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## Executive summary

Health Council of the Netherlands. Standing, kneeling and squatting work. The Hague: Health Council of the Netherlands, 2011; publication no. 2011/41.

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### The request for an advisory report

In the present report, at the request of the Minister of Social Affairs and Employment, the Health Council of the Netherlands has investigated whether at the present time there are any new scientific insights concerning health-based or safety-based limit values for work performed while standing, kneeling or squatting. This report is one of a series of advisory reports in which the Committee on the Identification of Workplace Risks examining occupational risks covered by the Dutch Working Conditions Act and its associated regulations. To answer the Minister's questions, the Committee studied the scientific data on adverse health effects of working in standing, kneeling or squatting position, and considered the results of longitudinal studies to be particularly important, as they involve the least likelihood of bias.

### Scope

In the Netherlands, nearly 2.5 million people say that they 'regularly' or 'very often' perform their work in standing position. More than 900,000 people perform work in kneeling or squatting position. Examples of sectors in which these occupational risks frequently occur include the agricultural, construction, installation and cleaning sectors.

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Lower back complaints are one of the consequences of performing work in standing, kneeling or squatting position. Many studies have investigated the onset of lower-back pain during the preceding 12 months. It is known that nearly a quarter of these people with lower-back complaints are likely to develop chronic complaints with obvious adverse effects on their health.

More than a third of people who had suffered lower-back complaints in recent months said that they felt limited in their daily life; 30% of them had visited their general practitioner and 30% of them had been on sick leave because of these health problems.

#### Working in standing position

The available scientific data show that working in standing position can result in pain in the lower back, legs, knees and feet. Working in standing position can also lead to varicose veins in the legs. Pregnant women who sustainably stand at work have a higher risk of premature birth. On the basis of the small number of studies, the Committee is of the opinion that it is not possible to indicate a safe threshold level below which no adverse health effects could be expected for people who work in standing position. However, by combining the results of the available longitudinal studies in a meta-analysis, it is possible to obtain information on the extent of the risk of lower-back complaints having occurred in the past 12 months.

#### Working in squatting position

The available scientific data indicate that working in squatting position can cause lower-back pain and pain in the knees. The Committee is of the opinion on the basis of the small number of studies and their results that it is not possible to indicate a safe threshold level below which no adverse health effects could be expected for people who work in squatting position. However, by combining the results of the available longitudinal study in a meta-analysis, it is possible to obtain information on the extent of the likelihood of lower-back complaints having occurred in the past 12 months.

Low back pain complaints	Working in standing position ( <i>hours</i> per day)					
	no <sup>a</sup>	0.5 hour	1 hour	2 hour	3 hour	4 hour
Percentage (%) onset low back pain in working population per year	13.0	14.1	15.2	17.7	20.5	23.7
Extra incidence (%)		1.1	2.2	4.7	7.5	10.7
	Working in squatting position ( <i>minutes</i> per day)					
	no	10 min	20 min	30 min	40 min	
Percentage (%) onset low back pain in working population per year	13.0	13.7	14.5	15.3	16.2	
Extra incidence (%)		0.7	1.5	2.3	3.2	

<sup>a</sup> Incidence of low-back pain complaints in general population without exposure to physical load: 13.0%.

### Working in kneeling position

Scientific studies show that working in kneeling position can lead to lower-back pain complaints as well. Another adverse impact of working in this position is osteoarthritis of the knee joint. The Committee is of the opinion on the basis of the small number of studies and their results that it is not possible to indicate a safe threshold level below which no adverse health effects could be expected for people who work in a kneeling position. It is also not possible to further estimate the risks on the basis of the available data.

### Possibilities for occupational limits-values

On the basis of the available scientific data, the Committee concluded that it is not possible to indicate a safe level below which no adverse health effects would be expected for people who work in standing, kneeling or squatting position. However, it was possible to obtain information on the extent of the risks of lower-back complaints arising from either working in standing position or working squatting position. The Committee is of the opinion that these substantiated health-based risks can serve as a starting point for determining occupational limit values.

To this end, it will be necessary to hold at different levels discussions on what risk is still acceptable. This will require the establishment of a prescriptive framework. An important choice here involves deciding what extra risk of a given adverse effect on health is deemed acceptable, taking into account aspects such as the prevalence and incidence of the health effect within the general population. As the prevalence and incidence of lower-back complaints in the

general population are high and most episodes of lower-back complaints are of short duration and end spontaneously, it will be necessary to reach agreement on the level of severity and duration of back complaints that will not be considered acceptable. However, policy and social considerations will also play a role in the ultimate decision.