the right place. In the last decade, interest in nanotechnology has increased enormously among the scientific community and more widely. This interest is expected to continue as more and more applications are discovered. According to the OECD (OECD & Allianz Group 2005) global public sector expenditure on nanotechnology is in the region of €3 billion. The combination of biotechnology and nanotechnology is expected to lead to significant breakthroughs in medical technology.

## **2.2 Implications for the working environment**

Although there remain many uncertainties about the possible applications of new technological advances, they are expected to be used on a wide scale in products, technologies and systems. The impact on productivity and the content of work is predicted to be enormous.

### *Opportunities and risks of virtualization, automation and robotics*

The further development and wider application of automation, robotics and the virtualization of manufacturing processes will enable employees to work at a greater distance from materials, machines and products, reducing or even eliminating physical exposure to the risks of poisoning, contamination and faults or breakdowns. On the other hand, these technologies also enable significant increases in labour productivity, potentially making the work more mentally challenging for employees. This applies especially to the virtualization of work since thanks to these technologies almost unlimited flexibility becomes possible in terms of working hours and working relationships. As a result, it will become increasingly difficult to monitor working conditions since the virtual working environment offers fewer opportunities for the enforcement of rules relating to occupational safety and health (for example because of the lack of a clearly defined place of work).

### *Safety technology*

Vehicles and machines will continue to become safer as they replace the tasks traditionally carried out by the driver or operator and reduce the impact of human error (Van Genabeek et al 2007). For example, the freight truck of the future will brake automatically if it approaches an object too closely, its windscreen wipers will automatically be deployed in the event of rain and the vehicle will warn the driver about hazardous situations in traffic. In recent years, the use of advanced security cameras, motion sensors and smoke alarms has made it easier to ensure safety on construction

sites, in machines and electronics. At the same time, machines are increasingly fitted with safety mechanisms designed to reduce damage during use.

The use of safety technology is expected to result in a further decrease in the number of industrial accidents in the coming years. However, faults in these security systems can present a new kind of threat to safety. Drivers or operators accustomed to being assisted by built-in safety mechanisms are suddenly left to their own devices in the event of a fault in the system. This can actually increase the likelihood of significant damage. Safety technology can also create unsafe situations at work if drivers/operators are too easily distracted by signals on dashboards or displays.

#### *More intensive use of space*

New technology also makes it possible to use space more intensively. The high population density in the Netherlands means that space is limited and expensive. As a result, businesses are continually in search of new ways to use the available space more efficiently and effectively. The resulting increased intensity in the use of space can have repercussions for safety in business premises and on means of transport (Van Genabeek et al 2007).

#### Business premises

Recent years have seen the development in the Netherlands of numerous business complexes in which different companies share specific spaces and facilities, such as the reception, restaurant and sanitary facilities. Combining a wide range of activities in a single building, which may also be subject to frequent changes, increases the risk of fire or equipment failure. This means that although the risk of fire for one user may in itself be limited, it is actually increased by the activities of other users nearby. When various different activities are coordinated, this can also present additional risks. If one activity in the coordinated process suddenly fails, this can have serious consequences for the safety of the workers involved. Finally, the increased intensity in the use of space has also led to significant growth in underground construction. The risks of working in such confined spaces can have far-reaching consequences. If fire breaks out or if an underground area becomes flooded, the consequences for staff working in that space can be incalculable.

#### Means of transport

In the Netherlands, the available infrastructure is being used more and more intensively. This applies to roads, the already congested Dutch railway network and shipping. Although the vehicles and vessels used are becoming ever safer, the increased intensity in the use of the road and railway network and shipping routes raises the likelihood of accidents and collisions. The chance of damage occurring that has major consequences has also increased. When space is used so intensively, a motorway accident in a heavily populated area can set off a highly destructive chain reaction.

#### *Biotechnology and nanotechnology*

Much remains unknown about the risks of such major trends as biotechnology and nanotechnology. If one examines the potential risk scenarios, it is possible to identify several trends.

In the near future, it is highly likely that biotechnology and nanotechnology will be applied in corporate processes and products on a major scale. This will result in growing numbers of people being exposed to products generated by these technologies. The potentially damaging effects remain largely unknown, partly because it can take a long time before they become evident (as such they may be compared to the effect of

asbestos on human health). In individual cases, it is likely to be extremely difficult to identify causal relationships between the application of biotechnology and nanotechnology in corporate processes and the emergence of health problems among employees.

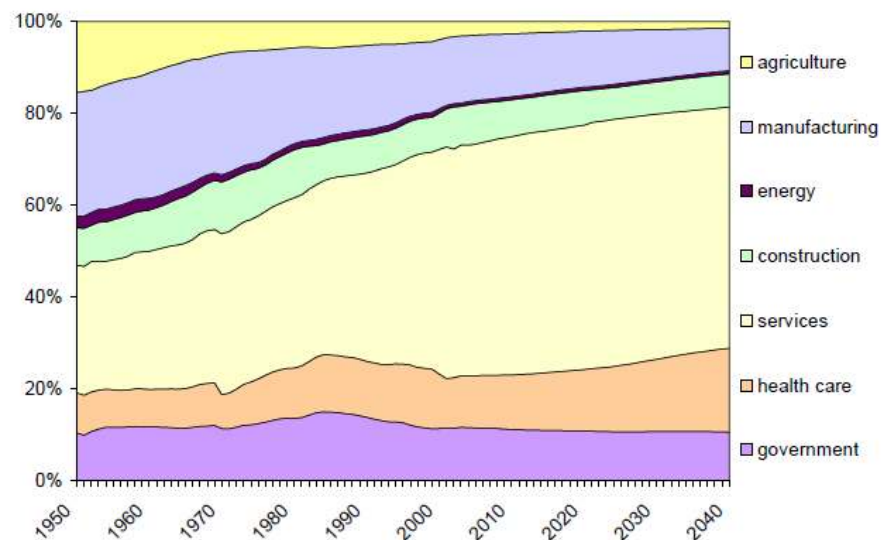


## 3 Dominance of the service sector

### 3.1 Specification of the trend

Analyses suggest that in the coming years the service sector will continue to increase its share in the Dutch economy. Commercial services (especially transport and communication services) have seen more than average economic growth over a long period. Over the same period, there has also been an identifiable shift towards service-related tasks.

Figure 1: Share in employment, Netherlands Bureau for Economic Policy Analysis (CPB) 'transatlantic market' scenario



Source: Huizinga and Smid (2004)

The share of the service sector in total employment is expected to continue to increase in the coming years. Although substantial job losses are predicted in the business services and transport sectors between 2009 and 2011, the growth in jobs in the health care and education sectors is expected to continue undiminished. The demand for health care will grow as a result of the rapidly ageing population after 2010 (since elderly people tend on average to require more health care). At the same time, there is also expected to be an increase in the number of jobs in higher vocational education and higher education as more students continue their studies in response to rising unemployment. The service sector will therefore maintain its dominance in the coming years especially in view of the significant fall in industrial employment.

### 3.2 Implications for the working environment

#### *Aggression and intimidation*

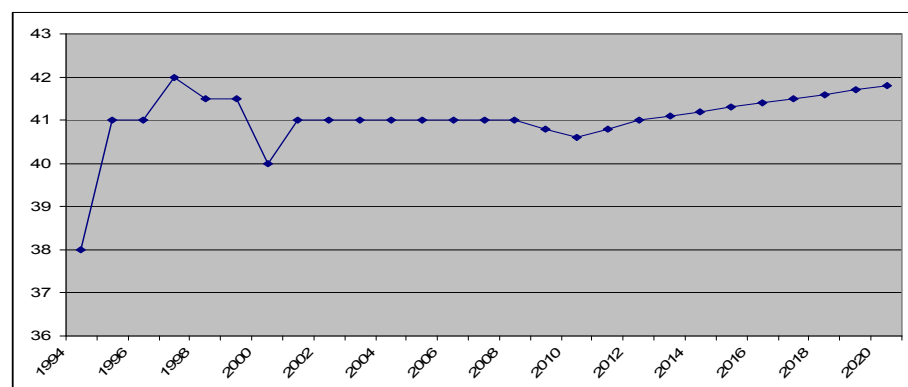
The dominance of the service sector will lead to an increase in social interaction at work. This will place greater demands on employees' social and emotional intelligence.

(Weehuizen 2006). This increased interaction with clients, patients or students for example will also raise the likelihood of people being confronted with undesirable behaviour at work. The National Survey of Working Conditions commissioned by TNO and Statistics Netherlands or CBS (Koppes et al. 2009) shows that in 2008, 19% of employees in the Netherlands experienced sexual or other intimidation and/or bullying by their clients and 6.5% of employees reported physical violence by clients. The health care sector is particularly risky in this regard. Comparison with previous Surveys of Working Conditions shows that the number of employees reporting intimidation and violence has fallen slightly in recent years. This positive trend can perhaps be explained by the successful application of preventive measures in the form of anti-aggression training and improved security in health care, the police and education. However, incidents involving extreme violence at work appear to have increased in recent years. This may be seen as a reflection of a wider trend in Dutch society as a whole. The increasing dominance of the service sector means that by 2020 we expect more than one third of the total working population to be exposed to undesirable behaviour at work.

#### *Work pressure and psychological pressure*

Following a rapid acceleration in the 1990s, the pressure of work in the Netherlands is relatively high. Figures from Dutch Statistics (CBS) show that the number of working people who claim to have to work at speed has stabilized in recent years. Pressure at work is high especially in the service sector (hospitality and catering, education, financial and commercial services and health care being the most obvious) and low in the agriculture and fisheries sector. In 2009 and 2010, we expect to see a slight drop in work pressure as a result of the sudden economic downturn, followed by a gradual resurgence from 2011. In the longer term, the ageing population, the decline in the numbers of young people and the shift in employment to the service sector will lead to a further increase in the psychological pressure faced by those in employment (see figure 2).

Figure 2: Pressure of work in the Netherlands 1994-2020 (need to work against the clock)



Source: Dutch statistics (CBS); processed by TNO

Pressure at work is experienced as less of a problem if one is able to control the work one does. Fortunately, this kind of independence at work is common among Dutch employees. When high work pressure is combined with a significant degree of autonomy, this is more likely to be considered as challenging work. TNO research

shows that workers in the financial and commercial services sector and in public administration in particular experience their work as challenging. Work is considered to be exhausting if there is high pressure and limited autonomy. This is relatively common among employees in the hospitality and catering sectors, in education and health care. Work is considered to be easy if the work pressure is low and autonomy high (e.g. the cultural sector). Finally, if low work pressure is combined with limited autonomy the work is considered to be boring. Easy and boring work occurs most frequently in agriculture, fisheries and the transport sector.

In view of the growth in services, we expect to see an increase especially in challenging (high work pressure, high autonomy) and exhausting work (high work pressure, limited autonomy) and a rapid fall in boring work (high work pressure and limited autonomy) in the coming years.

## 4 Upgrading and downgrading

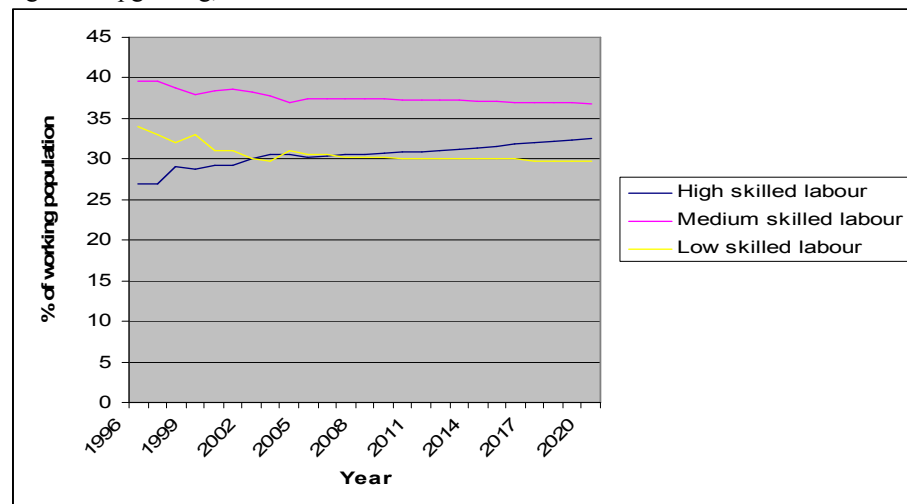
### 4.1 Specification of the trend

The process of skills upgrading means that employees are increasingly expected to be more highly qualified as a result of the growing complexity of the work they are required to do. This may also be caused by a shift in employment from lower to higher positions and careers. Upgrading is not a new phenomenon on the Dutch labour market since it has been in evidence to varying degrees for many decades. Figure 3 shows the skills upgrading trend since 1996 (ROA 2007). The interrupted lines show the trend in the demand for labour at a specific skills level assuming that upgrading increases at a constant speed. Based on these trends, the demand for academics is expected to increase in the coming years while the demand for unskilled or poorly qualified employees drops.

ROA (2007) does however show that the speed of upgrading has slowed somewhat since the end of the last century (see the uninterrupted lines in figure 3). This is largely due to organizational changes combined with the introduction of new technologies. In recent years, organizational changes have often gone hand-in-hand with a shift in demand for labour: from more general to more specific skills. This last trend is expected to continue in the years to come. This means that there will be an increasing demand for high skilled labour and for specific skills. On the other hand, there will only be a limited decrease in the demand for low skilled labour. This is because technology will not only result in more complex work but will also simplify tasks that were previously much more onerous.

This leads to the emergence of both more complex work and simpler work. This diverging development presents a threat for the demand for middle management positions, previously considered to be the backbone of many organizations: this demand will fall and the people holding these positions will be either need to upgrade or downgrade.

Figure 3 Upgrading, 1996-2009 and forecast for 2010-2020



Source: ROA 2007; forecast for 2010-2020 processed by TNO

This last prediction is confirmed by the most recent labour market forecasts from ROA. Table 1 shows the upgrading for each level of education for the period 2007-2012. The effect of education column shows the degree of upgrading within professions or the effect on employment of changes in educational background required. The effect of higher education is positive while the effect of a lower education is negative.

The table also shows that in the coming years employment will increase at all levels. ROA also added a note to the table indicating that in previous forecast studies, upgrading was far more evident (and the effect of education significantly stronger). There is also a reference to the decreasing speed of the upgrading.

Table 1 ‘Upgrading’ per educational level, 2007-2011.

	Effect of education/ ‘upgrading’	Employment change
	%	%
Primary education	-0.5	0.1
Lower secondary education	-0.5	0.2
Higher secondary education	-0.4	1.0
Intermediate vocational education	0.0	0.8
Higher vocational education	0.4	1.1
Higher education	0.6	1.6
Total (including others)	0	0.8

Source: ROA (2007)

#### *Shifts in the employment structure at lower levels*

Although employment at the lower levels of the labour market remains to a certain extent guaranteed, there are significant changes underway. These changes can best be described as a shift in the structure of employment. By 2020, the demand for low skilled work in industry and agriculture will be substantially lower than is currently the case. This can perhaps be explained by a reduction in the agricultural area exploited, the deregulation of agricultural markets, the relocation of industrial production to low-wage countries and the further use of technology and automation for more rudimentary activities (see chapter 2). Job relocation leads to the disappearance of jobs at the lower end of the market, the use of technology and automation makes the jobs that do remain (maintenance and repair) increasingly complex meaning that increasingly higher demands are made on employees.

Another shift in the employment structure at the lower end of the labour market comes as a result of women’s increasing participation in the employment process. This leads to increased demand for household services, childcare etc. The ageing population, the desire or necessity to continue working for longer and the desire to live independently for longer also result in an increased need for personal services and care. Work at the lower end of the labour market is therefore changing significantly in character and this has repercussions primarily for poorly qualified men. This people currently tend to work mainly in the industrial, construction and agricultural sectors. Owing to the decreasing employment in these sectors, a large part of this group will ultimately need

to find work elsewhere. The question remains however as to whether they will find the transition to a job in personal services or in health care to be an easy one.

## 4.2 Implications for the working environment

### *Upgrading and cognitive pressure*

Upgrading entails more demanding requirements for the positions involved. This can make the job more interesting and increase the opportunities for development. On the other hand, it can lead to greater cognitive pressure in such jobs. TNO figures (Van den Bossche, Smulders, Houtman 2006) do not yet show any increase in the number of employees in the Netherlands exposed to a high degree of cognitive pressure (see table 2). Indeed, for certain indicators the opposite would appear to be true.

Table 2: complexity of work (percentage often/ always)

	2000	2002	2004
Does your work demand intensive thought?	57	54	56
Do you need to recall large amounts of information over a long period?	50	48	50
Does your work demand that you keep track of your thoughts?	90	86	87
Does your work demand a lot of attention?	80	77	77
Do you have to monitor a lot of different things at the same time in your work?	74	72	70

Source: TNO situation of work; Survey, 2000-2002-2004.

The extent to which the supply and demand of highly qualified labour (in other words the relationship between cognitive pressure and the ability to take such pressure) remains in balance will determine whether the increase in knowledge-related work proves to be detrimental or indeed beneficial to the mental health of those working in the Netherlands. Nevertheless despite the positive figures above we expect that skills upgrading in the service sector will lead to an increase in psychological pressure on employees over the longer term.

### *Health risks at the lower end of the labour market*

As a result of upgrading, the lower end of the labour market is likely to decrease in size in the coming years. This applies in particular to those carrying out work for which high qualifications are not required (low level of education, low salary) with an employment contract or agency contract<sup>1</sup>. The health risks of this declining group will remain limited in the coming years because they generally have access to company health care from health and safety professionals, company physicians or in the case of agency workers insurance doctors from the social security agency UWV. However, there are indications that casual labourers (including growing numbers of illegal workers) will form an increasingly substantial portion of the lower end of the labour market in the coming years. For some years there has been a major influx of foreign labour onto the Dutch labour market from EU member states in Eastern Europe and the Ukraine, who work in construction, transport and agriculture as agency workers, on standby or independently. This group often has limited or no access to company health care or health care provided by the UWV and can be inhibited from accessing curative health care (no health insurance, high excess payments for health insurance and fear of discovery in the case of illegal workers). There is also an increasing use of subcontracting by companies

<sup>1</sup> For a breakdown of the lower end of the employment market in the Netherlands, see: De Beer, 1996 and Netherlands Centre for Occupational Diseases (NCvB), 2009.

who pass on the risk of absence caused by sick leave and incapacity for work to third parties who do not provide company health care. At the same time, research shows (Fouarge et al 2006) that poorly qualified employees are faced with difficult working conditions relatively often (see table 3). These are permanent working conditions that are highly likely to remain relatively unchanged in the years to come.

Table 3: working conditions by level of education in percentages

	Primary education	Lower secondary education	Higher secondary education	Higher vocational education	Higher education
Dangerous working conditions	25	21	15	8	4
Working with hazardous materials	16	18	16	8	5
Unpleasant smells, noise, draught or high/low temperatures	46	49	38	25	18
Physically demanding work	45	45	33	17	5

Fouarge et al, 2006).

We can therefore make the following conclusions about the lower end of the labour market in the coming years:

- upgrading will reduce the supply of work available;
- working hours and working relationships will become more flexible;
- measures to prevent illness or promote health will increasingly be lacking or will not be applied;
- the work will therefore remain relatively unsafe.

## 5 Occupational Safety and Health

### 5.1 The general health of the working population

The health of Dutch employees has improved in recent years. Sick leave has fallen from just 5% in 2005 to 4% in 2008. Furthermore, the percentage of Dutch employees with a positive perception of their own health has increased from 86% in 1990 to 91% in 2007.<sup>2</sup>

The increasing number of healthy employees may be largely due to the changing structure of employment. In sectors with the most risk, such as the agricultural sector and heavy industry, the number of people working is decreasing, reducing the number of employees exposed to health risks. Another explanation for the improved health of Dutch employees is what has been called the healthy worker effect. This is the phenomenon whereby relatively large numbers of people with health issues gradually disappear from the employment process over the years. Although average participation in employment (based on a working week of twelve hours or more) has fluctuated between 64% and 70% since 2002, participation in employment by those with occupational disabilities fell from 44% in 2002 to 40% in 2006 and has remained stable since then. Within the Dutch working population a process of selection takes place (selection on entry). Unhealthy employees are either not appointed in the first place or disappear from the employment process more quickly than healthy workers as they are more likely to be made redundant or not have their temporary contracts renewed in the event of reorganizations or mergers.

Until recently, this healthy worker effect was expected to decline after 2010. The increasing scarcity of labour was expected to force employers to increasingly consider the supply of less employable people causing the average employment participation of those with occupational disabilities and chronic illnesses to increase. Recent forecasts however have suggested that this scarcity of labour is not likely to emerge until 2015 (Van Ewijk, Teulings 2009; De Beer 2009). The current economic crisis is predicted to lead to a substantial rise in unemployment in 2009 and 2010, after which (from 2011) employment will gradually recover. The obvious conclusion is that there will still be little room in the labour market for those with occupational disabilities and chronic illnesses in the coming years.

Despite the fact that the healthy worker effect is likely to continue, there are indications that the health of the active working population will worsen in the coming years. Firstly, the Dutch working population faces the problem of rapid ageing (although compared to other EU countries, the Netherlands is slightly behind). This pressure caused by the ageing population (expressed in terms of the number of over 65s as a percentage of those between 20 and 64) will increase from 23% in 2007 to 35% in 2020 (Huizinga and Smid 2004). This ageing process is also accompanied by increasing health problems which seriously limit people's usefulness in the labour market. Examples of illnesses that occur on average more frequently among older workers include cardiovascular diseases, cancer, osteoarthritis, bronchitis and contact eczema.

---

<sup>2</sup> Although some of this group of employees do have work related health problems. See 5.2 for more information.



These illnesses are obviously likely to become increasingly prevalent in the coming years.

The growing problem of obesity is another indication that the health of the Dutch working population is likely to worsen more acutely in the years to come. Dutch statistics from the Ongoing Lifestyle Survey on Health and Well-being (*Permanente Onderzoek Leefsituatie Gezondheid en Welzijn*) show that the percentage of adults who were moderately to seriously overweight increased from 35% in 1990 to 45% in 2007 (with as many as 11% of adults being morbidly obese in 2007). The percentage of overweight children aged seven and above almost doubled between 1997 and 2004. If this trend continues, the percentage of adults who are seriously overweight (obese) will increase by 50% in the next twenty years (Bemelmans et al 2004).

People who are overweight are relatively more likely to suffer health problems that inhibit their ability to function physically. Examples include back, hip and knee problems, fatigue and shortness of breath. Obesity can also cause diseases such as cardiovascular diseases, osteoarthritis and diabetes. According to a study of trends by the Dutch National Institute for Public Health and the Environment (RIVM, Bemelmans et al 2004) by around 2020 the total number of deaths and prevalence of strokes, heart attacks, and osteoarthritis of the hip will have risen as a result of the expected growth in the numbers of people who are overweight or obese. The most significant impact will be in the numbers suffering from diabetes mellitus type 2. The expected increase in the number of people who are moderately overweight or obese is expected to lead to an increase in the number of diabetes patients of as much as 9% by 2020.

## 5.2 Occupational safety and health of Dutch workers

### *The Netherlands compared with the rest of Europe*

Within Europe, the Netherlands scores relatively well in terms of physical and environmental risks. This is not only due to the relative scarcity of physically demanding work in the Netherlands, the relatively large size of the service sector or the fall in the numbers of physically demanding jobs over recent decades. A sector-by-sector comparison of reported exposure to risks at work by Dutch people and other Europeans shows that it is precisely in those areas of industry and construction that are most physically demanding that Dutch people report fewer risks than those in the rest of the European Union (Bakhuys Roozenboom et al 2009). It is only within financial institutions and health care and welfare that exposure to risks at work in the Netherlands does not score better than in the rest of Europe (but nor does it score worse).

### *Employment-related health issues*

To what extent are health problems caused by work? According to the report on Dutch occupational safety and health, *Arbobalans 2007/2008* (Bakhuys Roozenboom et al 2009) 17% of the working population say that they have one or more health problems caused by factors at work. The most common health issues reported are physical symptoms involving the musculoskeletal system (back, neck and arms, hands, legs and feet). In the case of 6% of employees, these symptoms are caused by their work. The type of physical complaints also varies according to the different professional groups. Administrative staff are more likely to suffer from RSI and unskilled workers and labourers in the agricultural sector, construction and in transport tend to suffer more from back problems.

Psychological health problems caused by work are significantly less common (just 2%). The professions that do report psychological problems caused by work relatively often

are primarily those involved in less physically demanding work, such as teachers and senior or medium-level professionals.

In recent years, there has been a noticeable increase in the number of employees reporting damage to hearing caused by work, although this involves only half a percent of employees. This increase is primarily accounted for by employees in catering and hospitality (nightclubs, pop concerts, musicals, house parties, etc.).

Health problems caused by exposure to chemical or biological agents are relatively rare in the Netherlands. Less than half a percent of employees suffer work-related pulmonary problems (asthma, bronchitis, emphysema) and only 0.1% have skin complaints that are linked to employment. This is despite the fact that as many as 10% of Dutch workers are regularly exposed to dangerous substances. These are predominantly hairdressers and beauticians (63%), painters (50%), machinery workers, assembly workers and instrument manufacturers (45%), and plumbers, fitters, welders and sheet and construction workers (42%). In practice, it appears that employees exposed to chemical and biological agents are happy with the protective measures taken. As many as 95% believe that the protective measures taken are adequate (Koppes et al 2009).

#### *Expectations for the future (2010-2020)*

It seems that in the coming years there are likely to be no major changes in terms of the health problems caused by work. However, the situation is likely to worsen as a result of the following factors:

- the increasing dominance of the service sector and the related increase in work pressure, psychological pressure and incidents involving aggressive and intimidating behaviour at work;
- new applications of technology whose effects on health are still insufficiently understood (especially biotechnology and nanotechnology);
- increasing flexibility in terms of working hours and working relationships, especially at the lower end of the labour market;
- the ageing population and the decline in the numbers of young people making up the working population along with the related increase in the number of age-related health problems;
- unhealthy lifestyles (obesity, alcohol and drug use, regular exposure to noise);

Occupational health and safety is likely to improve as a result of the following factors:

- the use of new safety technologies;
- the use of automation and robotics in work that involves a high level of risk;
- health and safety measures designed to combat work pressure, RSI, physically demanding work and exposure to noise and safer working conditions intended to prevent aggression, intimidation and violence;
- improved information designed to promote health at work, especially at the lower end of the labour market.

## 6 Knowledge gaps

What gaps are there in our knowledge and where can we predict that further research will be required?

Firstly, we know relatively little about the relationship between chronic illnesses and employment. It is expected that the ageing population and increasing obesity are likely to lead to large numbers of employees suffering from chronic illnesses such as diabetes, rheumatism, psoriasis, osteoarthritis, etc. It still remains unclear as to how these people will be able to continue to be employable and productive in a rapidly changing labour market in spite of their illnesses. What types of work are more appropriate for such people and what kind of work exposes them to health risks? What changes will be required to the workplace in order to enable people to continue to play a productive role in the workforce until a later age? What kind of support will they require and who will provide it (employer, personal coaches, medical specialists, etc.)? Experimental research in companies and in health care will provide a better understanding of these gaps in knowledge.

In the context of the above, curative health care will need to focus more specifically on work-related health issues. Various publications have highlighted the fact that work remains a neglected area among general practitioners and medical specialists. At the same time, there are increasing indications that work is beneficial for health and equally that health is advantageous for work. What health benefits could be achieved if general practitioners and medical specialists were to focus more specifically on work-related health issues? What can be done to improve coordination between company health care and curative health care? These gaps in knowledge demand research into the cost-effectiveness of work-related care, the development of concepts to enhance communication and coordination (public information, guidelines and strategies for effective cooperation between company medical officers and general practitioners) and the testing of such concepts by means of experimentation.

The effectiveness of safety technology in different working environments has not yet been proven. Research is required to identify in which sectors, in which specific working conditions and for which workers, the application of safety technology actually results in increased safety or in increased risks.

Finally, there is still insufficient understanding of the health effects of biotechnology and nanotechnology for people in general and for occupational health and safety in particular. In the Netherlands, guidelines are currently being drawn up by the Social and Economic Council to regulate work with nanotechnology (SER 2009). However, the drafting of such guidelines will be of little use until more evidence-based knowledge is available about the health effects of this technology.

## 7 Overview of national strategies and policy priorities in the Netherlands

The Dutch national strategies and policy priorities are largely based on the report issued by the government's Labour Participation Committee (*Commissie Arbeidsparticipatie 2008*). Since this report took no account of the consequences of the current economic crisis, the Dutch national government has also devised a number of additional strategies and policy priorities. These are included in the overview below.

In terms of occupational safety and health, the national government sets target regulations for the degree to which employees should be protected. The target regulations are laid down in the Working Conditions Act, the Working Conditions Decree and the Working Conditions Regulation. Employees and employers then have to agree on how to achieve these targets on healthy and safe working conditions. Beside the regular administration of current legislation and regulation the government has selected a number of areas for additional focus in the upcoming period. These areas are incorporated in table 4.

Table 4: Overview of national strategies and policy priorities in the Netherlands

Strategies	Policy priorities
<p><i>Involve more people in the workforce as soon as possible.</i></p> <p><i>Target: increase labour participation from 70% to 80% of the working population</i></p>	<p>A. Short-term</p> <ul style="list-style-type: none"> <li>- Introduce a temporary scheme for part-time unemployment benefits in order to maintain essential employment in companies hardest hit by the economic crisis</li> <li>- Set up mobility centres to find new employment for redundant employees as soon as possible</li> <li>- Reintegrate the unemployed and those with occupational disabilities</li> <li>- Provide incentives for part-time workers to increase their working hours</li> <li>- Promote continued employment until pensionable age</li> <li>- Improve the links between (vocational) education and the labour market</li> <li>- Improve employability through the introduction of e-portfolios and talents scans</li> </ul> <p>B. Long term</p> <ul style="list-style-type: none"> <li>- Introduce an employment budget for training designed to improve employability</li> <li>- Transform unemployment insurance into work insurance (from income support in the event of unemployment to incentives designed to encourage participation in the workforce)</li> <li>- Place the responsibility for reintegration of the unemployed and those with occupational disability in the hands of the municipalities</li> </ul> <p>C. Sustainable labour participation</p>

<i>Strategies</i>	Policy priorities
	<ul style="list-style-type: none"> <li>- Gradually increase the pensionable age from 65 to 67</li> <li>- Introduce taxation on pensions</li> <li>- Shift taxation on employment to taxation on expenditure (homes).</li> </ul>
<i>Promote occupational safety and health</i>	<p>A. Physical pressures</p> <ul style="list-style-type: none"> <li>- Prevent damage to hearing by means of additional inspections by the employment inspectorate at nightclubs etc.</li> <li>- Prevent construction site accidents by means of additional inspections by the employment inspectorate of the construction site and use of scaffolding</li> <li>- Promote the use of machinery in street paving work in preference to manual labour</li> <li>- Extend legislation on emergency response first aid to cover the self-employed</li> <li>- Introduce measures to prevent the spread of influenza A H1N1 (Mexican flu)</li> </ul> <p>B. Psychological pressures</p> <ul style="list-style-type: none"> <li>- Introduce subsidies for initiatives to prevent aggression and violence</li> <li>- Combat discrimination at work: employers to be compelled to introduce anti-discrimination policy as part of their working conditions.</li> </ul>

## 8 Literature

Bakhuys Roozeboom M, Gouw P, Hooftman W, Houtman I, Klein Hesselink J (2009). Arbobalans 2007/2008. Kwaliteit van de arbeid, effecten en maatregelen in Nederland. Hoofddorp: TNO.

Beer, Paul de (2009). 'Krapte arbeidsmarkt verdwijnt uit zicht'. ESB, 94(4566).

Bemelmans WJE, Hoogenveen RT, Visscher TLS, Verschuren WMM, Schuit AJ (2004). Toekomstige ontwikkelingen in matig overgewicht en obesitas. Inschatting effecten op Volksgezondheid. RIVM-rapport nr. 260301003. Bilthoven: RIVM.

Besseling J, De Vroome E, Klein Hesselink J, Sanders J (2008). 'Arbeidsparticipatie van arbeidsgehandicapten', in: Jehoel-Gijsbers J, Beter aan het werk: trendrapportage ziekteverzuim, arbeidsongeschiktheid en werkhervatting. Den Haag: SCP.

Bossche SNJ van der, Smulders PGW, Houtman ILD (2006). 'Trend and risk groups in working conditions'. In: Smulders PGW (ed.), Worklife in the Netherlands. Hoofddorp: TNO.

Commissie Arbeidsparticipatie (2008). Naar een toekomst die werkt. Den Haag.

Ewijk C van, Teulings C (2009). De grote recessie. Het CPB over de kredietcrisis. Den Haag: CPB.

Fouarge D, Gielen A, Grim R (2006). Trendrapport Aanbod van arbeid 2005. Tilburg: OSA.

Genabeek J van, Boxsel J van, Hoogendoorn J, Klerkx, M (2007I). Gevolgen van toekomstige trends voor schadeverzekeringen. Hoofddorp: TNO

Genabeek J van, Gründemann R, Wevers CWJ (2007II). De toekomst werkt. Mens en bedrijf in 2020. Hoofddorp: TNO.

Genabeek J van, Wevers CWJ (2009). Trends in arbeid. Keuzes voor toekomstige kennisontwikkeling. Hoofddorp: TNO.

Koppes L, Klein Hesselink, J, Mol M, Bossche S. van der (2009). Nationale Enquête Arbeidsomstandigheden (NEA). Hoofddorp: TNO.

OECD & Allianz Groep (2005). Small sizes matter: Opportunities and risks of nanotechnologies. Paris.

Pal TM, Molen HF van der, Zweerman H.F., Stinis HP, Prakken EW, Lenderink AF, Popma J, Spreeuwiers, S (2009). Beroepsziekten aan de onderkant van de arbeidsmarkt: Een verkenning naar verbetering van monitoring, signalering en preventie. Themarapport NCvB. Amsterdam: NCvB.

ROA: Research Centre for Education and the Labour Market (2007). De Arbeidsmarkt naar opleiding en beroep tot 2012. Maastricht: ROA-R-2007/4.

SER (2009). Veilig omgaan met nanodeeltjes op de werkplek. Den Haag: SER, advies nr. 2009/01 - 20 maart 2009

Weehuizen R (2006). Mentaal Kapitaal: een verkennende studie naar de psychologische dimensie van economische ontwikkeling. Den Haag: Commissie Overleg Sectorraden voor Onderzoek en Ontwikkeling.

Wevers CWJ, Genabeek J van (2005). Agenda voor de toekomst sociale zekerheid en arbeidsmarkt. Hoofddorp: TNO.