

Taking Preventive Actions on Early Warnings for Occupational Risks

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In this paper we focus on prevention of drop out of employment by preventive actions based on early warning for occupational risks. We describe the infrastructure on occupational safety & health in The Netherlands and the role of insurers in this field. The insurers have taken the initiative to start a National Prevention Platform with the focus of prevention of work-related risks. The use of a newly developed method for Early Recognition of Occupational Risks (VOAR method) for this Platform is discussed. The paper concludes with some early lessons learned.

Introduction

The demographic situation of most European countries shows a growing number of older and retired people, alongside a decrease of new/young employees because of a significant fall of births the last decades. Compared to the numbers of working people the non-working population is growing hard. Therefore, one of the most challenging issues for the coming decades is to maintain economic growth, despite this demographic trend. To meet this challenge, European nations can follow several strategies:

- Economic growth can be created by (young) people who as prosumers (Toffler, 2006) create new ideas and develop their business through e-commerce.
- Device other work models by generating non-labour related income for instance.
- Increase the workforce by an influx of migrant workers; however this is politically not very opportune at this moment of EU skepticism.
- Assure that employees lengthen the age before retirement, so they can be productive longer. In The Netherlands the social partners agreed upon in June 2011 to change the retirement age to 66 in the year 2020 and 67 in 2025.
- Try to increase the labour participation and the productivity of the labour force. Both these possibilities are only feasible when jobs are available and the demand for the products and services is high enough.
- Work on sustainable employability of the working population by making sure that employees don't miss their work through sick leave caused by unhealthy and unsafe conditions.

The last strategy is the main focus of the National Prevention Platform which the association of insurers in The Netherlands has started. For this Platform TNO

developed a new method for Early Recognition of Occupational Risks (VOAR method). Why it is so important to act upon early warnings is shown by the numbers.

Safety & Health at work numbers

In Europe 12.5 million Europeans are absent from work and stay ill at home yearly by failing working conditions and work-related health problems (Eurostat, 2011). In total, this costs at least an estimated 367 million lost work days. Of all Europeans between 15 and 65 years 8.6% suffer from health problems caused or aggravated by work. This covers over 23 million people!

Between 1999 and 2007 the number of workers reporting health problems increased by half from 4.7% to 7.1% (based on a comparison of nine EU countries). Half of them have minor limitations in performing daily tasks as a result of these complaints. More than 20% experience severe limitations of which more than half are absent from work because of the complaints. More than one fifth is absent more than 1 month.

Under the age of 55, the number of people with work-related health problems grows. Above that age there is a decrease probably caused by the so-called 'healthy worker effect'. People with work-related health problems leave the workforce earlier.

Two of the most important types of work-related health problems are physical symptoms (main complaint for approximately 60% of respondents¹ with work-related complaints) and stress, depression and anxiety disorders (major for 14% of respondents). Highly educated people often mention stress, anxiety or depression as the most serious health problems, while lower and middle educated people often mention physical problems.

Besides the health issues there is the direct loss of work because of unsafe working conditions and accidents. In the EU-27 in 2007, 3.2% of workers (7 million people) had an accident at work in the last 12 months² (in The Netherlands this was 2.5%). Ten percent of these accidents was a traffic accident.

According to the LFS ad hoc module 2007, 73% of the accidents at work resulted in sick leave of at least one day and 22% resulted in sick leave of at least one month. It was estimated that accidents at work resulted in minimally 83 million calendar days of sick leave in 2007. This does not yet include those workers that expect never to work again and workers that were still on sick leave.

Main risk sectors for men and women are agriculture, hunting and fishing and mining'. Additionally for women it is the health and welfare sector.

¹ Labour Force Survey (LFS) from Eurostat and the European Survey on Working Conditions (EWCS)

² LFS ad hoc module

The numbers speak for themselves. These show that it is more than worthwhile to invest in prevention of this kind of 'economic loss', let alone the emotional and psycho-social loss that the people involved (including their families and friends) Experience.

The Dutch situation

In the Netherlands, the employer and employees within a company are required to reach agreement on working conditions. They are supported by the trade association for the sector and trades unions in drafting appropriate occupational health and safety measures. A new feature in health and safety in the Netherlands is for agreements on the subject between employers and employees to be laid down in a 'declaration of intent' for the sector as a whole. The declaration of intent is a collection of measures and solutions which companies in a particular sector can choose from in order to improve the working conditions.

The government (the Ministry of Social Affairs and Employment) is allowing companies greater leeway to customize the way they seek to promote good working conditions. Rules are target oriented, the Dutch government has positioned itself remote from the field of action. All rules derive from the Working Conditions Act (Arbowet), the Working Conditions Decree (Arbobesluit) or the Working Conditions Regulation (Arboregeling). This legislation also implements special European guidelines based on the framework directive. The target requirements and limit values in the Working Conditions Decree relate to the standards and values for risks that exist in more than one branch. Target requirements are laid down for aspects like noise, working with a vdu., radiation and dangerous substances. The target requirements and limit values in the Working Conditions Decree provide employers and employees with a framework for making agreements about the way they intend to comply with the working condition legislation. The total package of agreements forms the health & safety catalogue (arbocatalogus).

The Agenda stipulations (Agendabepalingen) deserve special attention in the Working Conditions Decree. Agenda stipulations describe matters for which target requirements have not yet been formulated, or for which limit values are impossible to define. 'Psycho-social problems at work' is a good example. This can take the form of bullying or gossip and backbiting in the workplace. Employers and employees are responsible for ensuring that psycho-social problems do not get out of hand. It is impossible to define a concrete limit value, but the health & safety catalogue can suggest ways for a company to combat bullying and 'mobbing'.

The working conditions regulation (Arbo-regeling) contains detailed stipulations, which are largely derived from the appendices to various European guidelines.

The Labour Inspectorate is responsible for enforcing the legislation. Declarations of intent play an important role regarding enforcement. The Inspectorate checks and approves on forehand the health & safety catalogue of a sector. In the field the Inspectorate checks whether a company complies with the measures and solutions that are agreed upon in the declaration of intent. However, the Labour Inspectorate will not examine the details of these catalogues, but will come down more heavily if a company violates agreements that are in place.

The Government organizes projects, such as the 'Improving Safety at Work' program and the 'Enhancing Works Policy on Substances' program. These projects provide instruments for informing people and stimulate research into developing a targeted approach to the issue.

In the end it all comes down to the (f)actual working conditions on the shop floor. Employer and employees have to find proper solutions for a safe & healthy workplace. This can be part of the Corporate Social Responsibility policy for instance (Jain et al, 2011).

The interaction between parties in The Netherlands is shown in figure 1.

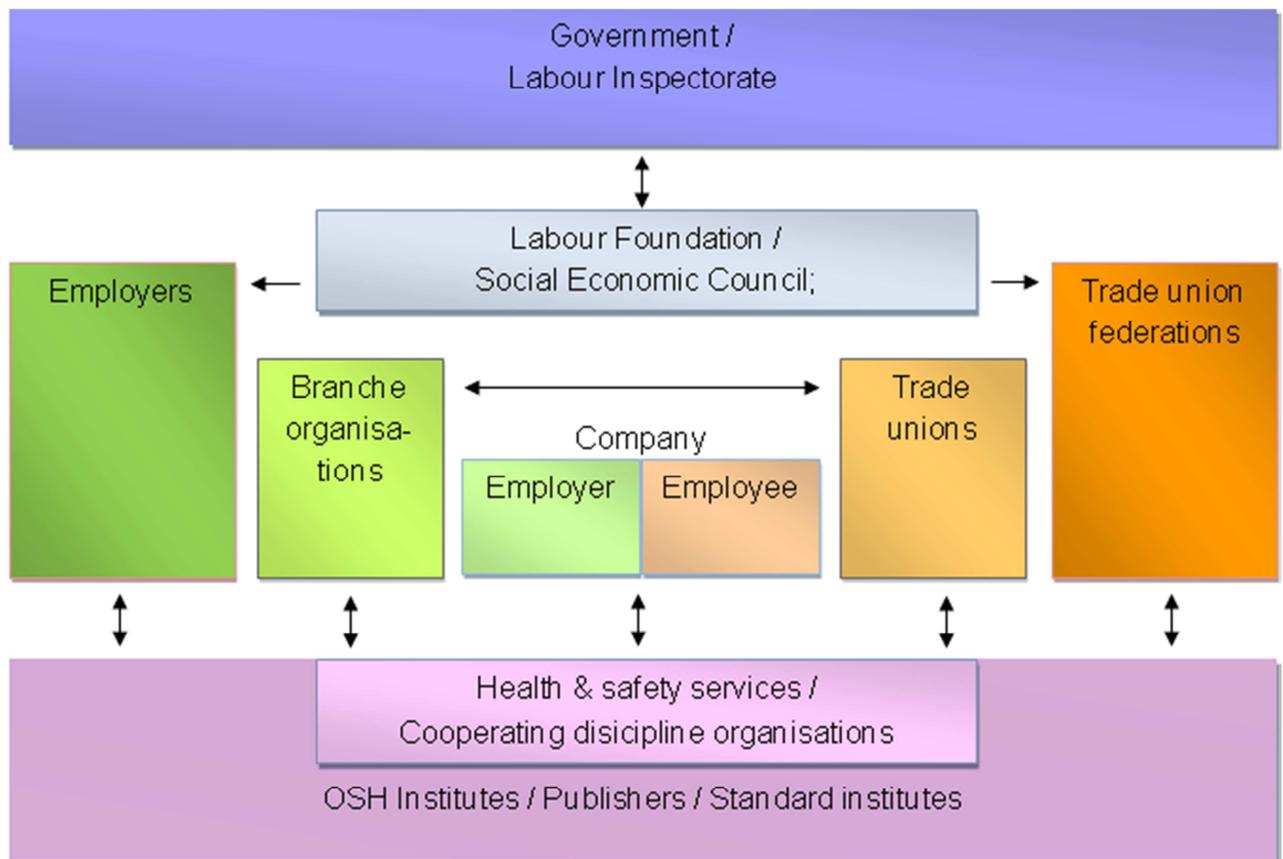


Figure 1 - OSH Infrastructure in The Netherlands (derived from OSH Focal Point)

Role of insurers

In The Netherlands there is no difference between *risque sociale* and *risque professional*: the cause of disability is of no consequence, only that the person is not capable of working and the resulting reduced residual earning capacity is used for the disability benefit. For compensation in case of damages at work employees are dependent on civil law practice.

Also (health) insurers have great influence in their role towards employers. There lies one of the keys for prevention. And investing in prevention pays off: the less claims, the lower the premium can be. Therefore, insurance companies play an increasing role in occupational safety & health. Insurers have invested in allying themselves with Health & safety services and have installed insurance terms that benefit preventive measures like risk management tools, fitness and early counseling.

Insurers are very well aware of their role to play. They develop products to support employers and employees. An example is the guide 'Nobody Off side' that the Dutch Association of Insurers the insurers developed together with the Association of health & safety services, intervention companies, outplacement and career counseling, reintegration companies and job coach organizations. This is a guide for employers to guarantee that the study into sustainable employability of the working population matches quality criteria, complies with all privacy legislation and leads to significant information. An active commitment to sustainable employability study gives insurers the possibility of early detection of risk factors to on employability and employment of the own insured population. This allows insurers to prevent and mitigate employability risks. Early warning of deployment risks gives insurers the ability to perform (preventive) interventions of claims in terms of care and reduction of absenteeism.

Another example is the installation of a National Prevention Platform that deals with new / not-known / uncertain work-related risks. Most of the known work-related risks can be tackled in between the relevant parties as described above. However, there is an increasing number of risks that is not yet clear in the sense that they are multi-causal, uncertain, not clearly defined or scientifically not yet well understood. Examples of these are:

- Nano-technology
- Non-ionizing radiation
- Fatigue (transport / care)
- Rare accident caused by of unexpected complex system failures
- Working hours and origin of cancer
- Genetically Modified/Enhanced Foods
- Hazardous Substances
- Biological agents (waste, healthcare, agriculture)
- Risk of disorders of muscles and joints
- Risk of psychological distress, burnout and depression

- Risk of work-related stress.

For these risks another approach has been developed.

How to find preventive actions based on early warnings?

In accordance with the developments in risk governance (IRGC, 2005), resilience engineering (Hollnagel, 2006), Presence and Theory U (Scharmer, 2007) the challenge for the National Prevention Platform is to comprise the existing knowledge on the chosen risks and to discuss this with all relevant stakeholders. Initiated by the insurers it's motive is to tackle risks that can lead to negative financial, social and individual outcomes.

To tackle the uncertainty with the work-related risks mentioned above, TNO (together with the University of Delft) developed a method called VOAR. It stands for 'Vroegtijdige Onderkenning Arbeidsgerelateerde Risico's' (Early Recognition of Occupational Risks).

It is loosely based on the Risk Governance Deficits method (IRGC, 2010)¹ in which relevant questions are asked to evaluate the deficits that can be involved with dealing with specific risks. They have thus analyzed several cases, such as the Bovine Spongiform Encephalopathy (BSE) Epidemic in the UK and Electromagnetic Fields: Cell Phones and Power Lines.

The VOAR method for work-related risks in The Netherlands is a more comprised approach. The playing field is more constraint, the players are well-known, the OSH legislation is the basis for action, knowledge is fairly easy to gather and the discussion is held in formal and informal counsels. See Annex 1 for a comparison of the National Prevention Platform with the questions of the IRGC approach.

The purpose of the VOAR method is to exchange information about the risks between the most involved parties in this field and scientific experts who are capable of summarizing the state of scientific knowledge available. In the National Prevention Platform the relevant stakeholders can discuss the need for pre-emptive action.

The VOAR method has the following steps.

¹ The approach is based on finding deficits related to the assessment and understanding of risks, including the collection and development of knowledge. They affect the decisions that will be made with regard to risk management (cluster A). And in finding deficits related to the management of risks; the acceptance of responsibility and the taking of action in order to reduce, mitigate or avoid the risk (cluster B).

The steps of the VOAR method are:

A. AVAILABLE INFORMATION

Step 1. Who has experience with the subject?

- Which parties have information about it?
- What information is this?

Step 2. How big is the problem?

What signs are there that there is an increased risk?

- Lagging indicators: accidents, deaths, illnesses, damages, etc.
- Leading indicators: early warning signals that there might be a causal relationship
- Radar: unrest in society, media reports, etc.

Step 3. What is critical information for prevention?

- Is there enough information for concern about this risk?
- Do we know enough about this risk to start with prevention?

B. RISK MANAGEMENT

Step 4. How do we get a more complete picture?

- How can we get additional information?
- Is central coordination (agenda-setting, registration, early warning system, etc.) useful?

Step 5. Acceptance or action?

- Is the risk substantial enough for action to be taken?
- When will you be ready to take action for prevention?

Step 6. What can parties do about it?

- Do we know what preventive measures are effective?
- If you're willing to take action, what can you do?

Step 7. Critical functions / resilience in system secured?

- Is prevention sufficiently enough maneuvered out of the sphere of competition?
- Are there sufficient incentives to work on prevention?

Table 1 – Steps of the VOAR method

Central to the VOAR method is the division in available information which is preparatory work to be done by the knowledge institutes (steps 1 – 3) and the discussion part that takes place in the Platform meetings (steps 4 – 7).

In the preparation of the meetings the first three steps are elaborated and existing scientific knowledge about the risk is listed. The second step is especially important: What signs are there that there is an increase in risk? To answer this TNO distinguish between 3 types of signals:

1. Lagging indicators: the damage is done, this is all information about (trends in) accidents, deaths, illnesses, damages, etc.
2. Leading indicators: early warning signals that there might be a causal relationship because of experiments, field test, animal tests, indication studies, model development, explanation of significant differences in outcomes, etc.
3. Radar: these are all 'emotionally colored' signals that can be detected, such as unrest in society, media reports, internet blog messages, analysis of trend watchers, etc.

For an example of the information gathered about the risk of accidents with touring cars, see Annex 2.

So how to find proper preventive actions?

The platform takes on the task of screening the extent to which developments may lead to occupational hazards, where expected societal costs can be involved, and whether preventive measures against these risks are taken, developed or just sensible on behalf of e.g. the precautionary principle. The Platform focuses on trends, not case studies. The platform does not develop knowledge but combines (existing) knowledge (consilience). It brings together new knowledge or retracts old(-er) knowledge that threatens to disappear under water. Thus, the platform can identify measures that can be effective.

Participants of the Platform are representatives of the relevant stakeholders: government, employers federation, trade union federation, knowledge institutes, Health Council. Until now the National Prevention Platform has had two meetings: the first meeting was held on the subject of accidents with touring cars; the second on the relationship of development of breast cancer & nightshifts.

The discussions show that participants want to know the degree of causal relationship between the actual damage or negative outcomes and the risk at hand. When there is no scientifically evidence of such a causality so far the question arises whether the indication of a positive correlation is sufficient to take action.

For both employers and employees the stakes can be high. Changing the work schedules for instance in the case of breast cancer and nightshifts, involves in most cases increasing the work population and increases the costs of work and production, which is not a popular measure from the employers point of view. On the other hand the employees want to act on bases of the precautionary principle that animal test show an increase in disruption of the circadian rhythm and development of (breast) cancer, so why would this not also happen in humans? The Platform offers a podium to discuss the assumptions that lay underneath the positions taken. This brings parties together although a solution is not always found.

Interesting element of the National Prevention Platform is the fact that all parties participate on behalf of their organization but on a free-of-hand basis which means that all are free to decide whether action is possible alone or together. Parties may decide on further joint action after the the platformmeeting . The effect of this take place outside the scope of the platform. The platform is only the starting point. Continuation of the choosen route therefore takes place within the organizations of the participating parties themselves. That (joint) action is not primarily the responsibility of the National Prevention Platform, but the platform has a stimulating role in creating more cooperation.

One factor for success seems to be the mandate for decisions of the individual participant. Can he/she influence his organization to take action? Further challenge is the capacity of the Platform to define central or joint actions and the process how to perform those actions. For instance: Who is leading in installing new mechanisms for early detection and warning? Last but not least the question arises whether knowledge institutes are willing to share information? So far, the institutes don't want to miss the action the Platform provides and are very willing to participate. Authors hope that this initiative is vital enough to maintain this attitude.

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ANNEX 1

IRGC – Risk Governance Deficits		Dutch National Prevention Platform
1.1 Gathering and interpreting knowledge		
A1	Is there an early warning system in place that produces useful signals?	Yes
A2	Is adequate and factual knowledge available?	Yes
A3	How do perceptions of the risk differ from factual evidence?	Archetypical: Employers see risks as part of the job and preventive measures cost money. Employees see risks as preventable issues that cause harm to workers.
1.2 Dealing with disputed, potentially biased or subjective knowledge		
A4	How are stakeholders involved?	Bound in all other formal counsels Quite free in the NPP
A5	What variables influence risk attitude?	Not yet done
A6	Is this a controversial issue?	Usually it is
1.3 Dealing with knowledge related to systems and their complexity		
A7	Does the assessment consider systemic interactions?	As much as possible
A8	Are we monitoring relevant changes?	Focus is on trends
A9	Are model inputs, assumptions and results regularly reviewed?	Yes, knowledge institutes challenge each other
1.3 Acknowledging that knowledge and understanding are never complete or adequate		
A10	What tools are used to stimulate creative thinking?	Brainstorms
2.1 Preparing and deciding on risk management strategies and policies		
B2	What is the risk management strategy?	Employers have the primary responsibility to take care of healthy working conditions the way they see fit. Trade-offs are always involved between employers and employees
B3	Are all reasonable options fully considered?	Government has chosen that employers and employees are in charge for OSH. They can choose any approach they like.
B4	Is this an efficient risk management strategy? Is this an equitable risk management strategy?	Up to employers to decide for themselves.
B6	What are the potential side effects of the risk management decision?	Trade-off between economic incentives and working conditions are possible
B7	Does the risk management strategy's timescale fit that of the risk?	Monitoring of trends is crucial to see whether the chosen strategy of employers is effective.
B8	What should and can be communicated to stakeholders?	As neutral as possible the information of trends and weak signals.

2.2 Formulating responses, resolving conflicts and deciding to act

B1	Are early warning signals processed?	The radar function shows (societal) early warning
B11	Will stakeholders engage to manage risks to common assets?	This is the main discussion
B12	Is there a conflict resolution process?	No, but is incorporated in all other counsels between parties
B13	Are we prepared for and can we respond to unexpected events?	Not known

2.3 Developing organisational capacities for responding and monitoring

B5	How well are risk management decisions enforced and implemented?	None, but the Labour Inspectorate checks the implementation of solutions in the 'arbocatalogus'
B9	Is the necessary risk management capacity available?	Arranged as part of OSH policy in companies
B10	Are there defined and clear responsibilities?	Yes

ANNEX 2

Accidents with touring cars

Indicators

- Claims: during (international) shuttle services much damage is caused. In the Netherlands it is not known how much this is.
- Accident: buses and coaches (at 0.57% of fatal accidents in the EU) - a total of 10 accidents with fatalities over 15 years with 1 insurer
- Fire: appears to be increasing because extension of life of old buses (by replacement of engine) renovation of wiring which is not always included, which burns through and starts a fire. Smoking passengers also cause fires.

Accidents:

- October 2009, Spain: 1 dead, 17 injured
- July 2009, Spain: 6 dead, 40 injured
- March 2005, Gran Canaria: 28 injured
- June 2002, Germany: 3 killed, 39 injured
- March 2002, France: 7 dead, 27 injured
- August 2000, France: 4 dead, 26 injured
- January 2000, The Netherlands: 1 dead, 11 injured

How could this happen (causes)?

'Leading' indicators:

- Driver-related factors: carelessness, fatigue, 'Sekunden Schlaf', with several (heavy) tasks (lugging suitcases, bus cleaning). increased workload, more night work, too comfortable car, perhaps indifference, cultural differences in other countries, increased paperwork or unclear / impractical international regulations.
- Technical aspects: comfortable equipment will reduce sharpness drivers, insufficient life-saving resources, midlife update buses
- Related conditions: traffic, weather, slipperiness, traffic, diversions, signage, poor condition of infrastructure in border areas, distraction / boredom by technical means (eg on-board computer).

Radar:

- Economic crisis: too many buses, too little work
- Travel agencies impose liability down to coach operators
- Competition is increasing: prevention is under-funded
- More charters (more hiring, supervising drivers less)
- More and more noisy passengers driver leads off
- Fear of aggression and violence
- ...

Causes damage:

- Driving reverse
- Driving away from parking position
- Lane changing
- Road furniture and objects
- Sway
- Head tail collisions
- Nonchalance
- ...