Gezondheidsraad
Health Council of the Netherlands

To the State Secretary of Social Affairs and Employment

Subject	: Presentation of advisory letter *Job strain*	
Your reference	: ARBO/A&V/2007/22676	
Our reference	: U6434/AvdB/832-S1	Publication no. 2011/05E
Enclosure(s)	: 2	
Date	: March 23, 2011	

Dear State Secretary,

In his request for advice dated 10 July 2007, the then Minister of Social Affairs and Employment asked the Health Council of the Netherlands to report, on a periodic basis, whether at the present time there are any new (international) scientific insights concerning health-based and safety-based limit values for various occupational risks. The request concerned occupational risks mentioned in the Working Conditions Act and its associated regulations. In this advisory letter, the Health Council's Committee on the Identification of Workplace Risks (see Annex A) examines the occupational risk of job strain.

The advisory letter has subsequently been reviewed by the Standing Committee on Health and the Environment of the Health Council.

There is no single generally accepted definition of job strain

At the request of the Committee, an examination was made of relevant literature in peer-reviewed scientific journals (via PubMed) and in books. Furthermore, a number of experts in the field of job strain in the Netherlands were consulted as well as, websites of reputable organisations such as the World Health Organization (WHO) and the American National Institute for Occupational Safety and Health (NIOSH).

The question asked by the Committee was how job strain could best be defined, and what the most important determinants of job strain are.

Job strain is regarded as an occupational risk because it can lead to stress, which is known to be able to cause health problems. The Committee has concluded that scientific literature currently

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offers no clear-cut view about how best to define job strain. Depending on the scientific field (for example, epidemiology or psychology) existing definitions vary from 'job strain is a feature of work' or 'job strain is a feature of both work and the personal condition of the employee' to 'job strain is a combination of features of work, personal condition and psychosocial environment inside and outside work'.

The Working Conditions Act and its associated regulations offer no resolution either. In January 2007, job strain was added to the Working Conditions Act as a psychosocial work-related burden. However, no definition of job strain is provided by law.

Determinants that lead to job strain

Scientific literature uses several models to describe the relationship between features of work and work-related stress. One such model is Karasek's Job Demand-Control Model.[1] It was published in 1979 and has been elaborated in the period since.

According to the model, the most important determinants for job strain are job demands (work rate, work load, nature of the work), opportunities for controlling one's own work, and social support. Being able to control one's own work and having social support have a positive impact on the job demands that lead to stress. On the basis of this model, causes of job strain include:

- Too high job demands, quantitative or qualitative,
- Too little time for carrying out the work,
- Too few opportunities for controlling one's own work or too little autonomy in one's work and
- Too little social support from managers or colleagues.

The degree to which job strain is perceived and the degree to which stress develops will depend not only on the features of the work or the organisation, but also on the employee's personal characteristics. As already stated, tough job demands, few opportunities for controlling one's own work and little social support are significant factors when it comes to the onset of stress as a result of job strain. However, most people find a certain level of time pressure in their work to be a good motivator, but there are also people who are no longer able to concentrate properly when faced with time pressure and, as a result, need more time than is available to complete their work. If this

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situation persists and an employee is not able to do anything about it, then this will lead to stress, even with the hardiest of employees. In short, whether or not job strain becomes a problem and leads to stress in any given employee depends in part on his personal characteristics and private life. This makes quantifying job strain particularly complicated.

Job strain is a contemporary problem

Scientific literature shows that work-related stress goes together with health issues, both short and long term.[2-5] In the short term, stress can lead to symptoms such as fatigue, lack of alertness and a longer time needed for recovery. Long-term stress can result in the sufferer becoming unfit for work through psychological and physical complaints like burn-out, depression, musculoskeletal problems and cardiovascular disorders. Besides the reduction in productivity that work-related stress can lead to through absenteeism, it can also be a factor in determining the age up to which people are able to work. Although the effects of work-related stress are clear from the literature, there is a lack of quantitative and causal data concerning the relationship between job strain (occupational risk) and its effects on health.

In the last ten years, the results of various longitudinal studies have been published, which have shown, among other things, that work-related stress (perceived job strain) is associated with ischemic heart disease and death.3 These studies have provided new information which the Committee feels has important value for assessing the health effects of job strain.

The Committee is therefore of the opinion that job strain is a relevant occupational risk. Many employees nationally and internationally face the consequences of job strain. In its report *Occupational burden of disease in the Netherlands* (2007), the National Institute for Public Health and the Environment (RIVM) established that 19 percent of employees in the Netherlands have had to deal with work-related stress.[6] According to the 2009 *Arbobalans* (an annual overview of working conditions), job strain is mentioned more frequently as a risk than any other occupational risk. In the 2009 Netherlands Working Conditions Survey (NEA)[7], 29 percent of employees stated that measures designed to combat job strain and job-related stress were inadequate. This feeling was particularly strong among people aged 55 to 64 in the education (42 percent), health and care (40 percent) and public administration (35 percent) sectors. 51 percent of employees mentioned job strain as being the most significant causal factor for burn-out. The consequences of job strain for society as a whole are less productivity, absenteeism through sickness and long-term disability.[6]

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Quantifying job strain

Job strain is generally quantified by using psychological testing methods, of which questionnaires are the most commonly used. Questionnaires designed to measure job strain are accepted by every expert who was interviewed, as well as the scientific literature, as a valid method.

There are currently a large number of questionnaires in circulation in the Netherlands that use different definitions and measure various effects and causes of job strain. Fatigue, recovery time, work load and work rate are the most commonly mentioned aspects in the questionnaires. The Committee also notes that there is a great deal of advice available on job strain from commercial agencies, the efficacy of which is not clear.

The predictive value of questionnaires has indeed been proven, but as long as no generally accepted definition of job strain is firmly established, it is unclear which questionnaires (or parts thereof) are preferable.

As a result, the Committee currently sees no means by which it can propose the setting of a health-based or safety-based limit value on the basis of the questionnaire studies. However, this does not diminish its conviction that questionnaires can be useful in measuring job strain.

In addition to psychological testing methods, the effect of job strain on the body can also be measured using physiological methods. The most frequently used physiological stress measurements are blood pressure, heartbeat, sympathetic and parasympathetic influences on the heart and the adrenalin and cortisol concentrations in the blood. However, it does not appear possible to quantify stress using one physiological parameter. Also people differ in the way they respond physiologically to stressful situations: one may show an increase in cortisol levels, for example, while another shows an increase in blood pressure. Physiological parameters may vary considerably between different people and within the same person, which makes it difficult to establish a relationship with work-related stress.[8]

The Committee notes that physiological methods for measuring job strain are not representative or reliable instruments and that they are therefore unsuitable as a basis for a limit value.

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Recommendation

In summary, the Committee concludes that on the basis of the literature survey and interviews with experts, it is currently not possible, nor will it be in the near future, to determine a concrete health-based or safety-based limit value for job strain.

The Committee is of the opinion that job strain is a relevant occupational risk. It is a modern-day problem for employers and employees, and it is therefore of great importance that the complex relationship between job strain and the effects on health be identified.

Up to now, different researchers and research groups have defined job strain in a variety of ways. In order to arrive at an integrated approach for the consequences of this occupational risk, it is first essential to have a definition that enjoys generally acceptance.

With an unambiguous definition of job strain, the Committee believes it might be easier to gain insight into the determinants that play an important role in the creation of job strain. With greater knowledge about determinants, the Committee also sees opportunities for managing the consequences of job strain more effectively. In addition, more research is needed in order to better identify the short and long-term consequences of job strain. However, this falls outside the framework of this advisory request from the Minister of Social Affairs and Employment.

Yours sincerely,
(signed)
Professor L.J. Gunning-Schepers
President

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Literature

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2 Bultmann U, Kant IJ, van den Brandt PA, Kasl SV. Psychosocial work characteristics as risk factors for the onset of fatigue and psychological distress: prospective results from the Maastricht Cohort Study. Psychol Med 2002; 32(2): 333-345.

3 Eller NH, Netterstrom B, Gyntelberg F, Kristensen TS, Nielsen F, Steptoe A et al. Work-related psychosocial factors and the development of ischemic heart disease: a systematic review. Cardiol Rev 2009; 17(2): 83-97.

4 Nieuwenhuijsen K, Bruinvels D, Frings-Dresen M. Psychosocial work environment and stress-related disorders, systematic review. Occup Med (Lond) 2010; 60(4): 277-286.

5 Van Amelsvoort LG, Kant IJ, Bultmann U, Swaen GM. Need for recovery after work and the subsequent risk of cardiovascular disease in a working population. Occup Environ Med 2003; 60 Suppl 1: i83-i87.

6 RIVM (2007). Ziektelast van ongunstige arbeidsomstandigheden in Nederland. Bilthoven: RIVM

7 TNO (2009). Nationale Enquete Arbeidsomstandigheden Methodologie en globale resultaten. Hoofddorp: TNO.

8 Van Doornen LJ, Houtveen J. Fysiologische metingen in de werksituatie: nut, beperkingen en bevindingen. Gedrag en Organisatie 22(3), 275-293, 2009. Lemma.

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Annex **A**

The request for advice

In a letter dated 10 July 2007, reference number ARBO/A&V/2007/22676, the Minister of Social Affairs and Employment wrote to the President of the Health Council of the Netherlands:

On 26 September 2006, during deliberation in the Dutch House of Representatives of a bill to modify the Working Conditions Act, a motion by House members Koopmans and Stuurman was adopted*. This motion requests the government to promptly set up a work programme yielding health-based and safety-based limit values (regulations comprising concrete figures), to which end advice is to be requested of the government's social partners.

In the debate in the Dutch House of Representatives the former State Secretary for Social Affairs and Employment indicated, in reference to this motion, that it was not the government's intention to include an unbridled number of scientific limit values for every conceivable work risk in the Working Conditions Act. This would undermine the essential nature of the Act and run counter to the government's active policy of stimulating customisation in enterprises and sectors, reducing regulatory overhead, and slimming down Dutch supplements to European legislation on working conditions. During the debate the motion's proposers confirmed that it was not their intention that the motion lead to an unbridled number of new concrete regulations in the legislation and regulation, but that the motion would help to support, facilitate and curtail that which the government specified in a working programme.

* Kamerstuk 2005/06, 30 552, nr.27.

In a letter of 18 January 2007 to the Dutch House of Representatives* on the status of the Working Conditions Act, a proposal was made for the further elaboration of the motion. During its General Consultations of 7 February 2007 the Dutch House of Representatives made no remarks on this elaboration, but it did indicate that it wished to be informed on the different phases sketched therein:

- A committee shall be established within an independent scientific institute, which can survey the scientific domain of working conditions;
- This committee shall provide periodic reports of any new (international) scientific insights into concrete health-based or safety-based limit values;
- On the basis of the results of these reports the Ministry of Social Affairs and Employment can initiate, where appropriate, further scientific research into health-based and / or safety-based limit values;
- The Ministry of Social Affairs and Employment will then assess the need for and desirability of including a limit value (as a concrete regulatory paragraph) in the Working Conditions Act and associated regulations. The department will hereby observe the provisions given in the Explanatory Memorandum on the Working Conditions Act, which stipulate that scientific limit values will be included in the legislation and regulation if these are generally recognised, have broad social support, and are generally applicable;
- The Ministry of Social Affairs and Employment will then present its opinion on the inclusion or otherwise of a limit value in the Working Conditions Act and associated regulations to the Social and Economic Council of the Netherlands (SER) for advice;
- On the basis of the advice put forward by the SER, a decision will be taken on whether to actually adopt the limit value in the Working Conditions Act and its associated regulations.

In accordance with the stipulations of the motion, consultations have been held with the government's social partners. It is important that the evaluation of the revision of the Working Conditions Act can be sent to the Dutch House of Representatives within five years of the coming into force of the amendment of the law – that is to say, before 1 January 2012. This evaluation must comprise a report on the practical effects and efficacy of the Working Conditions Act.

On 21 February 2007 we consulted on the possibility of the Health Council establishing a committee comprising experts on working conditions, health, safety, and occupational disease, and the Health Council indicated its willingness to establish such a committee. I therefore request that you establish a committee for the purposes of surveying the scientific domain of working conditions and examining the following subjects:

2 Periodic reports on whether *at this moment* new (international) scientific insights exist with regard to concrete health-based and / or safety-based limit values;

3 Periodic reports on whether *in due course* new (international) scientific insights may be expected with regard to concrete health-based and / or safety-based limit values.

The focus shall be on the first part, periodic reports of current new (international) scientific insights into concrete health-based and / or safety-based limit values. In the first instance, these reports will be based on

* Kamerstuk 2006-2007, 25 883, nr. 100.

those working condition risks included in the Working Conditions Act and its associated regulations. Other risks may be taken into consideration at a later date.

Please initiate the establishment of the committee and a Plan of Approach for the period 2007 to 2012, which should include reference to all the subjects mentioned above and comprise a budget. I should like to receive the Plan of Approach before next 1 September. The Health Council's Plan of Approach requires the approval of the Ministry of Social Affairs and Employment.

With regard to the periodicity of reporting, I would consider it important to publish an annual report. With this in mind I look forward to receiving the first of these annual reports before the end of 2007.

Yours sincerely,
The Minister of Social Affairs and Employment,
(signed)
J.P.H. Donner

Annex **B**

The Committee

- Professor T. Smid, *chairman*
  Endowed Professor of Working Conditions, VU University Medical Center, Amsterdam and working conditions advisor, KLM Health Services, Schiphol-East
- Professor A.J. van der Beek
  Professor of Epidemiology of Work and Health, EMGO Institute, VU University Medical Center, Amsterdam
- Professor A. Burdorf
  Professor of Occupational Epidemiology, Erasmus MC, Rotterdam
- H.J. van der Brugge, *observer*
  Ministry of Social Affairs and Employment, Den Haag
- Professor M.H.W. Frings-Dresen
  Professor of Occupational Health, Coronel Institute for Work and Health, AMC, Amsterdam
- Professor D.J.J. Heederik
  Professor of Health Risk Analysis, Institute for Risk Assessment Sciences, Utrecht
- Professor J.J.L. van der Klink
  Professor of Social Medicine, Work and Health, UMC, Groningen
- Dr. P.C. Noordam, observer
  senior advisor, Labour inspectorate, Den Haag
- Professor W.R.F. Notten
  Professor of Knowledge Management and Innovation in Health Care, Erasmus MC, Rotterdam

- Dr. T. Spee
  Occupational Hygiene policy advisor, the Arbouw Foundation, Amsterdam
- J. van der Wal
  Head of Safety, Shell Europa Exploration and Production, Nederlandse Aardolie Maatschappij (NAM), Assen
- Dr. C.A. Bouwman, *scientific secretary till January 2011*
  Health Council, Den Haag
- Dr. A.S.A.M. van der Burght, *scientific secretary*
  Health Council, Den Haag

The committee consulted the following external experts:

- Professor L.J.P van Doornen, Professor of Clinical and Health Psychology, Department of Clinical and Health Psychology, Utrecht University
- Dr. S. van den Heuvel, researcher, TNO Quality of Life, Hoofddorp
- L. de Jong, Work and organisational psychologist, Labour Inspectorate, Den Haag
- Professor IJ. Kant, endowed Professor of Occupational Epidemiology, Department of Epidemiology, Maastricht University
- Dr. J.K. Sluiter, Coronel Institute for Work and Health, AMC, Amsterdam
- Dr. M.J.P.M van Veldhoven, Work and organisational psychologist, Department of Human Resource Studies, Tilburg University
- Dr. N. Wiezer, senior consultant/researcher, TNO Quality of Life, Hoofddorp
- Professor. F.R.H. Zijlstra, Professor of Work and Organisational Psychology, Department of Work and Social Psychology, Maastricht University

The Health Council and interests

Members of Health Council Committees are appointed in a personal capacity because of their special expertise in the matters to be addressed. Nonetheless, it is precisely because of this expertise that they may also have interests. This in itself does not necessarily present an obstacle for membership of a Health Council Committee. Transparency regarding possible conflicts of interest is nonetheless important, both for the chairperson and members of a Committee and for the President of the Health Council. On being invited to join a Committee, members are asked to submit a form detailing the functions they hold and any other material and immaterial interests which could be relevant for the Committee's work. It is the responsibility of the President of the Health Council to assess whether the interests indicated constitute grounds for non-appointment. An advisorship will then sometimes make it possible to exploit the expertise of the specialist involved. During the inaugural meeting the declarations issued are discussed, so that all members of the Committee are aware of each other's possible interests.