

On regional differences in sick leave : the role of work, individual and health characteristics and socio-cultural environment

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ON REGIONAL DIFFERENCES IN SICK LEAVE
THE ROLE OF WORK, INDIVIDUAL AND HEALTH
CHARACTERISTICS AND SOCIO-CULTURAL ENVIRONMENT

Willibrord Beemsterboer

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ON REGIONAL DIFFERENCES IN SICK LEAVE
THE ROLE OF WORK, INDIVIDUAL AND HEALTH
CHARACTERISTICS AND SOCIO-CULTURAL ENVIRONMENT

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan
de Universiteit Maastricht,
op gezag van de Rector Magnificus, Prof. mr. G.P.M.F. Mols,
volgens het besluit van het College van Decanen,
in het openbaar te verdedigen
op vrijdag 18 december 2009 om 14.00 uur

door

Willibrord Beemsterboer



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'ou sont les neiges d'antan?' ('waar is de sneeuw uit vroeger tijd?')
(François Villon)

'we hebben de kunst om niet aan de waarheid te sterven'
(Friedrich Nietzsche)

*opgedragen aan de nagedachtenis
van padre Paulo Punt scj (heerom Arie)*

ter herinnering aan mijn vader

voor mijn moeder

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Chapter 1

General introduction

Over the years research on sick leave has become quite extensive and resulted in many determinants that are supposed to explain this phenomenon. It concerns determinants like personal characteristics and characteristics of the work situation. Thus, it is well known that people working in different professions show different sick leave patterns because of the variety in physical and mental workload of these professions. It is also known that companies show a company-related sick leave behaviour of the employees. Generally, health complaints are the motive to report sick, whereas at the same time indications exist that health as such is too less an explanation for sick leave. The way people estimate their own health status or perceive their work situation appears to be also an important factor in their sick leave behaviour. Apart from this, there are strong indications that sick leave behaviour is also predicted by regional factors, while little is known about the sick leave determinants that are responsible for regional differences in sick leave.

In the Netherlands regional differences in sick leave behaviour are found, whereas research on the type of relevant sick leave determinants that might explain these differences appears to be scarce. Subsequently, as for regional differences in relevant sick leave determinants between homogeneous groups in socio-economically comparable regions, little is known about possible region-related socio-cultural factors that may play a role in the type of determinants that predominate per region. Further on, as for the possible influence of socio-cultural factors on sick leave determinants, it is assumed that within one region with for all professional groups similar socio-cultural conditions, those conditions are – independent of professional group – reflected in the type of relevant sick leave determinants.

It will only be possible to study regional differences in relevant sick leave determinants by comparing employees doing the same work, living in regions with comparable demographic characteristics of the residents, a comparable socio-economic structure, comparable health services and a similar statutory social security system. Therefore, the present study focusses *primarily* on possible differences in relevant sick leave determinants among homogeneous groups in socio-economically comparable but socio-culturally different regions in the Netherlands, and it focusses on possible similarities in relevant sick leave determinants between different professions within one region. *Secondly*, the

found differences and similarities in relevant sick leave determinants are viewed in the light of regional differences in socio-cultural environment.

Taking into account the objectives of this study, this general introduction provides first of all in a literature search on regional differences in sick leave (par. 1.1). Further on, a literature search on sick leave determinants (frequency and duration) over the past decades (1984-2004) was performed in order to define a set of relevant sick leave determinants (par. 1.2). Subsequently the possible influence of socio-cultural factors on health status and sick leave are discussed and the theoretical model for sick leave behaviour is given (par. 1.3). The literature on regional differences in health-related and socio-cultural characteristics in the Netherlands is reviewed in par. 1.4. On the basis of the results of the performed literature search in the preceding paragraphs, a choice is made for the regions and professions to be compared in this study (par. 1.5). In par. 1.6 the registration of regional differences in sick leave in the Netherlands is discussed and in par. 1.7 the research questions and the design of the study are given. This general introduction ends with the design of the thesis (par. 1.8).

1.1 Literature search on regional differences in sick leave

In a Finnish study on *frequency* of sick leave, performed in three demographic comparable municipalities, it appeared that the sickness absence practice is expression of the sickness absence habitus, which is deeply rooted in the social history of a locality as well as in the health-related behaviour of the residents (Virtanen et al., 2000; 2004). In the Netherlands the mean frequency of sick leave showed differences between the provinces Overijssel and Gelderland (1.72 spells) and Utrecht, North- and South-Holland (2.00 spells) (Brouwer and Vrijhof, 1988). These differences were attributed to the economic structure of a region, characteristics of the population, health services and cultural differences (Vrijhof and Prins, 1993).

The most important outcome of studies on regional differences in *duration* of sick leave is, that these are a consequence of socio-economic class differences c.q. circumstances and development (Picard and Mills, 1992; Vrijhof and Prins, 1993; Szubert and Zycinska, 1996; Feeney et al., 1998; Virtanen et al., 2000; Moncrieff and Pomerleau, 2000; Virtanen et al., 2004).

In the Netherlands some studies showed a regional difference in *duration* of sick leave. Tordoir et al. (1978) and Soeters (1980) observed, in the region South-Limburg, a longer duration of sick leave than in the rest of the country and the regional organisation of health services (e.g. waiting period before effectively being treated) was supposed to be responsible, however Soeters (1980) emphasized that factors like the way of using medical services and visiting the doctor, could also play a role in these differences. In other words it is not only the *system* that makes the difference, but also the *people*. Soeters'

study (1980) primarily concentrated on the influence of health services on duration of sick leave, being just one of the determinants of sick leave. Soeters performed his study irrespective of professional group or type of company and found that the mean duration of sick leave was longer in the Dutch province of Limburg than in the rest of the Netherlands, but this did not apply for frequency of sick leave which, in Limburg, did not substantially differ from frequency of sick leave elsewhere, and it still does not (Statistics Netherlands: Nationale Verzuimstatistiek, 2006a).

Prins (1990) performed a study on differences in sick leave between Belgium, Germany and the Netherlands and showed that cultural differences attribute to differences in sickness behaviour. The same author stated that considerable regional differences in life style, health care and economic factors may underlay the general sickness absence levels within a country, for instance regional differences that were found in the German sick fund (Halusa et al., 1982). These differences most probably express themselves by different determinants that are effective on sick leave.

In the early nineties the Dutch social fund Detam found nationwide that regions differed in sick leave pattern (Table 1).

Table 1: Sick leave in several districts of the social fund Detam in the Netherlands (Detam, 1991)

	mean sick leave frequency	mean sick leave duration (days)
Groningen	1.0	23.95
Amsterdam	1.2	23.08
Utrecht	1.0	23.13
The Hague	1.2	19.57
Heerlen (South Limburg)	0.9	29.23

The region that showed the strongest difference with the rest of the country was South Limburg (district Heerlen). This made curious to know the cause of this phenomenon. Later figures showed a still existing longer sick leave duration in the Limburg area (Statistics Netherlands: Nationale Verzuimstatistiek, 2006a).

The higher sick leave in South Limburg in comparison with the rest of the Netherlands was, summarized, explained by a less healthy lifestyle, a perceived poorer health, more air pollution and insufficient health services (Tordoir et al., 1978; Soeters, 1980; Philipsen, 1985; Stevens and Van der Zee, 1990). As for socio-cultural aspects for the explanation of regional differences in sick leave, especially a less healthy lifestyle and a perceived poorer health are characteristics that refer to socio-cultural influences in the sense of habits and traditions.

1.2 Literature search on sick leave determinants (frequency and duration) over the past decades (1984-2004)

To get an idea of the continuity in relevant sick leave determinants, a literature search over the years 1984-2004 was performed. Continuity in relevant sick leave determinants is important as the study uses data dating back to the nineties.

Sick leave is associated with numerous determinants and over the years extensive research, either national or international, has been performed to establish the precise character of these determinants (Nijhuis and Soeters, 1982; Smulders, 1984; Grosfeld, 1988; Schalk, 1989; Klein Hesselink et al., 1993; Marmot et al., 1993; North et al., 1993; Geurts et al., 1994; Stansfield et al., 1995; Marmot et al., 1995; Rael et al., 1995; North et al., 1996; Stansfield et al., 1997; Feeney et al., 1998; Niedhammer et al., 1998; Melchior et al., 2003; Moreau et al., 2004).

Studies on sick leave often distinguish between frequency and duration of sick leave, therefore we consider determinants that: (1) give rise to sick leave (frequency), and determinants that: (2) continue or end sick leave (duration).

(1)

Frequency of sick leave indicates the number of sickness spells an employee takes a year. This number is influenced by attitude towards absenteeism, the relation between health and work situation and motivation. The *second* column of Table 2 gives a literature review of determinants being of influence on frequency of sick leave.

In general determinants that play an important role in giving rise to sick leave (frequency) are determinants of personal well-being (Schalk, 1989; Hoverstad and Kjolstad, 1991; Kentner, 1991; Hornquist et al., 1993; Reynolds, 1997), of individual factors (Soeters, 1980; Smulders, 1984; Kentner, 1991; Schröer, 1993; Feeney et al., 1998; Muller et al., 1999; Virtanen et al., 2001; Boedeker, 2001; IJzelenberg et al., 2004) and of atmosphere at the workplace (Soeters, 1980; Kaiser, 1992; North et al., 1993; Geurts et al., 1994; Rael et al., 1995; North et al., 1996; Stansfield et al., 1997; Vahtera et al., 1997; Feeney et al., 1998; Kivimaki et al., 2000; Kivimaki et al., 2003; Melchior et al., 2003; Eriksen et al., 2004).

(2)

A substantial number of determinants is of influence on duration of sick leave, as the performed literature review shows (the *third* column of Table 2). Apparently, according to literature, several determinants are as well of influence on sick leave frequency as they are on sick leave duration. Further on, duration of sick leave depends on determinants like the way employers deal with sick reported employees and with reintegration activities (Van Dijk and Prins, 1995; Marnetoft et al., 1999; Aronsson et al., 2000; Hogelund, 2002; Nordqvist et al.,

2003) as well as motivation to return to work (Grosfeld, 1988; Bonsall et al., 1991; Olbrich et al., 1998; Berglind and Gerner, 2002; Arola et al., 2003) and the organisation of health care (waiting periods before effectively being treated).

Table 2 gives a global insight how a number of determinants, according to the given references, apparently play a role in frequency of sick leave as in duration. The, on the basis of the literature review, found specific direction of the influence of the mentioned determinants on frequency and duration of sick leave is given in the successive chapters. Some early Dutch studies like those of Nijhuis & Soeters (1982), Smulders (1984) and Grosfeld (1988), studied a great number of determinants of which a substantial part influenced frequency as well as duration, be it not always in the same direction.

Table 2: Determinants of influence on frequency and duration of sick leave, according to literature 1984-2004

DETERMINANTS	LITERATURE on frequency (giving rise to sick leave)	LITERATURE on duration (continuing/ending sick leave)
satisfaction	Leijon and Mikaelsson (1984) Schalk (1989) North et al. (1993) Melamed et al. (1995) Frank (1998)	Smulders (1984) Grosfeld (1988) North et al. (1993) Pettersson et al. (1995) Allgood et al. (2000) Wright et al. (2002) Andrea et al. (2003)
support	Nijhuis and Soeters (1982) Smulders (1984) Schalk (1989) Rael et al. (1995) North et al. (1996) Vaananen et al. (2003) Moreau et al. (2004)	Winnubst et al. (1982) Marcelissen et al. (1988) Uden (1996) North et al. (1996) Peter and Siegrist (1997) Bourbonnais and Mondor (2001)
autonomy	Nijhuis and Soeters (1982) Schalk (1989) North et al. (1993) Niedhammer et al. (1998) Ala-Mursala et al. (2002)	Smulders (1984) Karasek (1990) Greiner et al. (1998) Shain (1999) Boedeker (2000) Ala-Mursala et al. (2002)
pace & pressure	Smulders (1984) Schalk (1989) Geurts (1994) Heaney and Clemans (1995) Greiner et al. (1998) Moreau et al. (2004)	Grosfeld (1988) Heaney and Clemans (1995) Bourbonnais and Mondor (2001) Eshoj et al. (2001) Ala-Mursala et al. (2002)
relations with colleagues and supervisors	Smulders (1984) Buunk and Janssen (1987) Buunk et al. (1993) Janssen et al. (1994) Geurts (1994) Geurts et al. (1999) Kivimaki et al. (2001) Melchior et al. (2003) Eriksen et al. (2004)	Smulders (1984) Grosfeld (1988) Vahtera et al. (1997) Kivimaki et al. (2000)
work circumstances/ climate	Smulders (1984) Schalk (1989) Leigh (1991) Ekberg and Wildhagen (1996) Szubert et al. (1999) Wargocki et al. (2002)	Nijhuis and Soeters (1982) Grosfeld (1988) Milton et al. (2000) Wargocki et al. (2002)
physical and mental workload	Nijhuis and Soeters (1982) Schalk (1989) Heaney and Clemans (1995) Jacobson et al. (1996) Schechter et al. (1997) Feuerstein et al. (2001) Voss et al. (2001) Ijzelenberg et al. (2004)	Nijhuis and Soeters (1982) Grosfeld (1988) Ekberg and Wildhagen (1996) Vasse et al. (1998) Lund et al. (2001) Ala-Mursala et al. (2002)
health complaints	Houtman et al. (1994) Melamed et al. (1995) Dewa and Lin (2000) Moncrieff and Pomerleau (2000) Savikko et al. (2001)	Astrand and Isacson (1988) Grunfeld and Noreik (1992) Grossi et al. (1999) Atroshi et al. (2002) Andrea et al. (2003)

DETERMINANTS	LITERATURE on frequency (giving rise to sick leave)	LITERATURE on duration (continuing/ending sick leave)
drugs use	Schalk (1989) Bass et al. (1996)	Grosfeld (1988) Bass et al. (1996)
gender	Smulders (1984) Schalk (1989) North et al. (1993) Alexanderson et al. (1994) Feeney et al. (1998) Mastekaasa (2000) Hensing and Alexanderson (2004)	Smulders (1984) Grosfeld (1988) Feeney et al. (1998) Brage et al. (1998) Leijon et al. (1998) Sandanger et al. (2000)
age	Schalk (1989) Geurts (1994) Arola et al. (2003) Van Deursen et al. (1999)	Smulders (1984) Grosfeld (1988) Tsai et al. (1997) Knuttson and Goine (1998) Gjesdal and Bratberg (2002)
level of education	Leigh (1991) Bloemhoff et al. (1993)	Smulders (1984) Grosfeld (1988) Geurts et al. (1994) Heaney and Clemans (1995) Vasse et al. (1998) Gjesdal and Bratberg (2002)
smoking	Ryan et al. (1992) Bush and Wooden (1995) Halpern et al. (2001)	Smith et al. (1981) Grosfeld (1988) Eriksen et al. (1998) Natvig et al. (2002)
drinking alcohol	Jenkins et al. (1992) Marmot et al. (1993) Upmark et al. (1999a)	Smulders (1984) Grosfeld (1988) North et al. (1993) Vasse et al. (1998) Upmark et al. (1999b) Upmark and Thundal (2002)

In conclusion the performed literature review of the past decades showed, that in sick leave research a substantial number of comparable determinants are as well of influence on sick leave frequency as on sick leave duration. In the meantime hardly any study of sick leave concentrates on regional differences in sick leave whereas there are strong indications that these differences exist (Tordoir et al., 1978; Soeters, 1980; Brouwer and Vrijhof, 1988; Vrijhof and Prins, 1993; Virtanen et al., 2000; Virtanen et al., 2004).

The review of the literature on sick leave in the past decades (1984-2000) also learns that determinants of sick leave frequency and sick leave duration did not substantially change. This literature review was performed over the period before begin nineties – the very last time regional data of sick leave were still accurately registered – as well as over the period thereafter. As the results indicated that in the past few decades no substantial changes in sick leave (frequency and duration) determinants were found, we considered it opportune to perform an explorative study-in-retrospective among homogeneous groups in two different regions in the Netherlands as well as between two different professions within these regions.

1.3 Socio-cultural factors, health status and sick leave (the theoretical model for sick leave behaviour)

Factors of culture and social tradition, or lifestyle, may be considered as of influence on the health status of communities (Hofstee, 1961; Hofstede, 1980). As for the cultural identity of a population, this was defined by Hofstede et al. (1990) as a collective 'programme' of the mind that discriminates groups from each other. Culture, expressed through people's behaviour and opinions, is a common characteristic of groups of people on the level of a family, company, region or country (Stevens and Van der Zee, 1990). In their Euregional study Stevens and Van der Zee (1990) compared the German 'Land' (country) Nordrhein Westfalen (NRW) with Limburg and with the rest of the Netherlands. According to Hofstede (1980) Germans can not deal appropriately with uncertainty, therefore they are more concerned about their health than the Dutch are; for this reason Germans consult their doctor more frequently. In the Limburg area as compared to the rest of the Netherlands a less healthy lifestyle as the perception of a poorer health stimulate the medical consumption and probably sick leave.

Sick leave is not only related with illness (Van Deursen et al., 1997; Feeney et al., 1998; Boot et al., 2004), but also with behaviour (De Groot, 1958; Philipssen, 1969; Veerman, 1993) that is influenced by individual and socio-cultural characteristics like habits, traditions and moral standards. As a consequence people show a different perception of such things as their own health or their work situation. This leads to different choices in comparable circumstances. Therefore sick leave is often associated with a certain freedom to decide for it or not. Such a decision is influenced by the socio-cultural background i.e. moral standards and values. In the present study the assumption is made that, in case regional differences in relevant sick leave determinants exist, socio-cultural differences may play a role in the type of determinants that predominate and lead to a decision to take a sick leave or not. Socio-cultural factors may have impact on sick leave determinants related to the perception of one's own health and/or related to the perception of the work situation. As for health status, regional differences in health status or in type of diseases as in morbidity and mortality rates may exist (Municipal Health Services Limburg, 2005). Thus, in socio-cultural different regions different sick leave determinants may play a role in sick leave. As illness is not the only predictor of sick leave, the assumption is that socio-cultural factors influence sick leave behaviour.

For the theoretical model see Figure 1.

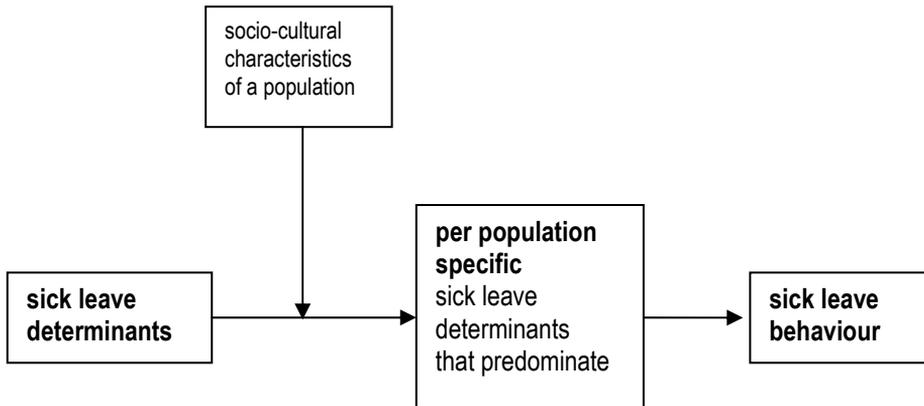


Figure 1: Theoretical model for sick leave behaviour

Taking in view that sick leave determinants are universal and that we first of all studied the relation between relevant sick leave determinants and sick leave itself and not socio-cultural characteristics as such, the assumption is that the fact that people differ in their socio-cultural background leads to per population different acting determinants. Different socio-cultural backgrounds will probably lead to different sickness behaviour and different medical consumption. As to know whether socio-cultural factors indeed have their influence on the type of sick leave determinants that predominate, one needs to know which determinants are relevant. Therefore a literature search was performed in order to form a set of relevant sick leave determinants (par. 1.2).

1.4 Literature on regional differences in health-related and socio-cultural characteristics in the Netherlands

Health related characteristics

Soeters (1980) as well as Prins (1990) refer to the studies of Hofstee (1961) and Hofstede (1980). According to these authors regional differences in medical consumption and death-rates exist and these differences are apparently based on cultural characteristics of the local inhabitants. Life style factors like eating habits, smoking and drinking alcohol, are of influence on health and therefore on sick leave behaviour. Meanwhile drinking more alcohol, being a culture-related phenomenon, is just one determinant that can explain a higher frequency or longer duration of sick leave, whereas cultural differences may also find expression in other determinants of sick leave than those of life style. This observation agrees with the outcome of international research (Virtanen et al., 2000; 2004).

In the Netherlands differences in health status were found between the Dutch province of Limburg and the rest of the country (Stevens and Van der

Zee, 1990; Bloemberg et al., 1993; Statistics Netherlands, 1993; Municipal Health Services Limburg, 2005; Statistics Netherlands, 2006b). As for these since decades found differences, Limburgers visited their doctor more often, used more medicines, stayed longer in hospitals and showed higher death rates.

Since decades Limburgers *perceive* a poorer health (see Table 3).

Table 3: Indicators of subjective health

	LIMBURG			NETHERLANDS		
	women	men	women and men	women	men	women and men
perception of own health (%very good) ¹	62	78		74	82	
questions on own's own health (the higher score the poorer health) ¹	5.0	4.3		4.1	4.1	
perception of a poorer health 2001-2003 (RIVM) ²			20-25%			< 20-25%
% chronic diseases and handicaps ¹	30	20		32	23	
% visit doctor ¹	58	65		55	61	

1. Bisscheroux et al. (1986)

2. Nationaal Kompas Volksgezondheid 2001-2003 [National Compass Public Health 2001-2003] (RIVM, 2006)

Limburg (Table 4) and the rest of the country differ in registered disability pensions, whereas (Table 3) chronic diseases and handicaps are not remarkable prominent in Limburg, on the contrary: the Limburg residents show lower rates.

Table 4: Indicators of subjective health

	LIMBURG (%)	NETHERLANDS (%)
disability pension 1986 ¹	9.5	6.8
disability pension 2000 ²	10.7	8.8
disability pension 2003 ³	11.1	8.9
disability pension 2005 ³	10.1	8.0

1. Bisscheroux et al. (1986)

2. Nationaal Kompas Volksgezondheid 2001-2003 [National Compass Public Health 2001-2003] (RIVM, 2006)

3. Atlas Sociale Verzekeringen 2003/2005 [Atlas Social Insurances 2003/2005] (UWV, 2005)

In conclusion the Limburg population differs from the rest of the Netherlands in the perception of a poorer health (especially as far as women are concerned) as in visiting the doctor and in disability rates.

As for lifestyle, some indicators show that Limburgers live less healthy than their countrymen. They have a higher body weight (Zorgatlas, 2004) and they engage in less physical exercise (Municipal Health Services Limburg, 2005). Traditionally Limburgers drink more alcohol and show more tobacco

addiction, although smoking is decreasing (Municipal Health Services Limburg, 2005). Apart from lifestyle, differences in health status were attributed to the socio-economic structure i.e. industrialization and growth of the urban population in Limburg (Philipsen, 1985; Stevens and Van der Zee, 1990). Meanwhile, taking into account that these characteristics have a socio-cultural background, the question is in what extent *lifestyle* and *perception of health* influence the health status of the Limburg population and whether they influence sick leave.

Socio-cultural characteristics

As far as possible socio-cultural differences (and their origins) between the South Limburg area and the rest of the country are concerned, Stevens and Van der Zee (1990), as did earlier Philipsen (1985), indicated that the dominant Roman Catholic culture in South Limburg, with a less sober life style, is a factor in the health status. Although the attending of religious services diminished dramatically and interest for religion as well, in 2000 still 92,3% of the South Limburg respondents called themselves Roman Catholic, in Utrecht this was 47% (Eisinga and Coenders, 2000). As for the statistical analysis of the SOCON-data¹, in 2000 this showed some remarkable similarities with the results in 1985, a signal for a certain continuity in differences in socio-cultural characteristics of the Limburg population as compared to the rest of the country (Eisinga and Coenders, 2000). Further on Knibbe (2007) found that people in Limburg still seek for a certain continuity with the past in the sense of forming part of a community, which as a matter of fact is in contradiction with the assumed growth of individualism. According to Soeters & Felling (1990) moral standards are the core of a culture that are the less changeable and it seems that this observation is supported by recent findings (Knibbe, 2007). As for the more Calvinistic north of the Netherlands, this shows a healthier population with a longer life expectation.

The perception of one's own health as the frequently consulting of medical doctors – as an expression of differences in culture – may lead to higher sick leave and disability rates (Table 4) in South Limburg as compared to the rest of the country (Stevens and Van der Zee, 1990).

1.5 The regions and professions to be compared

Taking into account the different sick leave figures in the region South Limburg versus the rest of the country, the – in the past decades – higher disability and unemployment rates in this region (Atlas Sociale Verzekeringen [Social Insurance Atlas 2003-2005], 2005; Limburg in cijfers [Limburg in figures],

¹ The SOCON 2000 data (Eisinga and Coenders, 2000) were statistically analysed by the author as to compare the results with the results of the earlier performed analysis of the SOCON 1985 data (Felling and Peters, 1985; Soeters and Felling, 1990).

2006; Statistics Netherlands, 2006c), the different life style and the different socio-cultural history as the – as a consequence of the removal of the internal European border checkpoints – growing euregional influence of the neighbouring countries and, finally, the different perception of health status, we considered the Limburg population as socio-culturally different from the rest of the Netherlands.

Thus, for obvious reasons we choose for the region South Limburg as to be compared with another Dutch region. Till now remarkable differences in health status determinants between the province of Limburg and the rest of the Netherlands were presented. As to find another region to compare the region South Limburg with, pragmatic considerations predominated, like the central position of the city of Utrecht and this city being the residence of the social fund Detam. Sick leave frequency and duration figures from the Detam, in general and for specific professions, showing differences between the region Utrecht and the region South Limburg, stimulated the choice for the region Utrecht, that is the city of Utrecht and its immediate surroundings, to be compared with the region South Limburg. As for the sick leave rates of the study populations of the present study – be it only for employees working in sale and cleaning and between 20 and 40 years old – these are shown in Table 5.

Table 5: Sick leave rates found in the present study, of the regions Utrecht and South Limburg, for workers in sale and cleaning between 20 and 40 years old (Detam, 1991)

	MSLF*		MSLD**	
	Utrecht	South Limburg	Utrecht	South Limburg
independent of profession	1.01(1.22) N=109	1.77(1.91) N=183	10.1(18.6) N=109	19.7(24.8) N=182
sale	1.10 (1.23) N=71	1.92(1.71) N=102	10.3(20.6) N=71	15.9(21.1) N=102
cleaning	0.89(1.42) N=38	1.66(2.18) N=81	9.6(15.9) N=38	24.6(27.2) N=80

*MSLF = Mean Sick Leave Frequency; **MSLD = Mean Sick Leave Duration

It appeared that regional differences in sick leave were found for various professions, especially for sale and cleaning. The professions sale and cleaning differ in the sense that workers in sale, as compared to workers in cleaning, generally experience less physical workload and that they work under rather strict supervision on regular working hours. The obvious different character of these two professions and the on good grounds assumed socio-cultural differences between the regions South Limburg and Utrecht, their socio-economic comparability and the comparable mix of urban and rural qualities of both regions, did us choose for these two professions and these two regions to compare. The regions showed, for sale as for cleaning, differences in sick leave in the sense that, in South Limburg, sick leave frequency was higher and sick

leave duration was longer than was the case in Utrecht. The differences between the regions Utrecht and South Limburg as between the professions sale and cleaning, gave the opportunity to compare both regions in the effect of relevant sick leave determinants with regard to the profession sale as to the profession cleaning and make a comparison between, as well as within, the two regions.

To eliminate profession- and company-related factors a choice was made for certain professions and not for a specific company. Ethnic influences were excluded as only employees who could read and write Dutch were invited to participate.

Apart from their profession, subjects participating in this study were comparable in age, sex and level of education. Thus, we considered homogeneous groups in two different regions and two different professions in the same regions. Further on a distinction is made between frequency and duration of sick leave, as these two measures of sick leave know – at least for a part – different influences.

1.6 Registration of regional differences in sick leave in the Netherlands

In the Netherlands, till begin nineties, a rather strict registration of sick leave was usual; till then Dutch social funds registered sick leave per region. Each of these funds was for a part responsible for social security, that is for the specific branches they represented (there was a social fund for the agricultural sector, one for industry, for health care, etc.). The end of a strict registration of sick leave, especially registration per region, meant a serious loss of relevant information on sick leave. After the social funds disappeared, the ‘Questionnaire Professional Population’ (QPP) of Statistics Netherlands was the only source of (self reported) sick leave of employees, who are spread over the western, northern, eastern and southern part of the country. Since 2003 the Nationale Verzuimstatistiek (Statistic Netherlands, 2006a) is the better successor of the QPP as it registers sick leave per province. Meanwhile the quality of regional registration of sick leave is hardly a shadow of what it was, as the registration is not objectively administrated as was done before and it is not anymore a registration on the level of a district or a region. As a consequence regional differences in sick leave have lost attention of social security authorities and policy-makers, whereas these differences do exist and have not yet been subject of systematic research. Studies on differences in sick leave concentrate on company-, branch- or profession-related sick leave patterns as on sick leave related to specific diseases rather than on aspects of regional character.

Considering the fact that sick leave is as well a phenomenon that touches socio-economic matters as it does health status, one can only wonder why regional sick leave is not one of the important issues of public and occupational health, and of social security, to be monitored permanently. Especially as strong

indications exist that sick leave, apart from health status and profession or type of company one works for, is also predicted by regional factors. Moreover, in case regional differences in relevant sick leave determinants indeed exist, nationwide operating companies with multiple stores all over the country and organisations (in the Netherlands called ‘Arbodiensten’) that offer commercial services to companies to reduce the sick leave volume, should take into account that different socio-cultural regions might demand a different sick leave reducing policy.

1.7 The research questions and the design of the study

As we did not come across any study which compared between different regions the relation between a same set of relevant sick leave determinants and sick leave itself among comparable employee groups, the research questions we wanted to answer focussed on in age and profession homogeneous study populations. Such populations are expected to show comparable determinants that affect sick leave. If not, region-related factors may play a role. Therefore the research questions we want to answer are:

1. As for the past decades, according to literature, which determinants related to sick leave frequency and duration were relevant? (Chapter 2 and Chapter 5.)

This research question will be answered in Chapter 2 (sick leave frequency determinants) and Chapter 5 (sick leave duration determinants).

2. Are there any differences in the determinants of sick leave frequency between homogeneous groups in two different regions within the same country?

This research question will be answered for two different professional groups i.e. sale (Chapter 3) and cleaning (Chapter 4).

3. Are there any differences in the determinants of sick leave duration between homogeneous groups in different regions within the same country?

This research question will be answered for two different professional groups i.e. sale (Chapter 5) and cleaning (Chapter 6).

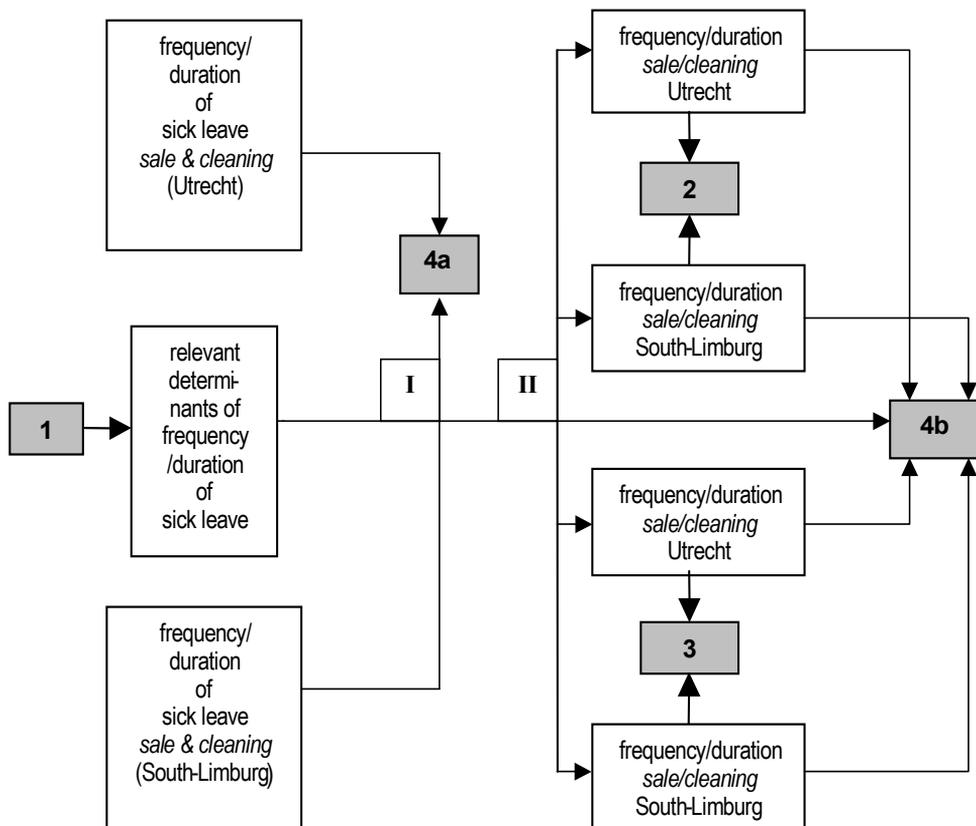
4. a. How do sick leave frequency and duration, without regard to professional group, relate to relevant determinants between different regions within a country and are there differences between these regions in determinants that predict sick leave frequency and duration, and:

b. Are there, between different professional groups within a region, similarities in determinants that affect sick leave frequency and duration indicating an influence of socio-cultural environment? (Chapter 7).

The research questions 4a and 4b will be answered in Chapter 7.

The design of the study (the numbers refer to the research questions), is given in Figure 2.

Figure 2: Design of the study



I = statistical analysis for research question 4a

II = statistical analysis for the researchquestions 2, 3 and 4b

1.8 The design of the thesis

On the basis of found regional differences in sick leave, the present study seeks to find a socio-cultural explanation for those differences. Socio-cultural factors are supposed to influence the type of relevant sick leave determinants that predominate per region. As to define a set of relevant sick leave frequency determinants, in PART ONE of the thesis a literature review on sick leave frequency (Chapter 2) is presented. In PART TWO two socio-culturally different regions are compared in order to find any differences in relevant sick leave *frequency* determinants in case employees are working in sale (Chapter 3) or are working in cleaning (Chapter 4). In PART THREE the same regions are

compared in order to find any differences in relevant sick leave *duration* determinants in case employees are working in the same two different professions sale (Chapter 5) and cleaning (Chapter 6). In PART FOUR the same socio-culturally different regions as in the previous parts are compared in order to find, *independent* of professional group, differences in relevant sick leave frequency and duration determinants *between* the regions and, *dependent* of professional group, the sick leave frequency and duration determinants are compared in order to find similarities *within* the regions (Chapter 7).

As for the aim of this study similar study populations were needed in the PARTS TWO, THREE and FOUR (see Table 6). As a consequence the chapters involved show in the various sections some inevitable repetitions.

Table 6: Study populations involved per PART and per Chapter

PART	measure of sick leave	Chapter	sale and cleaning Utrecht	sale Utrecht	cleaning Utrecht	sale and cleaning South Limburg	sale South Limburg	cleaning South Limburg
II	sick leave frequency	3		x			x	
		4			x			x
III	sick leave duration	5		x			x	
		6			x			x
IV	sick leave frequency and sick leave duration	7	x	x	x	x	x	x

As for similar or different results, in using homogeneous groups in different regions (Chapters 3 till 6) or using different professions in the same region (Chapter 7), we aimed at finding such similarities or differences to test the assumption as to which socio-cultural factors play a role in sick leave. In Chapter 8 the results of the preceding Chapters (3 till 7) are compared as for notable similarities and differences.

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PART ONE:

Literature review on sick leave frequency determinants

In the next chapter, in order to define a set of relevant sick leave frequency determinants as to establish the topicality of a study using data dating back to the nineties, a literature review for sick leave frequency determinants (Chapter 2) was performed.

Chapter 2

A literature review on sick leave frequency determinants of the past decades

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Abstract

Objectives: A literature review on relevant sick leave frequency determinants during the past decades was performed.

Methods: The literature review referred to national and international studies on sick leave frequency determinants.

Results: During the past decades, in research literature, a broad range of sick leave frequency determinants was mentioned in a highly consistent pattern.

Conclusion: Over the past decades sick leave frequency was influenced by a broad range of similar determinants.

Key words: review; sick leave frequency; determinants

Introduction

Sick leave is associated with numerous determinants and over the years extensive research, either national or international, has been performed to establish the precise character of these determinants. Studies on sick leave often distinguish between frequency and duration of sick leave. In this review we focus on determinants that give rise to sick leave, i.e. sick leave frequency determinants.

The research question is: *for the past decades, according to literature, which sick leave frequency determinants were relevant?*

Methods

The aim of the present literature review was to find out which sick leave frequency determinants were relevant during the past decades. Sick leave frequency indicates the number of sickness spells an employee takes a year. This number is influenced by determinants that refer to attitude towards absenteeism, the relation between health and working conditions and working relations and motivation. To identify the relevant sick leave frequency determinants over the past decades, apart from (inter)national scientific journals and academic theses, Medline was consulted.

This literature review focussed on determinants with a general and *not* a specific character. For instance, the habit of smoking was not detailed to the level of the number of cigarettes a person smokes a day and the duration in months or years of temporary appointments was not specified.

Keywords for the literature review on relevant determinants of sick leave frequency were: absenteeism, sickness absence, sickness spells, sick leave and sick leave frequency. Keywords for determinants of the work situation focussed on the working conditions, the work contents, working relations and the working circumstances. Other keywords referred to lifestyle like smoking and drinking alcohol or to individual characteristics and circumstances like age and gender, marital state and level of education. Keywords referring to the health status were: medical consumption (more specified: visits to the family doctor and frequently taking medicines), health complaints and perception of own health or perceived physical and mental health and perceived physical and mental workload.

Results

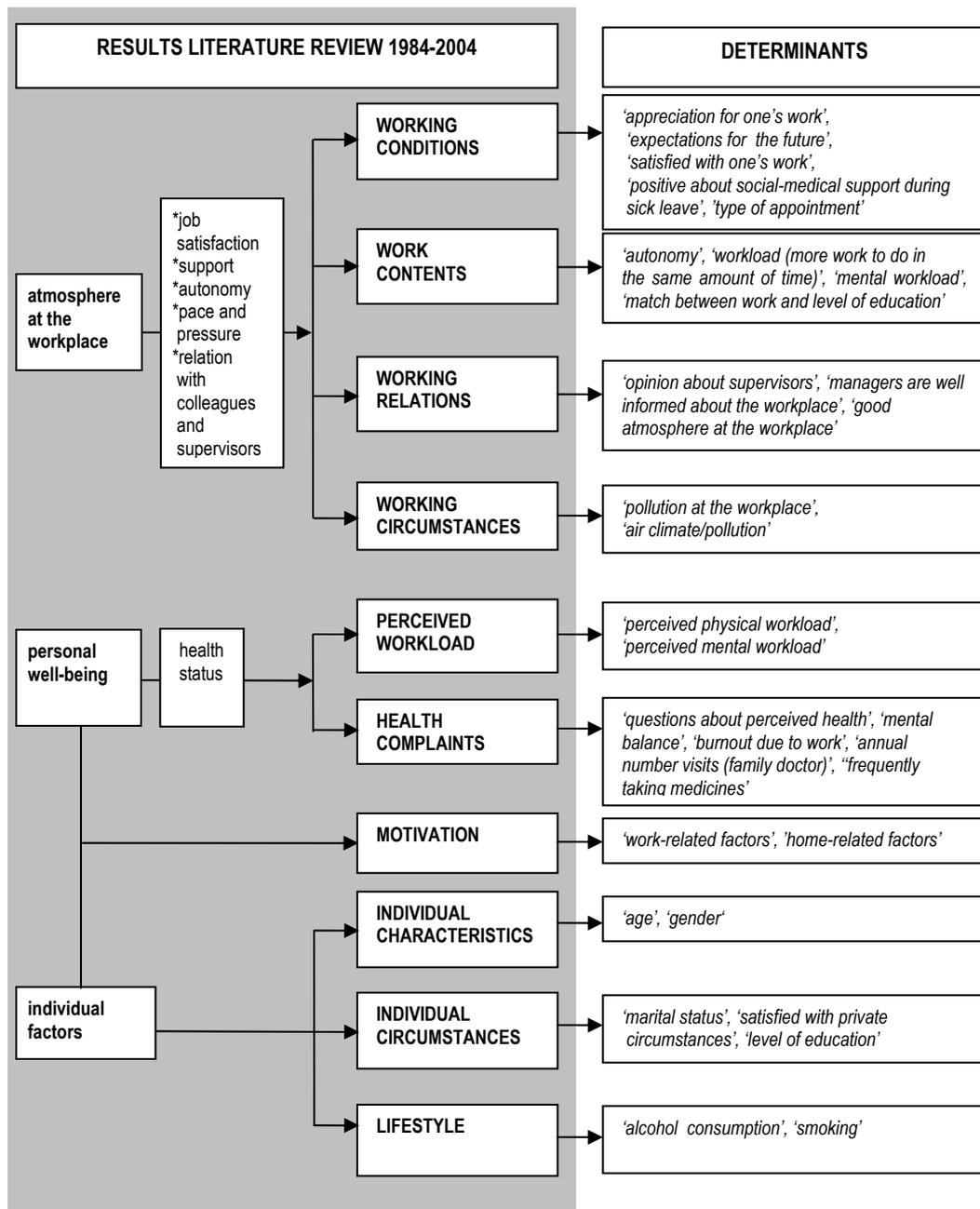
The literature review referred to a number of earlier Dutch studies on sick leave frequency determinants [1-6].

As for studies that focus on sick leave frequency determinants, **personal well-being** [1; 7-10], **individual factors** [8; 2-3; 11; 12-16] and **atmosphere at the workplace** [2; 11; 17-26] are regarded as important factors for sick leave frequency.

Sick leave frequency is related to determinants of the *work situation* i.e. work characteristics, categorised as ‘*working conditions*’, ‘*work contents*’, ‘*working relations*’ and ‘*working circumstances*’. In ‘*working conditions*’ **job satisfaction** prevails (*the less satisfying job, the higher the sick leave frequency*) [1; 27-31], as do **support** (*lesser support means a higher frequency*) [1; 19-20; 32-34], and **type of appointment** (*in case of a temporary appointment, sick leave frequency can be higher and lower*) [1; 4-6; 27-35]. In ‘*work contents*’ **autonomy** prevails (*more autonomy means a lower sick leave frequency*) [1; 5; 28; 36-37] as do **pace and pressure** (*the higher the pace and pressure, the higher the sick leave frequency*) [1; 3; 32; 34; 38-41]. In ‘*working relations*’ **the relations with colleagues and supervisors** are important (*the poorer the relations, the higher the sick leave frequency*) [3; 25; 34; 42-45] as are inconvenient ‘*working circumstances*’ that lead to a higher sick leave frequency (the poorer the working circumstances in terms of air pollution and climate, the higher the sick leave frequency) [1; 3; 46-49]. As for *health status*: health complaints through **physical and psychic perceived** workload, are an expression of a poor health (*the more the physical and psychic perceived workload, the higher the sick leave frequency*) [1; 16; 38; 50-54] as are **mental problems** (*the more the mental problems, the higher the sick leave frequency*) [29; 55-58]. Taking medicines means a higher sick leave frequency [1; 59]. As for *motivation*: less affinity with one’s work leads to a higher sick leave frequency [1], the same is seen in case of a low working morale [8; 34]. As for *individual characteristics and circumstances*: with an increasing age sick leave frequency reduces [1; 34; 60-61]; for women, a higher sick leave frequency is observed [1; 3; 28; 62-64]; married people show a lower sick leave frequency [3; 47; 65-66]; the same applies for higher educated people [3-5]. A relation was found between a high sick leave frequency and little balance between education and level of functioning [47; 67]. Finally, drinking [68-70] and smoking [71-73] are associated with a higher sick leave frequency.

Figure 1 provides the results classified in accordance with the literature review.

Figure 1: Results of the literature review for sick leave frequency determinants (1984-2004)



For the direction of the influence of the mentioned sick leave frequency determinants on the basis of the literature review see Table 1.

Table 1: Sick leave frequency determinants: the direction of the influence

sick leave frequency determinants	direction of the influence¹
working conditions	
appreciation for one's work	more appreciation > lfsl
expectations for the future	better expectations > lfsl
satisfied with one's work	more satisfaction > lfsl
positive about social-medical support during sick leave	indifferent ²
type of appointment (<i>permanent or temporarily</i>)	indifferent
work contents	
autonomy	more autonomy > lfsl
workload (more work in the same amount of time)	more work in the same amount of time > hfsl
mental workload	heavier mental workload > hfsl
match between work and level of education	better match > lfsl
working relations	
opinion about supervisors	more positive opinion > lfsl
managers are well informed about the workplace	better informed > lfsl
good atmosphere at the workplace	better atmosphere > lfsl
working circumstances	
pollution at the workplace	more pollution > hfsl
air climate / pollution	bad air climate / more pollution > hfsl
health status (perceived workload):	
perceived physical workload	perception of heavier physical workload > hfsl
perceived mental workload	perception of heavier mental workload > hfsl
health status (health complaints):	
questions about perceived health	perception of a poorer health > hfsl
mental balance	the more out of balance > hfsl
burnout due to work	the more severe burnout > hfsl
annual number of visits (family doctor)	higher number of visits > hfsl
frequently taking medicines	more frequently taking medicines > hfsl
Motivation	
work-related factors (working with pleasure)	working with more pleasure > lfsl
home-related factors (more or less motivated)	more motivated for work > lfsl
individual characteristics and circumstances	
age	older > lfsl
gender	female > hfsl
marital status	married > lfsl
satisfied with private circumstances	more satisfied > lfsl
level of education (<i>high or low</i>)	higher level of education > lfsl
alcohol consumption	drinking more > hfsl
smoking	smoking more > hfsl

¹Direction of the influence based on the literature review: the *assumed* effect on the frequency of sick leave (lfsl = lower frequency of sick leave; hfsl = higher frequency of sick leave). ²Indifferent: literature is scarce or ambiguous.

Discussion and conclusion

A literature review on sick leave frequency determinants during the past decades was performed. The aim was to find sick leave frequency related determinants and not to evaluate the size of the effect of those determinants. As

for future studies, it would be useful that the relative effect of determinants is also taken into consideration.

After reviewing the literature we concluded that, during the last decades, a broad spectrum of determinants of sick leave frequency was mentioned in a highly consistent pattern. This conclusion was based on the finding that studies on sick leave frequency during the years 1984-2004 apparently focussed on similar determinants.

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PART TWO

Regional differences in sick leave frequency within one country

In the next two chapters regional differences in sick leave frequency for the profession sale (Chapter 3) as for the profession cleaning (Chapter 4) are compared.

Chapter 3

The influence of sick leave frequency determinants on homogeneous groups in two socio-economically comparable, but socio-culturally different regions in the Netherlands

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Summary

Objectives: The aim of this study was to explore the influence of sick leave frequency determinants on in terms of age and profession homogeneous groups in two socio-economically comparable, but socio-culturally different regions in the Netherlands, i.e. Utrecht (mean frequency 1.10 spells) and South Limburg (mean frequency 1.92 spells). In addition, to get an idea of the study's topical interest, a literature review on sick leave frequency determinants covering the past few decades was performed.

Material and methods: 184 participants in the Utrecht and South Limburg regions were interviewed on work, individual and health characteristics. Sick leave frequency data were obtained from a social fund. For the literature review (inter)national scientific journals, academic theses and Medline were consulted.

Results: A comparison of sick leave frequency in the two regions showed that, in South Limburg, the determinants called 'opinion on social-medical support during sick leave', 'type of appointment' and 'annual number of visits (family doctor)' were associated with sick leave frequency whereas this was not the case in Utrecht. The literature review presented a highly consistent picture of determinants of sick leave frequency over the last few decades.

Conclusions: In the two regions studied, different determinants appeared to be associated with sick leave frequency. This phenomenon is attributed to the different socio-cultural characters of the regions. As per region different determinants appeared to be associated with sick leave frequency, nationwide interventions to reduce sick leave frequency should take into account the potential influence of regional differences in determinants that predict sick leave frequency. Sick leave frequency determinants have not changed in the past few decades. Although the study was performed in the nineties, its results are still relevant.

Keywords: regions, homogeneous groups, sick leave frequency, determinants, the Netherlands

Introduction

In the Netherlands indications for regional differences in sick leave frequency exist, whereas regional registration and research on determinants that could play a role in these differences is scarce. The same applies to research on determinants that could play a role in regional differences in sick leave duration, be it that recently an explorative study showed that in different regions different determinants predict sick leave duration (1).

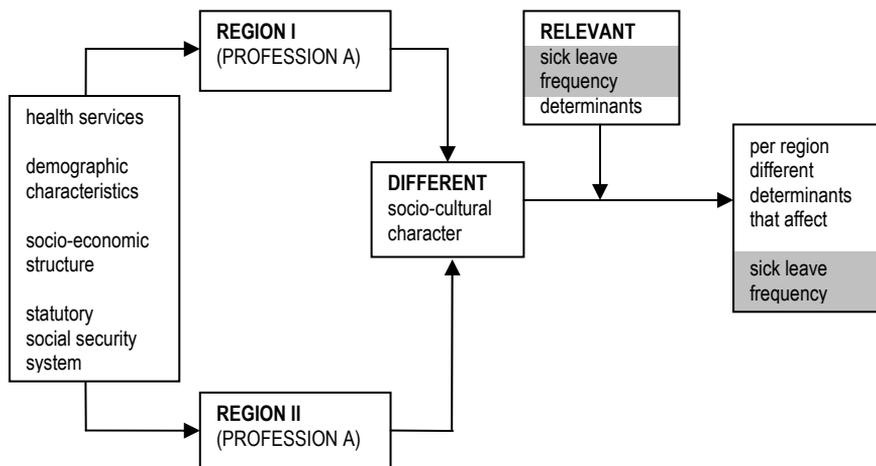
In a Finnish study on sick leave frequency, performed in three demographic comparable municipalities, it appeared that the sickness absence practice is expression of the sickness absence habitus, which is deeply rooted in the social history of a locality as well as in the health-related behaviour of the residents (2, 3). In the Netherlands the mean frequency of sick leave showed differences between the provinces Overijssel and Gelderland (1.72 spells) and Utrecht, North- and South-Holland (2.00 spells) (4). These differences were attributed to the economic structure of a region, characteristics of the population, health services and cultural differences (5).

Regional differences in health were found between the Dutch province of Limburg and the rest of the country (6, 7), but illness is not a good predictor of sick leave (8-10) whereas *personal well-being* (11-15) and *individual factors* are (9, 13, 16-22), as *atmosphere at the workplace* is (9, 16, 23-32).

Regarding *personal well-being*, *individual factors* and *atmosphere at the workplace* as important factors we assume that regional, i.e. socio-cultural characteristics, might influence the type of sick leave frequency determinants effective per region.

As for regions that show comparable demographic characteristics, are socio-economically comparable and have similar health services, in age and profession homogeneous study populations are expected to show comparable determinants that affect sick leave frequency. If not, region-related socio-cultural factors may play a role. Fig. 1 shows the theoretical model:

Fig. 1: Theoretical model*.



* Figure belonging to Willibrord Beemsterboer et al. (2008): The influence of sick leave frequency determinants on homogeneous groups in two socio-economically comparable, but socio-culturally different regions in the Netherlands.

In regions with comparable health services, comparable demographic characteristics of the residents, a comparable socio-economic structure and a similar statutory social security system, employees with a same profession live in an environment of different socio-cultural character.

We could not find any studies which compared the relation between similar sets of relevant sick leave frequency determinants and sick leave frequency in different regions. Therefore, the research question was: Are there any differences in the determinants of sick leave frequency between homogeneous groups in different regions within the same country?

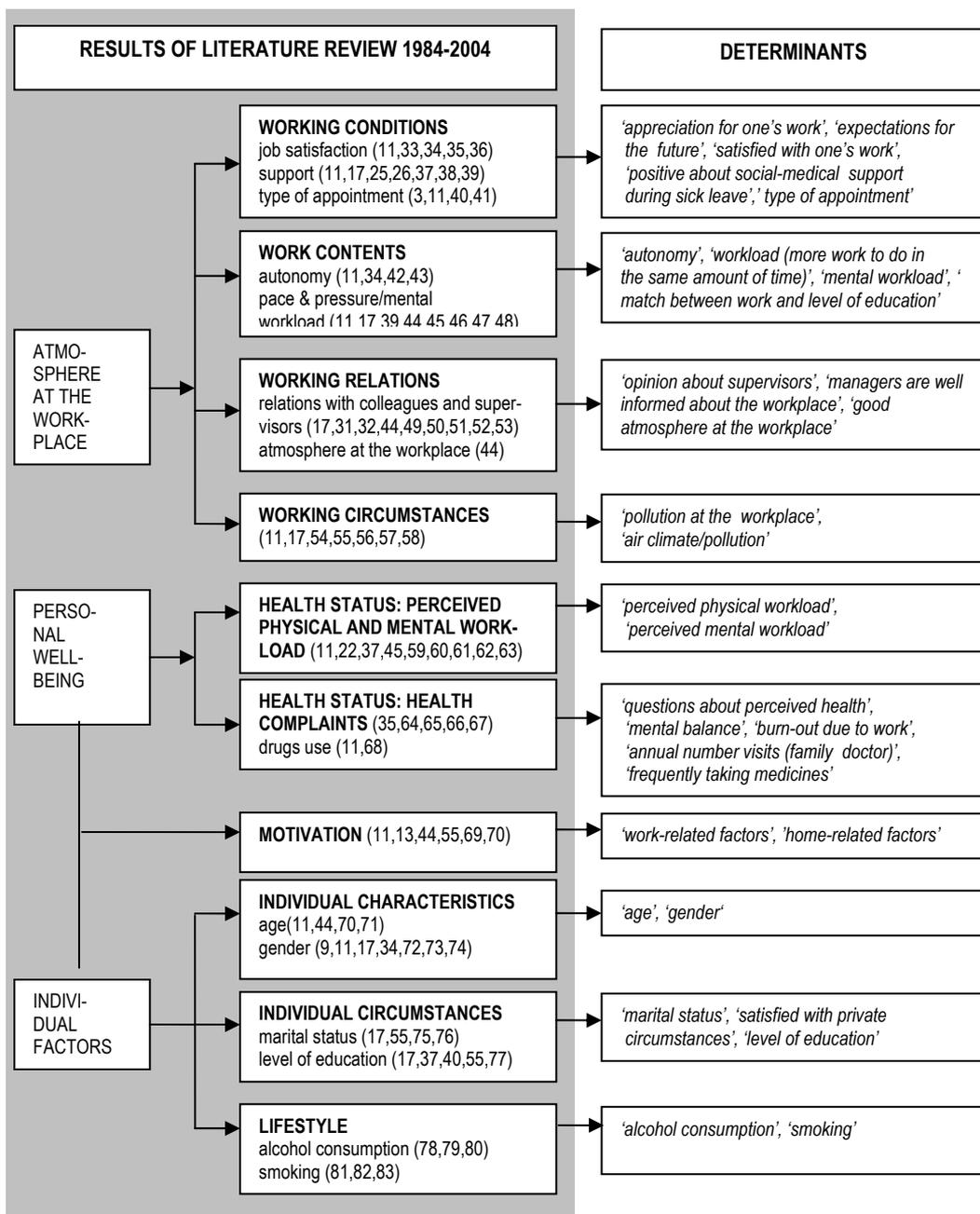
The question was divided into four subquestions: (1) How does sick leave frequency compare between homogeneous groups in different regions? (2) How do scores of individual sick leave frequency determinants compare between homogeneous groups in different regions? (3) How does sick leave frequency relate to relevant determinants between homogeneous groups in different regions? (4) Are there any differences in determinants that predict sick leave frequency between homogeneous groups in different regions? (5) Are the determinants in which regions differ correlated?

To answer these questions a literature review was needed to identify the determinants of sick leave frequency found until the early nineties. The aim was to define a set of relevant determinants. In order to estimate the topicality of the

study it was also considered useful to review the literature from the early nineties onwards.

The review resulted in the findings as showed in Fig.2 (*Results of the literature review 1984-2004*). For the direction of the effect of determinants see Table 1 ('meaning of the score').

Fig. 2. Results of literature review 1984-2004/Determinants*.



* Figure belonging to: Willibrord Beemsterboer et al. (2008): The influence of sick leave frequency determinants on homogeneous groups in two socio-economically comparable, but socio-culturally different regions in the Netherlands.

Table 1: Selected determinants, interpretation of the scores

independent determinants	number of items	Cronbach's alpha	meaning of the score ¹
working conditions			
appreciation for one's work (sum)	4	0.78	high is more > lfsl
expectations for the future (sum)	4	0.80	high is better > lfsl
satisfied with one's work (yes=1/no=0)	1		high is more > lfsl
positive about social-medical support during sick leave (yes=1/no=0)	1		high is more positive: indifferent ²
type of appointment (permanent=1/temporarily=0)	1		indifferent
work contents			
autonomy (sum)	8	0.77	high is more > lfsl
workload (more work in same amount of time) (yes=1/no=0)	1		high is more > hfsl
mental workload (yes=1/no=0)	1		heavier > hfsl
match between work and level of education (yes=1/no=0)	1		high is better > lfsl
working relations			
opinion on supervisors (sum)	9	0.90	high is more positive > lfsl
managers are well informed about the workplace (yes=1/no=0)	1		high is better > lfsl
good atmosphere at the workplace (yes=1/no=0)	1		high is better > lfsl
health status (perceived workload)			
perceived physical workload (sum)	10	0.77	high is more > hfsl
perceived mental workload (sum)	5	0.72	high is more > hfsl
health status (health complaints)			
questions about perceived health (sum)	22	0.86	high is more perception of poor health > hfsl
mental balance (sum)	21	0.86	high is more out of balance > hfsl
burnout due to work (sum)	6	0.72	high is more severe > hfsl
Annual number of visits (family doctor)	1		more is poorer health > hfsl
frequently taking medicines (yes=1/no=0)	1		more is poorer health > hfsl
motivation			
work-related factors (yes=1/no=0)	1		high is more pleasure in work > lfsl
home-related factors (sum)	8	0.70	high is less motivated for work > hfsl
individual characteristics and circumstances			
age	1		older > lfsl
gender (w=1/m=0)	1		female > hfsl
marital status (married=1/unmarried=0)	1		married > lfsl
satisfied with private circumstances (yes=1/no=0)	1		more > lfsl
level of education (high=1, vocational school level=0)	1		high > lfsl
alcohol consumption (yes=1, no=0)	1		drinking > hfsl
smoking (yes=1, no=0)	1		smoking > hfsl

¹Interpretation of score and – based on the literature review performed – the assumed influence on the frequency of sick leave (lfsl = lower frequency of sick leave; hfsl = higher frequency of sick leave). ²Indifferent: literature is scarce or ambiguous.

After reviewing the literature we concluded that, during the last decades, a broad spectrum of determinants of sick leave frequency was mentioned in a highly consistent pattern. This conclusion was based on the finding that studies on sick leave frequency during the years 1984-2004 apparently focussed on similar determinants.

The literature search was performed in order to identify a set of relevant determinants. Identifying these determinants was merely a means to achieve the main purpose of the present study, i.e. to find any differences in effective sick leave frequency determinants between regions based on their socio-cultural differences. Thus our study, focussed primarily on socio-cultural differences as a cause of regional differences in active sick leave frequency determinants, was not a study on sick leave frequency determinants as such.

Materials and methods

The aim was to study the relation between relevant determinants of sick leave frequency and the actual frequency of sick leave in terms of age and profession in homogeneous population groups in different regions of the country. Earlier an explorative study was performed on regional differences in duration of sick leave (1). In the present study, first it was established which determinants of sick leave frequency were relevant according to the literature of the last few decades. The literature review refers to a number of Dutch studies on determinants of frequency of sick leave until 1993 (11, 16, 17, 37, 40, 84).

For the period after 1993 (inter)national scientific journals, academic theses and Medline were consulted.

Registration of data of sick leave

Since one of the authors worked for a Dutch social fund which registered the sick leave frequency per region - although for specific professional groups only (sale, cleaning, trade) - it was possible to compare the relations between relevant sick leave frequency determinants and the sick leave frequency registered per region.

Regions and profession studied

It was found that the professions sale and cleaning showed remarkable differences in sick leave frequency in different regions. For this reason and because a difference in socio-cultural climate was likely to be found, it was decided to investigate two regions: Utrecht (city of Utrecht and surroundings) and South Limburg (including the cities of Heerlen and Maastricht). As for the assumption that both regions were socio-culturally different, several indicators supported this as for instance the different socio-cultural history of Southern Limburg (i.e. a region hemmed in by Belgium and Germany), a less sober lifestyle of the

residents (85), a poorer perception of health of the South Limburg population (86) and the higher disability rates found in South Limburg (86, 87) made it plausible that the regional character of this region was socio-culturally different from the rest of the country.

Earlier it was found that the profession sale showed remarkable differences in sick leave duration in specific regions (1). It appeared that the same applied to this profession but for sick leave frequency. Therefore, in the present study, we focussed on workers in sale which were compared as to their sick leave frequency. The ratio of this approach was to investigate the same phenomenon as we did earlier, be it now for another measure of sick leave. As a consequence per region remarkable similarities in determinants that affect sick leave may indicate the influence of socio-cultural characteristics of the study populations concerned.

Participants

Workers were included in the study population as soon as they reported sick and unable to work. This was the best possible moment because most of those reporting sick (> 95%) were visited by a controlling official within a week.

In order to exclude specific effects of younger (< 20 years) and older (> 40 years) subjects on the results and to enhance the homogeneity of the study population, participants had to be between 20 and 40 years old and their reason for reporting sick had to be 'low back pain' or 'uncomplicated stress'. The decision to use these diagnostic categories had a pragmatic basis: it was assumed that, using these *commonly found* diagnoses which - other than specific diseases - leave the subject much freedom to act (i.e. to report sick or not), a substantial number of participants (at least 50 to 100 per region) could be recruited within a relative short period of time (6 months). 184 employees (79 in Utrecht, 105 in South Limburg) agreed to participate. This number was the outcome of the interview period of six months as the result of an aselect procedure in which every next employee meeting the requirements was asked to participate. All employees who agreed to participate ($N = 184$) really did participate in the study. Strictly individual characteristics such as age and gender were the only determinants of the non-responding group to be included in the statistical analysis.

It is recognised that the sample size is small, even if the study examined what effects differences in regional socio-cultural character might exercise on the type of determinants that affect sick leave frequency. This is why the study was carried out on strictly homogeneous groups in socio-economically similar though geographically different regions, under the jurisdiction of a uniform social security system.

Questionnaire

Some data on the individual and work characteristics of participants were derived from a specific form, completed by the employer and sent to the social

fund to report the first day of sick leave. When employees agreed to participate, a booklet with questions was handed out which they were asked to answer. In accordance with the results of the literature review until the early nineties, the booklet consisted of sets of questions that referred to the determinants identified. The questions were derived from the validated VAG (Vragenlijst Arbeid en Gezondheid, Questionnaire on Work and Health) (88).

Fig. 2 presents the origins of the questions. The figure reflects the finding that the results of the literature review showed a remarkable consistency over the years 1984-2004. Determinants belonging to similar categories were combined. Thus, the categorized determinants constitute the *independent* variables while sick leave frequency is the *dependent* variable.

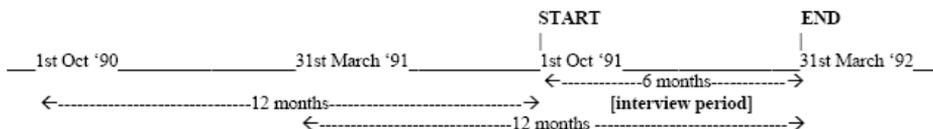
Parameters of social and demographic developments were not investigated because legal, political and socio-economic status and developments were similar throughout the country and the study population was homogeneous.

The selected determinants cf. Fig. 2 were used as the basis for statistical analysis.

In *South Limburg* 82% of the distributed booklets was returned, in *Utrecht* this was 63%.

Timetable

A study of the mean frequency of sick leave requires a certain period of registration which, in the present study, was the year before the day of reporting ill. For those reporting sick on the first of October, 1991, we referred to the period starting on the first of October, 1990; for those reporting sick on the first of December, 1991, we referred to the period starting on the first of December, 1990, and so on. The mean frequency of sick leave in the referred year was used in the analyses. As a result, the time line of the study, including the 12-month period preceding the spell of sick leave, was as follows.



Determinants, design of the study

The collected answers (items) were classified for statistical purposes and, based on a factor analysis (not presented here), combined to form compound determinants. Table 1 provides a classification of the determinants in accordance with those in Fig. 2; it gives the number of items as well as Cronbach's alpha for compound determinants.

The level of Cronbach's alpha was fixed on .70 as this was a rather safe procedure in the sense that the value is less dependent on the number of items (constituting the compound determinant) than if higher levels are used (89). A few compound determinants lacked internal coherence (Cronbach's alpha < .70) and were eliminated. They were 'pollution at the workplace' and 'air climate/pollution' of the *working circumstances*.

Fig. 3 presents the study design. The relations between similar sets of sick leave frequency determinants, on the one hand, and sick leave, on the other, were analyzed for homogeneous groups in Utrecht and South Limburg. The resulting outcomes for the two regions were then compared.

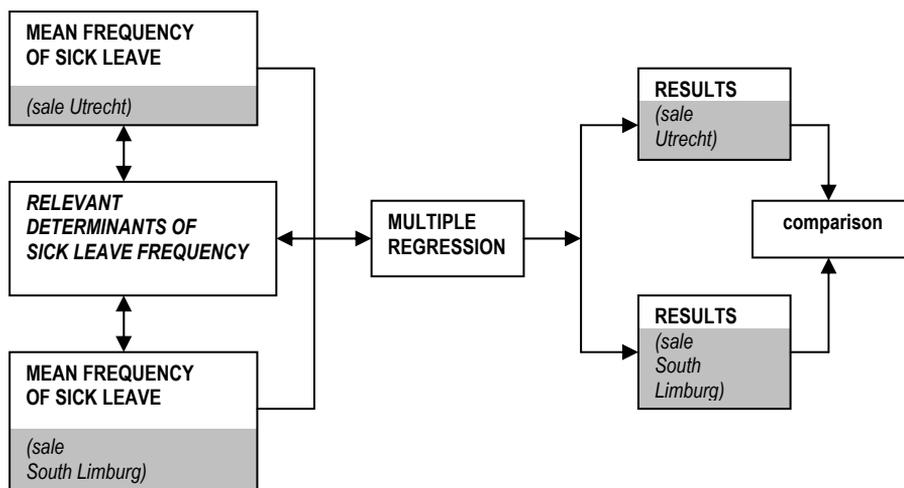


Fig.3 Study design*.

* Figure belonging to: Willibrord Beemsterboer et al. (2008): *The influence of sick leave frequency determinants on homogeneous groups in two socio-economically comparable, but socio-culturally different regions in the Netherlands.*

A missing data analysis was performed in order to find out whether the number of missing data might influence the results. If so, imputation was applied. Consequently, the potential effect of missing data on the outcome was estimated. A box plot was performed to check the potential effect of extreme/outlying scores on the outcome.

A significance level of $p < 0.05$ was applied.

Statistical analysis

The statistical analysis included: (a) a dependent group t test; (b) an independent sample t test; (c) regression analyses per region; (d) a comparison of the

regression coefficients for the two regions (90) and (e) a regression analysis in order to find any correlations between the determinants in which the regions differ.

Results

As far as demographic data were concerned, the average age in South Limburg was 26.5 years, in Utrecht 26.8 years. In South Limburg the percentage of female participants was 87%, in Utrecht 84%; in both regions, the majority of participants had low levels of education (vocational school level): South Limburg 84%, Utrecht 94%. Thus, the two study populations were remarkably similar in nature.

We now turn to the five subquestions of the study, to be followed immediately by the research question itself.

1. How does sick leave frequency compare between homogeneous groups in different regions?

Statistical comparison of the mean frequency of sick leave between the two regions showed a difference (t-value: 3.70, $p:0.001$) between the mean frequency of sick leave a year in South-Limburg (1.92 spells; sd: 1.71, N: 102) and that in Utrecht (1.10 spells; sd: 1.23, N: 71). In a number of cases (3 in South Limburg, 8 in Utrecht) the social fund was not able to provide the exact sick leave frequency data per individual or these data were not reliable, so that these were missing cases.

2. How do scores of individual sick leave frequency determinants compare between homogeneous groups in different regions?

In South Limburg as compared to Utrecht: the subjects perceived a poorer health ('health status': health complaints, $p: 0.03$) and the number of married people was higher ('individual characteristics and circumstances': marital status, $p:0.01$).

3. How does sick leave frequency relate to relevant determinants between homogeneous groups in different regions?

A regression analysis was applied to examine the relation between the selected determinants as independent variables and the mean sick leave frequency as the dependent variable (Table 2).

Table 2: Results of the regression analyses of sick leave frequency determinants per region

DETERMINANTS	UTRECHT			SOUTH-LIMBURG		
	adjusted R ²	Beta	Sig T	adjusted R ²	Beta	Sig T
WORKING CONDITIONS	0.00 ¹ (N=49)			0.10 (N=85)		
positive about social-medical support during sick leave		-0.02	0.93		-0.30	0.01*
type of appointment		-0.06	0.73		0.27	0.02*
WORK CONTENTS	0.07 (N=45)			0.01 (N=67)		
autonomy		0.28	0.07		-0.26	0.05
HEALTH STATUS: HEALTH COMPLAINTS	0.01 (N=49)			0.09 (N=75)		
annual number of visits (family doctor)		-0.11	.53		0.27	0.04*

* $p < 0.05$; ¹negative R² substituted by 'zero'

Estimated variance components should theoretically be nonnegative. As relative small components of the variance with a negative sign are generally a consequence of a small sample size, those variance components were substituted by 'zero'.

In South-Limburg a lower sick leave frequency was seen if one was positive about social-medical support during sick leave ('working conditions', $p:0.01$) and a higher sick leave frequency was observed if one had a permanent (and not temporary) appointment ('working conditions', $p:0.02$) and in case of a larger number of annual visits to the family doctor ('health status': health complaints, $p:0.04$); in Utrecht - a remarkable though not significant result - a higher sick leave frequency was seen in case of more autonomy ('work contents': autonomy, $p:0.07$), whereas in South-Limburg more autonomy, though not significant either, lead to a lower sick leave frequency ('work contents': autonomy, $p:0.05$).

4. Are there any differences in determinants that predict sick leave frequency between homogeneous groups in different regions?

The outcomes of the comparisons that were made to establish differences in regression coefficients between the two regions, if any, lead to the conclusion that regional differences were found for the determinants called 'positive about social-medical support' ($p<0.01$), 'type of appointment' ($p:0.04$), 'autonomy' ($p<0.01$) and 'annual number of visits (family doctor)' ($p:0.02$).

Thus, the regression analysis showed that, though not significant for 'autonomy', regions differed in predictive determinants of sick leave frequency and that the regression coefficients for those determinants differed as well.

5. Are the determinants in which regions differ correlated?

Differences between the regions were found for several determinants (subquestion 4). In order to find a possible correlation between those determinants a regression analysis was performed for the working conditions determi-

nants 'positive about social-medical support' and 'type of appointment', for the work contents determinant 'autonomy' and for the health status determinant 'annual number of visits (family doctor)'. The correlation matrix showed that the determinants 'positive about social-medical support' and 'autonomy' were correlated (0.19, $p:0.005$) as were the determinants 'type of appointment' and 'autonomy' (0.15, $p:0.02$). The Variance Inflation Factor (range 1.03-1.06) did not show any co-linearity of these determinants.

The determinants 'alcohol consumption' and 'satisfied with private circumstances', belonging to the category 'individual characteristics and personal circumstances', met so many missings ('alcohol consumption') or showed such an extent of skewness ('satisfied with private circumstances'), that they were less relevant for further analysis and therefore had to be excluded. The performed boxplot showed that several determinants had extreme/outlying scores. Most of them did not influence the outcome except for the determinants 'autonomy' (South-Limburg) and 'autonomy' and 'work-related factors' (Utrecht), in the sense that only after reducing the value of the extremes/outliers of these determinants to the next extreme score or the mean value, the strong relation between them and frequency of sick leave did exist.

The main question of the study was: Are there any differences in the determinants of sick leave frequency between homogeneous groups in different regions within the same country?

Based on the results of the statistical analyses it was concluded that, within our country, regional differences in sick leave frequency determinants really did exist and that *different* determinants predicted sick leave frequency in *different* regions.

Discussion

The present study compared the responses to relevant determinants of sick leave frequency shown by homogeneous groups in two areas of similar socio-economic character. Employment contracts in the two regions were similar, as was the administrative implementation of social security regulations. Employees who did not speak or write Dutch - most of them belonging to other ethnic groups - were not invited to participate as they would have been unable to fill in the interview booklet. Furthermore, in selecting both the 'Utrecht region' with the city of Utrecht and its immediate surroundings and the 'South Limburg region' including the cities of Heerlen and Maastricht, a balance of rural and urban qualities was reached which also attributed to the homogeneity of the study populations. However, taking into account a few indicators, this did not rule out the possibility that the two regions differed in character. Thus, over the years, a relatively large number of employees has come to depend on disability benefits or has become unemployed in South Limburg than has been the case in the western part of the country; further on it turned out that residents of the

South Limburg area show a poorer perception of their own health than residents elsewhere in the country (86, 87). The assumption is that these differences have been caused by similar phenomena as are the differences in determinants of sick leave frequency, that is to say, socio-cultural differences.

Methodological reflections

The topicality of the study

Sick leave frequency has gradually decreased in the Netherlands. At the same time, as a result of changes in the organization of the social security system, regional registrations of sick leave frequency have ceased to exist. This does not mean, however, that regional differences in sick leave frequency have ceased to exist. Since 2003 the Nationale Verzuimstatistiek (Statistics Netherlands, 2006) has been providing sick leave registration per Dutch province and what it shows is that there are still differences in sick leave between provinces (91). Moreover, although the study was carried out during the 1990s, the consistency in determinants predicting frequency of sick leave adds to the relevance of its outcome.

Although the changes of the social security system have affected the country as a whole rather than specific regions, the social security system for the certification of sick leave has grown less uniform. Therefore, apart from the independent determinants presented in this study which are still effective today, future studies on regional differences in sick leave will have to include determinants of the statutory compensation system as well.

The present study seeks to find an explanation for regional differences in sick leave and applies an original research model to achieve this. The model assumes the existence of regional differences in sick leave on the basis of socio-cultural differences, which find their expression in well-known sick leave determinants. Changes in the organisation of the social security system will not alter the present theoretical model as such and at the time when the study was performed, the two regions had the same statutory compensation system, i.e. employees reporting sick were met with a similar approach.

Subjects

Subjects for the study were recruited at a time when they reported sick. An alternative for this approach would have been a study among employees of a few big companies. The latter approach would have been a better alternative to cover the entire group of workers in sale. In the present case, only those were included who, at some point, reported sick. So it was for practical reasons that we decided to use this procedure. Relevant individual data as well as systematically registered individual absenteeism data could easily be obtained from the social fund. Actually, it would have been a great disadvantage to study the employees of a few big companies because the outcome might be strongly

affected by their specific, company-related culture of absenteeism (92, 93). In this context it is important to mention the exclusion of company-specific characteristics that often play an important role in sick leave behaviour (94, 95).

A choice for the Age Group of 20 till 40 Years

In order to exclude specific effects of younger (<20 years) and older (>40 years) subjects on the results and to enhance the homogeneity of the study population, a choice was made for the age group of 20 till 40 years. It is recommended to repeat the study with study populations older than 40 years as to see whether these groups, as a consequence of socio-cultural factors, show regional differences in sick leave too.

Number of spells of sick leave

By starting from a reported case of sick leave to recruit participants, participants seem to have had at least one spell of sick leave during the study period and so-called 'zero' sick leaves seem to have been excluded. However, this assumption is not correct. The time we referred to was the 12-month period preceding the first day of sick leave. Thus, it is always possible that participants had a 'zero' frequency of sick leave. Meanwhile, once people report sick for work they apparently show a greater tendency to have another sick leave than people who never did (96), so the results of this study are representative for those employees who were on sick leave at some point in time rather than for those who never had sick leave before.

Analysis per category

It would have increased our understanding of the association between determinants and observed sick leave frequency if the entire group of selected determinants could be analysed in a single regression analysis. However, a regression analysis of all selected determinants was not a real option. The number of participants actually participating in the analysis (N) would have been quite small due to the number of missing data. This would have made the estimates of the regression analysis unreliable. Thus, for pragmatic reasons the determinants were classified according to the categories they belonged to and then analysed per category. Also, considering the possibility that determinants distinguishing between regions were correlated, a regression analysis for the relevant determinants was performed.

Possible correlations between the independent determinants

In interpreting the outcome it should be realized that possible correlations between independent determinants were not the object of study, although such correlations may exist. For instance, a notable gender-related effect may be correlated with factors like social circumstances and the work situation (70, 97-99). In developing a policy to reduce the mean frequency of sick leave in a

specific region it will be necessary to take into account any correlations between determinants before drawing conclusions.

Study results and level of significance

Some determinants show notable results. This was a reason to consider also $0.05 < p < 0.10$, in addition to $p < 0.05$. After all, using only the 5% significance level in applied research may be inappropriate (100). Such a conservative approach may provide policy-makers with an unnecessarily incorrect picture, at least when correlations above the 5% level are not taken into consideration. Therefore, we have distinguished results for which $p < 0.05$ and results for which $0.05 < p < 0.10$. As for the determinants 'autonomy' and 'annual number of visits (family doctor)' the opposite sign of the beta values (Table 2) attributes to the difference in effect of this determinant in the two regions. Moreover, the higher number of annual visits to the family doctor in South Limburg confirms the perception of a poorer health (subquestion 2) which confirms both earlier and later findings in this region (86, 101). The outcome supports the conclusion that, between regions, different determinants may predict frequency of sick leave and that the underlying causes are region-related.

If employees, in South-Limburg, were positive about social-medical support during sick leave and met a certain autonomy at the workplace, they had a tendency to a lower frequency of sick leave whereas a permanent appointment and a larger annual number of consultations of the family doctor lead, in this region, to a higher frequency of sick leave. The paradoxical finding, in Utrecht, of autonomy having a heightening effect on frequency of sick leave, needs further research for its possible cause.

Conclusions

If a study uses homogeneous groups, then comparable determinants can be expected to affect sick leave frequency in either group. That this is not the case has its implications for the nature of interventions per region. In case nationwide, general measures to reduce frequency of sick leave are intended, one has to take into account that determinants that predict frequency of sick leave may differ and that only tailor-made interventions, focussed on those determinants that predict sick leave frequency per region, may be effective.

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Chapter 4

On regional differences in determinants of sick leave frequency for cleaning workers in two regions of the Netherlands: a comparative study

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Abstract

Objectives: To explore regional differences in the effects of the sick leave frequency determinants between two homogeneous groups of workers from two comparable socio-economic regions in the Netherlands, namely Utrecht and South Limburg. *Materials and Methods:* Data on sick leave frequency for 137 cleaning workers in the regions of Utrecht (mean sick leave frequency: 0.89 spells) and South Limburg (mean sick leave frequency: 1.66 spells) were obtained from a Dutch social fund, and the data regarding their job, and health-related and individual characteristics were elicited by an interview. *Results:* A statistical analysis of the sick leave frequency in the two regions showed little differences, except for the determinant 'perceived physical workload' which was associated with the sick leave frequency in South Limburg but not in Utrecht. *Conclusion:* A regional difference in the sick leave frequency was noted with respect to 'perceived physical workload' as the study parameter. This would indicate that the findings of our earlier studies performed in the nineties of the 20th cent. are still relevant. In further research, the principles of the new certification system on sick leave frequency should also be considered, as the previous uniform statutory compensation system has been terminated.

Key words: Sick leave frequency, Determinants, Regions, The Netherlands

Introduction

Sick leave frequency is a measure for absenteeism which generally shows a rather strong relationship with the factors of motivation and indicates the number of sickness spells an employee takes a year. In the Netherlands, regional differences in the sick leave frequency have been observed [1]. However, the studies investigating the determinants that could account for these differences are scarce. The present study compares the sick leave frequency between two groups of workers of the same profession and age but coming from different country regions. The Dutch social fund that registers the frequency of sick leave noted remarkable regional differences in this parameter for various professions. As the character of these professions does not differ per region, the question was which relevant determinants of sick leave frequency could explain this finding.

This study is focused primarily on the possible differences in the determinants of sick leave frequency between homogeneous groups of workers from different country regions of the Netherlands. Secondly, these differences are analyzed in the light of the different socio-cultural background of the two regions. Therefore, it was necessary to define the socio-cultural characteristics in general and investigate which of these can be applied to the regions of South Limburg and Utrecht. This subject will be considered in more detail in the Discussion.

As the sick leave frequency is associated with many determinants, a literature search had to be performed in order to identify the determinants relevant to the present study [2]. The literature on the regional differences in sick leave frequency was also reviewed.

Regional differences in sick leave frequency

A Finnish study on the sick leave frequency, performed in three demographically comparable municipalities, revealed that the sickness absence practice is the expression of the sickness absence habitus which is deeply rooted in the social history of the locality as well as in the health-related behaviour of the residents [3–4]. In the Netherlands, the mean frequency of sick leave showed regional differences between the provinces of Overijssel and Gelderland (1.72 spells) and between Utrecht, and North and South-Holland (2.00 spells) [5]. These differences were attributed to the economic structure of the region, as well as the characteristics of the population, health services, and cultural differences [6].

Considering the personal well-being [7–11], individual factors [9,12–19] and atmosphere at the workplace [12–13,20–29] as important factors for the sick leave frequency, we assume that the regional differences in the socio-cultural characteristics have influence on the type of relevant determinants of sick leave frequency that are effective per region. The workplace atmosphere is

determined by ‘job satisfaction’, ‘support’, ‘autonomy’, ‘pace and pressure’ and ‘relation with colleagues and supervisors’ [2].

With regard to the country regions that are comparable in socio-economic terms and have a similar health care system, and to the study populations that are homogenous in age and profession, one may expect that the sick leave frequency determinants will also be comparable. If not, then the region-specific socio-cultural characteristics are likely to play a role. Figure 1 shows the theoretical model we have considered in this study.

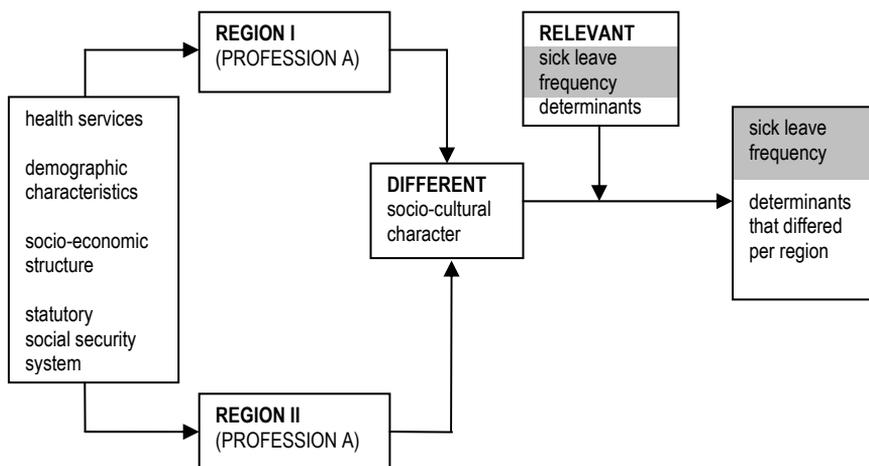


Fig. 1. A theoretical model of the influence of regional sociocultural differences on determinants of the sick leave frequency.

In the regions with comparable health services, demographic characteristics of the residents, and socio-economic structure that share a uniform statutory social security system, the workers of the same profession live in an environment with different socio-cultural characteristics.

Research questions

The main research question was: Are there any differences in the determinants of sick leave frequency between homogeneous groups from different regions of the same country and, if so, what are the possible reasons for these differences?

This general research question was further considered as five subquestions:

- (1) How does the sick leave frequency compare between homogeneous groups from different regions?
- (2) How do the scores of individual sick leave frequency determinants compare between homogeneous groups from different regions?
- (3) How does the sick leave frequency relate to relevant determinants for homogeneous groups from different regions?
- (4) Are there any differences in the

determinants that predict sick leave frequency for homogeneous groups from different regions? (5) Is there any correlation between the determinants for which regional differences were found?

These questions could only be answered after a literature review that would identify relevant determinants of the sick leave frequency that had been reported until the early 1990s. Apart from this, to evaluate the topicality of the study, we also decided to review the literature from early 1990s onwards [2].

Materials and methods

We aimed to study the relationship between relevant determinants of the sick leave frequency and the actual frequency of sick leave in two homogenous populations from two different country regions of the Netherlands. Secondly, the differences in effective determinants of the sick leave frequency were analyzed in terms of regional differences in the socio-cultural environment.

It can be expected that under comparable socio-economic conditions, the groups of workers with a similar profession (household cleaning) will show similar patterns of the sick leave frequency determinants. In case they do not, the socio-cultural differences might be the cause as they lead to the differences in the type of determinants that affect sick leave. A literature search on the determinants of sick leave frequency was performed in order to establish which of them were relevant according to the literature reports of the last few decades [2]. As for the topicality of the study, the sick leave pattern observed in the nineties of the 20th cent. was compared with the present trend. The findings are reported in detail in the Discussion.

Profession studied

One of the authors worked for a Dutch social fund which registered sick leave frequency per region, for specific professional groups (sales, cleaning, trading workers). Thus we had an opportunity to compare the relations between relevant sick leave frequency determinants and the frequency registered per region, in particular for the regions of Utrecht and South Limburg that were considered in this study. The findings of our earlier studies revealed that the sales workers showed remarkable differences in the sick leave duration in particular country regions [30]. It appeared that the same applied also to the sick leave frequency among cleaning workers. Therefore, in the present study, the cleaning workers from different regions were compared with respect to the sick leave frequency. The rationale of the study was to investigate the same phenomenon as we did in the past, but for another professional group and another measure of sick leave. As a consequence, the remarkable similarities in determinants that affect sick leave per region may indicate the influence of the socio-cultural characteristics of the study populations.

Participants

The workers were enrolled in the study population as soon as they reported their illness. This was the best possible moment because within a week most of those reporting illness (> 95%) were visited by a controlling official. The workers who did not speak Dutch, most of them belonging to other ethnic groups, were not invited to participate as they would be unable to respond to an interview in Dutch. In order to exclude the specific effects of younger (< 20 years) and older (> 40 years) subjects on the results and to enhance the homogeneity of the study group, the participants had to be between 20 and 40 years of age, and the reason why they reported illness had to be 'low back pain' or 'uncomplicated stress' (stress not originating from serious psychic suffering). These diagnostic categories were used for pragmatic reasons: it was assumed that using these commonly found diagnoses, which leave the subject much freedom to act (i.e. to report being ill or not), a substantial number of participants (at least 50 to 100 per region) could be recruited within a relatively short period of time (6 months). Eventually, 137 workers (52 in Utrecht and 85 in South Limburg) agreed to participate. This number was an outcome of the 6 months' selection procedure, based on an interview, in which every worker meeting the enrolment criteria was asked to participate. Some of the workers who initially agreed to take part in the study did not respond to the interview. For this non-responding group, the strictly individual characteristics such as age and gender were the only determinants that were included in the statistical analyses.

Questionnaire

The data on individual and job characteristics of the participants were elicited using a special form for reporting the first day of the sick leave. This form was completed by the employer and sent to the social fund. A standard form was used for this purpose all over the country. Therefore, the forms provided similar data on some individual characteristics (age and gender) and job characteristics (working hours). All the participating workers were asked to complete the questionnaire and send it back to the researcher.

The questionnaire items concerned the sick leave frequency determinants that had been identified in the literature review concerning the period till early 1990s [2]. These questions were derived from the validated VAG questionnaire (Vragenlijst Arbeid en Gezondheid, Questionnaire on Work and Health) [31]. Determinants belonging to similar categories were classified into 'working conditions', 'work contents', 'working relations', 'working circumstances', 'health status (perceived workload)', 'health status (health complaints)', 'motivation', 'individual characteristics and circumstances'. Thus categorized determinants constitute the independent variables, while the sick leave frequency is the dependent variable.

(The parameters of the social and demographic development were not investigated because the legal, political and socio-economic status was similar across the country and the study population was homogeneous).

The selected determinants were used as the basis for a statistical analysis.

The questionnaire response rate was 68.2% in South Limburg and 75% in Utrecht.

A study of the mean frequency of sick leave requires a certain period of registration which in the present study was a year before the day of reporting illness. For example, if the day of reporting was October 1, 1991, we referred to the period starting on October 1, 1990, and if it was December 1, 1991, the study period started on 1st December, 1990, and so on. In the analysis, the mean frequency of sick leave during the 12-month period was considered. The interview period for both the regions was 6 months, from October 1, 1991 till March 31, 1992. The timetable of the study, including the 12-month period preceding the spell of sick leave, is shown in Figure 2.

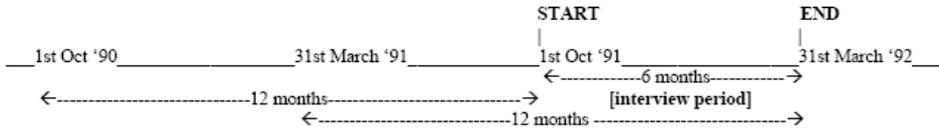


Fig. 2. A timerable of the study on regional differences in sick leave frequency determinants in two country regions of the Netherlands.

Determinants and study design

For statistical purposes, the questionnaire responses were classified and some were combined to form compound determinants (this was based on a factor analysis not presented here). The compound determinants, with the number of items that constituted them, included ‘appreciation for one’s work’ — 4 items, ‘expectations for one’s future’ — 4, ‘autonomy’ — 8, ‘opinion on supervisors’ — 9, ‘perceived physical workload’ — 10, ‘perceived mental workload’ — 5, ‘questions about perceived health’ — 22, ‘mental balance’ — 21, ‘burnout due to work’ — 6 and ‘home-related factors’ — 8.

A detailed description of the determinants with the direction of the effect per determinant was provided elsewhere [2]. The Cronbach’s alpha coefficients of the independent variables were satisfying (> 0.70) [32].

The level of Cronbach’s alpha was fixed at 0.70 as this was a rather safe procedure in the sense that the value is less dependent on the number of items (constituting the compound determinant) than when higher levels are used [33]. A few compound determinants lacked internal coherence (Cronbach’s alpha < 0.70) and were eliminated. These were ‘pollution at the workplace’ and ‘air climate/pollution’ category of the ‘working circumstances’.

Figure 3 presents the study design. The relations between similar sets of sick leave frequency determinants and the sick leave were analyzed for homogeneous groups in Utrecht and South Limburg. The outcomes for the two regions were then compared.

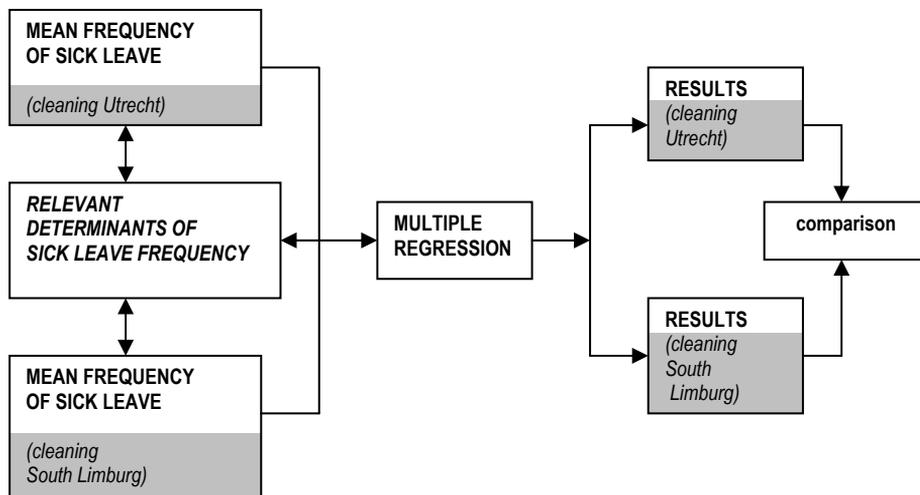


Fig. 3. The design of the study on regional differences in sick leave frequency determinants in two country regions of the Netherlands.

Statistical analysis

In accordance with the research subquestions 1 to 5, as formulated earlier in the text, the statistical analysis included successively: (1) a t test for the dependent determinants in both regions; (2) a t test for independent determinants between the two regions; (3) regression analysis (method enter) per region; (4) a comparison of the regression coefficients for the two regions [34] and (5) a regression analysis for the determinants that differed for both the regions, in order to find a possible correlation between these determinants.

A missing data analysis was performed to find out whether the number of missing data might affect the results. Where possible, i.e. if their number did not exceed 10%, the missing data were imputed and in the case they had influence on the outcome, the determinants concerned were excluded from analysis. A boxplot was drawn to check the potential effect of the extreme/outlying scores on the outcome.

Results

The mean age of the study population was 33.5 years in South Limburg and 33.2 years in Utrecht. The percentage of female participants was 82% in South Limburg and 73% in Utrecht. In both regions, the majority of participants had a low level of education (vocational school level): 96% in South Limburg and 95% in Utrecht. Thus, as far as the sociodemographic characteristics (age, gender and education) are concerned, the two study populations were remarkably similar. We will now discuss the results regarding the particular subquestions of the present study.

1. How does the sick leave frequency compare between homogeneous groups from different regions?

The statistical comparison of the mean frequency of sick leave between the two regions showed a difference (t-value = -1.99, p = 0.049) between the mean yearly frequency of sick leave in South Limburg (1.66 spells; SD = 2.18, N = 81) and that in Utrecht (0.89 spells; SD = 1.42, N = 38). In a number of cases (4 in South Limburg, 14 in Utrecht), the social fund was not able to provide the exact sick leave frequency data per individual or these data were not reliable, and these were the missing cases.

2. How do the scores of individual sick leave frequency determinants compare between homogeneous groups from different regions?

When the two regions were compared, none of the determinants [2] showed a difference in the score (p < 0.05).

3. How does the sick leave frequency relate to relevant determinants between homogeneous groups from different regions?

A regression analysis was applied to examine the relationship between the selected determinants as independent variables and the mean frequency of sick leave as the dependent variable (Table 1).

Table 1: Results of the regression analyses of sick leave frequency determinants per region

DETERMINANTS	UTRECHT			SOUTH-LIMBURG		
	adjusted R Square	Beta	Sig	adjusted R Square	Beta	Sig
HEALTH STATUS:	-0.001(N=32)			0.04 (N=50)		
PERCEIVED WORKLOAD						
perceived physical workload (p: 0.010) ¹		-0.21	0.25		0.30	0.04*
perceived mental workload		-0.10	0.58		-0.05	0.68

* p < 0.05

¹ Difference was found when comparing the regression coefficients between Utrecht and South Limburg.

In South Limburg, a higher sick leave frequency was observed in the case the subjects reported poor health condition due to physical workload ('health status': perceived physical workload, $p = 0.04$).

4. Are there any differences in the determinants that predict the sick leave frequency between homogeneous groups from different regions?

The outcomes of the comparisons that were carried out to establish the differences in regression coefficients between the two regions showed a considerable difference (see Table 1) with respect to the determinant expressed as 'perceived physical workload' ($p = 0.010$).

Thus, the regression analysis showed that the regions differed in this particular determinant of the sick leave frequency and so did the regression coefficients.

5. Is there any correlation between the determinants for which regional differences were found? The regions differed in just one determinant; therefore, the regression analysis was not applicable.

After imputing the missing data by the mean value, some determinants showed influence on the results. This refers to such determinants as 'expectations for the future', 'match between work and level of education', 'mental balance', 'alcohol consumption' and 'level of education'. These determinants were excluded from further analysis. The boxplot showed that several determinants had extremes/outliers but none of them affected the outcome.

The main question of the study was: Are there any differences in the determinants of sick leave frequency between homogeneous groups from different regions of the same country and if so, what are the possible reasons for these differences? The results of the statistical analysis made us conclude that the two regions differed in the effect that the determinant 'perceived physical workload' had on the sick leave frequency. The possible influence of the socio-cultural characteristics on the outcomes will be evaluated in the Discussion.

Discussion

In South Limburg, the cleaning workers reported a higher 'perceived physical workload' leading to a higher sick leave frequency than in respective population of workers from Utrecht. This finding is remarkable if one takes into account that the characteristics of the cleaning profession in Utrecht do not differ from that in South Limburg. The determinant 'perceived physical workload' refers to the health status in the sense that health complaints related to this determinant are the expression of a poor health condition [7,19,35,36]. The regional difference with respect to 'perceived physical workload' that was noted between South Limburg and Utrecht is consistent with earlier findings for sales workers

in respective regions for whom a higher level of health service consumption associated with longer duration of sick leave could be noted in South Limburg [30]. This outcome is related to a more general observation that the residents in South Limburg show a poorer health status and more health complaints, probably due to less healthy lifestyles [32].

Influence of socio-cultural factors

As the outcomes of this study are evaluated in the light of the possible socio-cultural differences between the regions concerned, it was necessary to define the socio-cultural characteristics in general and to investigate which of these can be applied to the regions of South Limburg and Utrecht. The socio-cultural identity of a population is defined by Hofstede et al. [37] as a collective 'programme' of the mind that discriminates groups from each other. Culture, expressed through people's behaviour and opinion, is a common characteristic of the groups of people on the level of a family, company, region or country [38]. Soeters and Felling [38] observed that the region of South Limburg differs somewhat from the rest of the country, due to its specific history. Till 1830 the region was ruled by the surrounding principalities and as a consequence, a remarkable influence could be noted of the German and Flemish/Wallonian socio-cultural traditions, and it was a rather Roman-Catholic oriented region than the western part of the Netherlands which is more of a Calvinistic character. They also concluded that moral standards are the core of a culture that are less prone to changes.

Stevens and Van der Zee [39] observed that smoking and drinking, as the possible socio-cultural manifestations of a less healthy lifestyle, are a more accepted habit in the daily life in South Limburg. These authors also found that South Limburg residents report more health complaints and show higher disability pension rates. Like in the report by Philipsen (1985) [40], the dominant Roman Catholic culture in South Limburg, with a less healthy lifestyle, seems to be a factor determining the health status of its residents. The Calvinistic north shows a healthier population with a longer life expectation.

People in South Limburg lead less healthy lives than their countrymen [41–43]. This may be an explanation for the higher health service consumption in this region and may lead to a higher sick leave frequency. As far as the possible role of the socio-cultural factors is concerned, one should realize that a disease as such is not a good predictor of the sick leave [12,44–45]. The sick leave frequency is related not only to the disease, but also to one's behaviour that is influenced by individual and socio-cultural characteristics, like habits, traditions and moral standards [46–48]. It is assumed that regional socio-cultural differences may have influence on the predominant determinants and lead to the decision to take a sick leave or not. The socio-cultural factors may have impact on the perception of the work situation and on lifestyle and the perception of one's own health. As a consequence, regional differences may exist in the

health status or in the type of diseases as in morbidity and mortality rates [43]. Thus, in the regions that differ in respect of the socio-cultural characteristics, different determinants may play a role in the sick leave behaviour. The participants of this study were considered to share the socio-cultural characteristics of the whole population of the region as they were Dutch-speaking and writing, working in various companies spread over the region and living in the cities and villages located over the region. Therefore, it was presumed that they were representatives of a certain socio-cultural disposition.

The literature search performed showed that the influence of tradition and social class [3–4] or the quality of health services and the tendency to a higher health service consumption might play a role in the regional differences in sick leave [13,49]. Other studies indicated that such factors as culture and social tradition, or lifestyle, could be considered as having influence on the sick leave pattern within communities [50–51].

As for the earlier finding that health complaints predominate in the South Limburg area, and that lifestyle may be the cause [32], a socio-cultural explanation for this may be the traditional Roman Catholic culture of the region, as was earlier postulated by Soeters and Felling [38]. In 2000, as much as 92.3% of the South Limburg respondents called themselves Catholic, while the respective proportion in Utrecht was 47% [52]. However, the precise character of this phenomenon as a factor determining health behaviour was not further investigated. The results of previous studies [30,32] and of the present study may be interpreted as a recommendation for further research into this problem.

The socio-economic comparability of the regions

Generally, in the Netherlands, the socio-economic parameters are comparable nationwide. As regards the socio-economic comparability of the two regions under study, in the 1960s and 70s., the eastern South Limburg area belonged to the less economically advanced parts of the country. This was mostly associated with the closing down of the coal mines operating there. However, during 1970s and 80s, the Dutch government strengthened the economic infrastructure of the region by the transfer of government services like Statistics Netherlands (CBS, Centraal Bureau voor de Statistiek) and the social fund for civil servants (ABP, Algemeen Burgerlijk Pensioenfonds) from the Randstad to the eastern South Limburg area. Furthermore, the Dutch government stimulated new economic activities in the region which resulted in higher rates of employment [53]. Although it is presumed that the socio-economic factors are related to a less healthy lifestyle [54], there is no reason to suppose that in terms of the socio-economic situation or the extent of poverty, the socio-economic status of the population of Utrecht in 1990s differed substantially from that of South Limburg, as in the latter region the economic conditions have largely improved [53,55]. Consequently, the socio-economic situation of the regions of Utrecht and South Limburg can be regarded as comparable.

Changes in the social security system

With regard to the changes in the social security system in the two regions, the following aspects have to be considered. The present study was performed at the time when the two regions had the same statutory compensation system and a similar approach was used with respect to the workers reporting illness. Therefore, the study results were not influenced by the differences in procedure as the study populations were selected based on the same criteria, and under the jurisdiction of the same social fund. Besides, the aim was to find differences between the two regions on the basis of socio-cultural characteristics, and not to find an explanation for the frequency of sick leave as such.

In the Netherlands, the rate of sick leave has gradually decreased since 1990s. This decrease is generally attributed to the changes in the organization of social security (Wet Verbetering Poortwachter: Law Improving Gatekeeper). Although these changes affected the whole country and not specific regions, the social security system has become less uniform with respect to the certification of sickness absence. Therefore, future research into regional differences in sick leave will have to address not only the independent determinants discussed in the present study, that are still effective nowadays, but also the determinants related to the statutory compensation system.

Another consequence of the changes within the social security system is the termination of the structural regional registration of sick leave. However, this does not mean that regional differences in sick leave have ceased to exist. The Nationale Verzuimstatistiek (National Statistics on Sick Leave) [1] shows a difference in the sick leave between the region of Limburg and the rest of the country that is consistent with the findings reported by Soeters in 1980 [13]. These differences have even increased as far as the South Limburg area is concerned [56].

Referring to the situation in 2006, there are still some important indicators that the socio-cultural factors have a similar influence on the behaviour of the residents of the South Limburg area as they had a few decades ago. Compared to the rest of the country, the rate of disability pensions is still higher in South Limburg (17.7% vs. 11.9%); the same applies to unemployment rates (11.3% vs. 9%) [56]. Moreover, when considered nationwide, the probability of developing disability is especially high for workers in the cleaning profession and this refers not only to older age workers [57]: in the age group 25–34 years, the rates were 2.5% vs. 1.1% ; and in that of 35–44 years: 2.7% vs. 1.5% (idem).

Methodological remarks

(a) 137 cleaning workers (52 in Utrecht, 85 in South Limburg) agreed to participate in the present study. We do realize that the sample size is rather small for a study on the effect that the socio-cultural differences between the regions may have on the type of determinants of the sick leave frequency. For this reason, the study has been performed on homogeneous groups from two

geographical regions of the same country that were comparable in the socio-economic terms and under the jurisdiction of a uniform social security system.

(b) As a reported case of sick leave was the basis of the recruitment of participants to this study, it seems that they had at least one spell of sick leave during the study period and that the so-called ‘zero’ sick leaves were excluded. This assumption, however, is not correct. The time we referred to was the 12-month period preceding the first day of sick leave, which means that the participants with the ‘zero’ frequency of sick leave were not excluded. Meanwhile, as the people who report sickness-related absence from work show a higher tendency to go on another sick leave than the people who never do [58], the results of this study are representative for the workers who were on sick leave at some point in time rather than for those who had never been on sick leave before. Further on, only those subjects were included who at some point of time had reported being ill. We decided to use this procedure for practical reasons, as relevant individual data as well as systemically registered individual absenteeism data could easily be obtained from the social fund. The advantage of this approach was that the study results did not depend on a few big companies with their own specific company-related absenteeism. As a matter of fact, it would have been a great disadvantage to study just these few companies because the outcome might have been strongly affected by this specific characteristic.

(c) If the entire group of selected determinants were analyzed in a single regression analysis, it would help us better understand how the determinants were associated with the observed sick leave frequency. However, a regression analysis of all the selected determinants, was not a realistic option because the number of participants to be considered in the analysis (N) would be quite small due to the number of the missing data and, consequently, the estimates of the regression analysis would be unreliable. Thus, it was for pragmatic reasons that the determinants were classified according to the categories they belonged to and then analyzed per category. Meanwhile, to investigate a possible correlation between the determinants for which regional differences were found, we decided to extend the scope of research subquestions with this issue.

(d) When interpreting the outcomes, one should note that the possible correlations between the independent determinants were not the subject of study, although such correlations are plausible; for instance, the remarkable gender-related effect may correlate with specific working conditions. The future policies for reducing the mean frequency of sick leave in a specific region should take into account the possible correlations between the determinants, before any definite conclusions can be drawn.

(e) The number of participants in South Limburg was higher than in Utrecht. Therefore, it could be expected that a larger number of determinants would make the results reach the levels of significance in the study population of South Limburg. However, this was not the case and, apart from that, the Beta values showed opposite signs (Table 1). This finding supports the conclusion

that in comparisons between the regions, different determinants may predict the frequency of sick leave and that the underlying causes are region-specific.

(f) As regards the evaluation of the study results, the small sample size and the skewness of the dependent variable has to be taken into account. The finding for the region of South Limburg is not convincing (Table 1: Beta = 0.30, $p = 0.04$). Therefore, further studies, for instance involving other professions and more participants, are necessary to estimate the precise impact of the results discussed here.

Conclusions

The present study compared the response to relevant determinants of the sick leave frequency shown by homogeneous groups of workers (profession: cleaning) in two country regions with similar socio-economic characteristics. In the case of specific diseases, the sick leave is easier to certificate from the medical point of view and the freedom to report illness or not is less apparent. As the rural and urban qualities of both regions were similar and the same applied to the administrative implementation of the social security regulations and employment contracts, the study populations indeed were of a homogeneous character.

If a study investigates two groups that are homogeneous in age and profession, then the comparable determinants can be expected to affect the sick leave frequency in either group. We found that the study groups differed in the effect of the determinant referred to as 'perceived physical workload'. We concluded that the socio-cultural factors may be a reason for this regional difference in effective determinants. Such differences between the regions have its implications for the nature of interventions to reduce sick leave in particular regions. Especially on a commercial basis, the occupational health services operating nationwide have to take this finding into account, and so should the regional or national social security authorities. The general measures to be applied all over the country should be developed based on an assumption that the determinants of the sick leave frequency may differ per profession and that only tailored interventions that will focus on the determinants predicting regional sick leave frequency may be effective.

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PART THREE

Regional differences in sick leave duration within one country

In the next two chapters regional differences in sick leave duration for the profession sale (Chapter 5) as for the profession cleaning (Chapter 6) are compared.

Chapter 5

On regional differences in duration of sick leave: the role of work, personal and health characteristics

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Abstract

Objectives: The aim of this study is to explore the influence of determinants of duration of sick leave on in age and profession homogeneous groups in two different regions in the Netherlands. Apart from a statistical comparison of duration of sick leave in these regions, a literature search on determinants of duration of sick leave, spread over the last decades, was performed to get an impression of the topicality of the study.

Methods: 184 participants in the regions Utrecht and South-Limburg were interviewed about work, personal and health characteristics. Data of duration of sick leave were obtained from a Dutch social fund. Later, a literature search on determinants of duration of sick leave was performed.

Results: The statistical comparison of duration of sick leave in the two different regions showed that in South-Limburg determinants of 'state of health', 'motivation', 'work conditions' and 'work relations' were associated with duration of sick leave, whereas in Utrecht less predicting determinants were found, namely for 'work contents'. The literature search gives a quite consistent picture of determinants of duration of sick leave over the last decades.

Conclusions: In either of the investigated regions different determinants were associated with duration of sick leave. Thus, nationwide interventions to reduce duration of sick leave are useless without taking into account the existence of regional differences in determinants that predict duration of sick leave. Determinants of duration of sick leave did not change in the last decades, therefore the results of the study are, although performed in the nineties, still relevant.

Keywords: regions, homogeneous groups, duration of sick leave, determinants, the Netherlands

Introduction

In the Netherlands some studies show a difference in duration of sick leave between regions. Soeters (1) and Tordoir et al. (2) observed, in the region South-Limburg, a longer duration of sick leave than in the rest of the country. The most important outcome of studies on regional differences in duration of sick leave is that these are a consequence of socio-economic class differences, socio-economic development and circumstances (3-8).

We did not come across any study which compared between different regions the relation between a same set of relevant determinants of duration of sick leave and duration of sick leave.

Therefore the research question is: are there, between homogeneous groups in different regions within one country, differences in determinants of duration of sick leave?

This question is divided in four subquestions: (1) how do, for homogeneous groups, the sick leave durations in different regions relate to each other; (2) how do, for homogeneous groups in different regions, the scores per determinant of duration of sick leave relate to each other; (3) how does, between homogeneous groups in different regions, duration of sick leave relate to relevant determinants; (4) are there, between homogeneous groups in different regions, differences in determinants that predict duration of sick leave?

To answer these questions a literature search was necessary to get a picture of determinants of duration of sick leave until begin nineties; aim was to form a set of relevant determinants. To estimate the topicality of the study, we considered it opportune to review literature later than the beginning of the nineties as well.

Until 1993 a broad spectrum of determinants was investigated in a number of Dutch studies (9-12). Determinants of the work situation are a prominent cause of the duration of sick leave (10-11, 13-14). A review was made of the literature on the relation between duration of sick leave and 'work conditions' i.e. **satisfaction** (10-11, 15-20) and **support** (21-26), the way employers deal with sick employees is of influence as is an early start with reintegration activities (27-31); furthermore on 'work contents' i.e. **autonomy** on the workplace (32-36) and **pace and pressure** (11,25, 36-38), 'work relations' with colleagues and supervisors (10-11, 39-40) and 'work circumstances' i.e. **climate** (11, 41-42).

In literature 'state of health' is considered from two points of view: (a) perceived health as a consequence of **physical and mental workload** (11,36, 43-45) and (b) health complaints (20, 46-50). According to Schröer (14), one's sickness record, perceived health, psychic and psychosomatic complaints, physical limitations and lifestyle are determinants that lengthen duration of sick leave; as is consulting doctors. Programmes to improve the health of employees are important (51-52). **Drugs use** lengthens duration of sick leave (11,53).

Work and private life may influence the 'motivation' to return to work (11, 54-57).

Regarding personal characteristics and circumstances, **women** (6, 10-11, 58-60), **older** employees (10-11, 61-63), employees with a lower **education** (9-11, 37,44,63) or a **lesser social-economic status** or a long **duration of employment** (11,37,62,64), show a longer duration of sick leave. The same goes for smokers (11, 65-67) and drinkers (10-11, 15,44, 68-69). Differences in duration of sick leave between the sexes are mostly attributed to aspects of the workplace (58,60, 70-71).

According to Schröer (14) differences in duration of sick leave are a consequence of gender, age, level of education, marital status, the number of children and the burden in one's private life.

Social and demographic developments, or economic transformation, influence duration of sick leave, i.e. unemployment leads to a longer duration (72-75).

After review of the literature of the last decades we can conclude that determinants of duration of sick leave show a rather consistent picture.

Methods

We aimed to study, in homogeneous groups as to age and profession in different regions within one country, the relation between relevant determinants of duration of sick leave and duration of sick leave itself. Primarily we should answer the question which are, according to literature of the last decades, the relevant determinants. The literature search refers to a number of Dutch studies on determinants of duration of sick leave until October 1993 (9-12). For the period after 1993 (inter)national scientific journals, academic theses and Medline were consulted.

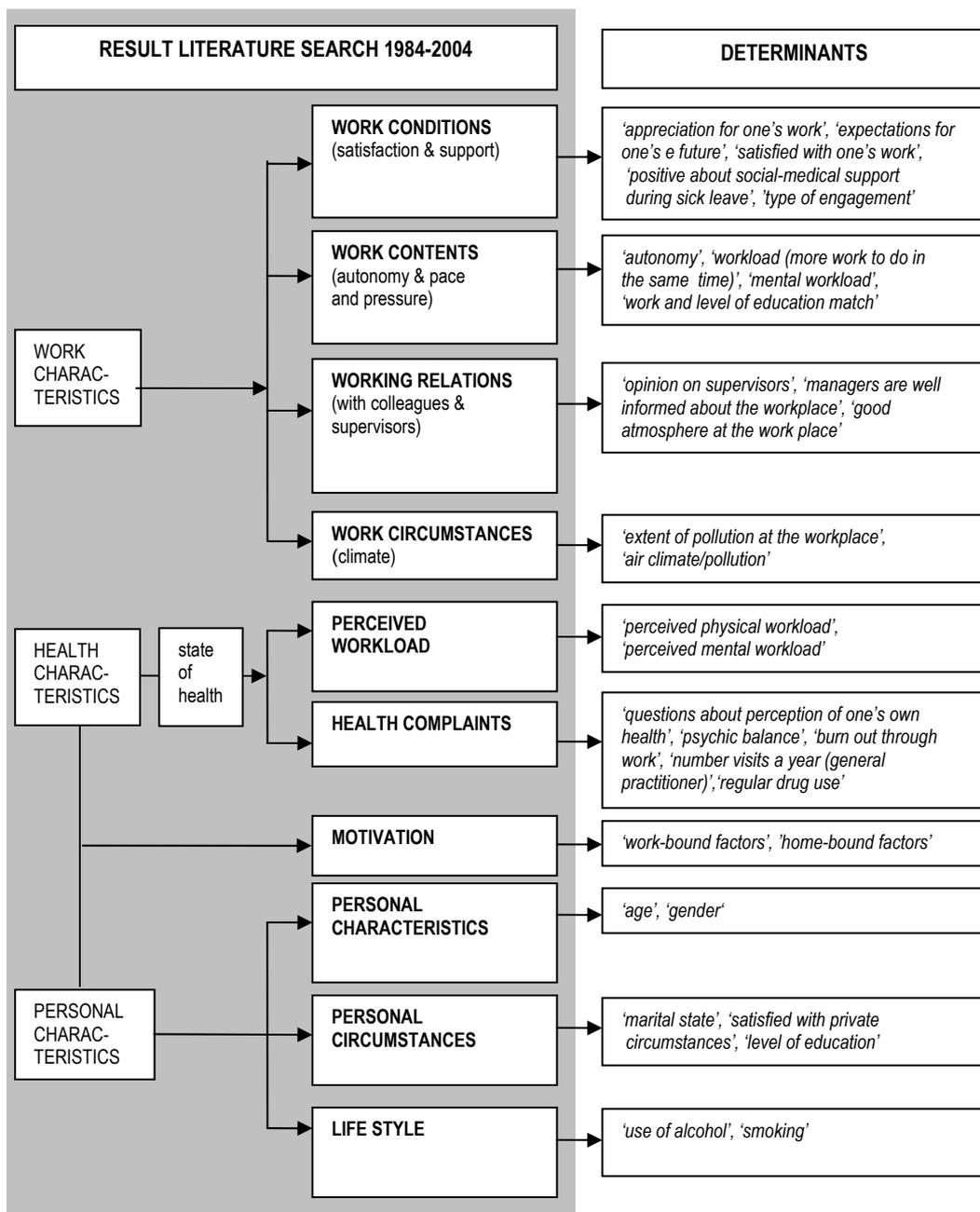
As one of the authors worked for a Dutch social fund that registered the duration of sick leave per region - be it only for specific professional groups (sales, cleaning, trade) - it was possible to compare the relation between relevant determinants of duration of sick leave and the per region registered duration of sick leave. It was observed that, in different regions, sales and cleaning showed a remarkable difference in duration of sick leave. For this reason two such regions were chosen: Utrecht (Utrecht and surroundings) and South-Limburg (including Heerlen and Maastricht); a choice was made for one professional group, namely sales.

The research group was contacted at the moment one reported sick for work. This was the most suitable moment, because within a week most of the people who reported to be ill (> 95%) were visited by a controlling official. Participants had to be 20 to 40 years of age and the reason of them reporting ill had to be 'low back pain' or 'uncomplicated stress'. The choice for these diagnostic categories had a pragmatic basis: the assumption was that, with these

frequently occurring diagnoses, we would reach a substantial number of participants (at least 50 to 100 per region) within a relative short period (6 months). 184 employees (79 in Utrecht, 105 in South-Limburg) agreed to participate. This number was the spontaneous outcome of the interview period of six months as result of an a-select procedure in which each next employee, who applied to the conditions, was asked to participate.

Personal and work characteristics of the participants were partly obtained by a special form, filled in by the employer and sent to the social fund, in which the first day of sick leave was reported. In case the employee agreed with participation, a booklet with questions was handed over with the request to fill it in. In accordance with the result of the literature search (which covered literature up to October 1993), the booklet consisted of sets of questions that referred to the found determinants. Figure 1 gives the origin of these questions. The figure also reflects the finding that the result of the literature search shows a remarkable consistency in the years 1984-2004. Determinants of a same category were brought together. The thus categorized determinants form the independent variables whereas 'duration of sick leave' is the dependent one.

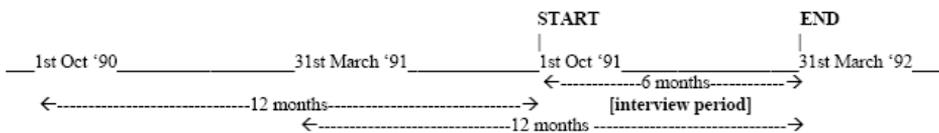
Figure 1: Result literature search / Determinants



Parameters of social and demographic developments were not investigated as legal, political and socio-economic status and developments were equal all over the country and the research group was homogeneous.

We used the selected determinants as a basis for statistical analysis. In South-Limburg, 81.9% of the distributed booklets was filled out and returned, in Utrecht 63.3%.

A study on the mean duration of sick leave needs a certain period of registration, in this study the year before the day one reported oneself ill. For those who reported ill on the first of October 1991, we referred to the period beginning on the first of October 1990, for those who reported ill on the first of December 1991, we referred to the period beginning on the first of December 1990, and so on. The mean duration of sick leave in the referred year was used in the analysis. Therefore, the timetable of the study, including the 12 month period preceding the started spell of sick leave, is as follows:



For statistical reasons the collected answers were classified and, as a result of a factor analysis (not presented here), brought together in composed determinants. In Table 1 these determinants are classified in accordance with those in Figure 1 and the meaning is given of the score as well as - in case of the composed determinants - the number of items and Cronbach's alpha.

Table 1: The selected determinants, meaning of the score

independent determinants	number of items	Cronbach's alpha	meaning of the score ¹
work conditions			
appreciation for one's work (sum)	4	.78	the higher the more > sdsl
expectations for one's future (sum)	4	.80	the higher the better > sdsl
satisfied with one's work (yes=1/no=0)			the higher the more > sdsl
positive about social-medical support during sick leave (yes=1/no=0)			the higher the more positive: indifferent ²
type of engagement (permanent=1/temporarily=0)			indifferent
work contents			
autonomy (sum)	8	.77	the higher the more > sdsl
workload (more work in the same time) (yes=1/no=0)			the higher the more > ldsI
mental workload (yes=1/no=0)			the heavier > ldsI
work and level of education match (yes=1/no=0)			the higher the better > sdsl
work relations			
opinion on supervisors (sum)	9	.90	the higher the more positive > sdsl
managers are well informed about the workplace (yes=1/no=0)			the higher the better > sdsl
good atmosphere at the workplace (yes=1/no=0)			the higher the better > sdsl
state of health (perceived workload):			
perceived physical workload (sum)	10	.77	the higher the heavier > ldsI
perceived mental workload (sum)	5	.72	the higher the heavier > ldsI
state of health (health complaints):			
questions about one's perception of one's own health (sum)	22	.86	the higher the more perception of bad health > ldsI
psychic balance (sum)	21	.86	higher less in balance > ldsI
burnout through one's work (sum)	6	.72	the higher the more severe > ldsI
number visits a year (family doctor)			more often worse health > ldsI
regular drug use (yes=1/no=0)			more use the worse health>ldsI
motivation			
work-bound factors (yes=1/no=0)			higher more pleasure work > sdsl
home-bound factors (sum)	8	.70	higher less motivated work > ldsI
personal characteristics & circumstances			
age			the older > ldsI
gender (w=1/m=0)			women > ldsI
marital state (married=1/unmarried=0)			married > sdsl
satisfied with private circumstances (yes=1/no=0)			the more > sdsl
level of education (high=1, from low to secondary=0)			high level > sdsl
use of alcohol (yes=1, no=0)			drinking > ldsI
smoking (yes=1, no=0)			smoking > ldsI

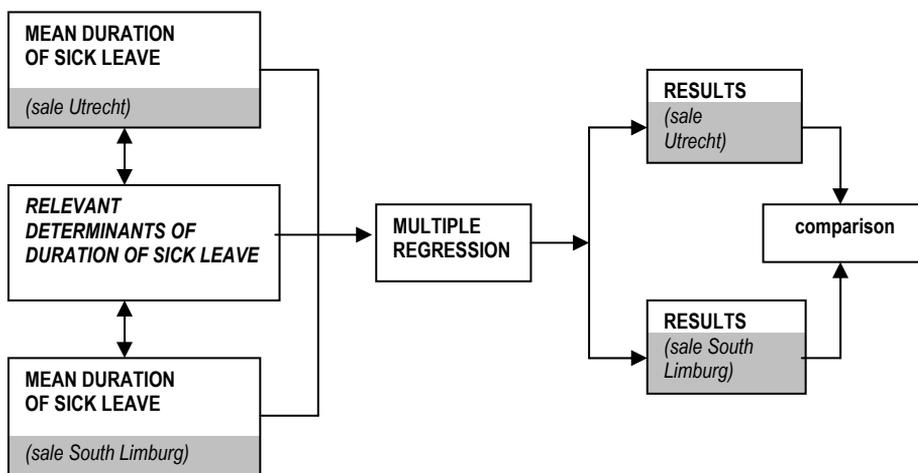
¹The direction of the score is mentioned together with (on the basis of the performed literature search) the assumed influence on the duration of sick leave (sdsl = shorter duration of sick leave; ldsI = longer duration of sick leave).

²Indifferent: literature is not in unison or very scarce.

Cronbach's alpha level was fixed on .70 because this is a rather safe number as the value is less dependent on the number of items (that constitute the composed determinant) than in case you take a higher level (.76). Some composed determinants missed internal coherence (Cronbach's alpha < .70) and were eliminated. It concerns the work circumstances 'extent of pollution on the work place' and 'air climate/pollution'.

Figure 2 presents the design of the study. The relation between the same set of determinants of duration of sick leave on the one hand and sick leave on the other, is analysed for homogeneous groups in Utrecht and South-Limburg. This gives for either region certain results, which are consequently compared with each other.

Figure 2: Design of the study



A missing data analysis was performed in order to estimate the extent to which missing data occurred and might influence results. If possible, that is in case their number did not exceed 10%, missing data were imputed. A boxplot was performed to check the possible influence of extremes/outliers on the outcome. In case such an influence was found, extremes/outliers were reduced to the next extreme score or replaced by the mean value.

The statistical analysis consists of a: (a) t-test for the dependent determinants in both regions; (b) t-test for independent determinants between both regions; (c) regression analysis per region and (d) comparison of the regression coefficients of both regions (77).

In applied research use of the 5% significant level can be inappropriate (78). Such a conservative approach can give an unnecessarily false picture for policymakers, at least when other correlations than the 5% level are not at all

considered. This study is an explorative one and one among homogeneous groups. For this reason the limit for p is fixed at .10.

Results

In order to form a set of relevant determinants of duration of sick leave and at the same time get an impression of the topicality of the study, we first had to answer the question which determinants are relevant according to the literature of the last decades.

The literature search gave a quite consistent picture of determinants of duration of sick leave (Figure 1). The conclusion is that the result of this study, although performed in the nineties, is still relevant.

As far as the demographic data are concerned, in South-Limburg the average age was 26.5 years, in Utrecht 26.8 years; in South-Limburg the percentage of female participants was 86.7%, in Utrecht 83.5%; in both regions most participants finished secondary school (South-Limburg 83.8%, Utrecht 93.8%). As a consequence both research groups are of a remarkable homogeneous character.

The research question was: are there, between homogeneous groups in different regions within one country, differences in determinants of duration of sick leave?

This question was divided in four subquestions: (1) how do, for homogeneous groups, the sick leave durations in different regions relate to each other; (2) how do, for homogeneous groups in different regions, the scores per determinant of duration of sick leave relate to each other; (3) how does, between homogeneous groups in different regions, duration of sick leave relate to relevant determinants; (4) are there, between homogeneous groups in different regions, differences in determinants that predict duration of sick leave?

(1) how do, for homogeneous groups, the sick leave durations in different regions relate to each other?

The statistical comparison of the mean duration of sick leave between the two regions showed a difference (t-value: 1.73, p: .085) between the mean duration of sick leave in South-Limburg (15.9 days; sd: 21.1, N: 102) and that in Utrecht (10.3 days; sd: 20.6, N: 71).

(2) how do, for homogeneous groups in different regions, the scores per determinant of duration of sick leave relate to each other?

Table 2 gives the outcome of the t-test per determinant and the number of participants as well as the mean value (composed determinants) or percentage of positive answers.

Table 2: Comparison of the scores

DETERMINANTS	N	UTRECHT	N	SOUTH-LIMBURG	p
work conditions					
appreciation for one's work (sum)	50	1.49 (.40 ¹)	85	1.51 (.40)	ns ²
expectations for one's future (sum)	50	1.46 (.38)	84	1.58 (.41)	.09
satisfied with one's work	50	71%	86	84%	.09
positive about social-medical support during sick leave	50	25%	83	35%	ns
type of engagement	50	92%	86	84%	ns
work contents					
autonomy (sum)	50	1.48 (.28)	83	1.47 (.32)	ns
workload (more work to do in the same time)	45	22%	66	30%	ns
mental workload	50	60%	83	68%	ns
work and level of education match	50	55%	82	57%	ns
work relations					
opinion on supervisors (sum)	49	1.56 (.32)	75	1.59 (.36)	ns
managers are well informed about the workplace	49	62%	82	78%	.05
good atmosphere at the workplace	50	63%	85	72%	ns
state of health: perceived workload					
perceived physical workload (sum)	47	1.39 (.23)	80	1.44 (.26)	ns
perceived mental workload (sum)	46	1.15 (.23)	78	1.13 (.26)	ns
state of health: health complaints					
questions of perception of one's own health (sum)	50	1.33 (.20)	85	1.40 (.21)	.03
psychic balance (sum)	50	1.30 (.22)	85	1.32 (.25)	ns
burnout through work (sum)	50	1.31 (.28)	78	1.39 (.29)	ns
number visits a year (family doctor) (sum)	49	2.98 (2.48)	82	3.41 (2.37)	ns
regular drug use	50	34%	86	41%	ns
motivation					
work-bound factors	50	70%	78	68%	ns
home-bound factors (sum)	30	1.10 (.15)	59	1.11 (.16)	ns
personal characteristics and circumstances					
age	79	26.82 (6.25)	105	26.49 (6.05)	ns
gender					ns
Women	66	84%	91	87%	
Men	13	16%	14	13%	
marital state					.01
Married	28	35%	57	54%	
Unmarried	51	65%	48	46%	
satisfied with private circumstances	50	92%	85	91%	ns
level of education					.06
High	3	6%	13	16%	
From low till secondary	45	94%	67	84%	
use of alcohol	34	62%	86	84%	ns
smoking	48	67%	71	69%	ns

¹standard deviation; ²not significant

In South-Limburg, in comparison with Utrecht, one has better expectations for one's future ('work conditions', $p = .09$), one is more satisfied with one's work ('work conditions', $p = .09$), the management is better informed about the workplace ('work relations', $p = .05$), one expresses more complaints about one's own health ('state of health': health complaints, $p = .03$), the number of

married people is higher ('personal characteristics and circumstances': marital state, $p = .01$) and the number of high-educated is higher ('personal characteristics and circumstances', level of education, $p = .06$).

(3) how does, between homogeneous groups in different regions, duration of sick leave relate to relevant determinants?

With a regression analysis, the relation between the selected determinants as independent variables and the mean duration of sick leave as dependent variable, was analysed (Table 3).

Table 3: Results of the regression analysis -per region- of determinants of duration of sick leave with*: $p < .10$

DETERMINANTS	UTRECHT			SOUTH-LIMBURG:		
	adjusted R Square	Beta	Sig T	adjusted R Square	Beta	Sig T
WORK CONDITIONS	.03(N=47)			.07(N=86)		
type of engagement		-.07	.64		.26	.02*
WORK CONTENTS	.02 (N=45)			.04(N=56)		
autonomy		.27	.09*		-.21	.13
WORK RELATIONS	-.02(N=42)			.04(N=70)		
opinion on supervisors		.22	.27		-.37	.02*
STATE OF HEALTH: HEALTH COMPLAINTS	.003(N=50)			.18(N=85)		
number visits a year (family doctor)		-.00	.98		.34	.003*
MOTIVATION	-.07(N=24)			.16(N=52)		
work-bound factors		.15	.49		-.25	.06*
home-bound factors		.0008	.99		.32	.02*

* $p < .10$

In South-Limburg a longer duration of sick leave is observed when one has a permanent engagement ('work conditions', $p = .02$), when one visits more often the family doctor ('state of health': health complaints, $p = .003$) and when there are demotivating factors at home ('motivation', $p = .02$). A shorter duration of sick leave is observed in South-Limburg when one has a positive opinion on one's supervisors ('work relations', $p = .02$) and when one is positive about one's employer ('motivation', $p = .06$). In Utrecht a longer duration of sick leave is observed when one has autonomy on the workplace ('work contents', $p = .09$).

(4) are there, between homogeneous groups in different regions, differences in determinants that predict duration of sick leave?

The comparison to establish a possible difference in regression coefficients between the two regions (Table 4) leads to the conclusion that, in case of the determinants 'autonomy', 'opinion on supervisors', 'number of visits a year (family doctor)', 'work bound factors' and 'home bound factors', a difference between the regions was found.

Table 4: Determinants that differ in regression coefficient for both regions

DETERMINANT	p
autonomy	.014*
opinion on supervisors	.017*
number visits a year (family doctor)	.029*
work bound factors	.032*
home bound factors	.039*

* $p < .10$

The regression analysis shows that regions differ in determinants that predict duration of sick leave and that the regression coefficients are only partly equal.

The boxplot showed that several determinants had extremes/outliers. Most of them were not of influence on the outcome except for the determinants ‘home bound factors’ (South-Limburg), ‘gender’ (Utrecht and South-Limburg) and ‘satisfied with private circumstances’ (South-Limburg). After reducing the value of the extremes/outliers of ‘home bound factors’ to the most next extreme score, the strong relation between this determinant and duration of sick leave turned out to be (in contrast to Table 3) no longer existent.

The research question was: are there, between homogeneous groups in different regions within one country, differences in determinants of duration of sick leave? On the basis of the results of the statistical analysis we conclude that, within one country, regional differences in determinants of duration of sick leave indeed exist, in different regions different determinants predict duration of sick leave.

Discussion and conclusions

In this study we compared, in two socio-economic equal regions and between homogeneous groups, the response to relevant determinants of duration of sick leave.

Duration of sick leave gradually reduced in the Netherlands. At the same time, as a consequence of changes in the organisation of social security, there is no longer a regional registration of duration of sick leave. However, this does not mean that regional differences in duration of sick leave no longer exist and moreover, although performed in the nineties, the consistency in determinants that predict ‘duration of sick leave’ makes the outcome of the present study still relevant.

Recruiting participants for the study was done at the moment one reported oneself ill. An alternative for this approach, like a study among employees of some big companies, would have been better in reaching the whole group of sales workers. Now only those are reached that, at a certain moment, reported to be ill. For practical reasons the first option was chosen. Relevant personal data, as well as systemically registered individual data of absenteeism, could easily

be obtained from the social fund. In fact a choice for some big companies would have had a major disadvantage: the outcome would have been under strong influence of the specific, company-bound, absenteeism culture.

By choosing a reported case of sick leave to recruit participants, it seems that participants at least had one spell of sick leave in the investigated period, and so called 'nil' sick leavers were excluded. This assumption however is not correct. The period we refer to is the 12 month period preceding the first day of sick leave. Therefore it is always possible that participants have a duration of sick leave of 'nil'. However, people who once report ill for work apparently show a greater tendency to take sick leave than people who never do so (79), therefore the results of this study are representative for those employees that, at a certain moment, take sick leave and not for those that never do so.

The whole of the selected determinants was not analysed in one single regression analysis. This would have given a better insight in how the determinants are related to the observed duration of sick leave. A regression analysis of all selected determinants, however, was not a realistic option, because the number (*N*) of participants actually participating in the analysis would have been, as a consequence of the number of missing data, quite small and the outcome not easy to interpret. Therefore, for pragmatic reasons, the determinants are classified according to the categories they belong to and analysed per category.

In interpreting the outcome, one should realize that possible correlations between the independent determinants were not the object of study, whereas such correlations may exist, for instance a remarkable gender-bound influence may be correlated with specific work conditions. In developing a policy to reduce the mean duration of sick leave in a region, one has to be aware of possible correlations between determinants before drawing conclusions.

Originally the determinant 'use of alcohol' was also considered as one of the determinants of the category 'personal characteristics and circumstances'. However, it turned out that this determinant met so many missing data (>10%) that it had to be excluded from analysis. As far as the determinants 'gender' and 'satisfied with private circumstances' are concerned, these were skewed to such an extent that, as a consequence, they were less relevant for further analysis.

In case of four determinants ('autonomy', 'opinion on supervisors', 'number of visits to the family doctor' and 'work bound factors') a difference was found in the influence of the concerning determinant on duration of sick leave.

If, in South-Limburg, one is positive about one's supervisor and willing to work for one's employer, there is a tendency to a shorter duration of sick leave, whereas a larger number of consultations of the family doctor leads, in this region, to a longer duration of sick leave. Contradictory with literature (32-36), in Utrecht, a greater autonomy on the workplace has an increasing, instead of a decreasing effect on duration of sick leave. A possible explanation for this result could be that the character of autonomy in this specific situation is paradoxally

that of a more 'laissez-faire' approach with less strict supervision of the employer at the workplace.

With regard to the determinant 'home bound factors' we found an inappropriate influence of extremes/outliers on the outcome. This result could not be explained by possible exceptional characteristics (age, gender) of the concerning participants. However, it turned out that within extremes/outliers of 'home bound factors', especially items concerning the burden of household appeared of importance and therefore, in South-Limburg, extra attention for this determinant is recommended.

The results of Utrecht lead to the conclusion that, in this region, apparently other determinants than those analysed in this study, are of influence on duration of sick leave. This finding, as well as the paradoxical finding of autonomy having an increasing effect on duration of sick leave, needs further research for its possible cause.

If one chooses, as done here, for homogeneous groups, i.e comparable work and personal characteristics, then one may expect that in both groups comparable determinants are of influence on the duration of sick leave. That this is not the case has consequences for the character of interventions per region. Nationwide, general measures to reduce duration of sick leave will not work. Only tailor-made interventions, directed on those determinants that predict duration of sick leave per region, can be effective.

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Chapter 6

Determinants of regional differences in sick leave duration for homogeneous groups in the Netherlands: their implications for social security policy-making

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(Submitted)

Abstract

Objectives: Regional differences in sick leave duration determinants were studied between in age and profession homogeneous groups in different regions in the Netherlands, i.e. Utrecht and Southern Limburg, in order to find any effects of socio-cultural factors.

Material and methods: 137 participants in Utrecht and Southern Limburg were interviewed. Data of sick leave duration were obtained from the social fund.

Results: A statistical comparison of sick leave duration figures showed that, in Southern Limburg, determinants of 'health status' (questions about perceived health and burnout due to work) and 'individual characteristics and circumstances' (age, gender and satisfaction with private circumstances) were associated with sick leave duration and, in Utrecht, the 'work contents' determinant autonomy.

Conclusions: In the regions studied, different determinants appeared to be associated with sick leave duration and for some of them the European integration was assumed to have a lasting effect. Nationwide policy interventions to reduce sick leave duration should take into account the existence of regional differences in determinants predicting sick leave duration and the potential effects of different socio-cultural characteristics on laying claim to social security.

Key words: regions, sick leave duration, determinants, social security policy

Introduction

Different socio-cultural characteristics of different regions may play a role in the type of determinants that affect sick leave. This was the result of a study which explored regional differences in sick leave with regard to relevant determinants of sick leave duration (1).

Sick leave duration is associated with many determinants, whereas little is known about region-related factors that possibly play a role in the type of determinants that predominate. Generally, sick leave is associated with illness although the perception of health may differ *between* or *within* countries, which may result in different outcomes in sick leave and disability rates. As for differences in health-related determinants *between* countries, the European Labour Force Survey (2) showed remarkable differences in national percentages of people with self-reported *disabilities* (Table 1).

Table 1: Persons with self-reported disabilities (PwD) in various circumstances and in different European countries

	Austria	Den- mark	Fin- land	France	Ger- many	Ire- land	Italy	Mal- ta	Nether- lands	Nor- way	Portu- gal	Slo- vakia	Slo- venia	United King- dom
PwD (persons with disability)	12.7*	19.9	32.0	23.6	10.0	10.8	6.6	8.5	25.3	16.3	19.7	8.2	19.5	25.0
PwD working	19.0	28.7	45.3	35.0	13.3	17.0	8.8	12.0	41.0	24.4	26.6	9.8	25.4	40.4
PwD disability pensions	3.5	7.0	4.8	4.7	3.7	2.0	0.0	0.0	8.1	0.0	0.0	6.1	0.0	3.7

* National percentages

Large differences were found between European countries both in individual health perception and in the number of people having disabilities or long-standing health problems. In Ireland, Austria, Slovenia, Norway, Portugal and Denmark 15-30% of the employees perceive themselves as having disabilities or long-standing health problems, while in France, the Netherlands, Finland and the United Kingdom this is even more than 30%.

As for *sick leave*, Prins (3) performed a study on differences between Belgium, Germany and the Netherlands which showed that cultural differences attributed to differences in sickness behaviour. The author stated that considerable regional differences in lifestyle, health care and economic factors may underlay the general sickness absence levels, including regional differences that were found in the German sick fund (4). Prins (3) also found that sick leave rates were poor indicators of illness and that culture, in the sense of an attitude towards legislation and avoiding uncertainty, produced differences in sick leave behaviour and in regulations for compensating loss of wages. This about the differences in disabilities and sick leave found *between* countries.

As for differences in sick leave *between regions within the same country* research appears to be scarce. The most important outcome of studies on regional differences in duration of sick leave is that they are the result of socio-economic class differences or circumstances and development (5,6,7,8,9,10,11). Tordoir et al. (12) and Soeters (13) found a longer duration of sick leave in the Dutch region of *Southern Limburg* as compared to the rest of the country and the regional organisation of health services (e.g. waiting-period before treated effectively) was held responsible for this. Later figures showed that the Limburg area still had a more prolonged sick leave duration (14,15), despite better organised regional health services (the founding of the Academic Hospital Maastricht in the 1990s), and demonstrated differences in health between the Dutch province of Limburg and the rest of the country (16,17,18,19,20). In their Euregional study Stevens and Van der Zee (16) hypothesised health attitude effects from the neighbouring German state of Nordrhein-Westfalen (NRW) on the people of Southern Limburg, especially regarding doubts about their personal health. The study of Stevens and Van der Zee (16) was focussed on the *Euregion Meuse-Rhine (EMR)*, with assumed socio-cultural influences on the Southern Limburg area from the adjacent countries, i.e. Belgium (provinces Limburg and Liège) and Germany (NRW).

The study presented here aims to examine regional differences in sick leave duration between geographically and socio-culturally different regions in the Netherlands - one of them being part of an Euregion - to discover possible effects of regional socio-cultural differences on sick leave behaviour. Since sick leave duration is influenced by various determinants, what we needed for this study was: a) at least two geographically and socio-culturally different regions, b) sick leave data of those regions, c) relevant sick leave duration determinants that are effective. A literature search was performed to define a set of relevant sick leave duration determinants.

Regions, socio-cultural characteristics and health and sick leave behaviour

Soeters (13) found that regional differences in sick leave were the result of regional differences in the organisation of health services, but according to this author other factors could play a role as well, e.g. the extent of medical consumption. Soeters found that the mean duration of sick leave in the Dutch province of Limburg was longer than in the rest of the country.

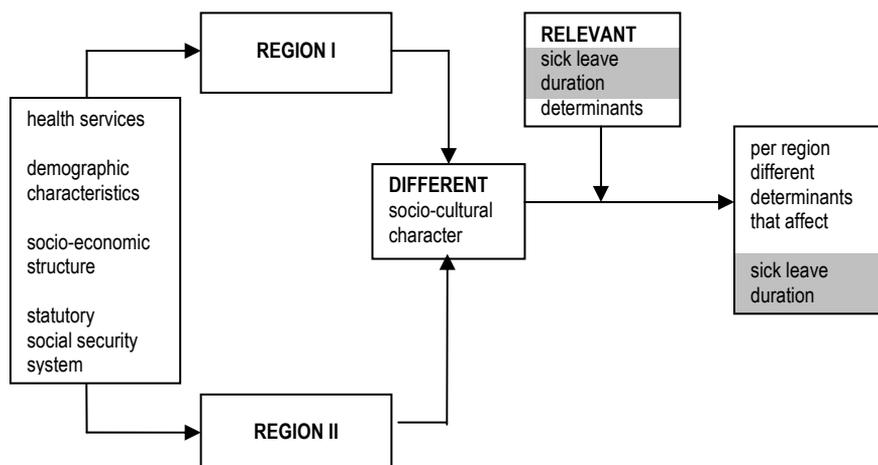
Soeters (13) as well as Prins (3) referred to studies by Hofstee (21) and Hofstede (22) in which the existence of regional differences in death rates and medical consumption was assumed. Those differences were attributed to cultural characteristics of the local inhabitants. Lifestyle factors like for instance eating habits and smoking and drinking alcohol have an influence on people's health and, consequently, on sick leave behaviour. This observation is in accordance with the outcome of international research (9,11).

Sick leave is related with *illness* (8,23,24) as it is with *behaviour* (25,26,27) and therefore subject to socio-cultural factors such as habits, traditions and moral standards. Consequently, people perceive their health or their work situation differently, i.e. make different choices under comparable circumstances. Thus, sick leave is often associated with a certain freedom to decide for or against taking it. Regional socio-cultural characteristics may influence this decision. As socio-cultural factors may influence the perception of the work situation and the perception of one's health, there may be regional differences in health status or in disease as well as in morbidity and mortality rates (19). When areas situated in Euregions are involved, these factors may also be influenced by socio-cultural characteristics from the neighbouring country and this effect may even increase as a result of developing European integration. As a matter of fact, the removal of internal European checkpoints and border control (Schengen Treaty, 1985) has undoubtedly attributed to a more intensive interaction between the different populations in Euregions and is very likely to sustain and stimulate mutual influence.

Factors of culture and social tradition, or lifestyle, are supposed to influence the health status of communities (21,22). Hofstede (22) defined the cultural identity of a population as a collective 'programme' of the mind that discriminates groups from one another. Culture is a common characteristic of groups on the level of a family or a region, expressed through the way people behave or through their opinions (16). Stevens and Van der Zee (16) compared Nordrhein-Westfalen with both Limburg and the rest of the Netherlands. According to Hofstede (22), since Germans tend to feel awkward in coping with uncertainty they are more concerned about their health than the Dutch; this is why Germans consult their doctor more frequently. Southern Limburg residents perceive themselves in poorer health than their countrymen and this, together with a less healthy lifestyle, stimulates medical consumption and, probably, sick leave.

Health status is not a good predictor of sick leave (8,23,24). Therefore the assumption is that socio-cultural factors play a role in sick leave behaviour. The theoretical model is as follows (Figure 1).

Figure 1: Theoretical model



Taking the view that sick leave determinants as such are universal, the assumption is that the fact that people have different socio-cultural backgrounds leads to different determinants having their effects in a population.

Research question

We could not find any studies which compared the relation between similar sets of relevant determinants of sick leave duration and the duration of sick leave for different regions of the Netherlands and no study reflected on possible (Eu)regional socio-cultural influences on the differences found.

Thus, the research question was defined as follows: Are there any differences in the determinants of sick leave duration between homogeneous groups in socio-culturally different regions within a single country and what evidence can be found to suggest an effect of the regional socio-cultural environment?

The first part of the research question was divided into five subquestions: 1) How does sick leave duration compare between homogeneous groups in different regions? 2) How do scores of individual sick leave duration determinants compare between homogeneous groups in different regions? 3) How does sick leave duration relate to relevant determinants between homogeneous groups in different regions? 4) What differences in determinants predicting sick leave duration can be found between homogeneous groups in different regions? 5) Are the determinants in which regions differ correlated?

To answer these questions a literature review was needed to identify the determinants of sick leave duration that were found until the early 1990s. The aim was to define a set of relevant determinants. In order to increase the study's topical interest it was also considered useful to review the literature from the early 1990s onwards. The review referred to several Dutch studies on determi-

nants of sick leave duration until October 1993 (28,29,30,31). For later years, both national and international scientific journals, academic theses and Medline were consulted².

After reviewing the literature on sick leave duration we concluded that, during the last few decades, a broad range of sick leave duration determinants was mentioned in a highly consistent pattern. This conclusion was based on the finding that studies on sick leave duration during the years 1984-2004 apparently focussed on similar determinants.

The literature search was performed in order to identify a set of relevant determinants. Identifying these determinants was merely a means to achieve the main purpose of the present study, i.e. to find any differences in effective sick leave duration determinants between regions based on their socio-cultural differences. Thus our study, focussed primarily on socio-cultural differences as a cause of regional differences in active sick leave duration determinants, was not a study on sick leave duration determinants as such.

Material and methods

Registration of sick leave data

One of the authors worked for a social fund (i.e. Detam) which registered - although for specific professional groups only (sale, cleaning, trade) - the duration of sick leave per region. This made it possible to compare the relations between relevant determinants of sick leave duration and the duration of sick leave registered per region. Remarkable regional differences in sick leave duration were observed (Table 2).

Table 2: Sick leave duration independent of profession in five districts of a Dutch social fund (Detam, 1991)

	Groningen	Amsterdam	Utrecht	The Hague	Heerlen (Southern Limburg)
mean sick leave duration (days)	23.95	23.08	23.13	19.57	29.23

Regions and professions studied

In order to compare sick leave between different regions of our country, it was necessary to select those specific regions.

Tordoir et al. (12) and Soeters (13) found differences between the region of Southern Limburg and the rest of the Netherlands, the Southern Limburg area being part of the Euregion Meuse-Rhine (EMR). Southern Limburgers appear to

² Literature is sent by the corresponding author on request.

have a less healthy lifestyle than their countrymen. Their body weight is higher (32) and they engage in less physical exercise (19). Traditionally, Southern Limburgers drink more alcohol and show more tobacco addiction, although smoking is decreasing (19). Limburgers perceived their health status as relatively poor (33). The Nationaal Kompas Volksgezondheid 2001-2003 (National Public Health Compass 2001-2003, 2006) (34) showed that 20-25% of the Limburgers still perceive themselves to be in relatively poor health, which was more than in any other part of the country. Besides disability rates in 2000, 2003 and 2005 were higher in Limburg and over the years they increased simultaneously with raising national rates (34,35) (Table 3).

Table 3: Disability pension rates (Limburg and the Netherlands)

	Limburg	Netherlands
% disability pension 1986 ¹	9.5	6.8
% disability pension 2000 ²	10.7	8.8
% disability pension 2003 ³	11.1	8.9
% disability pension 2005 ³	10.1	8.0

¹ Bisscheroux et al. (1986)

² Nationaal Kompas Volksgezondheid 2001-2003 [National Public Health Compass 2001-2003] (RIVM 2006)

³ Atlas Sociale Verzekeringen 2003/2005 [Social Insurance Atlas 2003/2005] (UWV 2005)

Taking into account the deviating regional sick leave duration figures in Southern Limburg versus the rest of the country, the high disability rates in this region, its different lifestyle, a different socio-cultural history (the area was ruled by surrounding principalities until 1830 and consequently influenced by German and Flemish/Wallonian socio-cultural traditions) as well as a growing Euregional influence from adjacent countries (Schengen Treaty, 1985) and, finally, the different perception of health status, we considered the Southern Limburg population as socio-culturally different from the rest of the Netherlands. Thus, for obvious reasons, it was decided to compare the region of Southern Limburg with one of the other regions of our country.

We mentioned some remarkable differences in health status between the province of Limburg and the rest of the Netherlands. As to find another region for comparison purposes practical considerations dominated, more specifically the central position of the city of Utrecht and this city being the residence of the Detam social fund. Additionally using the region Utrecht i.e. the city of Utrecht and its immediate surroundings for making comparisons with Southern Limburg, was motivated by sick leave duration figures from Detam showing differences between the Utrecht and Southern Limburg regions (Table 2). The comparable mixture of urban and rural qualities of the two regions, Southern Limburg including the cities of Heerlen and Maastricht, as well as their socio-

economic comparability were all the more reason to compare them in terms of sick leave behaviour.

As the cleaning profession showed marked differences in sick leave duration between Utrecht and Southern Limburg, this profession was selected to make comparisons between the two regions.

Participants

Workers were included in the study population as soon as they reported sick and unable to work. This was the best possible moment because most of those reporting sick (> 95%) were visited by a controlling official within one week.

In order to exclude specific effects of younger (< 20 years) or older (> 40 years) subjects on the results and to enhance the homogeneity of the study group, the participants had to be between 20 and 40 years old and their reasons for reporting sick had to be 'low back pain' or 'uncomplicated stress'. The decision to use these diagnostic categories had a pragmatic basis: by using these commonly found diagnoses which - other than specific diseases - leave the subject much freedom to act, it was assumed that a substantial number of participants (at least 50 to 100 per region) could be recruited within a relatively short period of time (6 months). 137 employees (52 in Utrecht, 85 in Southern Limburg) agreed to participate. This number was the outcome of an interview period of six months based on a random procedure in which every next employee meeting the requirements was asked to participate. All employees who agreed to participate (N = 137) really did participate in the study.

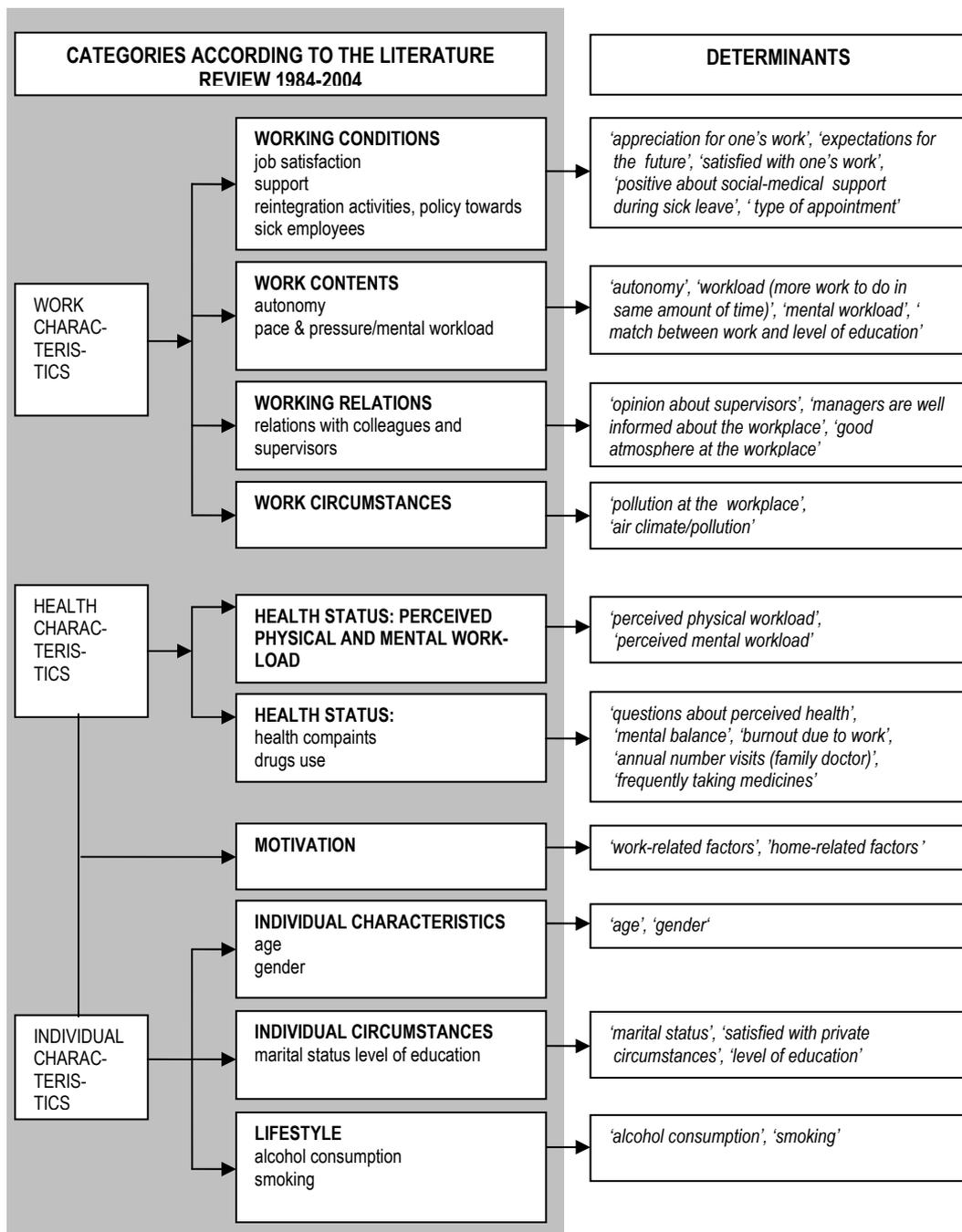
The responding and non-responding groups did not differ as far as age, gender or level of education were concerned. Strictly individual characteristics such as age and gender were the only determinants of the non-responding group to be included in the statistical analysis.

Questionnaire

Some data on the individual and work characteristics of participants were derived from a specific form which was completed by the employer and sent to the social fund to report the first day of sick leave. When employees agreed to participate, a booklet with questions was handed out which they were asked to answer. In accordance with the results of the literature review until the early 1990s, the booklet presented questions that referred to the determinants identified. The questions were derived from the validated VAG (Vragenlijst Arbeid en Gezondheid, Work and Health Questionnaire) (36).

Figure 2 presents the origins of the questions. The figure reflects the finding that the results of the literature review showed a remarkable consistency over the years 1984-2004.

Figure 2: Categories according to the literature review 1984-2004/Determinants of sick leave duration

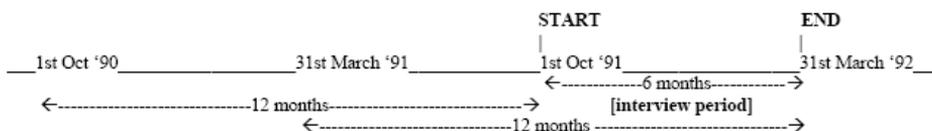


Determinants belonging to similar categories were combined. Thus, the categorised determinants constitute the independent variables while duration of sick leave is the dependent variable. Parameters of social and demographic developments were not investigated because legal, political and socio-economic status and developments were similar throughout the country and the study population was homogeneous.

The selected determinants were used as the basis for statistical analysis. In Southern Limburg 68% of the distributed booklets was returned, in Utrecht this was 75%.

Time line

A study of the mean duration of sick leave requires a certain period of registration which, in the present study, was the year preceding the day of reporting sick. For those reporting sick on the first of October, 1991, we referred to the period starting on the first of October, 1990; for those reporting sick on the first of December, 1991, we referred to the period starting on the first of December, 1990, and so on. The mean duration of sick leave in the referred year was used in the analysis. As a result, the time line of the study, including the 12-month period preceding the spell of sick leave, was as follows:



Determinants and study design

The collected answers (items) were classified for statistical purposes and, based on a factor analysis (not presented here), combined to form compound determinants. Table 4 provides a classification of the determinants in accordance with those in Figure 2; it also presents the number of items as well as Cronbach's alpha for compound determinants.

Table 4: The selected determinants, meaning of the score

independent determinants	number of items	Cronbach's alpha	meaning of the score ¹
work conditions			
appreciation for one's work (sum)	4	.78	the higher the more > sdsI
expectations for one's future (sum)	4	.80	the higher the better > sdsI
satisfied with one's work (yes=1/no=0)			the higher the more > sdsI
positive about social-medical support during sick leave (yes=1/no=0)			the higher the more positive: indifferent ²
type of engagement (permanent=1/temporarily=0)			indifferent
work contents			
autonomy (sum)	8	.77	the higher the more > sdsI
workload (more work in the same time) (yes=1/no=0)			the higher the more > ldsI
mental workload (yes=1/no=0)			the heavier > ldsI
work and level of education match (yes=1/no=0)			the higher the better > sdsI
work relations			
opinion on supervisors (sum)	9	.90	the higher the more positive > sdsI
managers are well informed about the workplace (yes=1/no=0)			the higher the better > sdsI
good atmosphere at the workplace (yes=1/no=0)			the higher the better > sdsI
state of health (perceived workload):			
perceived physical workload (sum)	10	.77	the higher the heavier > ldsI
perceived mental workload (sum)	5	.72	the higher the heavier > ldsI
state of health (health complaints):			
questions about one's perception of one's own health (sum)	22	.86	the higher the more perception of bad health > ldsI
psychic balance (sum)	21	.86	higher less in balance > ldsI
burnout through one's work (sum)	6	.72	the higher the more severe > ldsI
number visits a year (family doctor)			more often worse health > ldsI
regular drug use (yes=1/no=0)			more use the worse health>ldsI
motivation			
work-bound factors (yes=1/no=0)			higher more pleasure work > sdsI
home-bound factors (sum)	8	.70	higher less motivated work > ldsI
personal characteristics & circumstances			
age			the older > ldsI
gender (w=1/m=0)			women > ldsI
marital state (married=1/unmarried=0)			married > sdsI
satisfied with private circumstances (yes=1/no=0)			the more > sdsI
level of education (high=1, from low to secondary=0)			high level > sdsI
use of alcohol (yes=1, no=0)			drinking > ldsI
smoking (yes=1, no=0)			smoking > ldsI

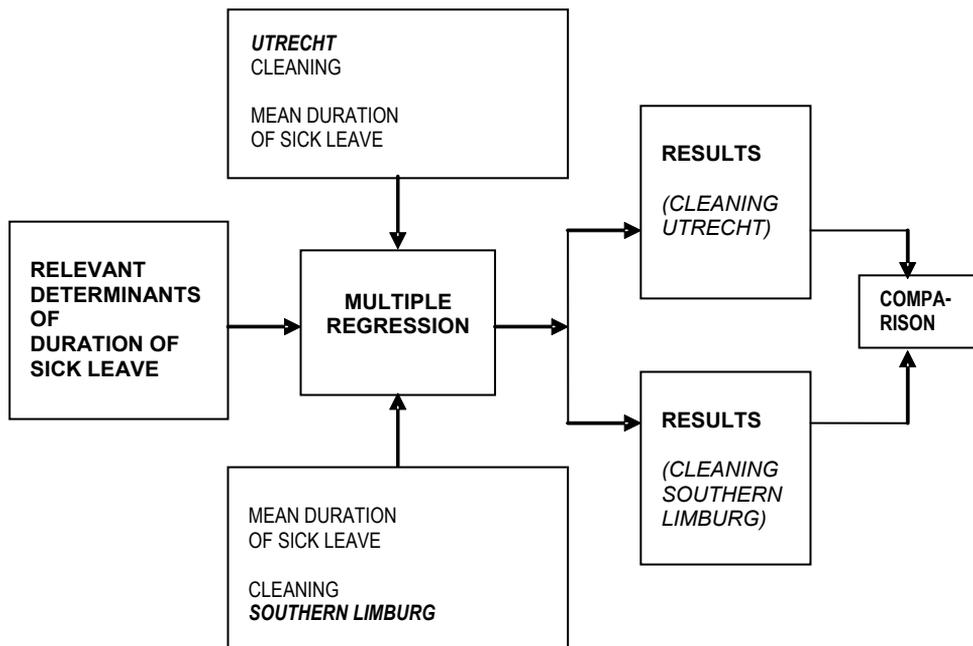
¹The direction of the score is mentioned together with (on the basis of the performed literature search) the assumed influence on the duration of sick leave (sdsI = shorter duration of sick leave; ldsI = longer duration of sick leave).

²Indifferent: literature is not in unison or very scarce.

The level of Cronbach's alpha was fixed on .70 as this was a rather safe procedure in the sense that the value is less dependent on the number of items (constituting the compound determinant) than if higher levels are used (37). A few compound determinants lacked internal coherence (Cronbach's alpha < .70) and were eliminated. They were 'pollution at the workplace' and 'air climate/pollution' of the work circumstances.

Figure 3 presents the study design.

Figure 3: Design of the study



The relations between similar sets of sick leave duration determinants, on the one hand, and sick leave, on the other, were analysed for homogeneous groups in Utrecht and Southern Limburg. The resulting outcomes for the two regions were then compared.

Statistical analysis

The statistical analysis included: a) a dependent group t test; b) an independent sample t test; c) regression analyses per region; d) a comparison of the regression coefficients for the two regions (38); and e) a regression analysis in order to find any correlations between the determinants in which the regions differ.

A missing data analysis was performed to find out whether the number of missing data might affect the results. If so, imputation was applied. Consequently, the potential effect of missing data on the outcome was estimated. A

box plot was performed to check the potential effect of extreme/outlying scores on the outcome. A significance level of $p < .05$ was applied.

Results

As far as demographic data were concerned, the average age in Southern Limburg was 33.5 years, in Utrecht 33.2 years. In Southern Limburg the percentage of female participants was 82%, in Utrecht 73%; in both regions, the majority of participants had low levels of education (vocational school level): Southern Limburg 96%, Utrecht 95%. Thus, the two study populations were remarkably similar. We now turn to the five subquestions of the study, immediately followed by the main research question.

1) How does sick leave duration compare between homogeneous groups in different regions?

A statistical comparison of the mean duration of sick leave in the two regions showed a difference ($t = -3.94$, $p < .001$) between mean sick leave duration in Southern Limburg (24.61 days; $SD = 27.19$, $N = 80$) and in Utrecht (9.56 days; $SD = 15.95$, $N = 38$). In a number of cases (5 in South Limburg, 14 in Utrecht) the social fund was not able to provide the exact sick leave duration data per individual or these data were not reliable, so that these were missing cases.

2) How do scores of individual sick leave duration determinants compare between homogeneous groups in different regions?

In Southern Limburg as compared to Utrecht, an important although not significant characteristic ($.05 < p < .10$) was that the subjects had a perception of poorer health ('health status': health complaints, $p = .09$).

3) How does sick leave duration relate to relevant determinants between homogeneous groups in different regions?

A regression analysis was applied to examine the relation between the selected determinants as independent variables and the mean duration of sick leave as the dependent variable (Table 5).

Table 5: Results of the regression analyses of sick leave duration determinants per region

DETERMINANTS:	UTRECHT			SOUTHERN LIMBURG		
	adjusted R Square	Beta	Sig	adjusted R Square	Beta	Sig
WORK CONTENTS	.09 (N=25)			.01 (N=38)		
autonomy		.45	.04*		.12	.50
HEALTH STATUS:	.003 (N=32)			.17 (N=49)		
HEALTH COMPLAINTS						
questions about perceived health (sum)		-.10	.63		.29	.08
burn-out due to work (sum)		.09	.66		-.41	.01*
INDIVIDUAL CHARACTERISTICS AND CIRCUMSTANCES	.06 (N=35)			.18 (N=47)		
age		.31	.07		.18	.18
gender		-.07	.71		-.34	.02*
satisfied with private circumstances		.13	.51		-.33	.02*

* $p < .05$.

In Utrecht a longer duration of sick leave was observed if subjects experienced autonomy ('work contents', $p = .04$) and in Southern Limburg if they perceived a poorer health ('questions about perceived health', $p = .08$), an important factor although not significant. In Southern Limburg, a shorter duration of sick leave was observed for women ('individual characteristics and circumstances', gender, $p = .02$). A shorter duration of sick leave was also observed in Southern Limburg if subjects had a burn-out due to their work ('health status': health complaints, $p = .01$) or if they were satisfied with their private circumstances ('individual characteristics and circumstances', $p = .02$).

4) What differences in determinants predicting sick leave duration can be found between homogeneous groups in different regions?

The outcomes of the comparisons that were made to establish any differences in regression coefficients between the two regions led to the conclusion that regional differences existed for the determinants called 'burn-out due to work' ($p = .01$), 'gender' ($p = .01$) and 'satisfied with private circumstances' ($p = .01$).

Thus, the regression analysis showed that regions differed in predictive determinants of sick leave duration and that the regression coefficients for those determinants differed as well, with the exception of the determinant called 'autonomy'.

5) Are the determinants in which regions differ correlated?

Differences between the regions were found for several determinants (subquestion 4). In order to find a possible correlation between those determinants a regression analysis was performed for the health complaints determi-

nants called 'questions about perceived health' and 'burn-out due to work' and the determinants concerning individual characteristics and circumstances called 'age', 'gender' and 'satisfied with private circumstances'. The correlation matrix showed that the determinants 'questions about perceived health' and 'burn-out due to work' were correlated (.43, $p < .01$) as were the determinants 'questions about perceived health' and 'gender' (.03, $p = .79$). The Variance Inflation Factor (range 1.05-1.42) did not show any co-linearity of these determinants.

A missing data analysis showed that the number of missing data affected the results for some determinants. After the imputation operation, some determinants with a substantial number of missings continued to have an inappropriate effect on the results. They were the determinants 'expectations for the future', 'match between work and level of education', 'mental balance', 'alcohol consumption' and 'level of education'. These determinants were excluded from further analysis. Although the box plot showed that several determinants had extremes/outliers, none of them affected the outcome.

The main question of the study was: Are there any differences in the determinants of sick leave duration between homogeneous groups in socio-culturally different regions within a single country and what evidence can be found to suggest an effect of the regional socio-cultural environment?

Based on the results of the statistical analyses it was concluded that, within our country, regional differences in sick leave duration determinants really did exist and that different determinants predicted the duration of sick leave in different regions. The potential influence of both socio-cultural factors and European integration is discussed in the next section.

Discussion

Socio-cultural characteristics of Southern Limburg in national and euregional perspective and the relation with health and sick leave behaviour

As for the assumption that, seen from a socio-cultural perspective, Southern Limburg differs from the rest of the Netherlands, Soeters and Felling (1990) observed that Southern Limburg has a different history than the rest of the country because for many centuries it was under the influence of German and Flemish/Wallonian socio-cultural traditions such as a Roman Catholic orientation, whereas the western part of the Netherlands is more of a Calvinistic nature. An indication to suggest some socio-cultural influence from the neighbouring foreign countries is the perception of a poorer health among Southern Limburg residents, as residents of the adjacent Nordrhein-Westfalen also show doubts about their health (22) and therefore visit their doctor more often, as do Southern Limburgers (16). Philipsen (40) and Stevens and Van der Zee (16) assumed

that the dominance of Roman Catholic culture in Southern Limburg was a factor that contributed to a less sober lifestyle of Southern Limburg residents. It was expected that Southern Limburg would gradually come to be more like the rest of the country while at the same time, as a result of Euregional influences, it would continue to bear a resemblance with Nordrhein-Westfalen which, together with the border areas of Southern Limburg and the Wallonian province of Limburg, constitutes the *Euregion Meuse-Rhine (EMR)*. As for health perception, the prediction made by Stevens and Van der Zee (16) has come true as recent figures show that residents of Southern Limburg still perceive themselves to be in poorer health than their countrymen (34). A few other important indicators still suggest that socio-cultural factors affected the behaviour of Southern Limburg residents in 2006 the same as they did a few decades earlier. Disability pensions in Southern Limburg continued to exceed those in the rest of the country (17.7% vs. 11.9%) and the same applied to unemployment rates (11.3% vs. 9%) (35,41). The differences between Southern Limburg and the rest of the country which have been found since decades include that Limburgers visit their doctor more often, take more medicines, stay longer in hospitals and show higher death rates. More specifically, medical consumption in terms of doctor consultations and the consumption of medicines seems to correspond with the health behaviour of residents in the neighbouring German state of Nordrhein-Westfalen.

As for some socio-cultural characteristics of the Southern Limburg population that were not health-related we observed the following. Socio-cultural differences between Southern Limburg and the rest of the country were found with regard to more collectivism in the Limburg area versus more individualism in the region Utrecht and, especially for youngsters, a stronger orientation on one's partner and family in Southern Limburg as compared to Utrecht (42,43). The SOCON study of 2000 showed some remarkable similarities with the 1985 results (42,43), which suggests a certain continuity in differences in the socio-cultural characteristics of the Southern Limburg population as compared to the rest of the country. Thus it appears that Limburg youngsters still show a stronger tendency to solidarity, i.e. they show a stronger orientation towards groups or social integration. Meanwhile Knibbe (44) has found that people in Limburg still seek continuity with the past in the sense of being part of a community, which is in contradiction with the assumed growth of individualism. As a result, Limburg is still characterised by a 'community spirit', which may be related with the stronger collectivist orientation of Roman Catholic culture, whereas the rest of the country is characterised by a more individualistic and Calvinistic culture. In fact, the more collectivist attitude of Southern Limburg residents is thought to be a factor in the establishment of certain industries in the area (39). As the core of a culture is the less changeable (39), an observation supported by recent findings (44), the assumption is that, compared to a more individualistic culture, the collectivist character of Roman

Catholic culture still plays a role in the way people in Southern Limburg view life.

The study results in the light of socio-cultural characteristics

A few remarkable results can be mentioned here. Although not significant ($p > .05$), the subjects in Southern Limburg as compared to Utrecht had a perception of poorer health ('questions about perceived health', $p = .09$) and the same determinant showed a longer sick leave duration in Southern Limburg ($p = .08$), the opposite signs of the beta values attributing to the different effect of this determinant in the two regions. This finding concerning the 'questions about perceived health' determinant, a major though not significant characteristic leading to longer sick leave duration in Southern Limburg, corresponds with earlier findings on the health status of Southern Limburg residents (1,19,35,41). Feeling uncertain about one's health is a typical phenomenon of the Southern Limburg population which can also be observed in the adjacent German state of Nordrhein-Westfalen.

As for the outcomes in the Utrecht region, in contrast with the literature (45,46,47,48) a greater autonomy at the workplace had an increasing rather than reducing effect on sick leave duration. As the socio-cultural environment is supposed to affect this determinant, a possible explanation for the finding may be that, in the Utrecht area, employees of 20 to 40 years old appreciate 'autonomy' at the workplace in the more individualistic sense that it has a connotation of more freedom rather than more responsibility, whereas employees of the same age in the Southern Limburg area appreciate autonomy as an opportunity to prove their discipline in performing the job in the sense of attributing to the group, an attitude that refers to a more collectivist attitude.

The finding in Southern Limburg that burn-out due to work or being female is associated with a shorter duration of sick leave needs further study regarding burn-out. A possible explanation for the sex difference may be found in the composition of the study sample. In fact, both in Utrecht (73%) and Southern Limburg (82%) this profession (cleaning) is practised mainly by women, which may partly explain the finding.

The following Euregional influences were examined. As for health attitude, similarities in behaviour were found between the populations of Southern Limburg and Nordrhein-Westfalen (NRW). In addition, the collectivist Roman Catholic culture was considered to be a lasting factor in the Southern Limburg residents' view of life and to be influenced by the neighbouring Roman Catholic states (Belgium and the German state of NRW) surrounding the region, an influence that is stimulated by the Schengen Treaty (1985). Indeed, like others (49) we expect that open borders will stimulate the maintenance or even growth of foreign socio-cultural influences, especially in this eccentric part of the Netherlands, and that this will find its expression through indicators such as the consumption of health services and claims made for social security. In this context we are fully aware of the paradox that both centrifugal and centripetal

powers are active in Euregions. On the one hand central governments strive for European integration, on the other hand they do not want to lose political control over internal regions that are part of Euregions. This phenomenon does not differ from the time preceding the Schengen Treaty, but the difference is that mutual influences are stronger when open rather than controlled borders are in place. Thus, it makes sense to assume that typical socio-cultural characteristics of (eu)regional populations will be subject to some exchange between these populations. This exchange is expected to find its expression through various economic, cultural and social standards pertaining, for example, to medical consumption or the possibility to claim social security benefits.

Methodological reflections

Topicality of the study for the organisation of social security

Due to changes in the organisation of the social security system in the Netherlands, strict regional registration of sick leave duration has ceased to exist. From 2003 onwards, the Nationale Verzuimstatistiek (15) has been providing sick leave registration per Dutch province and what it shows is that interprovincial differences in sick leave still exist. Moreover, as the present study was carried out during the 1990s, the consistency in determinants predicting duration of sick leave adds to the relevance of its outcome.

Subjects

Subjects for the study were recruited at a time when they reported sick. An alternative approach would have been to study the employees of a few big companies. This would have been a better method to cover the entire group of workers in the cleaning industry. However, for practical reasons it was decided to include only those who reported sick at some point in time. Relevant individual data as well as systematically registered individual absenteeism data could easily be obtained from the social fund. Actually, it would have been a great disadvantage to study the employees of a few big companies because the outcome might be strongly affected by their specific, company-related culture of absenteeism (50,51).

Small sample size

Although the samples were small, the statistical analyses were performed on study populations that were remarkably similar in nature. As was pointed out earlier and is summarised here, the study populations were homogeneous in age, gender, level of education and profession; their socio-economic circumstances were similar, as was the quality of health services; there was similarity in employment contracts and in the administrative implementation of social security regulations; and, finally, both study populations had similar ethnic

backgrounds and originated from areas with a similar mixture of urban and rural qualities.

Number of spells suffered by participants

By starting from a reported case of sick leave when recruiting the study subjects, it would seem as if the participants had at least one spell of sick leave during the study period while so-called 'zero' sick leaves were excluded. This assumption is not correct. The time referred to was the 12-month period preceding the first day of sick leave. Thus, it is possible that participants had a 'zero' duration of sick leave. Furthermore, once people report sick for work they apparently show a greater tendency to have another sick leave than people who never reported sick (52) so the results of this study are representative for those employees who were on sick leave at some point in time rather than for those who never had sick leave before.

Analysis per category

It would have increased our understanding of the association between determinants and observed sick leave duration if the entire group of selected determinants could be analysed in a single regression analysis. However, a regression analysis of all selected determinants was not a real option. The number of participants actually participating in the analysis (N) would have been quite small due to the number of missing data. This would have made the estimates of the regression analysis unreliable. Thus, for pragmatic reasons the determinants were classified according to the categories they belonged to and then analysed per category. Also, considering the possibility that determinants distinguishing between regions were correlated, a regression analysis for the relevant determinants was performed.

Possible correlations between independent determinants

In interpreting the outcome it should be realised that correlations between independent determinants were not the object of study, although such correlations may exist. In developing a policy to reduce the mean duration of sick leave in a specific region it will be necessary to take into account any correlations between determinants before drawing conclusions.

Study results and level of significance

Some determinants show notable results. This was a reason to consider also $.05 < p < .10$, in addition to $p < .05$. After all, using only the 5% significance level in applied research may be inappropriate (53). Such a conservative approach may provide policy-makers with an unnecessarily incorrect picture, at least when correlations above the 5% level are not taken into consideration.

Therefore, we have distinguished results for which $p < .05$ and results for which $.05 < p < .10$. As was noticed earlier (subquestions 3 and 4), $p < .05$ for most results, except for the determinants 'questions about perceived health'

(subquestions 2 and 3) and ‘marital status’ (subquestion 2). As for the determinant ‘questions about perceived health’, the opposite sign of the beta values attributes to the difference in effect of this determinant in the two regions and the result is remarkable as it confirms both earlier and later findings (33,34). Furthermore, the small sample size is thought to be the cause of not reaching this significance level.

Conclusions

If a study uses strictly homogeneous groups, i.e. comparable individual and work characteristics and comparable socio-economic conditions, it might be expected that comparable determinants affect sick leave duration in either group. This was not the case and so the results of this study suggest an effect of the regional socio-cultural environment on determinants of sick leave duration in addition to the influence of characteristics such as health status, work situation or professional group. First of all, the results of our study are strongly suggestive of this tendency and they can be generalised to the point that if policy makers intend to take nationwide measures to reduce sick leave duration, they should take into account that determinants predicting sick leave duration may differ per region and that only tailor-made interventions focussed on determinants predicting sick leave duration per region may be effective. The present study investigated socio-culturally different regions under similar social security regulations, assuming that, based on different socio-cultural influences, differences in factors such as health perception may play a role in explaining differences in sick leave duration. In terms of international comparisons, people not only differ in their health perception (Table 1), they are also subject to different social security systems. These observations have consequences for social security policies on a European scale. When regions are part of Euregions, socio-cultural influences of the nearby foreign countries may find their expression in claims made for social security. This phenomenon will last as long as the residents of those regions share socio-cultural characteristics in terms of world view, lifestyle, standards and values. As a result, Euregions in the future could show some substantial similarities with the border regions of adjacent countries which they do not have with their own country. In focussing on sick leave and disability, European as well as national policy-makers of social security should be aware of this phenomenon.

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PART FOUR

Differences in sick leave frequency and sick leave duration between and within regions

In the next chapter (Chapter 7) sick leave frequency and sick leave duration were, independent of professional group, compared between regions as, dependent of professional group, within regions.

Chapter 7

On regional differences in sick leave: the role of work, individual and health characteristics and socio-cultural environment

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Abstract

Objectives: Regional differences in sick leave frequency and duration determinants were studied between different professions (sale and cleaning) in different regions in the Netherlands (Utrecht and South Limburg) and the influence of socio-cultural factors on those determinants was explored.

Materials and Methods: Employees in Utrecht and South Limburg were interviewed on work, individual and health characteristics. Sick leave data were obtained from the social fund.

Results: A statistic comparison of sick leave frequency and duration figures between the two professions in the two regions showed that for a part similar, and for another part different determinants were associated with sick leave.

Conclusion: In Utrecht socio-cultural influence was assumed for the perception of autonomy and in South Limburg for health complaints. As a consequence nationwide interventions to reduce sick leave should take into account the potential effects of socio-cultural factors on the type of sick leave determinants that predict sick leave per region.

Key words: Sick leave determinants, Regions, Socio-cultural environment

Introduction

Socio-cultural differences between regions may play a role in the type of determinants that affect sick leave. This finding was the result of a study that explored regional differences in sick leave with regard to well known determinants of sick leave duration [1]. The study was performed among homogeneous groups in different regions in the Netherlands. In the present study, the idea of socio-cultural differences as an important factor in sick leave behaviour was explored further.

While sick leave duration is associated with many determinants, little is known about region-related socio-cultural factors that may play a role in the type of determinants that predominate. Generally, sick leave is associated with illness, although the perception of health may differ between regions within countries, which may result in different outcomes in sick leave rates. The assumption is that, within a region with socio-cultural conditions similar for all professional groups, those conditions are - independent of professional group - reflected in the type of determinants that affect sick leave. As for the sick leave measures, frequency and duration, similarities in results for those two measures support the assumption that region-related socio-cultural phenomena are active.

Regional differences in sick leave frequency and duration

In the Netherlands, regional differences in sick leave frequency do exist [2], whereas research on determinants that could play a role in these differences appears to be scarce.

In a Finnish study on sick leave frequency, performed in three comparable demographic municipalities, it appeared that the sickness absence practice is the expression of the sickness absence habitus, which is deeply rooted in the social history of a locality as well as in the health-related behaviour of the residents [3-4]. In the Netherlands, the mean frequency of sick leave showed differences between the provinces Overijssel and Gelderland (1.72 spells) and Utrecht, North- and South-Holland (2.00 spells) [5]. These differences were, put in general terms, attributed to the economic structure of a region, characteristics of the population, health services and cultural differences [6]. Further on, literature showed that aspects of the profession play an important role in sick leave behaviour [7-12].

The most important outcome of studies on regional differences in duration of sick leave is that they are the result of socio-economic class differences or circumstances and development [3-4,6,13-16]

Tordoir et al. [17] and Soeters [18] found a longer duration of sick leave in the Dutch region of South Limburg as compared to the rest of the country and the regional organisation of health services (e.g. waiting-period before treated effectively) was said to be responsible for that. Later figures showed that the Limburg area had a still longer sick leave duration [19,20] and demonstrated

differences in health between the Dutch province of Limburg and the rest of the country [20-24]

Socio-cultural characteristics and health and sick leave behaviour

Although Soeters [18] found that regional differences in sick leave were the result of regional differences in the organisation of health services, he emphasised that other factors could play a role as well, i.e. how people used medical services or visited their doctors. Soeters [18] performed his study independently of professional groups or specific companies and found that the mean duration of sick leave in the Dutch province of Limburg was longer than in the rest of the Netherlands.

Soeters [18] as well as Prins [25] referred to studies by Hofstee [26] and Hofstede [27]. According to those authors, regional differences in death rates and health consumption exist and these differences are apparently based on cultural characteristics of the local inhabitants. Lifestyle factors like eating habits, tobacco smoking and alcohol drinking have an influence on health and, consequently, on sick leave behaviour. This observation corresponds with the outcome of international research [3,4].

Sick leave is related not only with illness [15,28-29], but also with behaviour [30-32] that is subject to individual and socio-cultural factors such as habits, traditions and moral standards. These factors may have an impact on the perception of the work situation and on the perception of one's health. As a result, there may be regional differences in health status or in disease types as well as in morbidity and mortality rates [24].

Culture and social tradition, or lifestyle, may be considered to influence the health status of communities [26-27]. For the cultural identity of a population, this was defined by Hofstede [27] as a collective 'programme' of the mind that discriminates groups from one another. Culture, expressed through people's behaviour and opinions, is a common characteristic of groups of people on the level of family, company, region or country [21].

Since health status is not a good predictor of sick leave [15,28-29], it is assumed that socio-cultural factors influence sick leave behaviour.

In regions with comparable health services, comparable demographic characteristics of the residents, a comparable socio-economic structure and a similar statutory social security system, employees with various professions live in an environment of different socio-cultural character. Differences in socio-cultural characteristics may find expression through similar determinants (different professions within regions) or different determinants (different socio-cultural environment between regions).

Research questions

The first research question we want to answer, is: How do sick leave frequency and duration, without regard to professional group, relate to relevant determi-

nants between different regions within a country, and are there differences between these regions in determinants that predict sick leave frequency and duration?

The second research question we want to answer, is: Are there, between different professional groups within a region, similarities in determinants that affect sick leave frequency and duration indicating an influence of socio-cultural environment? For each of the examined regions this second research question was divided in five subquestions: 1) How do sick leave frequency and duration compare between different professions in a region? 2) How do scores of individual sick leave frequency and duration determinants compare between different professions in a region? 3) How do sick leave frequency and duration relate to relevant determinants between different professions in a region? 4) Are there remarkable similarities or differences in determinants that predict sick leave frequency and duration between different professions within a region? 5) Are the determinants in which both professions per region differ correlated?

To answer both research questions a literature search was needed to identify sick leave frequency and duration determinants and to establish the direction of the effect of those determinants [1,33]. Identifying these determinants was merely a means to achieve the main purpose of the present study, i.e. to find any differences in effective sick leave frequency and duration determinants between regions based on their socio-cultural differences. Thus, our study focussed primarily on socio-cultural differences as a cause of regional differences in active sick leave frequency and duration determinants and was not a study on sick leave determinants as such.

Materials and methods

Since sick leave frequency and duration are influenced by various determinants, what we needed for this study was: a) at least two geographically and socio-culturally different regions, b) sick leave data of those regions, c) relevant sick leave frequency and duration determinants that are effective [1,33].

Registration of data of sick leave

Since one of the authors worked for the Dutch social fund Detam which registered the sick leave per profession and per region - although for specific professional groups only (sale, cleaning, trade) - it was possible to compare the relations between relevant sick leave determinants and registered sick leave between regions without regard to professional group, as well as to compare these relations within these regions with regard to professional group.

Regions and professions studied

It was necessary to select specific regions of our country, i.e. the Netherlands, to compare the sick leave behaviour of those regions.

Earlier studies [17-18] showed differences between the South Limburg region and the rest of the Netherlands. South Limburgers appear to have a less healthy lifestyle than their countrymen. Their body weight is higher [34] and they engage a less physical exercise [24]. Traditionally, South Limburgers drink more alcohol and show more tobacco addiction, although smoking is decreasing [24]. Bisscheroux et al. [35] found that Limburgers perceive a poorer health. Recently, the Nationaal Kompas Volksgezondheid 2001-2003 (National Public Health Compass 2001-2003, 2006) [36] showed that Limburgers differ from their countrymen in that 20-25% of them still perceive a relatively poor health, which was more than in any other part of the country (Table 1).

Table 1: Indicators of health

Indicators of health	LIMBURG (%)			NETHERLANDS (%)		
	women	men	women and men	women	men	women and men
perception of own health (very good)*	62	78	-	74	82	-
questions on one's own health (the higher score the poorer health)*	5,0	4,3	-	4,1	4,1	-
perception of a poorer health 2001-2003 (RIVM)**	-	-	20-25	-	-	< 20-25
chronic diseases and handicaps*	30	20	-	32	23	-
visit doctor*	58	65	-	55	61	-

* Bisscheroux P, Nijhuis J, Kruijnen M, Knipschild P, Limonard C. Gezondheidsvademecum Limburg. Maastricht: Rijksuniversiteit Limburg; 1986. [in Dutch].

** National Institute of Public Health and the Environment. Nationaal Kompas Volksgezondheid [cited 2008 Jan 14]. Available from: http://www.rivm.nl/vtv/object_document/o4237n16906.html [in Dutch].

Another remarkable fact is that disability rates in 2000, 2003 and 2005 were higher in Limburg and over the years they increased simultaneously with raising national rates [36-37] (Table 2).

Table 2: Disability pension rates

Rates	Limburg (%)	Netherlands(%)
disability pension 1986*	9.5	6.8
disability pension 2000**	10.7	8.8
disability pension 2003***	11.1	8.9
disability pension 2005***	10.1	8.0

* ** As in Table 1

*** Uitvoeringsinstituut Werknemersverzekeringen. Atlas Social Insurances 2003-2005. Amsterdam: UWV; 2005 [in Dutch.]

Taking into account the different regional sick leave frequency and duration figures in South Limburg versus the rest of the country, the higher disability rates in this region, its different lifestyle and the different socio-cultural history (the area was ruled by surrounding principalities until 1830 and consequently influenced by German and Flemish/Wallonian socio-cultural traditions) and the different perception of health status, we considered the South Limburg population as different in socio-cultural terms from the rest of the Netherlands. Thus, for obvious reasons, it was decided to compare the region South Limburg with one of the other regions of our country.

Thus far we have mentioned some remarkable differences in health status between the province of Limburg and the rest of the Netherlands. Our efforts to find another region for comparison purposes were dominated by practical considerations like the central position of the city of Utrecht and this city being the residence of the social fund Detam. This fund was responsible for the certification and registration of sick leave for workers in sale, cleaning and trade. Sick leave duration figures from Detam showing differences between the regions Utrecht and South Limburg (mean sick leave duration in days: 23 and 29, respectively) were an additional motivation to use the region Utrecht, i.e. the city of Utrecht and its immediate surroundings, for making comparisons with South Limburg. The comparable mixture of urban and rural qualities, South Limburg including the cities of Heerlen and Maastricht, and the socio-economic comparability of the regions were all the more reason to compare them in terms of sick leave behaviour.

The sale and cleaning jobs differ in the sense that workers in sale, as compared to workers in cleaning, generally experience less physical workload and that they work under rather strict supervision on normal working hours. The obviously different character of those two jobs and also the fairly well-grounded socio-cultural differences between the regions South Limburg and Utrecht caused us choose those two jobs and regions for the comparison. The regions showed, for sale as for cleaning, differences in sick leave in the sense that, in South Limburg, sick leave frequency was higher and sick leave duration was longer than was the case in Utrecht.

The specified differences between the regions Utrecht and South Limburg, and between the professions sale and cleaning, made it possible to compare both regions in the effect of sick leave frequency and duration determinants with regard to the profession sale as to the profession cleaning, and make a comparison between, as well as within, the two regions.

Participants

Workers were included in the study population as soon as they reported sick and unable to work. This was the best possible moment, because most of those reporting sick (> 95%) were visited by a controlling official of the social fund within one week. According to the Dutch social security system, all employers with employees working in sale and cleaning were committed to report sick employees to the social fund, where independent social health officials were responsible for certifying sick leave. In order to exclude specific effects of younger (< 20 years) and older (> 40 years) subjects on the results and, apart from the professional group, to enhance the homogeneity of the research groups in both regions, the participants had to be between 20 and 40 years old, and their reasons for reporting sick had to be 'low back pain' or 'uncomplicated stress'. The decision to use these diagnostic categories had a pragmatic basis: it was assumed that, using commonly found diagnoses which leave the subject - other than specific diseases - much freedom to act (i.e. to report sick for work or not), a substantial number of participants (at least 50 to 100 per region) could be recruited within a relative short period of time (6 months). In Utrecht 79 employees in sale and 52 in cleaning, and in South Limburg 105 employees in sale and 85 in cleaning agreed to participate. These numbers were the outcome of the interview period of six months based on a random procedure in which every next employee meeting the requirements was asked to participate. In Utrecht, 37% (sale) and 25% (cleaning), while in South Limburg 18% (sale) and 32% (cleaning) did not respond. The responding as the non-responding groups were comparable in terms of age and gender. From the non-responding group, strictly individual characteristics, such as age and gender were the only determinants to be included in the statistical analyses. In Utrecht 56% of the responding group was working in sale and in cleaning this was 44%; in South Limburg 60% of the responding group was working in sale and in cleaning this was 40%. The figures justify the observation that the study populations were homogeneous. It is recognised that the sample size is small, even if the study examined what effects differences in regional socio-cultural character might exercise on the type of determinants that affect sick leave duration. This is why the study was carried out on strictly homogeneous groups in socio-economically similar though geographically different regions under the jurisdiction of a uniform social security system.

A between professions within a region remarkable similarity in types of determinants that affect sick leave, is supposed to support the assumption of regional socio-cultural factors being of influence on sick leave.

Questionnaire

Some data on the individual and work characteristics of participants were derived from a specific form, completed by the employer and sent to the social fund to report the first day of sick leave. When employees agreed to participate, an interview booklet with questions they were asked to answer was handed out. In accordance with the results of the literature review, the booklet consisted of sets of questions that referred to the determinants identified earlier [1,33]. These questions were derived from the validated VAG (Vragenlijst Arbeid en Gezondheid, Questionnaire on Work and Health) [38]. Determinants belonging to similar categories were combined. Thus, the categorised determinants constitute the independent variables while sick leave frequency and duration are the dependent variables. Parameters of social and demographic developments were not investigated because legal, political and socio-economic status were similar throughout the country and the study population was, apart from professional group, homogeneous. The selected determinants were used as the basis for statistical analysis.

Time line

A study of the mean sick leave frequency or duration requires a certain period of registration which, in the present study, was the year before the day of reporting sick. Thus, the started spell of sick leave as such was not analysed, but was the sick leave pattern in the preceding year. For those reporting sick on the first of October, 1991, we referred to the period starting on the first of October, 1990; for those reporting sick on the first of December, 1991, we referred to the period starting on the first of December, 1990, and so on. The mean frequency and duration of sick leave in the referred year was used in the analysis and they were calculated as follows. For the mean frequency the sum of the individual frequency indices was divided by the number of participants and for the mean duration the sum of the number of days of absenteeism was divided by the sum of the individual frequency indices. The interview period for both regions was 6 months, that is from 1st October 1991 till 31st March 1992.

Determinants and study design

The collected answers were classified for statistical purposes and, based on a factor analysis (not presented here), were combined to form compound determinants. Table 3 provides a classification of the sick leave frequency and duration determinants and gives the number of items as well as Cronbach's alpha for compound determinants.

Table 3: Selected determinants

independent determinants	number of items	Cronbach's alpha
working conditions		
appreciation for one's work (sum)	4	0.78
expectations for the future (sum)	4	0.80
satisfied with one's work (yes=1/no=0)	1	-
positive about social-medical support during sick leave (yes=1/no=0)	1	-
type of appointment (permanent=1/temporarily=0)	1	-
working contents		
autonomy (sum)	8	0.77
workload (more work in same amount of time) (yes=1/no=0)	1	-
mental workload (yes=1/no=0)	1	-
match between work and level of education (yes=1/no=0)	1	-
working relations		
opinion about supervisors (sum)	9	0.90
managers are well informed about the workplace (yes=1/no=0)	1	-
good atmosphere at the workplace (yes=1/no=0)	1	-
health status (perceived workload):		
perceived physical workload (sum)	10	0.77
perceived mental workload (sum)	5	0.72
health status (health complaints):		
questions about perceived health (sum)	22	0.86
mental balance (sum)	21	0.86
burnout due to work (sum)	6	0.72
annual number of visits (family doctor)	1	-
frequently taking medicines (yes=1/no=0)	1	-
motivation		
work-related factors (yes=1/no=0)	1	-
home-related factors (sum)	8	0.70
individual characteristics and circumstances		
age	1	-
gender (w=1/m=0)	1	-
marital status (married=1/unmarried=0)	1	-
satisfied with private circumstances (yes=1/no=0)	1	--
level of education (high=1, vocational school level=0)	1	-
alcohol consumption (yes=1, no=0)	1	-
smoking (yes=1, no=0)	1	-

The level of Cronbach's alpha was fixed at 0.70 as this was a rather safe procedure in the sense that the value was less dependent on the number of items (constituting the compound determinant) than if higher levels were used [39]. A few compound determinants lacked internal coherence (Cronbach's alpha < 0.70) and were eliminated. They were 'pollution at the workplace' and 'air climate/pollution' of the working circumstances. The direction of the effect of determinants was given earlier [1,33].

Statistical analysis

The statistical analysis for the first research question included: 1) a t-test for the sick leave variable between the two regions, 2) a t-test for independent determinants between the two regions, 3) a regression analysis for frequency and for duration per region, 4) a comparison of the regression coefficients for the two regions [40], 5) a regression analysis for the determinants that both regions differed in, in order to find a possible correlation. The statistical analysis for the second research question, performed for Utrecht and South Limburg as well as for frequency and duration, included in accordance with the five subquestions for each region: 1) a t-test for the sick leave variable between the two professions in each region, 2) a t-test for independent determinants between the two professions in each region, 3) a regression analysis for frequency and for duration per region and per profession, 4) a comparison of the regression coefficients for the two professions per region, 5) a regression analysis for determinants distinguishing the two regions, in order to find any correlation. A missing data analysis was performed in order to find out whether the number of missing data might influence results. If so, imputation was applied. Consequently, the possible influence of the missing data on the outcome was estimated. A boxplot was performed to check the potential effect of extreme/outlying scores on the outcome. A significance level of $p < 0.05$ was applied.

Results

As far as the study populations for the analysis between both regions were concerned (first research question), the demographic data for South Limburg were: mean age 29.6 years, 85% female and 89% low level of education (vocational school level), and for Utrecht: mean age 29.3 years, 80% female and 94% low level of education. As far as the study populations for the analysis between both professions were concerned (second research question), the mean age in South Limburg was 26.5 years (sale) and 33.5 years (cleaning) and in Utrecht 26.8 years (sale) and 33.2 years (cleaning). In South Limburg the percentage of female participants was 87% (sale) and 82% (cleaning) and in Utrecht 84% (sale) and 73% (cleaning). Further on, the majority of participants had low levels of education: South Limburg 84% (sale) and 96% (cleaning),

Utrecht 94% (sale) and 95% (cleaning). As in Utrecht 56% were working in sale and 44% in cleaning and in South Limburg 60% were working in sale and 40% in cleaning, for the first research question, the study populations between the regions were remarkable similar; for the second research question the study populations were different in terms of profession.

We will now turn to the first research question: How do sick leave frequency and duration, without regard to professional group, relate to relevant determinants between different regions within a country and are there differences between these regions in determinants that predict sick leave frequency and duration?

The statistical analysis for this question led to the following results.

With regard to **1**): the statistical comparison of the mean frequency and duration of sick leave between the two regions showed a difference ($t = -4.234$, $p < 0.001$) between the mean sick leave frequency in South Limburg (1.770; SD = 1.906, N = 183) and in Utrecht (1.006, SD = 1.223, N = 109) as well as ($t = -3.838$, $p < 0.001$) between the mean sick leave duration in South Limburg (19.68 days; SD = 24.758, N = 182) and in Utrecht (10.05 days; SD = 18.581, N = 109).

With regard to **2**): in Utrecht as compared to South Limburg: subjects had lesser expectations for the future ($p = 0.040$) and were less satisfied with their work ($p = 0.024$), further on they perceived a better health ($p = 0.008$) and were less often married ($p = 0.001$).

With regard to **3**): per region a regression analysis for frequency and for duration was applied to examine the relation between the selected determinants as independent variables, and the mean frequency and duration of sick leave as the dependent variable (Table 4).

Table 4: Results of the regression analyses of sick leave frequency and duration determinants per region and of the comparison of the regression coefficients

DETERMINANTS	UTRECHT			SOUTH LIMBURG		
	adjusted R Square	Beta	Sig	adjusted R Square	Beta	Sig
sick leave frequency determinants						
WORK CONTENTS	0.119 (N = 58)	-	-	0.001 (N = 99)	-	-
autonomy	-	0.345	0.009*	-	-0.086	0.416
sick leave duration determinants						
WORK CONTENTS	0.065 (N = 70)			.002 (N = 98)		
autonomy	-	0.326	0.007*	-	-0.132	0.211
HEALTH STATUS: HEALTH COMPLAINTS	0.019 (N = 82)	-	-	.164 (N = 134)		
annual number of visits (family doctor)	-	-0.18	0.887	-	0.358	<0.001*

* p < 0.05.

** in comparing the regression coefficients a difference was found.

In Utrecht a higher frequency and a longer duration of sick leave was observed if subjects experienced more autonomy. In South Limburg a longer duration of sick leave was observed if subjects showed a higher number of annual visits to the family doctor.

With regard to 4): the outcomes of the comparisons that were made to establish differences in regression coefficients between the two regions, if any, led to the conclusion (see Table 4) that for duration a regional difference was found for the determinant called ‘annual number of visits (family doctor)’.

The regression analysis for the first research question showed that regions differed in determinants that predicted sick leave frequency and duration and that for one determinant the regression coefficients differed as well.

With regard to 5): as for only one determinant [‘annual number of visits (family doctor)’] a difference between the regions was found, no regression analysis was performed in order to find a possible correlation for the determinants that both regions differed in.

We will now turn to the five subquestions of the second research question of the study, with the results of each region, to be followed immediately by the first and the second research question.

1) How do sick leave frequency and duration compare between different professions in a region?

In Utrecht the statistical comparison of the mean sick leave frequency and duration between the two professions showed no difference. In South Limburg the statistical comparison of the mean sick leave frequency and duration between the two professions showed a difference ($t = -2.409$, $p = 0.017$) with regard to sick leave duration: sale (15.91 days; $SD = 21.074$, $N = 105$) and cleaning (24.61 days; $SD = 27.185$, $N = 85$).

2) How do scores of individual sick leave frequency and duration determinants compare between different professions in a region?

In Utrecht, sale as compared to cleaning: the subjects experienced a lesser workload in the sense that there was not more work to do in the same amount of time ($p = 0.003$); further on they were younger of age ($p < 0.001$) and less often married ($p = 0.001$). In South Limburg, sale as compared to cleaning: the subjects experienced a lesser workload in the sense that there was not more work to do in the same amount of time ($p < 0.001$) and, at the same time, experienced a higher mental workload ($p = < 0.001$) while the match between work and level of education ($p = 0.004$) was better; further on they found managers more often well informed about the workplace ($p = 0.004$) and subjects were (work-related factors) less motivated for work ($p = 0.016$), younger of age ($p = < 0.001$), less often married ($p = < 0.001$) and more often of higher education ($p = 0.010$).

In the comparison within the regions of the individual frequency and duration determinants there was a remarkable similarity in results between the regions in the sense that working contents regarding workload (more work to do in the same amount of time) were equally different appreciated by the employees of both professions; further on in both regions employees in sale were (individual characteristics and personal circumstances) younger ('age') and less often married ('marital status') than those in cleaning. These results indicate the influence of individual - and profession - i.e. not region-related determinants.

3) How do sick leave frequency and duration relate to relevant determinants between different professions in a region?

A regression analysis for frequency and duration for Utrecht as for South Limburg and for sale as for cleaning, was applied to examine the relation between the selected determinants as independent variables and the mean frequency and duration of sick leave as the dependent variable (Table 5).

Table 5: Results of the regression analyses of sick leave frequency and sick leave duration per profession and per region and of the comparison of the regression coefficients

DETERMINANTS	SALE			CLEANING		
	adjusted R Square	Beta	Sig	adjusted R Square	Beta	Sig
UTRECHT (DURATION):						
WORKING CONTENTS autonomy	0.020 (N=45)	0.271	0.092	0.091 (N=25)	0.452	0.039*
SOUTH LIMBURG (FREQUENCY):						
WORKING CONDITIONS appreciation for one's work	0.102 (N=85)	-0.055	0.749	0.091 (N=48)	0.521	0.023*
positive about social-medical support during sick leave **($p = 0.037$)		-0.296	0.010*		-0.096	0.600
type of appointment		0.268	0.018*		-0.191	0.188
WORKING CONTENTS autonomy	0.014 (N=67)	-0.259	0.050	0.092 (N=32)	0.062	0.771
HEALTH STATUS: PERCEIVED WORKLOAD perceived physical workload	0.018 (N=85)	0.168	0.133	0.043 (N=50)	0.295	0.046*
SOUTH LIMBURG (DURATION):						
WORKING CONDITIONS type of appointment	0.071 (N =86)	0.256	0.025*	0.023 (N=48)	0.121	0.418
WORKING RELATIONS opinion about supervisors	0.042 (N =70)	-0.373	0.019*	0.019 (N=50)	0.099	0.647
HEALTH STATUS: HEALTH COMPLAINTS burnout due to work ** ($p = 0.006$)	0.184 (N =85)	0.159	0.177	0.168 (N=49)	-0.409	0.013*
annual number of visits (family doctor)		0.345	0.004*		0.229	0.123
INDIVIDUAL CHARACTERISTICS AND PERSONAL CIRCUMSTANCES gender ** ($p = 0.004$)	0.018 (N=85)	0.119	0.326	0.180 (N=47)	-0.345	0.016*

Aberrations as in Table 4

In Utrecht, in cleaning, a longer sick leave duration was observed if subjects experienced more autonomy. In South Limburg, in sale, a higher sick leave frequency was observed if subjects had a permanent appointment and a lower sick leave frequency was observed if they were positive about social medical support during sick leave. In cleaning, in the same region, a higher sick leave frequency was observed if subjects experienced more appreciation for their work and experienced more physical workload. Further on in South Limburg, in sale, a shorter sick leave duration was observed in case subjects had a positive opinion about their supervisors and a longer sick leave duration was observed if

subjects had a permanent appointment or visited their family doctor more often and, in cleaning, a shorter sick leave duration was observed if subjects had a burnout due to work or if they were female.

4) Are there remarkable similarities or differences in determinants that predict sick leave frequency and duration between different professions within a region?

For Utrecht, for duration, the regression coefficients for the determinant called 'autonomy' did not differ and had, for sale as for cleaning, a similar effect (see Table 5). For South Limburg, for frequency, the regression coefficients for the determinant called 'perceived physical workload' did not differ and had, for sale as for cleaning, a similar effect (see Table 5). For South Limburg, for duration, the regression coefficients for the determinants called 'type of appointment' and 'annual number of visits (family doctor)' did not differ and had, for sale as for cleaning, a similar effect (see Table 5). In Utrecht, for frequency and for duration, the comparisons that were made to establish differences in regression coefficients between the two professions, showed no such differences (see Table 5). The outcomes of the comparisons that were made to establish differences in regression coefficients between the two professions within South Limburg, if any, led to the conclusion (see Table 5) that, for frequency, differences were found for the determinant 'positive about social medical support during sick leave' and, for duration, for the determinants called 'burnout due to work', and 'gender'.

The regression analysis for the second research question showed that professions differed in determinants that predicted sick leave frequency and duration. Further on, in comparing the regression coefficients, a difference was found for some determinants.

5) Are the determinants in which both professions per region differ correlated?

For Utrecht, for duration, for none of the determinants a difference between the professions was found. For South Limburg, for frequency, for only one determinant a difference between the professions was found, therefore no regression analysis was performed in order to find a possible correlation for the determinants that both professions differed in. For South Limburg, for duration, a difference between the professions was found for the determinants called 'burnout due to work' and 'gender'. In order to find a possible correlation between these determinants a regression analysis was performed for the health complaints determinants called 'burnout due to work' and 'annual number of visits (family doctor)' and for the determinant called 'gender'. The correlation matrix in the region South Limburg (sale and cleaning) showed that the determinants 'burnout due to work' and 'gender' were correlated ($0.07, p = 0.39$) as were the determinants 'burnout due to work' and 'annual number of visits

(family doctor)' (0.32, $p < 0.01$). The Variance Inflation Factor (range 1.04-1.14) showed that there was no co-linearity of these determinants.

For sale as for cleaning, in Utrecht as in South Limburg, a substantial number of missings was found for the determinants called 'expectations for the future', 'match between work and level of education', 'mental balance' and 'alcohol consumption'. The missing data analysis showed that for some determinants the number of missing data influenced the results. After the imputation operation some determinants with a substantial number of missings kept an inappropriate influence on the results. It concerns the determinants 'expectations for the future', 'match between work and level of education', 'mental balance' and 'alcohol consumption'. These determinants, such as 'level of education' and 'satisfied with private circumstances' because of their extent of skewness, were excluded from further analysis. Most of the determinants that showed extreme/outlying scores did not affect the outcome and if so, they did not affect it after reducing the value of the scores to the next extreme score or the mean value.

Discussion

The present study compared the responses to relevant sick leave determinants shown by strict homogeneous groups in two regions of different socio-cultural character and also compared, within the same areas, the responses to relevant sick leave determinants of two different professions.

The first research question was: How do sick leave frequency and duration, without regard to professional group, relate to relevant determinants between different regions within a country and are there between these regions differences in determinants that predict sick leave frequency and duration? Based on the results of the statistical analysis it was concluded that, within our country, regional differences in sick leave determinants for frequency and duration did exist and that different determinants predicted sick leave frequency and duration in different regions. As far as a possible influence of socio-cultural environment on duration is concerned, this applies for South Limburg to the determinant called 'annual number of visits (family doctor)'.

The second research question was: Are there, between different professional groups within a region, similarities in determinants that affect sick leave frequency and duration indicating an influence of socio-cultural environment? In Utrecht as in South Limburg the regression analysis showed that professions differed in determinants that predicted sick leave frequency and duration and that the regression coefficients differed for some determinants only.

As for Utrecht, for duration, for sale as for cleaning, for the determinant called 'autonomy' a similar effect was found. This observation may indicate

that in Utrecht for duration ‘autonomy’ is a determinant that is influenced by socio-cultural environment.

As for South Limburg, for duration, for sale as for cleaning, for the determinants called ‘type of appointment’ and ‘annual number of visits (family doctor)’ a similar effect was found. And also for South Limburg, for frequency, for sale as for cleaning, for the determinant called ‘perceived physical workload’ a similar effect was found. These observations may indicate that, in South Limburg, socio-cultural environment influences the sick leave frequency determinant called ‘perceived physical workload’ and the sick leave duration determinants called ‘type of appointment’ and ‘annual number of visits (family doctor)’.

In comparing the outcomes of the first and the second research question we concluded that they were, in South Limburg, for duration, corresponding for the determinant called ‘annual number of visits (family doctor)’. The finding for South Limburg corresponds with the earlier finding that workers in sale showed a higher medical consumption leading to a longer sick leave duration than in Utrecht [1].

Socio-cultural characteristics of South Limburg as compared to the rest of the country and the relation with health and sick leave behaviour

As for the assumption that, seen from a socio-cultural perspective, South Limburg differs from the rest of the Netherlands, Soeters and Felling [41] observed that South Limburg has a different history than the rest of the country because for many centuries it was under the influence of German and Flemish/Wallonian socio-cultural traditions such as a Roman Catholic orientation, whereas the western part of the Netherlands is more of a Calvinistic nature. Philipsen [42] and Stevens and Van der Zee [21] assumed that the dominance of Roman Catholic culture in South Limburg was a factor that contributed to a less sober lifestyle of Southern Limburg residents. The Calvinistic north shows a healthier population with a longer life expectation. Stevens and Van der Zee [21] observed that smoking and drinking as possible socio-cultural manifestations of a less healthy life style, are a more accepted habit in daily life in South Limburg. These authors also found that South Limburg residents reported more health complaints and show higher disability pension rates, as they still do [37] (Table 2). Sickness absence and disability pensions, being higher in South Limburg than in the rest of the Netherlands, will be a consequence of differences in health as well of culture, especially as far as perception of own health, own responsibility and consulting medical doctors are concerned.

As for some socio-cultural characteristics of the Southern Limburg population that were not health-related we observed the following. Socio-cultural differences between South Limburg and the rest of the country were found with regard to more collectivism in the Limburg area versus more individualism in the region Utrecht and, especially for youngsters, a stronger orientation on one’s partner and family in South Limburg as compared to Utrecht [43].

A few other important indicators still suggest that socio-cultural factors affected the behaviour of residents of South Limburg residents as they did a few decades earlier. Disability pensions in South Limburg continues to exceed those in the rest of the country (17.7% vs. 11.9%) and the same applied to unemployment rates (2006 nationwide: 9%, Limburg: 11.3%) [44].

The study results in the light of socio-cultural factors

Limburgers are less healthy than their countrymen and live less healthy too [18]. In agreement with this, Limburgers visit their doctor more often, use more medicines, stay longer in hospitals and show higher death rates. Later studies confirmed the difference in health between Limburg and the rest of the country [22-24], be it that illness is not a good predictor of sick leave [15,28-29]. Sick leave is not only related with disease, but also with behaviour that is influenced by individual and socio-cultural characteristics like habits, traditions and moral standards [30-32]. People show a different perception of their own health or of their work situation and this leads to different choices in comparable circumstances. As a consequence, sick leave is often associated with a certain freedom to decide for it or not.

As for the outcomes in the region South Limburg, from a socio-cultural point of view we consider those as typical for the South Limburg population. This applies to the determinants called 'perceived physical workload', referring to health status in the sense that health complaints through physical perceived workload are an expression of a poor health [45-48], and the determinant called 'annual number of visits (family doctor)', referring to health status in the sense of health complaints. These determinants cause more sick leave. As the chosen diagnoses 'low back pain' and 'uncomplicated stress' leave the subject much freedom to act, we observe that the combination of the perception of a poor health and more medical consumption leads to a higher sick leave frequency and a longer sick leave duration. The less healthy lifestyle of the South Limburg residents will attribute to this phenomenon.

As for the outcomes in the Utrecht region, in contrast with the literature [49-52], a greater autonomy at the workplace in Utrecht had, independent of profession, an increasing rather than reducing effect on sick leave frequency and duration. As the socio-cultural environment is supposed to affect this determinant, a possible explanation for the finding may be that, for sale, in the Utrecht area employees in the age of 20 to 40 years perceive 'autonomy' at the workplace in the more individualistic sense that it has a connotation of more freedom rather than more responsibility, whereas employees of the same age in the South Limburg area perceive autonomy as an opportunity to prove their discipline in performing the job, an attitude that refers to a more collectivistic attitude.

In accordance with literature we found that, independent of profession, in South Limburg, though not significant, more autonomy led to a lower frequency and a shorter duration (Table 4) and that, for sale in South Limburg, autonomy appeared to be related with a lower frequency (Table 5). In comparing the effect

of the 'autonomy' determinant for cleaning in Utrecht with that for cleaning in South Limburg we observed, though not significant in the latter region, a longer sick leave duration in South Limburg and a higher frequency in Utrecht (Table 5), which may indicate the existence of a profession-related influence. In this regard we consider the difference between the two professions, sale and cleaning, as a possible explanation. In cleaning supervision at the workplace is generally less strict with probably a paradoxical effect as far as perception of 'autonomy' is concerned.

Whether 'age' is a factor in the appreciation of 'autonomy' at the workplace, for sale as for cleaning, needs further study. This also applies to the paradoxical finding, in South Limburg, that for cleaning 'appreciation for one's work' is associated with a heightening effect on frequency of sick leave. This finding may be attributable in that professional group to its less strict supervision at the workplace, leading to a different perception of such things as 'appreciation for one's work'. Further research is also necessary with regard to the finding in South Limburg that a burnout due to work is associated with a shorter duration of sick leave. Regarding being female, a possible explanation for the finding that, for cleaning, this leads to a shorter duration of sick leave, may be the composition of the study population. In fact, the profession cleaning is in Utrecht (73%) as well as in South Limburg (82%) particularly practised by women and this may be the explanation for the finding.

Methodological considerations

Topicality of the study for the organisation of social security

Due to changes in the organisation of the social security system in the Netherlands, strict regional registration of sick leave frequency and duration has ceased to exist. From 2003 onwards the Nationale Verzuimstatistiek (Statistics Netherlands, 2006) [20] has been providing sick leave registration per Dutch *province* and what it shows is that interprovincial differences in sick leave still exist. Moreover, as the present study was carried out during the 1990s, the consistency in determinants predicting sick leave frequency and duration [1,33] adds to the relevance of its outcome.

In the Netherlands sick leave has gradually decreased since the nineties. This decrease is generally attributed to changes in the organisation of social security. Occupation health services took the place of the social funds. Although these changes affected the country as a whole rather than specific regions, the social security system for the certification of sick leave has grown less uniform. Therefore, a future research on regional differences in sick leave, apart from the independent determinants presented in this study still effective today, will have to include determinants of the statutory compensation system.

The present study seeks to find an explanation for regional differences in sick leave and applies an original research model. The model assumes the existence of regional differences in sick leave on the basis of socio-cultural differences, which find their expression in well-known sick leave determinants. Changes in the organisation of the social security system will not alter the present theoretical model as such and at the time the study was performed, the two regions had the same statutory compensation system, i.e. employees reporting sick experienced a similar approach.

Subjects

Subjects for the study were recruited at a time when they reported sick. An alternative approach would have been to study the employees of a few big companies. This would have been a better method to cover the entire group of workers in sale and cleaning. However, for practical reasons it was decided to include only those who reported sick at some point in time. Relevant individual data as well as systematically registered individual absenteeism data could easily be obtained from the social fund. Actually, it would have been a great disadvantage to study the employees of a few big companies because the outcome might have been strongly affected by their specific, company-related culture of absenteeism. In this context it is important to mention the exclusion of company-specific characteristics that often play an important role in sick leave behaviour [53-54], while the subjects of the present study were recruited from all kinds of companies, working in the same kind of household cleaning (i.e. not industrial cleaning) and living in similar socio-economic conditions.

Small sample size

Although the samples were small, the statistical analyses were performed on study populations that were remarkably similar in nature. As was pointed out earlier and is summarised here, the study populations were homogeneous in age, gender, level of education and profession; their socio-economic circumstances were similar, as was the quality of health services; there was similarity in employment contracts and in the administrative implementation of social security regulations; and, finally, both study populations had similar ethnic backgrounds and originated from areas with a similar mixture of urban and rural qualities.

Number of spells suffered by participants

By starting from a reported case of sick leave when recruiting the study subjects, it would seem as if the participants had at least one spell of sick leave during the study period while so-called 'zero' sick leaves were excluded. This assumption is not correct. The time we referred to was the 12-month period preceding the first day of sick leave. Thus, it is possible that participants had a 'zero' frequency or duration of sick leave. Furthermore, once people report sick for work they apparently show a greater tendency to have another sick leave

than people who never reported sick [55], so the results of this study are representative for those employees who were on sick leave at some point in time rather than for those who never had sick leave before.

Opposite signs

As for the first research question, the standardized regression coefficients showed opposite signs (Table 4). This finding supports the conclusion that, between regions, different determinants may predict sick leave frequency and duration and that the underlying causes may be of socio-cultural character. As for the second research question, for several determinants the standardized regression coefficients showed, for frequency as for duration, opposite signs (Table 5). This finding indicates that between professions different determinants may predict sick leave frequency and duration and that the underlying causes may be profession-related.

Possible correlations between the independent determinants

In interpreting the outcome it should be realised that correlations between independent determinants were not the object of study, although such correlations may exist. For instance, a notable gender-related effect may be attributed to a number of other factors such as social circumstances and the work situation [56-59] and qualities of the workplace [60-62]. In developing a policy to reduce the mean frequency and duration of sick leave in a specific region it will be necessary to take into account any correlations between determinants before drawing conclusions.

Analysis per category

It would have increased our understanding of the association between determinants and observed sick leave duration if the entire group of selected determinants could be analysed in a single regression analysis. However, a regression analysis of all selected determinants was not a realistic option because the number of participants actually participating in the analysis (N) would have been quite small due to the number of missing data which would have made the estimates of the regression analysis unreliable. Thus, for pragmatic reasons, the determinants were classified according to the categories they belonged to and then analysed per category. Meanwhile, considering a possible correlation between determinants in which the regions (first research question) or the professions per region (second research question) differed, a regression analysis for the relevant determinants was performed.

Conclusion and Practical Implications

The results of this study indicate an influence of socio-cultural environment on determinants of sick leave next to the influence of characteristics of health status, the work situation or professional group. The results are so far generalisable that, in case nationwide measures are intended to reduce sick leave fre-

quency or duration, one has to take into account that determinants that predict sick leave frequency or duration may differ per region and that only tailor-made interventions, focussed on those determinants that predict sick leave frequency or duration per region, may be effective.

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Chapter 8

General discussion

Introduction

Aim of this study was to investigate regional differences in relevant sick leave determinants in the Netherlands. Subsequently the assumption was made that – in case regional differences in relevant sick leave determinants indeed exist – the type of relevant sick leave determinants might be influenced by region related socio-cultural characteristics.

A performed literature search on regional differences in sick leave showed that the influence of tradition and social class (Virtanen et al., 2000; 2004), or the quality of health services and the tendency to a higher medical consumption might play a role in those differences (Tordoier et al., 1978; Soeters, 1980). Other studies indicated that factors of culture and social tradition, or lifestyle, could be considered as of influence on the health status of communities (Hofstee, 1961; Hofstede, 1980).

As several indicators like for instance socio-cultural history and life style, as perception of own health and higher disability rates, made it plausible that the region South Limburg had a socio-cultural different character than the rest of the country, we choose this region to compare with the region Utrecht. The reason for the choice for the latter region was, that certain professions obviously showed differences in sick leave frequency and duration between the South Limburg and the Utrecht area. Further on urban and rural qualities were comparable as the region Utrecht stands for the city of Utrecht and its immediate surroundings and the region South Limburg stands for the cities of Heerlen and Maastricht and their surroundings.

If one compares sick leave in different regions and one supposes an influence of socio-cultural factors on the type of relevant sick leave determinants per region, one should define these sick leave determinants. For this reason a literature search was performed. Besides, to eliminate profession- and company-related factors a choice was made for certain professions and not for a specific company

As, next to profession and company, socio-economic, rural/urban factors and health services play a role in sick leave, these factors were excluded by choosing for regions, i.e. Utrecht and South Limburg, with an assumed compa-

rable socio-economic and rural/urban environment, and with a comparable quality of health services. Ethnic influences were excluded as only employees who could read and write Dutch were invited to participate.

Generally, in the Netherlands, socio-economic circumstances are nationwide comparable. As for the socio-economic comparability of the two investigated regions, in the sixties and seventies, as a consequence of the closing of the coal mines, the eastern South Limburg area belonged to the, from an economic point of view, weaker parts of the country. However, during the seventies and eighties, the Dutch government strengthened the economic infrastructure of the region by the transfer of government services like Statistics Netherlands (CBS, Centraal Bureau voor de Statistiek) and the social fund for civil servants (ABP, Algemeen Burgerlijk Pensioenfonds) from the Randstad to the eastern South Limburg area. Further on the Dutch government stimulated new economic activities in the region leading to improving employment rates (Van de Vooren and Hanraets, 1990). As for the socio-economic comparability of the regions Utrecht and South-Limburg, it is recognized that socio-economic factors lead to a lesser healthy lifestyle (Programmacommissie SEGV-II, 2001), but there is no reason to suppose that in terms of the socio-economic situation or the extent of poverty, the socio-economic status of the population in the region Utrecht differed begin nineties substantially from that in South Limburg, as in the latter region the economic circumstances had been improved (Derks, 1990; Van de Vooren and Hanraets, 1990). Thus, for obvious reasons, in the nineties the socio-economic situation of the regions Utrecht and South Limburg was comparable. Apart from this, the closing of the coal mines in eastern South Limburg did not sufficiently explain why, in the whole South Limburg area, the levels of sick leave kept higher and a relatively greater number of employees has come to depend on disability benefits or has become unemployed than has been the case in the western part of the country. And this phenomenon apparently continued despite further economic recovery in the South Limburg area.

Generally the regional presence and quality of health services in the Netherlands are comparable. As for health services in South Limburg, over the years these improved substantially. The main reason for this was the opening begin nineties of a new University Medical Center (Academic Hospital) in Maastricht that caused an increase of the number of general practioners and clinical specialists (Stevens and Van der Zee, 1990).

In conclusion, despite the on good grounds assumed comparability of socio-economic circumstances, a comparable presence and quality of health services in our country and comparable legislation on social security, between different regions in the Netherlands differences in sick leave were found.

In the present study we first of all observed the difference in relevant sick leave determinants between the two regions Utrecht and South Limburg in analysing

the effect, per region, of determinants in case homogeneous groups were considered. We assumed that differences in socio-cultural environment might be expressed through relevant determinants related with those differences. The same assumption was made in comparing within one region the determinants of influence on sick leave in case two different professions, i.e. sale and cleaning, were considered. We assumed that, apart from being different professions with a different sick leave pattern, on the basis of socio-cultural characteristics within a region, comparable relevant determinants might be of importance for the sick leave pattern of both professions.

Main findings

Research questions

Research question 1

The first research question was: as for the past decades, according to literature, which determinants related to sick leave frequency and duration were relevant?

In Chapter 2 and Chapter 5 we performed a literature review of the past decades to define a set of relevant sick leave frequency (Chapter 2) and duration (Chapter 5) determinants as to establish the topicality of an intended study using data dating back to the nineties. The performed literature review showed that over the past decades sick leave frequency and duration determinants were presented in a highly consistent picture. It was concluded that a study on sick leave data dating back to the nineties would still be relevant.

Research question 2

The second research question was: are there any differences in the determinants of sick leave frequency between homogeneous groups in two different regions within the same country?

This research question has been answered by comparing different professional groups i.e. sale (Chapter 3) and cleaning (Chapter 4).

In Chapter 3 we compared, between the regions Utrecht and South-Limburg, of the profession sale, the influence of determinants of frequency of sick leave. The results showed differences between the regions with regard to the opinion subjects had about social-medical support during sick leave, the type of appointment they had, the experienced autonomy at the workplace and the annual number of visits to the family doctor. In Utrecht a higher sick leave frequency was seen in case one experienced more autonomy at the workplace. In South-Limburg a higher sick leave frequency was seen in case one had a permanent

appointment and visited the family doctor more often. A lower sick leave frequency was seen in South Limburg if one was more positive about social medical support, experienced more autonomy or was satisfied with private circumstances. It was concluded that apparently per region other determinants were responsible for sick leave frequency.

In Chapter 4 we compared, for the profession cleaning, between the regions Utrecht and South-Limburg, the influence of determinants of sick leave frequency. The regions showed differences concerning the experienced physical workload. If, in South-Limburg, subjects experienced more physical workload, there was a tendency to a higher sick leave frequency. It was concluded that among homogeneous groups in different regions apparently different determinants of sick leave frequency are active. It was also concluded that the outcome corresponded with earlier findings as to which residents of the South Limburg area show a perception of a poorer health, a higher medical consumption and as a consequence higher sick leave rates.

Research question 3

The third research question was: are there any differences in the determinants of sick leave duration between homogeneous groups in different regions within the same country?

This research question has been answered by comparing different professional groups i.e. sale (Chapter 5) and cleaning (Chapter 6).

In Chapter 5 we compared, between the regions Utrecht and South-Limburg, of the profession sale, the influence of determinants of duration of sick leave. The results showed differences between the regions as far as the experienced autonomy at the workplace was concerned, subjects' opinion about supervisors, the annual number of visits to the family doctor and a positive attitude towards work. In Utrecht, though not significant, a longer duration of sick leave was seen if one experienced more autonomy. In South Limburg a longer sick leave duration was seen in case one had a permanent appointment and visited the family doctor more often, and a shorter sick leave duration was seen in case subjects had a positive opinion about their supervisors and about their work. It was concluded that per region other determinants were responsible for sick leave duration.

In Chapter 6 we compared, between the regions Utrecht and South-Limburg, of the profession cleaning, the influence of determinants of duration of sick leave. In Utrecht a longer duration of sick leave was observed if subjects experienced more autonomy and in South Limburg if they perceived a poorer health, an important finding although not significant. In South Limburg, a shorter duration of sick leave was observed for women and if subjects had a burn-out due to their work or if they were satisfied with their private circumstances. It was

concluded that despite the homogeneous groups that were studied regional differences exist in determinants of duration of sick leave.

Research question 4

The fourth research question consisted of two subquestions:

- (a) how do sick leave frequency and duration, without regard to professional group, relate to relevant determinants between different regions within a country and are there differences between these regions in determinants that predict sick leave frequency and duration, and
- (b) are there, between different professional groups within a region, similarities in determinants that affect sick leave frequency and duration indicating an influence of socio-cultural environment?

In Chapter 7 for two socio-culturally different regions the effects of sick leave frequency and sick leave duration determinants were compared *independent* of professional group as to find differences in active sick leave determinants per region (subquestion 4a), and the sick leave determinants were compared *dependent* of professional group as to find similarities within regions (subquestion 4b).

With regard to the first subquestion (4a) it was concluded that, within our country, regional differences in sick leave determinants for frequency and duration did exist and that different determinants predicted sick leave frequency and duration in different regions. As far as a possible influence of socio-cultural environment on duration is concerned, this applies for South Limburg to the determinant called ‘annual number of visits (family doctor)’.

As far as similarities between the two professions within both regions were concerned (the second subquestion: 4b), in Utrecht, for duration, for sale as for cleaning, for the determinant called ‘autonomy’ a similar effect was found. This observation may indicate that in Utrecht for duration ‘autonomy’ is a determinant that is influenced by socio-cultural environment. As for South Limburg, for duration, for sale as for cleaning, for the determinants called ‘type of appointment’ and ‘annual number of visits (family doctor)’ a similar effect was found. And also for South Limburg, for frequency, for sale as for cleaning, for the determinant called ‘perceived physical workload’ a similar effect was found. These observations may indicate that, in South Limburg, socio-cultural environment influences the sick leave frequency determinant called ‘perceived physical workload’ and the sick leave duration determinants called ‘type of appointment’ and ‘annual number of visits (family doctor)’.

In comparing the outcomes of the two subquestions (a and b) we concluded that they were, in South Limburg, for duration, corresponding for the determinant called ‘annual number of visits (family doctor)’. The finding for South Limburg

corresponds with the earlier finding as to which workers in sale showed a higher medical consumption leading to a longer sick leave duration than in Utrecht.

On the basis of the outcome of research question 1 it was concluded that over the past decades sick leave frequency and duration determinants were presented in a highly consistent picture and that a study on sick leave data dating back to the nineties would still be relevant. Resuming the outcomes of the research questions 2 till 4, given the assumption that regional socio-cultural differences may play a role in the type of determinants that affect sick leave, we concluded that this assumption was confirmed for experienced autonomy at the workplace (Utrecht: higher frequency and longer duration) and for the annual number of visits to the family doctor (South Limburg: longer duration).

As far as other determinants are concerned that showed differences in effect on sick leave between the regions, the following has to be taken into consideration. The finding in South Limburg that the family doctor is more often visited may be related to the finding that for cleaning, for frequency, employees experience a higher physical workload. It is unlikely that for cleaning in South Limburg as compared to Utrecht, there would be a structural higher physical workload. Thus, probably not profession-related factors play a role, but a regional difference in the perception of workload and this may be related with socio-cultural factors.

As for the finding for sale in South Limburg, that a permanent appointment leads to a longer sick leave duration, this did not apply to cleaning and was not found in Utrecht. Therefore, this may be an effect of profession- and region-related character.

For South Limburg a sick leave reducing effect was seen if employees were positive about social medical support (for frequency for sale) or if they had a positive opinion about their supervisors (for duration for sale). These findings may be associated with regional socio-cultural factors in the sense that employees in South Limburg appreciate aspects of the work situation generally more positive than employees in Utrecht do.

One of the determinants that appeared to affect sick leave in just one of the regions (Chapter 7, second subquestion: 4b), was: the appreciation for one's work (South Limburg, cleaning: a higher frequency). The reason for this paradoxical finding as to which the outcome is contradictory to literature is unclear. As yet we consider it as a mere coincidental finding. In this respect, in case one finds regional differences in determinants that affect sick leave, it is recommended to consider always the possibility of isolated coincidences, being not of any specific character, that attribute to this phenomenon.

As far as the comparison of the individual frequency and duration determinants of the two professions within the regions is concerned (Chapter 7, second subquestion: 4b), we found a remarkable similarity in results between the

regions in the sense that working contents were equally different appreciated by the employees of both professions. This means that in both regions employees in sale as compared to cleaning experienced less workload in the sense that they did not need to do more work in the same amount of time, and they showed a better match between work and level of education. Further on in both regions employees in sale as compared to cleaning experienced more mental workload and they were younger and more often not married. It was concluded that these outcomes indicate the influence of profession- i.e. not region-related determinants.

Socio-cultural characteristics as a factor in sick leave in South Limburg as compared to the rest of the Netherlands

Before answering the question whether the found differences in relevant determinants between South Limburg and Utrecht refer to socio-cultural differences between those regions, a definition is needed as to what socio-cultural characteristics stand for and how they apply to the regions South Limburg and Utrecht.

Hofstede et al. (1990) defined the cultural identity of a population as a collective 'programme' of the mind that discriminates groups from each other. Soeters and Felling (1990) stated that the various socio-cultural fields are: religion and view of life, civic life and conservatism, marriage and personal relations, illness and health, localism and ethnocentricity, political opinions, work and consumerism. According to these authors, culture is a common characteristic of groups of people on the level of a family, company, region or country, expressed through people's behaviour and opinions.

As for the made assumption that from a socio-cultural point of view South Limburg differs from the rest of the Netherlands, Soeters and Felling (1990) observed that the history of South Limburg is different from that of the rest of the country, till 1830 being ruled by surrounding principalities and as a consequence influenced by German and Flemish/Wallonian socio-cultural traditions like a Roman Catholic orientated culture, whereas the western part of the Netherlands is Calvinistic of character. An indicator for a certain socio-cultural influence from the neighbouring abroad is the perception of a poorer health of the South Limburg residents, as residents of the German 'Land' Nordrhein Westfalen also show uncertainty about their health (Hofstede, 1980) and therefore, as South Limburgers do, visit their doctor more often (Stevens and Van der Zee, 1990).

Philipsen (1985) and Stevens and Van der Zee (1990) supposed that the dominant Roman Catholic culture in South Limburg is a factor in the less sober life style of the South Limburg residents. The population of the Calvinistic north is more healthy and has a longer life expectation. Stevens & Van der Zee

(1990) observed that smoking and drinking as possible socio-cultural manifestations of a less healthy life style, are a more accepted habit in daily life in South Limburg, be it that nowadays smoking is decreasing (Municipal Health Services Limburg, 2005). These authors also found that South Limburg residents report more health complaints and show higher disability rates. As a consequence of another perception of one's own health, one's own responsibility and the consulting of doctors, which are characteristics that reflect differences in health and differences in culture, South Limburg as compared to the rest of the Netherlands will show higher sickness absence and disability rates. Anno 2006 some important indicators still do suppose that socio-cultural factors influence the behaviour of residents of the South Limburg area as they did a few decades ago. Disability pensions in South Limburg are still higher than in the rest of the country (17.7% vs. 11.9%), the same applies to unemployment rates (11.3% vs. 9%) (Atlas Social Insurances 2003-2005, 2005; Limburg in cijfers. [Limburg in figures] 2006).

Socio-cultural differences between South Limburg and the rest of the country were found with regard to more collectivism in the Limburg area versus more individualism in the region Utrecht and, namely for youngsters, in South Limburg as compared to the Utrecht area, a stronger orientation on the partner and the family was found (Felling and Peters, 1985).

In summary important observations of the 1985-interview of the SOCON-study (Felling and Peters, 1985) were that values, attitude to life and socio-cultural opinions of the total Limburg population mostly evidently differ from that of the total Dutch population; that these differences are the stronger if people are older (> 50 year) and diminish if they are younger; that Limburg youngsters follow the values and attitude to life of the western youngsters from a distance. According to Soeters and Felling (1990) socio-cultural perceptions like ethnocentricity (stronger in South Limburg) and moral conservatism (idem) of the people of South Limburg are moving towards those of the people living in the western part of the country. As for the younger generation, this showed in 1985 (Felling and Peters, 1985) still a certain (with growing age narrowing) distance from the western youngsters, be it that a complete agreement was not expected. Youngsters in South Limburg differ with respect to their behaviour towards others: partner, family and authorities. The already mentioned tendency of Limburg residents to more collectivism is demonstrated by the participation in clubs. As compared to their countrymen especially Limburg youngsters were more active in clubs in 1985 as was still the case in 2000 (Eisinga and Coenders, 2000). This finding implies a certain consistency in differences between Limburg and the rest of the country. Further on, as compared to their peer group in the rest of the country, the younger generation in Limburg shows a stronger involvement in the neighbourhood. Moreover, Limburg youngsters consider living for family as more important than people of the same age elsewhere in the country do.

Finally, in 2000, young Limburg residents consider themselves more cooperative, less withdrawn, more kind, more sympathetic and more helpful than their western counterparts. Anno 2000 solidarity things like levelling of income have the sympathy of the Limburg youth (Eisinga and Coenders, 2000). Thus, it appeared recently that Limburg youngsters still show a stronger tendency to solidarity. They show a stronger orientation on groups c.q. social integration. These still existing differences between the Limburg youngsters and those in the rest of the country marks a more collectivistic mentality of the former and a more individualistic mentality of the latter. As a matter of fact the more collectivistic mentality of the South Limburg residents may be a factor in the settling of certain industrial companies in Limburg.

Most Limburgers still show affinity with the church of which the influence in daily life has been reduced dramatically and the attitude towards religious authorities is more ambiguous than ever. Nevertheless people are attached to continuity, i.e. a kind of 'familiarity' with community traditions, which is contradictory to a supposed individualistic tendency (Knibbe, 2007). Summarized, in Limburg 'community spirit' is still present and may be related with the former dominant Roman Catholic culture, whereas the rest of the country is characterized by a more individualistic orientated Calvinistic culture. As the core of a culture is the less changeable (Soeters and Felling, 1990), the assumption is that, as compared to a more individualistic culture, the collectivistic character of the Roman Catholic culture still plays a role in the way people in Limburg view life.

Soeters and Felling (1990) expected that with the rising number of not Limburg born residents, the differences in level of education would disappear. However, the situation in 2000 is not quite different from that in 1990, as we know that the percentage of low educated in Limburg is still more than 5% higher than elsewhere (Limburg in cijfers. [Limburg in figures], 2006). As for the present study we did not found such a difference in level of education. In this respect we considered the study populations as homogeneous, that is the results were not influenced by level of education.

As for the differences in health behaviour and medical consumption between Limburg and the rest of the Netherlands, it is expected that Limburg will gradually resemble the rest of the Netherlands. However, paradoxically as it is, as a consequence of Euregional influences through the removal of internal European checkpoints and border control (Schengen Treaty, 1985), South Limburg will keep a foreseeable resemblance with for instance the German 'Land' Nordrhein Westfalen. Thus, the European Union has a contrary effect on the since centuries developed 'nation-states' in the sense that the arising of 'euregions' stimulates (eu)regional initiatives with the consequence of more influence from the near-by abroad. In the end the influence of the surrounding

countries especially in regions as South Limburg may grow at the cost of the influence of a more ‘nation state’ culture. Similarities in the outcome of the analysis of the SOCON-data 1985 (Felling and Peters, 1985) and 2000 (Eisinga and Coenders, 2000), the study of Knibbe (2007) as the disappearing border control between European countries, indicate that *euregional* developments direct at a more *euregional* orientation (and integration) instead of an integration of characteristics on a *national* level, i.e. *between* countries, with the paradoxical consequence that socio-cultural characteristics of regions situated in *euregions* are diverging from national socio-cultural characteristics.

The results of this study viewed in the light of socio-cultural characteristics

We concluded that socio-cultural factors may play a role for health status in South Limburg and for autonomy in Utrecht.

As for the results with regard to the region South Limburg, from a socio-cultural point of view we consider these as typical for the South Limburg population. This applies to the determinants called ‘perceived physical workload’, referring to health status in the sense that health complaints through physical perceived workload are an expression of a poorer health (Schalk, 1989; Hopstaken, 1994; Feuerstein et al., 2001; IJzelenberg et al., 2004), and the determinant called ‘annual number of visits (family doctor)’, referring to health status in the sense of health complaints. These determinants cause more sick leave. As the chosen diagnoses ‘low back pain’ and ‘uncomplicated stress’ leave the subject much freedom to act, we observe that the combination of the perception of a poorer health and more medical consumption leads to a higher sick leave frequency and a longer sick leave duration. The lesser healthy lifestyle of the South Limburg residents will attribute to this phenomenon.

As for the results with regard to the region Utrecht, in contrast with the literature (Karasek, 1990; Greiner et al., 1998; Shain, 1999; Ala-Mursala et al., 2002), a greater autonomy at the workplace in Utrecht had, without respect of profession, an increasing rather than reducing effect on sick leave frequency and duration. As socio-cultural environment is supposed to influence this determinant, a possible explanation for the finding may be that, for sale, in the Utrecht area employees in the age of 20 to 40 years appreciate ‘autonomy’ at the workplace different in the more individualistic sense that it has a connotation of more freedom instead of more responsibility, whereas in the South Limburg area employees of the same age appreciate autonomy as an occasion to prove their discipline in performing the job in the sense of attributing to the group, an attitude that refers to a more collectivistic habitus. As for the South Limburg group of employees older than 40 years we expect them to attach even more to

collectivistic values, as these culture-bound characteristics were in this region the stronger present in case one was older.

In accordance with literature we found that, independent of profession, in South Limburg, though not significant, more autonomy lead to a lower sick leave frequency and a shorter sick leave duration and that, be it also not significant, for sale in South Limburg, autonomy appeared to be related with a lower frequency and a shorter duration. At the same time, in comparing the effect of the ‘autonomy’ determinant for cleaning in South Limburg with that in Utrecht we observed, though not significant in the South Limburg area, a longer sick leave duration in South Limburg and a higher frequency in Utrecht, which may indicate the existence of a profession-related influence. In this regard we consider the difference between the two professions, sale and cleaning, as a possible explanation. In cleaning supervision at the workplace is generally less strict with probably a paradoxical effect as far as perception of ‘autonomy’ is concerned.

Whether ‘age’ is a factor in the appreciation of ‘autonomy’ at the workplace, for sale as for cleaning, needs further study. This also applies to the paradoxical finding, in South-Limburg, that for cleaning ‘appreciation for one’s work’ is associated with a heightening effect on frequency. This finding may find its cause in the type of profession with its less strict supervision at the workplace, leading to another perception of such things as ‘appreciation for one’s work’. Further research is also necessary with regard to the finding in South Limburg that a burnout due to work is associated with a shorter duration of sick leave. Regarding being female a possible explanation for the finding that, for cleaning, this leads to a shorter duration of sick leave, may be the composition of the study population. In fact, cleaning is in Utrecht (73%) as well as in South Limburg (82%) particularly practised by women and this may be the explanation for the finding.

Methodological reflections

(a) the number of participants

Although we presumed to reach a number of at least 50 till 100 participants per region this estimation, taken into account the number of missings, turned out to be too optimistic. The research period – restricted for organizational reasons – had, in retrospect, better be somewhat longer. We obtained the sample sizes as follows. Participants had to be between 20 and 40 years old and the reason why they reported sick had to be ‘low back pain’ or ‘uncomplicated stress’. The decision to use these diagnostic categories had a pragmatic and theoretic basis: it was assumed that, using these commonly found diagnoses which leave the

subject – other than specific diseases – much freedom to act (i.e. to report sick for work or not), a substantial number of participants (at least 50 to 100 per region) could be recruited within a relative short period of time (6 months). 321 employees (131 in Utrecht, 190 in South Limburg) agreed to participate. This number was the outcome of the interview period of six months as the result of an aselect procedure in which every next employee meeting the requirements was asked to participate. Employees who agreed to participate really did, although some of them did not respond to the interview. In Utrecht 63% (sale, N: 79) and 75% (cleaning, N: 52) did respond and in South Limburg 82% (sale, N: 105) and 68% (cleaning, N: 85). It is recognized that the sample sizes are small, be it that the present study is a study of the possible influence of socio-cultural factors on the type of determinants that affect sick leave among in terms of age, profession and level of education homogeneous groups. Therefore the sample sizes were, though small, sufficient to perform the study. Besides, other aspects that attributed to the homogeneity of the study populations were: a) employment contracts in the two regions were similar for each of the professions, as was the administrative implementation of social security regulations; b) employees who did not speak or write Dutch – most of them belonging to other ethnic groups – were not invited to participate, as they would have been unable to fill in the interview booklet; c) in selecting both the ‘Utrecht region’ with the city of Utrecht and its immediate surroundings and the ‘South Limburg region’ including the cities of Heerlen and Maastricht, with regard to each region a balance of rural and urban qualities was reached.

(b) the small number of participating regions and participating professions

As for the small number of participating regions and professions, these obviously concerned regions with evident different socio-cultural characteristics and professions of a different character. As for the professions cleaning and sale, some remarkable differences are: in cleaning one often works part-time on moments beyond normal working hours and the work is heavier than in sale; the organisation of the work in cleaning is less strict in the sense that supervision is incidental and not permanent. In a sense, in cleaning, one is often working on his own, free from immediate responsibility, whereas in sale supervisors and clients are always present and demand direct alertness and enthusiasm. Apart from the for sale and cleaning found differences in sick leave between the regions Utrecht and South Limburg, the difference in character and performance of both professions implies that the choice for employees working in these professions, was an appropriate one. Workers in sale generally do their jobs within normal working hours, under less heavy physical circumstances, and in a more strict organisational setting as workers in cleaning do. Therefore, similarities in effects of determinants of sick leave between these professions, can be considered as relevant and indeed a right subject for interpretation.

(c) the skewness of the dependent variable in cleaning

Especially in cleaning, for frequency as for duration, we observed a remarkable skewness of the dependent determinant. This finding is quite usual in sick leave research in which the dependent determinant is often not normally distributed and this may be a reason to apply a statistical analysis on a non-parametric level. Further on we considered that the profession cleaning has, at least in the Netherlands, a reputation of rather high rates in frequency and duration of sick leave. Disability pensions in cleaning were, in the past few decades, the highest of all professions. This means that this type of profession is well known for its extreme/outlying scores in sick leave frequency and duration rates.

(d) analysing the entire group of selected determinants

If the entire group of selected determinants was analyzed in a single regression analysis, it would have given a better understanding of how the determinants were associated with the observed sick leave frequency and duration. A regression analysis of all selected determinants, however, was not a realistic option because the number of participants actually participating in the analysis (N) would have been quite small due to the number of missing data and, consequently, the outcome would not be easy to interpret. Thus, it was for pragmatic reasons that the determinants were classified according to the categories they belonged to and then analysed per category. Meanwhile, considering a possible correlation between determinants in which the regions differed, a regression analysis for the relevant determinants was performed.

(e) limitation in interpreting the outcomes

In interpreting the outcomes it should be realized that possible correlations between the independent determinants were not object of study, although such correlations may exist. In developing a policy to reduce the mean frequency or duration of sick leave in a specific region it will be necessary to take into account possible correlations between determinants before drawing any conclusions.

(f) the study's results and the level of significance

According to Plantenga (1981) using only the 5% significance level in applied research may be inappropriate and provide policy-makers with an unnecessarily incorrect picture, at least when correlations above the 5% level are not taken into consideration. Therefore, apart from results for which $p < .05$ we also distinguished results for which $.05 < p < .10$. Meanwhile $p < .05$ for most of the results. Furthermore in most cases the opposite sign of the beta values attributed to the difference in effect of the determinant as for instance shows Table 3 (Chapter 5).

As for the estimated variance components, they should theoretically be nonnegative. Relative small components of the variance with a negative sign are generally a consequence of a small sample size and/or a consequence of the

skewness of the dependent determinant. As for the results of Chapter 5 it is recognized that for some analyses the outcome is less reliable because of the negative sign of the components of the variance. However, as for the effect of the determinant ‘annual number of visits (family doctor)’ (Table 3, Chapter 5), in this case the sign of the component of the variance was positive.

The topicality of the study in terms of the organization of social security

As a result of changes in the organization of the social security system in the Netherlands, strict regional registration of sick leave frequency and duration have ceased to exist. Since 2003 the Nationale Verzuimstatistiek (Statistics Netherlands, 2006a) provides sick leave registration per Dutch province and this shows that differences in sick leave still exist on a provincial level. Moreover, as for the present study, as it was carried out during the 1990s, the consistency in determinants predicting frequency and duration of sick leave adds to the relevance of its outcome.

In the Netherlands sick leave has gradually decreased since the nineties. This decrease is generally attributed to changes in the organisation of social security. Occupation health services took the place of the social funds. Although these changes affected the country as a whole rather than specific regions, the social security system for the certification of sick leave has grown less uniform. Therefore in future research on regional differences in sick leave, apart from the in this study presented independent determinants still relevant today, will have to include determinants of the statutory compensation system as well.

As for the present study, this seeks an explanation for regional differences in sick leave and for this aim uses an original research model. This model assumes the existence of regional differences in sick leave on the basis of socio-cultural differences, which find their expression in well-known sick leave determinants. Changes in the organization of the social security system will not alter the present theoretical model as such and at the time the study was performed, the two regions had the same statutory compensation system, that is employees reporting ill were met with a similar approach.

Meaning of the results

People in South Limburg live less healthy than their countrymen (Soeters, 1980; Bloemberg et al., 1993; Statistics Netherlands, 1997; Municipal Health Services Limburg, 2005; Statistic Netherlands, 2006b). This may, as a consequence of

more health complaints, be an explanation for the higher medical consumption in this region and this may lead to a higher sick leave frequency and sick leave duration. As far as the findings of Virtanen et al. (2000; 2004) are concerned, these are confirmed in the present study in the sense that region related characteristics like a certain perception of autonomy (Utrecht) or medical consumption (South Limburg), may affect sick leave. The way people appreciate autonomy at the workplace (Utrecht) or perceive their own health in the sense that they visit the family doctor more often (South Limburg), may be expression of regional socio-cultural habits or traditions. In aiming at a reduction of sick leave on a regional level one has to count with these facts as one has to count with the finding that, per region, other determinants of sick leave may be relevant.

Tordoir et al. (1978) and Soeters (1980) observed, in the region South Limburg, that waiting lists for hospital treatment were a factor in the longer duration of sick leave in South Limburg versus the rest of the country. In the present study also a longer duration of sick leave was observed in South Limburg, be it that waiting lists are a less presumable cause, because the infrastructure of health services in South Limburg improved substantially with the opening, begin nineties, of the Maastricht University Medical Center. Despite this fact sick leave and disability rates in South Limburg as compared to the rest of the country kept higher levels.

The results of this study indicate that regional differences in sick leave may origin from socio-cultural differences between regions. This means that, apart from the fact that type of branch or type of profession, or character and seriousness of disease, are of influence on sick leave, aspects of behaviour are so too.

Suggestions for further research

As for the possibility to continue research on regional differences in sick leave, we recommend:

- 1) repeat the same study for the same regions but with different professions, presumably as different from each other as sale and cleaning are;
- 2) repeat the same study with other regions and the same or other professions;
- 3) repeat the study cf. a) and b), but with study populations older than 40 years as to see whether these groups, as a consequence of socio-cultural factors, show regional differences in sick leave too;
- 4) in sick leave the organisation of social security implies a certification system according to which controlling officials like occupational doctors certificate the sick leave period of employees. These controlling officials as well as family doctors and clinical specialists, which are consulted by employees that take a sick leave, have their own influence on the duration of sick leave, and they are part of the socio-cultural environment. As a consequence it is recommended that in future research the role of these officials is also taken into account;

5) consider the possibility that even within a relative small province like Limburg socio-cultural differences may exist that influence the way people act in sick leave, for instance the differences between the cities of Heerlen (near Germany) and Maastricht (near Belgian Wallony) and the differences between North and South Limburg. In this respect the following observation is important. As for South Limburg as compared to North Limburg, as a consequence of the oblong form of Limburg, even these two parts of the relative small province of Limburg differ. The condition of the South Limburg soil is different from that in North Limburg and the difference between urban and rural populations in North Limburg is bigger than is the case in South Limburg. These factors probably contribute to socio-cultural and socio-economic differences between two regions within one province and besides, apart from that, the South Limburg area is surrounded by foreign countries which is not the case in North Limburg and is not the case in any other region of the Netherlands.

Practical implications

If a study uses, as was done here, homogeneous groups i.e. with comparable work and individual characteristics, then comparable determinants can be expected to affect sick leave frequency and duration in either group. As for the study being performed among homogeneous groups, this contributes to the exclusiveness of the (small number) of sick leave determinants that regions apparently differ in. The results of the present study indicate that region-related socio-cultural factors may be of influence on sick leave. The results are so far generalisable that, in case nationwide measures to reduce frequency or duration of sick leave are intended, one has to take into account that determinants that predict frequency or duration of sick leave may differ per region. The outcome of this study should be taken into consideration by national governments, international operating companies and supra-national organisations like the European Union and the United Nations, in developing a policy on regional differences in sick leave and disability pensions. The finding is also important for nationwide operating organisations (in the Netherlands called ‘Arbodienst’) that offer commercial services to companies to reduce the sick leave volume. They should be aware of the possibility that their approach, especially concerning the type of determinants that affect sick leave, might be different per region. This should be a stimulus for them to registrate sick leave not only per company they work for, but also per region and per profession. Furthermore the type of interventions to reduce sick leave will have to be directed at the sick leave determinants active in that region.

Literature on sick leave generally concentrates on sick leave determinants, specific diseases or type of professions and less on local or regional socio-cultural environment that affects people’s perception of their work situation or their health status. In other words, the ‘human factor’ is under-estimated. And

this not only applies to sickness absence, but to a broad spectrum of social security and welfare facilities, both nationally and regionally organised. People are part of a social community with its own habits and traditions and these habits and traditions are of influence on consumer's behaviour. Such behaviour does not apply to consumers' habits only, which habits are generally the target of marketing strategies, but it also applies to the appeal people do on social security and welfare services. As sick leave behaviour is affected by different determinants per region, measures to reduce sick leave must be directed on the determinants that are characteristic for a specific region. Thus, in case measures to reduce sick leave are intended, one has to take into account that determinants that predict sick leave may differ and that only tailor-made interventions, focussed on those determinants that predict sick leave per region, may be effective.

As in European policy a number of topics like for instance disability pensions and unemployment, are considered in the light of regional circumstances and developments, it is recommended to pay also attention to regional differences in sick leave. As a matter of fact reducing non-participation is one of the topics of European social security policy (Lisbon Treaty, 2000). In case, on a European level, one aims a substantial reduction of sick leave in specific regions, one always has to take into account that, for reasons of socio-cultural differences between countries, and between regions within countries, sick leave can be affected by different types of well known determinants of sick leave. The same applies to international operating companies in industry and trade. As a growing number of these companies are moving their activities to low-budget countries, they have to take into account that aspects of public health like lifestyle and medical consumption differ between countries and, within countries, between regions.

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Summary

Introduction

The present study concentrates primarily on possible differences in effective sick leave determinants among homogeneous groups in different regions in the Netherlands. Secondly, the found differences in effective sick leave determinants are viewed in the light of regional differences in socio-cultural environment.

As in the Netherlands, till begin nineties, regional differences in sick leave were monitored permanently, this gave the opportunity to compare regions with regard to relevant sick leave determinants. As the professions sale and cleaning showed differences in sick leave between the regions Utrecht and South-Limburg and these regions were assumed to differ in socio-cultural atmosphere, a choice was made for those two professions and those two regions. This gave the opportunity to compare for similar professions the effect of sick leave determinants between the two regions. Besides, as the two chosen professions are of a different character, this made it possible to compare within the regions the effect of sick leave determinants between those professions. The research questions we want to answer are:

1. As for the past decades, according to literature, which determinants related to sick leave frequency and duration were relevant? (Chapter 2 and Chapter 5.)

This research question will be answered in Chapter 2 (sick leave frequency determinants) and Chapter 5 (sick leave duration determinants).

2. Are there any differences in the determinants of sick leave frequency between homogeneous groups in two different regions within the same country?

This research question will be answered for two different professional groups i.e. sale (Chapter 3) and cleaning (Chapter 4).

3. Are there any differences in the determinants of sick leave duration between homogeneous groups in different regions within the same country?

This research question will be answered for two different professional groups i.e. sale (Chapter 5) and cleaning (Chapter 6).

4. a. How do sick leave frequency and duration, without regard to professional group, relate to relevant determinants between different regions within a country and are there differences between these regions in determinants that predict sick leave frequency and duration, and:

b. Are there, between different professional groups within a region, similarities in determinants that affect sick leave frequency and duration indicating an influence of socio-cultural environment? (Chapter 7).

The research questions 4a and 4b will be answered in Chapter 7.

To get an idea of the continuity in relevant sick leave determinants, a literature search over the years 1984-2004 was performed. Continuity in relevant sick leave determinants is important as the study uses data dating back to the nineties.

Workers were included in the study population as soon as they reported sick and unable to work. In order to exclude specific effects of younger (< 20 years) and older (> 40 years) subjects on the results and, in doing so, enhancing the homogeneity of the research group, participants had to be between 20 and 40 years old and the reason why they reported sick had to be 'low back pain' or 'uncomplicated stress'. The decision to use these diagnostic categories had a pragmatic basis: it was assumed that, using these commonly found diagnoses which leave the subject – other than specific diseases – much freedom to act (i.e. to report sick or not), a substantial number of participants (at least 50 to 100 per region) could be recruited within a relative short period of time (6 months).

321 employees (131 in Utrecht, 190 in South Limburg) agreed to participate. In Utrecht 63% (sale, N: 79) and 75% (cleaning, N: 52) did respond and in South Limburg 82% (sale, N: 105) and 68% (cleaning, N: 85).

The interview questions referred to the determinants identified in the literature review. Determinants belonging to similar categories were combined. Thus, the categorized determinants constitute the independent variables while sick leave is the dependent variable. The selected determinants were used as the basis for the statistical analysis. A study of the mean frequency and duration of sick leave requires a certain period of registration which, in the present study, was the year before the day of reporting sick. The mean frequency and duration of sick leave in the referred year was used in the analyses. The performed statistic analysis was as follows: (a) a dependent group t test; (b) an independent sample t test; (c) regression analyses per region; (d) a comparison of the regression coefficients for the two regions; and (e) a regression analysis in order to find any correlations between the determinants in which the regions differ.

Chapter 1

In *Chapter 1* a definition was given as to which one should understand by a 'region' i.e. the socio-cultural characteristics of the residents of a region. Socio-cultural characteristics express themselves through people's behaviour and opinions and are common within groups of people.

Taking into account the different regional sick leave figures in South Limburg versus the rest of the country, the in the past decades higher disability and unemployment rates in this region, the different life style and the different socio-cultural history as the, as a consequence of the removal of the internal European border checkpoints, growing euregional influence of the neighbouring countries and, finally, the different perception of health status, we considered the Limburg population as socio-culturally different from the rest of the Netherlands. As to find another region to compare the region South Limburg with,

pragmatic considerations predominated like the central position of the city of Utrecht and this city being the residence of the social fund Detam. Sick leave frequency and duration figures from the Detam, in general and for specific professions, showing differences between the region Utrecht and the region South Limburg, stimulated the choice for the region Utrecht, that is the city of Utrecht and its immediate surroundings, to be compared with the region South Limburg. The comparable mix of urban and rural qualities of both regions, the region South Limburg including the cities of Heerlen and Maastricht, as the socio-economic comparability of the regions, were an extra stimulans to have these regions compared with regard to their sick leave behaviour.

Chapter 2 and Chapter 5

In *Chapter 2* and *Chapter 5* the answer on the first research question was given. This question was: as for the past decades, according to literature, which determinants related to sick leave frequency and duration were relevant? The performed literature review showed that over the past decades sick leave frequency and duration determinants were presented in a highly consistent picture. It was concluded that a study on sick leave data dating back to the nineties would still be relevant.

Chapter 3 and Chapter 4

In *Chapter 3* and *Chapter 4* the second research question was answered. This question was: are there any differences in the determinants of sick leave frequency between homogeneous groups in different regions within the same country?

In Chapter 3 we compared, between the regions Utrecht and South-Limburg, of the profession sale, the influence of determinants of frequency of sick leave. The results showed differences between the regions with regard to the opinion subjects had about social-medical support during sick leave, the type of appointment they had, the experienced autonomy at the workplace and the annual number of visits to the family doctor. In Utrecht a higher sick leave frequency was seen in case one experienced more autonomy at the workplace. In South-Limburg a higher sick leave frequency was seen in case one had a permanent appointment or visited the family doctor more often. A lower sick leave frequency was seen in South Limburg if one was more positive about social medical support or experienced more autonomy. It was concluded that apparently per region other determinants were responsible for sick leave frequency.

In Chapter 4 we compared, for the profession cleaning, between the regions Utrecht and South-Limburg, the influence of determinants of sick leave frequency. The regions showed differences concerning the experienced physical workload. If subjects in South-Limburg experienced more physical workload, there was a tendency to a higher sick leave frequency. It was concluded that

among homogeneous groups in different regions apparently different determinants of sick leave frequency are active. It was also concluded that the outcome corresponded with earlier findings as to which residents of the South Limburg area show a perception of a poorer health, a higher medical consumption and as a consequence higher sick leave rates.

Chapter 5 and Chapter 6

In *Chapter 5* and *Chapter 6* the third research question was answered. This question was: are there any differences in the determinants of sick leave duration between homogeneous groups in different regions within the same country?

In Chapter 5, of the profession sale, the influence of determinants of duration of sick leave between the regions Utrecht and South-Limburg was compared. The results showed differences between the regions as far as the experienced autonomy at the workplace was concerned, subjects' opinion about supervisors, the annual number of visits to the family doctor and a positive attitude towards work. In Utrecht a longer duration of sick leave was seen if one experienced more autonomy. In South Limburg a longer sick leave duration was seen in case one had a permanent appointment or visited the family doctor more often and a shorter sick leave duration was seen in case subjects had a positive opinion about their supervisors. It was concluded that per region other determinants were responsible for sick leave duration. Further on it was concluded that for duration, for sale in Utrecht, apart from the determinants analyzed in this study, apparently other determinants have their effects on sick leave duration.

In Chapter 6, of the profession cleaning, the influence of determinants of duration of sick leave between the regions Utrecht and South-Limburg was compared. In Utrecht a longer duration of sick leave was observed if subjects experienced more autonomy and in South Limburg if they perceived a poorer health. In South Limburg, a shorter duration of sick leave was observed for women and if subjects had a burn-out due to their work or if they were satisfied with their private circumstances. It was concluded that despite the homogeneous groups that were studied regional differences exist in determinants of duration of sick leave.

Chapter 7

In *Chapter 7* the fourth research question was answered which existed of two subquestions: a) how do sick leave frequency and duration, without regard to professional group, relate to relevant determinants between different regions within a country and are there differences between these regions in determinants that predict sick leave frequency and duration, and b) are there, between different professional groups within a region, similarities in determinants that affect sick leave frequency and duration indicating an influence of socio-cultural environment?

With regard to the first subquestion (4a) it was concluded that, for frequency as for duration, different determinants were of influence and that, as far as a possible influence of socio-cultural environment on duration is concerned, this applies for South Limburg to the determinant called ‘annual number of visits (family doctor)’.

As far as similarities between the two professions within both regions were concerned (the second subquestion: 4b), in Utrecht, for duration, for sale as for cleaning, for the determinant called ‘autonomy’ a similar effect was found. As for South Limburg, for duration, for sale as for cleaning, for the determinants called ‘type of appointment’ and ‘annual number of visits (family doctor)’ a similar effect was found. And also for South Limburg, for frequency, for sale as for cleaning, for the determinant called ‘perceived physical workload’ a similar effect was found. It was concluded that in Utrecht for duration ‘autonomy’ is a determinant that is influenced by socio-cultural environment and that, in South Limburg, socio-cultural environment influences the sick leave frequency determinant called ‘perceived physical workload’ and the sick leave duration determinants called ‘type of appointment’ and ‘annual number of visits (family doctor)’.

In comparing the outcomes of the two subquestions (a and b) we concluded that they were, in South Limburg, for duration, corresponding for the determinant called ‘annual number of visits (family doctor)’. The finding for South Limburg corresponds with the earlier finding as to which workers in sale showed a higher medical consumption leading to a longer sick leave duration than in Utrecht.

Conclusion

On the basis of the outcome of research question 1 it was concluded that over the past decades sick leave frequency and duration determinants were presented in a highly consistent picture and that a study on sick leave data dating back to the nineties would still be relevant. Resuming the outcomes of the research questions 2 till 4, given the assumption that regional socio-cultural differences may play a role in the type of determinants that affect sick leave, we concluded that this assumption was confirmed for experienced autonomy at the workplace (Utrecht: higher frequency and longer duration) and for the annual number of visits to the family doctor (South Limburg: longer duration).

As for regional differences in socio-cultural environment that might explain possible found differences in effective sick leave determinants per region, the following considerations were made.

Sick leave has been object for study for years and many determinants passed by, but a possible role of regional socio-cultural influences was neglected. Sick leave is not only related with illness, but also with behaviour.

Factors of culture and social tradition, or lifestyle, may be considered as of influence on the health status. The cultural identity of a population is defined as a collective 'programme' of the mind that discriminates groups from each other. Culture, expressed through people's behaviour and opinions, is a common characteristic of groups of people for instance within a family, region or country. Thus, traditionally, residents of the Dutch region South Limburg as compared to the rest of the Netherlands show a less healthy lifestyle and a perception of a poorer health that stimulate the medical consumption and probably sick leave. As for the origins of potential socio-cultural differences between the South Limburg area and the rest of the country, presumably the dominant Roman Catholic culture in South Limburg, with a less sober life style, is a factor in the health status of the residents. The more Calvinistic north of the Netherlands shows a healthier population with a healthier lifestyle and a longer life expectation.

As several indicators like for instance socio-cultural history and life style, as perception of own health and disability rates, made it plausible that the region South Limburg had a socio-cultural different character than the rest of the country, we choose this region to compare with the region Utrecht. Further on pragmatic considerations predominated like the central position of the province Utrecht and the city of Utrecht being the residence of the social fund Detam.

As for some not health-related socio-cultural characteristics of the South Limburg population we observed the following. Socio-cultural differences between South Limburg and Utrecht were found with regard to more collectivism in the Limburg area versus more individualism in the region Utrecht and, especially for youngsters, a stronger orientation on one's partner and family in South Limburg as compared to Utrecht.

As for the results with regard to the region Utrecht, in contrast with the literature, a greater autonomy at the workplace in Utrecht had, without respect of profession, an increasing rather than reducing effect on sick leave frequency and duration. As socio-cultural environment is supposed to influence this determinant, a possible explanation for the finding may be that, for sale, in the Utrecht area employees in the age of 20 to 40 years appreciate 'autonomy' at the workplace different in the more individualistic sense that it has a connotation of more freedom instead of more responsibility, whereas in the South Limburg area employees of the same age appreciate autonomy as an occasion to prove their discipline in performing the job in the sense of attributing to the group, an attitude that refers to a more collectivistic habitus. As for the group of employees older than 40 years we expect them to attach even more to individualistic (the rest of the country) or collectivistic (South Limburg) values, as these culture-related characteristics were, at least for the South Limburg population, the stronger present in case one was older.

As for the results with regard to the region South Limburg, from a socio-cultural point of view we consider these as typical for the South Limburg

population. This applies to the determinants called ‘perceived physical workload’, referring to health status in the sense that health complaints through physical perceived workload are an expression of a poor health, and the determinant called ‘annual number of visits (family doctor)’, referring to health status in the sense of health complaints. These determinants cause more sick leave. As the chosen diagnoses ‘low back pain’ and ‘uncomplicated stress’ leave the subject much freedom to act, we observe that the combination of the perception of a poorer health and more medical consumption leads to a higher sick leave frequency and a longer sick leave duration. The lesser healthy lifestyle of the South Limburg residents will attribute to this phenomenon.

In accordance with literature we found that, independent of profession, in South Limburg, more autonomy lead to a lower sick leave frequency and a shorter sick leave duration and that for sale in South Limburg, autonomy appeared to be related with a lower frequency. On the basis of the results, possible socio-cultural influences were assumed to exist with regard to the finding that, in cleaning in South Limburg, for frequency, employees experience a higher physical workload.

As for the finding for sale in South Limburg, that a permanent appointment leads to a longer sick leave duration, this did not apply to cleaning and was not found in Utrecht. Therefore, this may be an effect of profession- and region-related character.

For South Limburg a sick leave reducing effect was seen if employees were positive about social medical support (for frequency for sale) or if they had a positive opinion about their supervisors (for duration for sale). These findings may be associated with regional socio-cultural factors in the sense that employees in South Limburg appreciate aspects of the work situation generally more positive than employees in Utrecht do.

One of the determinants that appeared to affect sick leave in just one of the regions was the appreciation for one’s work (South Limburg, cleaning: a higher frequency). The reason for this paradoxical finding as to which the outcome is contradictory to literature is unclear. As yet we consider it as a mere coincidental finding. In this respect, in case one finds regional differences in determinants that affect sick leave, it is recommended to consider always the possibility of isolated coincidences, being not of any specific character, that attribute to this phenomenon.

As far as the comparison of the individual frequency and duration determinants of the two professions within the regions is concerned, we found a remarkable similarity in results between the regions in the sense that working contents were equally different appreciated by the employees of both professions. This means that in both regions employees in sale as compared to cleaning experienced less workload in the sense that they did not need to do more work in the same amount of time, and they showed a better match between work and level of education. Further on in both regions employees in sale as compared to cleaning experienced more mental workload and they were

younger and more often not married. It was concluded that these outcomes indicate the influence of profession- i.e. not region-related determinants.

In conclusion the study indicates that regional differences in sick leave determinants may originate from socio-cultural differences between regions. This means that, apart from the fact that type of branch or professional group, or character and seriousness of disease are of influence on sick leave, regional socio-cultural characteristics probably are so too. Thus, in case measures to reduce sick leave are intended, one has to take into account that determinants that predict sick leave may differ and that only tailor-made interventions, focussed on those determinants that predict sick leave per region, may be effective. As a consequence, the results of the study indicate that if one aims on a national or even European level, a substantial reduction of sick leave in specific regions, one always has to take into account that, for reasons of socio-cultural differences between regions within countries or between countries, sick leave can be affected by different types of well known determinants of sick leave. The same applies to national or international operating companies in industry and trade as for nationwide operating organisations (in Dutch: ‘Arbo-diensten’) that offer commercial services to reduce the sick leave volume. They should be aware of the possibility that their approach, especially concerning the type of determinants that affect sick leave, might be different per region or per country.

Samenvatting

Inleiding

Deze studie concentreert zich in de eerste plaats op mogelijke verschillen in werkzame ziekteverzuim determinanten onder homogene groepen in verschillende regio's in Nederland. In de tweede plaats worden de gevonden verschillen beschouwd in het licht van regionale verschillen in sociaal-culturele omgeving.

Aangezien ziekteverzuim in Nederland tot begin negentiger jaren regionaal geregistreerd werd, was het mogelijk relevante determinanten van ziekteverzuim regionaal te vergelijken. Er werd een keuze gemaakt voor de beroepsgroepen verkoop en schoonmaak, omdat deze verschillen in ziekteverzuim lieten zien tussen de regio's Utrecht en Zuid-Limburg en deze twee regio's verondersteld werden in sociaal-cultureel opzicht van elkaar te verschillen. Hierdoor kon dezelfde beroepsgroep tussen twee verschillende regio's vergeleken worden en twee verschillende beroepsgroepen in eenzelfde regio.

De onderzoeksvragen die we willen beantwoorden, zijn:

1. Welke verzuimfrequentie en verzuimduur determinanten waren volgens de literatuur gedurende de afgelopen decennia relevant? (Hoofdstuk 2 en Hoofdstuk 5.)
Deze onderzoeksvraag zal worden beantwoord in Hoofdstuk 2 (verzuimfrequentiedeterminanten) en Hoofdstuk 5 (verzuimduurdeterminanten).
2. Zijn er verschillen in verzuimfrequentie determinanten tussen homogene groepen in verschillende regio's van hetzelfde land?
Deze onderzoeksvraag zal worden beantwoord voor twee verschillende beroepsgroepen, namelijk verkoop (Hoofdstuk 3) en schoonmaak (Hoofdstuk 4).
3. Zijn er verschillen in verzuimduur determinanten tussen homogene groepen in verschillende regio's van hetzelfde land?
Deze onderzoeksvraag zal worden beantwoord voor twee verschillende beroepsgroepen, namelijk verkoop (Hoofdstuk 5) en schoonmaak (Hoofdstuk 6).
4. a. Hoe verhouden tussen twee regio's, afgezien van het beroep, verzuimfrequentie en verzuimduur zich tot relevante verzuimdeterminanten en zijn er verschillen tussen deze regio's in determinanten die verzuimfrequentie en verzuimduur verklaren, en:

b. Zijn er tussen verschillende beroepsgroepen binnen eenzelfde regio overeenkomsten in determinanten die verzuimfrequentie en verzuimduur verklaren en die wijzen op beïnvloeding door de sociaal-culturele omgeving? (Hoofdstuk 7).

De onderzoeksvragen 4a en 4b zullen in Hoofdstuk 7 beantwoord worden.

Om een indruk te krijgen van de continuïteit in relevante verzuimdeterminanten, werd een literatuuronderzoek over de jaren 1984-2004 uitgevoerd. Aangezien onderhavige studie gebruik maakt van data van begin negentiger jaren, is continuïteit in relevante verzuimdeterminanten van belang.

Werknemers die zich ziek meldden werden gevraagd aan het onderzoek mee te doen en om leeftijdseffecten uit te sluiten dienden zij tussen 20 en 40 jaar oud te zijn, waardoor de homogeniteit van de onderzoeksgroep werd vergroot. Om te voorkomen dat de ziekmelding gevolg zou zijn van een bijzondere ziekte, die de keuzevrijheid om wel of niet ziek te melden zou inperken, werd gekozen voor de diagnoses 'lage rugpijn' en 'ongecompliceerde stress'. De keuze voor deze diagnoses had ook een pragmatische reden: ze komen relatief vaak voor en de veronderstelling was dat zo binnen betrekkelijk korte tijd (6 maanden) een voldoende aantal deelnemers (tenminste 50 tot 100) aan de studie geworven kon worden. In totaal stemden 321 werknemers in met deelname aan het onderzoek: in Utrecht 131 (verkoop: 79, schoonmaak: 52) en in Zuid-Limburg 190 (verkoop: 105, schoonmaak: 85). De respons op het interview was: in Utrecht 63% (verkoop) en 75% (schoonmaak) en in Zuid-Limburg 82% (verkoop) en 68% (schoonmaak). De vragen van het interview waren geënt op de door het literatuuronderzoek gevonden verzuimdeterminanten. Determinanten die tot eenzelfde categorie werden gerekend, werden gecombineerd en vormden de onafhankelijke variabelen, terwijl ziekteverzuim de afhankelijke variabele was. Het jaar voorafgaand aan de dag van de ziekmelding werd als referentiejaar aangehouden waarover de gemiddelde verzuimfrequentie en de gemiddelde verzuimduur werd berekend. De uitgevoerde statistische analyse bestond uit: (a) een t-test voor de afhankelijke variabele in beide regio's; (b) een t-test voor de onafhankelijke variabelen tussen de regio's; (c) een regressie-analyse per regio; (d) een vergelijking van de regressiecoëfficiënten voor de twee regio's; en (e) een regressieanalyse ter bepaling van een eventueel verband tussen de determinanten waarin de regio's verschillen.

Hoofdstuk 1

In *Hoofdstuk 1* wordt beschreven wat onder een 'regio' moet worden verstaan, meer in het bijzonder de sociaal-culturele kenmerken van de bewoners van een regio. Sociaal-culturele kenmerken komen tot uitdrukking door het gedrag van mensen en door hun opvattingen en worden binnen groepen van mensen gemeenschappelijk gedragen. De verschillen in ziekteverzuim tussen Zuid-Limburg en de rest van het land in aanmerking nemend, de in de afgelopen decennia hogere werkloosheid- en arbeidsongeschiktheidscijfers in deze regio,

de verschillende leefstijl, het verschil in sociaal-culturele geschiedenis, de – door het vrije grensverkeer – groeiende euregionale invloed van buurlanden en, tenslotte het verschil in gezondheidsbeleving, werd Zuid-Limburg beschouwd als een regio die zich sociaal-cultureel onderscheidt van de rest van Nederland. Om een andere regio te vinden die met Zuid-Limburg vergeleken kon worden, speelden pragmatische overwegingen een belangrijke rol, zoals de centrale positie van de stad Utrecht en het feit dat de Detam haar hoofdkantoor in Utrecht had. Ziekteverzuimcijfers waar de Detam over beschikte lieten in het algemeen en voor bepaalde beroepen, verschillen zien tussen de regio Utrecht en de regio Zuid-Limburg. Dit stimuleerde de keuze voor de regio Utrecht, waaronder de stad Utrecht en haar onmiddellijke omgeving werd begrepen om deze te vergelijken met Zuid-Limburg. De vergelijkbare mix tussen landschapelijke en stedelijke kenmerken voor de beide regio's – tot de regio Zuid-Limburg werden de steden Heerlen en Maastricht gerekend – als de socio-economische vergelijkbaarheid van de regio's, vormden een extra stimulans om deze twee regio's wat ziekteverzuimgedrag betrof te vergelijken.

Hoofdstuk 2 en Hoofdstuk 5

In *Hoofdstuk 2* en *Hoofdstuk 5* werd het antwoord op de eerste onderzoeksvraag gegeven. Deze luidde: welke verzuimfrequentie en verzuimduur determinanten waren volgens de literatuur gedurende de afgelopen decennia relevant? De uitgevoerde literatuurstudie liet zien dat verzuimdeterminanten in de afgelopen decennia een consistent patroon te zien gaven. Er werd geconcludeerd dat een studie naar ziekteverzuim in begin negentiger jaren nog steeds relevant is.

Hoofdstuk 3 en Hoofdstuk 4

In *Hoofdstuk 3* en *Hoofdstuk 4* werd de tweede onderzoeksvraag beantwoord. Deze luidde: zijn er verschillen in verzuimfrequentie determinanten tussen homogene groepen in verschillende regio's van hetzelfde land?

In hoofdstuk 3 werd, van de beroepsgroep verkoop, tussen de regio's Utrecht en Zuid-Limburg de invloed van determinanten van verzuimfrequentie vergeleken. De resultaten lieten verschillen tussen de regio's zien met betrekking tot de mening die werknemers hadden over de sociaal-medische begeleiding tijdens het ziekteverzuim, het soort van dienstverband dat zij hadden, de ervaren autonomie op de werkplek en het aantal keren dat de huisarts werd bezocht. In Utrecht werd een hogere verzuimfrequentie gezien bij meer autonomie op de werkplek. In Zuid-Limburg werd een hogere verzuimfrequentie gezien bij een vast dienstverband en wanneer de huisarts vaker werd bezocht. In Zuid-Limburg werd een lagere verzuimfrequentie gezien als de werknemer positief was over de sociaal-medische begeleiding of bij meer autonomie. De conclusie was dat per regio kennelijk andere determinanten voor verzuimfrequentie verantwoordelijk waren.

In hoofdstuk 4 werd tussen de regio's Utrecht en Zuid-Limburg, van de beroepsgroep schoonmaak, de invloed van determinanten van verzuimfrequentie vergeleken. Er werden verschillen tussen de regio's gevonden met betrekking tot de ervaren fysieke werkbelasting. In Zuid-Limburg werd een hogere verzuimfrequentie gezien wanneer de werknemers meer fysieke werkbelasting ervoeren. Er werd geconcludeerd dat onder homogene groepen in verschillende regio's kennelijk verschillende determinanten van verzuimfrequentie werkzaam waren en dat de uitkomst van het onderzoek overeenkwam met eerder gedane bevindingen volgens welke inwoners van Zuid-Limburg een slechtere gezondheid ervaren en een hogere medische consumptie vertonen met als gevolg meer ziekteverzuim.

Hoofdstuk 5 en Hoofdstuk 6

In *Hoofdstuk 5* en *Hoofdstuk 6* werd de derde onderzoeksvraag beantwoord. Deze luidde: zijn er verschillen in verzuimduur determinanten tussen homogene groepen in verschillende regio's van hetzelfde land?

In Hoofdstuk 5 vergeleken we tussen de regio's Utrecht en Zuid-Limburg, van de beroepsgroep verkoop, de invloed van determinanten van verzuimduur. De resultaten lieten verschillen tussen de regio's zien wat betreft de ervaren autonomie op de werkplek, de mening van de werknemers over de leidinggevendenden, het aantal keren dat de huisarts werd bezocht en een positieve houding tegenover het werk. In Utrecht leidde meer autonomie tot een langere verzuimduur. In Zuid-Limburg was een langere verzuimduur te zien bij een vast dienstverband of bij een hoger aantal bezoeken aan de huisarts en een kortere verzuimduur bij een positief oordeel over de leidinggevendenden of over het werk. Er werd geconcludeerd dat per regio andere determinanten voor verzuimduur verantwoordelijk waren en dat voor verzuimduur voor de beroepsgroep verkoop in Utrecht, kennelijk andere determinanten dan de in deze studie onderzochte, effect op verzuimduur hebben.

In Hoofdstuk 6 werd tussen de regio's Utrecht en Zuid-Limburg, van de beroepsgroep schoonmaak, de invloed van determinanten van verzuimduur vergeleken. In Utrecht werd een langere verzuimduur gezien bij meer autonomie op de werkplek en in Zuid-Limburg bij een als minder goed ervaren gezondheid. In Zuid-Limburg werd bij vrouwen een kortere verzuimduur gezien en als van een burn-out sprake was of men zich tevreden toonde over de privé-situatie. Er werd geconcludeerd dat ondanks dat er homogene groepen werden onderzocht, er regionale verschillen in verzuimduur werden gevonden.

Hoofdstuk 7

In *Hoofdstuk 7* werd de vierde onderzoeksvraag beantwoord. Deze bestond uit twee subvragen: (a) hoe verhouden tussen twee regio's, afgezien van het beroep, verzuimfrequentie en verzuimduur zich tot relevante verzuimdetermi-

nanten en zijn er verschillen tussen deze regio's in determinanten die verzuimfrequentie en verzuimduur verklaren? en: (b) zijn er tussen verschillende beroepsgroepen binnen eenzelfde regio overeenkomsten in determinanten die verzuimfrequentie en verzuimduur verklaren en die wijzen op beïnvloeding door de sociaal-culturele omgeving?

Ten aanzien van subvraag (a) werd gevonden dat per regio op verzuimfrequentie en verzuimduur verschillende determinanten van invloed waren en dat voor wat betreft een mogelijke invloed van sociaal-culturele factoren op verzuimduur, deze in Zuid-Limburg voor het aantal bezoeken aan de huisarts aanwezig was.

Voor wat betreft overeenkomsten in effect van determinanten tussen de twee beroepsgroepen binnen de beide regio's (subvraag b), deze werden voor verkoop en schoonmaak met betrekking tot verzuimduur, voor autonomie op de werkplek gevonden in Utrecht. In Zuid-Limburg werden met betrekking tot verzuimduur, voor verkoop en schoonmaak overeenkomsten gevonden voor de aard van het dienstverband en het aantal bezoeken aan de huisarts. Verder werden in Zuid-Limburg met betrekking tot verzuimfrequentie voor verkoop en schoonmaak, overeenkomsten gevonden voor de ervaren werkbelasting. Geconcludeerd werd dat in Utrecht voor verzuimduur sociaal-culturele factoren van invloed waren op de ervaren autonomie op de werkplek en dat in Zuid-Limburg sociaal-culturele factoren van invloed waren op de verzuimfrequentie determinant ervaren werkbelasting en op de verzuimduur determinanten aard van het dienstverband en het aantal bezoeken aan de huisarts.

Vergelijking van de antwoorden op de subvragen 4a en 4b van de vierde onderzoeksvraag, leidde tot de conclusie dat deze voor Zuid-Limburg, met betrekking tot verzuimduur, overeen kwam wat betreft het aantal bezoeken aan de huisarts. Dit resultaat in Zuid-Limburg komt overeen met de eerdere bevinding volgens welke verkopers in Zuid-Limburg anders dan verkopers in Utrecht, een langere verzuimduur als gevolg van een hogere medische consumptie lieten zien.

Conclusie

Wat betreft het resultaat van onderzoeksvraag 1 werd geconcludeerd dat over de afgelopen decennia determinanten van verzuimduur en verzuimfrequentie een consistent patroon lieten zien en dat een studie naar ziekteverzuim in het begin van de negentiger jaren nog steeds relevant is. De resultaten van de onderzoeksvragen 2 tot en met 4 samenvattend, werd de veronderstelling dat sociaal-culturele verschillen mede bepalen welke verzuimdeterminanten in een bepaalde regio van invloed zijn bevestigd voor de op de werkplek ervaren autonomie (Utrecht, hogere verzuimfrequentie en langere verzuimduur) en voor het aantal bezoeken aan de huisarts (Zuid-Limburg, langere verzuimduur).

Voor wat betreft de verschillen in sociaal-culturele omgeving die mogelijke gevonden verschillen in werkzame ziekteverzuim determinanten per regio zouden kunnen verklaren, werd het volgende overwogen.

Ziekteverzuim is jarenlang voorwerp van studie geweest en daarbij waren vele determinanten betrokken, maar een mogelijke rol van sociaal-culturele invloeden werd buiten gesloten. Ziekteverzuim is niet alleen aan ziekte, maar ook aan gedrag gerelateerd. Cultuurkenmerken en sociale tradities of stijl van leven, worden geacht de gezondheidstoestand te beïnvloeden. De culturele identiteit van een populatie wordt gedefinieerd als een in de geest gemeenschappelijk 'programma' dat groepen van elkaar onderscheidt. Cultuur, tot uitdrukking komend door het gedrag en de opvattingen van mensen, vormt een gemeenschappelijk kenmerk van groepen van mensen bijvoorbeeld binnen een familie, een regio of een land. Zo is van bewoners van de regio Zuid-Limburg bekend dat zij er traditioneel een minder gezonde leefwijze op na houden en zich minder gezond voelen dan de rest van Nederland, iets dat de medisch consumptie bevordert en eventueel ook het ziekteverzuim. Wat betreft de mogelijke oorsprong van sociaal-culturele verschillen tussen Zuid-Limburg en de rest van het land, wordt aangenomen dat de dominante katholieke cultuur in Zuid-Limburg, gekenmerkt door een minder sobere leefwijze, een rol speelt in de gezondheidstoestand van de bevolking. Het meer calvinistische noorden van Nederland laat een gezondere bevolking zien met een gezondere leefwijze en een langere levensverwachting.

Aangezien verschillende indicatoren zoals bijvoorbeeld de sociaal-culturele geschiedenis en leefstijl alsook de gezondheidsbeleving en invaliditeitspercentages, het aannemelijk maakten dat Zuid-Limburg sociaal-cultureel gezien van een andere aard was dan de rest van het land, kozen we deze regio om te vergelijken met de regio Utrecht. Verder overheersten pragmatische overwegingen zoals de centrale ligging van de provincie Utrecht en het feit dat de bedrijfsvereniging Detam in de stad Utrecht gevestigd was.

Met betrekking tot niet aan gezondheid gebonden sociaal-culturele kenmerken van de bevolking van Zuid-Limburg het volgende. Sociaal-culturele verschillen werden tussen Zuid-Limburg en Utrecht gevonden op het vlak van gemeenschapszin, die in de Limburgse regio duidelijker aanwezig was tegenover een meer individualistische instelling in de regio Utrecht. In het bijzonder Zuid-Limburgse jongeren laten een sterkere betrokkenheid op hun partner en familie zien dan Utrechtse jongeren.

In tegenstelling tot de literatuur werd in Utrecht voor zowel de verkoop als de schoonmaak, bij een grotere autonomie op de werkplek een hogere verzuimfrequentie en een langere verzuimduur gevonden, in plaats van een lagere verzuimfrequentie en een kortere verzuimduur. Aangezien wordt verondersteld dat de sociaal-culturele omgeving deze determinant beïnvloedt, kan een verklaring voor deze bevinding zijn dat, voor de beroepsgroep verkoop in Utrecht, werknemers in de leeftijd van 20 tot 40 jaar autonomie op de werkplek in de meer

individualistische zin van meer vrijheid opvatten in plaats van meer verantwoordelijkheid, terwijl werknemers in Zuid Limburg van dezelfde leeftijd autonomie aangrijpen als een mogelijkheid zich in hun werk te bewijzen in de zin van een bijdrage leveren aan de groep, hetgeen een houding is die meer wijst op een op het collectief gerichte geaardheid. Voor wat betreft de leeftijdsgroep in Zuid Limburg ouder dan 40 jaar verwachten we dat deze nog collectivistischer gericht zal zijn, aangezien dit cultuurgebonden kenmerk in deze regio op oudere leeftijd duidelijker aanwezig is.

Voor wat betreft de resultaten van de regio Zuid-Limburg, deze worden sociaal-cultureel gezien als kenmerkend voor de Zuid-Limburgse populatie beschouwd. Dit geldt voor de ervaren werkbelasting, verwijzend naar de gezondheidstoestand in de zin dat gezondheidsklachten als gevolg van de ervaren werkbelasting uitdrukking zijn van een minder goede gezondheid en het aantal bezoeken aan de huisarts dat wijst op gezondheidsklachten. Deze determinanten veroorzaken meer ziekteverzuim. Aangezien de gekozen diagnoses 'lage rugklachten' en 'ongecomplieerde stress' het individu veel handlingsvrijheid geven, stellen we vast dat de combinatie van het gevoel een minder goede gezondheid te hebben en meer medische consumptie tot een hogere verzuimfrequentie en een langere verzuimduur leiden. De minder gezonde leefwijze van de Zuid-Limburgers zal hieraan bijdragen.

In overeenstemming met de literatuur werd gevonden dat onafhankelijk van het uitgeoefende beroep, meer autonomie op de werkplek in Zuid-Limburg tot een lagere verzuimfrequentie en een kortere verzuimduur leidde en dat voor de verkoop in Zuid-Limburg autonomie op de werkplek samenhang met een lagere verzuimfrequentie. Op basis van de resultaten werd een mogelijke invloed van sociaal-culturele factoren verondersteld ten aanzien van de bevinding dat voor schoonmaak in Limburg werknemers meer werkbelasting ervoeren.

Voor wat betreft de bevinding dat voor verkoop in Zuid-Limburg een blijvende aanstelling tot een langere verzuimduur leidt, deze bevinding werd niet gedaan voor schoonmaak en niet in Utrecht. Dit kan daarom een beroeps- en regiogebonden effect zijn.

In Zuid-Limburg werd een verzuimduur verlagend effect gezien wanneer de werknemers positief waren over sociaal-medische begeleiding tijdens het ziekteverzuim (verkoop, verzuimfrequentie) of wanneer zij een positief oordeel over hun supervisors hadden (verkoop, verzuimduur). Deze bevindingen zouden kunnen samenhangen met regionale sociaal-culturele factoren in de zin dat werknemers in Zuid-Limburg de werksituatie in het algemeen positiever waarderen dan werknemers in Utrecht.

Een van de determinanten die in maar een van de regio's ziekteverzuim bleek te beïnvloeden was, in Zuid-Limburg, de waardering die men kreeg voor zijn werk (schoonmaak, een hogere verzuimfrequentie). De reden voor deze met de literatuur in strijd zijnde bevinding is onduidelijk. Als zodanig beschouwen we deze als van louter incidentele aard. Het is daarom aan te bevelen dat men,

in geval sprake is van regionale verschillen in determinanten, steeds ook de mogelijkheid overweegt van een specifiek, geïsoleerd verschijnsel.

Voorzover het de vergelijking van de individuele verzuimfrequentie en verzuimduur determinanten binnen de regio's betreft, vonden we opmerkelijke overeenkomsten in resultaten tussen de regio's in de zin dat de werknemers van beide beroepen de werkinhoud in dezelfde mate verschillend waardeerden. In vergelijking met de werknemers in de schoonmaak vonden de werknemers in de verkoop in beide regio's dat zij minder werkbelasting hadden, niet meer werk in dezelfde tijd hoefden te doen en hun werk meer in overeenstemming was met hun opleiding. Verder voelden werknemers in de verkoop zich in beide regio's mentaal meer belast en ze waren vaker jonger en vaker ongehuwd. De conclusie was dat het hier om beroeps- en niet om regiogebonden determinanten ging.

Geconcludeerd wordt dat regionale verschillen in determinanten van ziekteverzuim gevolg kunnen zijn sociaal-culturele verschillen tussen regio's. Dit betekent dat ziekteverzuim niet alleen een gevolg is van het karakter en/of de ernst van een ziekte of van het soort werk dat iemand doet, maar dat daarbij ook factoren van sociaal-culturele aard een rol kunnen spelen en dat alleen maatwerk, gericht op die determinanten die per regio werkzaam zijn, doeltreffend kan zijn. De resultaten impliceren dat wanneer men op nationaal of zelfs Europees niveau ziekteverzuim in bepaalde regio's wil terugdringen, men er altijd rekening mee moet houden dat door sociaal-culturele verschillen tussen regio's binnen een land of tussen landen onderling, ziekteverzuim beïnvloed kan worden door verschillende van de bekende verzuimdeterminanten. Hetzelfde geldt voor nationaal of internationaal opererende bedrijven in handel en industrie als ook voor landelijk werkende Arbodiensten. Zij zullen zich ervan bewust moeten zijn dat bij ziekteverzuim mogelijk per regio of per land andere determinanten een rol kunnen spelen.

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CURRICULUM VITAE

Willibrordus Gerulphus Maria Beemsterboer werd op 25 september 1954 in Alkmaar geboren. In 1970 haalde hij het Mulo A en B diploma te Maastricht en in 1973 het HBS-B diploma te Alkmaar. In 1978 slaagde hij aan de Universiteit van Amsterdam voor het doctoraal examen geneeskunde en in 1983 voor het artsexamen. Na enige tijd freelance gewerkt te hebben, aanvaardde hij in 1987 werkzaamheden als ziektewetarts bij de bedrijfsvereniging Detam te Heerlen. Hij volgde daarna de opleiding tot verzekeringsarts, die in 1993 werd afgerond. Omstreeks dezelfde tijd werd een aanvang gemaakt met het nu gereed gekomen proefschrift. Voor de sociale zekerheid waren de negentiger jaren onrustige tijden. De bedrijfsverenigingen en de Gemeenschappelijke Medische Dienst verdwenen, de Arbodiensten en het Uitvoeringsorgaan Werknemers-verzekeringen kwamen ervoor in de plaats en gemeenten gingen de Wet voorzieningen gehandicapten (Wvg), de voorganger van de Wet maatschappelijke ondersteuning, uitvoeren.

Met de komst van de Wvg ontstond een nieuwe sociaal-medische discipline, die van de indicierend en adviserend arts. In die hoedanigheid was Willibrord Beemsterboer vanaf 1994 bij de GGD Zuid-Limburg in Heerlen en Maastricht werkzaam in het domein 'zorg en welzijn' (AWBZ en Wvg). Vanaf die tijd publiceerde hij regelmatig in tijdschriften en vakbladen over onafhankelijke, objectieve en integrale indicatiestelling van zorg en voorzieningen voor ouderen, gehandicapten en chronisch zieken. Een doelmatige en zorgvuldige verdeling van algemene middelen had daarbij zijn bijzondere aandacht. Van 1998 tot 2002 was hij werkzaam bij het Regionaal Indicatieorgaan Noord-Limburg en van 2002 tot 2005 bij het adviesbureau voor sociaal-medische expertise Trompetter & Van Eeden. In deze periode leverde hij, als lid van de Werkgroep Sociale Geneeskunde van de Universiteit Maastricht, een bijdrage aan het onderwijs voor co-assistenten Sociale Geneeskunde. In oktober 2005 aanvaardde hij een betrekking als beleidsmedewerker Medische zaken bij het Expertisecentrum van het Centrum Indicatiestelling Zorg (CIZ) te Driebergen, waar hij nu nog steeds werkzaam is.

Naast zijn reguliere werk verricht(te) Willibrord Beemsterboer enkele nevenactiviteiten. Gedurende de jaren 1996 tot 2005 was hij bestuurslid en vice-voorzitter van de Vereniging van Indicerende en adviserende Artsen (VIA). In die hoedanigheid was hij columnist en eindredacteur van het kwartaalblad Via Nieuws en leverde hij een bijdrage aan de voorbereiding van jaarlijks door de vereniging georganiseerde symposia. Verder is hij vanaf 2003 namens de VIA verbonden aan de Rijksuniversiteit Groningen alwaar een onderzoeksplan voor Indicatiestelling & Advisering is ontworpen en inmiddels gedeeltelijk uitgevoerd.

Naast zijn interesse voor de (sociale) geneeskunde is Willibrord Beemsterboer toegewijd aan de schone kunsten, meer in bijzonder de teken- en schilderkunst, die hij in de persoon van de hem goed bekende kunstenaar 'brord' als mecenas

royaal ondersteunt. Werk van de hand van deze kunstenaar alsook de in jaren her en der door Willibrord Beemsterboer gepubliceerde artikelen, opinies, ingezonden brieven e.d. zijn voor belangstellenden te vinden op de site van de kunstenaar: www.brord.nl.