Workload in general practice

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Chapter 1

Introduction and research questions

1 Introduction

This thesis concerns the workload of General Practitioners (GPs), the quality of care that they provide, and in particular the relation between these two aspects. The aim of this introduction is to describe the background of the study, to present the research problem and research questions, to explain the theoretical and methodological approach and to present the outline of this thesis.

1.1 Background

Workload has been one of the key issues in debates on the organisation of general practice care. In most countries with a primary care system many changes have taken place in the past decades. These changes often raise questions concerning workload. These questions fall into two categories: first, what will be the effect of these changes on workload? And second, what will be the consequences of these effects for GPs and patients? The underlying concerns are mainly related to the remuneration of GPs and the quality of care provided. Does a shift of services from secondary care to general practice care increase GPs' workload? (Pedersen and Leese, 1997) Do income differences between GPs reflect workload differences in a fair way? Are GPs still able to provide appropriate care during a flu pandemic? (BBC news, 2009) Will extending patient choice put more pressure on GPs? (Bupa, 2003)

These concerns are understandable from both the perspective of GPs and the perspective of policy makers and the general public. What is meant exactly by workload is, however, not so straightforward. Numbers of patients? Numbers of contacts? Complexity of the work? Numbers of working hours? According to Cobuild dictionary the workload of a person or organisation is "the amount of work that has to be done by them". In the literature on workload a diversity of definitions and operational measures is used.

The choice of measures depends on the kind of questions to be answered and the context in which this problem is situated. Hart and Staveland (1988) defined workload as the outcome of and interaction between tasks, individual characteristics and contextual factors:

> *"Workload is not an inherent property, but rather it emerges from the interaction between the requirements of a task, the circumstances under which it is performed, and the skills, behaviours, and perceptions of the operator." (Hart & Staveland, 1988).*

Translating this to the field of general practice, we can consider workload as an outcome of demand-related aspects (e.g. the number of patients, the number of contacts), supply-related factors (e.g. the behaviour of GPs) and the organisational context in which GPs work. Groenewegen and Hutten (1991) found that in research into GPs' workload, this concept is generally defined in terms of 'the amount of time that certain activities consume or the frequency in which these certain activities take place'.

In this thesis different workload measures will be used, depending on the type of question that is addressed. To measure objective workload, we will use the (individual) GP list size, the number of consultations or the number of hours spent on certain activities (e.g. out-of-hours-shifts). Subjective workload in this thesis is operationalised as GPs' satisfaction with available time.

There are two reasons for using different operational measures, instead of the same measure in all chapters. First, we may study one specific aspect of the broader concept of workload, for instance the burden of out-of-hours shifts. Second, we expect that workload affects the behaviour of GPs, but a causal effect in the opposite direction is also plausible. For example: the number of consultations may influence the number of working hours of the GP, but the number of working hours can also affect the number of patients that can be treated. When putting these variables in a model as independent and dependent variables, statistical problems arise with respect to reciprocal effects, also called simultaneity. Although simultaneity can not completely be ruled out, it can be reduced by selecting the right workload indicators.

Quality and the provision of care

An important reason for investigating GPs' workload is the possible effect of workload on GPs' provision of care. It is obvious that workload has important consequences for GPs themselves, but we will argue that it also has consequences for the care that patients receive. GPs work involves making many decisions, and these decisions can be affected and restricted by their workload which, in turn, may affect the quality of care. This assumption can be derived from the psychological theory on the relation between stress and job performance. It is commonly accepted that job performance will be negatively affected when workers suffer from a too high or too low stress level (Vroom, 1964; Selye, 1975; Muse et al., 2003).

In this thesis, we will look at adherence to clinical guidelines as an indicator for quality of care. These guidelines contain recommendations concerning e.g. prescriptions and referrals for specific diagnoses. Since most of these recommendations are evidence based, we assume that a higher adherence to guideline is an indication of a higher quality of care. Next to guideline adherence, we will study aspects of care provision that are more indirectly related to quality, such as length of consultations, waiting time to get an appointment or doing home visits.

The Dutch context

Role of general practitioners in the system

GPs play a pivotal role in primary care and in the Dutch healthcare system because they function as gatekeepers. The gate keeping principal denotes that access to hospital care and specialist care requires a referral by a GP. All citizens are listed with a GP, mainly in their own neighbourhood. A full-time working GP has a list of approximately 2300 patients (Hingstman and Kenens, 2008). For a long time, the field of general practice was dominated by single-handed practices. However, for some years now the number of partnerships has been on the rise. In 2005, the number of partnerships exceeded the number of solo practices for the first time. This development goes hand in hand with a rising number of part-time workers and female GPs.

People contact their GP five times per year on average; however, the frequency varies sharply between different age categories (see table 1.1). GPs are often consulted in case of acute complaints, but they also play an important role in the care for the chronically ill.

Table 1.1: Average patient contact rate with the general practitioner per year (2007) (Face-to-face contacts and telephone consultations)

Age	Men	Women	Total
0-4	3,6	3,3	3,5
5-14	2,2	2,3	2,2
15-24	2,0	4,3	3,2
25-44	2,8	5,2	4,0
45-64	5,2	7,2	6,2
65-74	9,0	10,9	10,0
75 +	13,9	16,5	15,5
Total	4,3	6,4	5,4

Source: LINH.

Dutch GPs are generally non-interventionist, which shows in very low prescription and referral rates. Approximately 96% of all contacts are handled within the general practice; only 4% is referred to secondary care or to other primary health care providers. Most GPs are easily accessible, generally within two days. During nights and weekends, general practice care is provided in larger GP co-operatives. These co-operatives (coops) are for emergency care only. Recently, concerns have been raised about an increasing contact frequency in GP coops for less urgent complaints (Giesen et al., 2009).

During the period studied, GPs were paid according to a mixed system. GPs received a capitation payment for publicly insured patients and a fixed amount of money per year for every listed (publicly insured) patient. This amount was slightly higher for elderly (above 65) and for patients living in deprived areas. In 2001, around 60% of the population was publicly insured, the remainder was privately insured. The insurance status of the patient depended on income. Above a certain income level, people had to take out private insurance. All GPs had a mixed population of publicly as well as privately insured patients. Since insurance type was related to income, the ratio between these two varied across areas. GPs in deprived areas had a vast majority of publicly insured patients on their lists, while those in more wealthy areas had more privately insured patients.

The workload of Dutch general practitioners

In 2001, dissatisfaction with workload reached a climax among Dutch GPs, which resulted in a series of nationwide campaigns and even a one-day strike. Clearly, many GPs perceived an increase in their workload. However, there was hardly any substantial evidence to justify this observation. This was an important reason to investigate the workload of GPs within the framework of the second Dutch National Survey of General Practice (DNSGP-2).

The workload study we carried out as a part of the DNSGP-2 resulted in paradoxical findings. These findings will be described in more detail in chapter 2, but we will reveal some of the results in advance for a better understanding of the design of this study.

In the period 1987 – 2001, the period between the first and second DNSGP, we found that the demand for care increased considerably; the consultation frequency rose by approximately 10%. This was partly due to the aging of the population and the rising number of chronically ill. Nevertheless, we saw an increase in all age categories, except for children under the age of 4. With this rising demand, one would expect a corresponding increase in care supply. Yet, within the period studied, the average number of hours that GPs worked decreased while the GP-density stayed more or less the same. Consequently, compared to the past, GPs had to deal with a larger number of health complaints within a shorter time frame. One of the main objectives of this thesis is to explain how GPs managed this.

Consequences of workload for the provision of care

It is probable that these developments will lead to increased feelings of job stress among GPs. Moreover, a rising workload among GPs might also have consequences for patients. After all, it is not unlikely that the quality of care may suffer from it. GPs and policymakers have tried to find solutions for these difficulties. This has resulted in a range of organisational changes since the late 1990s. Most of these measures intend to reduce GPs workload, to improve efficiency and to improve quality of care. However, although it seems likely that a high workload will have an adverse effect on the quality of care, it is less obvious that measures to reduce workload will have a positive effect on the quality of care. So, a high workload might adversely affect quality, but workload-reduction and quality-improvement can also be

clashing interests. Some examples that have recently been subject to debate include task delegation to lower educated personnel and the large-scale organisation of out-of-hours-services.

Although concerns about the quality of care are often put forward as an argument to carry out research on workload, there is little empirical evidence about the relation between these two aspects. An explanation for this lack of evidence might be the methodological difficulties of measuring quality. As was mentioned above, we will not extensively go into the discussion about the definition of quality of care. In stead, we will assume the professional perspective on quality, adherence to guidelines. One of the most profound studies on the relation between workload and guideline adherence was done by Hutten (1998). In this study, a range of quality-indicators was derived from professional guidelines developed by the Dutch College of General Practitioners (NHG). However, the development of professional guidelines was still in a very early stage at that time. Today, there are over 85 standards available and over 100 quality-indicators based on these standards (Braspenning et al., 2004; 2006). These developments enabled us to investigate the relation between workload and quality of care more profoundly.

1.2 Research questions

This thesis addresses the following main questions:

1 Did the workload of GPs change in the course of time (1987-2001), and if so, in what respect did it change?

2 Between 1987 and 2001, the average number of GPs' working hours decreased while the demand for care increased. How can these (paradoxical?) findings be explained?

3 (To what extent) are the provision of care and the quality of care affected by the workload of general practitioners?

1.3 Theoretical considerations

To understand more of the central problems addressed in this study, workload patterns and the relation between workload and quality of care, it is important to gain more insight into the behaviour of GPs and more specifically, into their responses to workload. Following previous research in this field, we will take as our point of departure a theory of goal oriented behaviour, the Social Production Function theory. This theory is a general theory about human behaviour and will be specified to understand GPs behaviour and to derive hypotheses. Hutten (1998) showed that the Social Production Function theory is a fruitful approach to understand how GPs respond to workload and how this can affect the provision of care.

Like all humans, GPs strive after physical- and social well-being. Important resources to produce physical well-being are income and leisure time. To achieve social well-being, the main instrumental goal is the care GPs give to their patients. Appropriate care will be approved by patients and colleagues and thus yield social approval. Patients will appreciate that they are given an adequate amount of consultation time. Time is a resource to produce appropriate care, which in turn produces social approval. On the other hand, the more time spent on one patient, the less time is left for others. This will result in long waiting times and sub-level accessibility which is likely to have a negative effect on patient satisfaction. GPs must try to find an optimal balance between spending enough time on individual patients and availability and accessibility for all patients. Furthermore, colleagues (immediate colleagues as well as the medical profession as a whole) are an important source for social approval. Next to providing good care, spending time and energy on other activities can contribute to one's status and social approval. For example, the improvement of skills and knowledge by continuing medical education (CME) may result in a higher status among peers.

Opportunities to realize the goals are determined by available resources and constraints. These are situated at three levels: the healthcare system, the GP and his practice, and the consultation (Groenewegen, 1996). An important structural condition is the type of payment system. In a fee-for-service system, working longer hours is the more attractive option since an increasing workload means more income in contrast to a capitation based or salaried system. At the second level, restrictions are related the GP and the

practice. GPs in single-handed practices are more dependent on their patients for social approval, whereas GPs in partnerships also receive approval from their colleagues (Freidson, 1973). Furthermore, personal resources and restrictions like knowledge and skills are of influence. The third level involves restrictions related to the actual consultation, more specifically, to the health problems presented and patient characteristics. For some health problems there is a recommended course of action, while for others there is a wide range of possible actions.

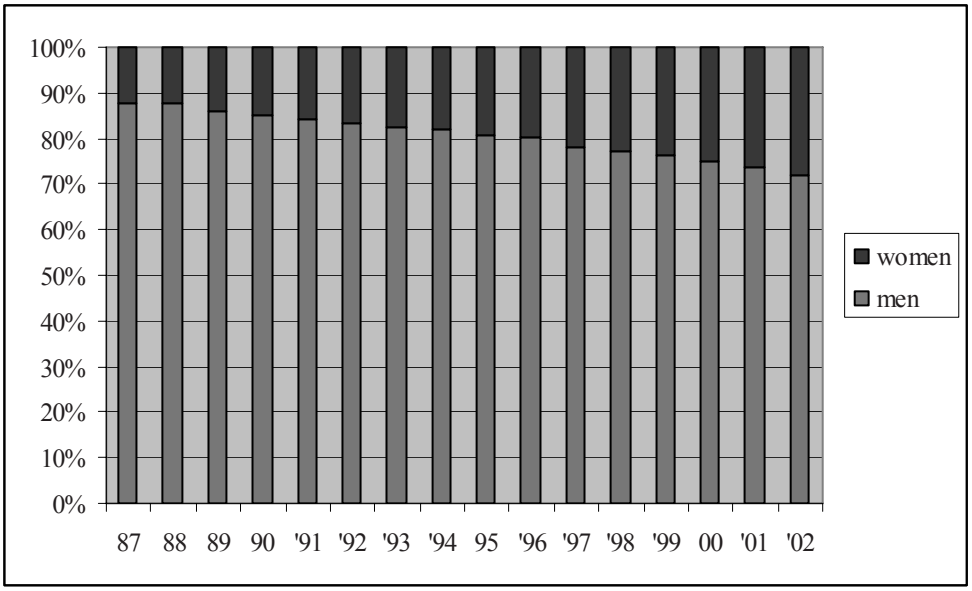
Possible explanations for a decreasing number of working hours despite a rising demand

In this thesis, we will focus on four striking developments that took place in the field of general practice within the period studied.

Changes in the social composition of the workforce and cohort replacement

Changes in the social composition of the workforce may be an important reason for the decreasing average number of working hours. Perhaps the most striking change that took place was the feminisation of the work force. As shown in figure 1.1, the proportion of female GPs more than doubled in the period 1987 – 2002. In 1987, only 13% of the GPs were women, in 2002 this was more than 28%. Within households, the division of labour is seldom equally distributed between both sexes. On average, men spend relatively more time on paid labour while women tend to spend more time on caring tasks. In line with the SPF-theory it is likely that many women are for social approval less dependent on their professional career compared to their male counterparts. Since the share of female part-time working GPs has become larger, this will decrease the average number of working hours.

Figure 1.1: Gender distribution in the general practice work force over the period 1987 – 2002 (Proportion male and female GPs).



Source: NIVEL, professions in healthcare

An alternative 'common sense' explanation might be that there has been a change in the way GPs think about their profession. Especially young doctors seem less likely to commit themselves to a full-time job and prefer working in partnerships to having their own practice (Van den Hombergh et al., 2005; Maiorova et al., 2007; Young and Leese, 1999; Sibbald and Young, 2001). Traditional role patterns are changing, and also men attach more importance to other aspects of life such as caring tasks. This leads to an overall decrease in average working hours.

Delegation of tasks

Delegation of tasks seems a logical way to increase efficiency. From an economic point of view, it is often efficient to delegate relatively simple tasks to less qualified personnel. By delegating routine activities, GPs can concentrate on more complicated tasks. Since the 1990s, there have been concerns about a growing shortage of GPs. Task delegation and differentiation got much attention as possible solutions to this scarcity and the number of assisting personnel increased. In the past 15 years, practice

nurses, nurse practitioners and physician assistants have entered general practice. However, in the period of this study these developments were still in a very early stage. Therefore, we will focus especially on the role of practice assistants in general practice. Practice assistants have been the GPs' right hand since the 1960s. Over time this function has been strongly professionalised.

GP cooperatives for out-of-hours services

A different organisation of out-of-hours shifts (OOH shifts) may have had an impact on the workload of GPs too. In traditional settings, working evenings, nights and weekends is generally regarded as one of the most onerous aspects of the GP profession. GPs are regularly disturbed in their sleep and are more often confronted with threatening situations and 'spurious' requests for help. In addition, these OOH shifts also constitute a substantial restriction to the freedom of movement. In a study on burn-out among GPs by Van Dierendonck et al. (1992), 30% referred to out-of-hours shifts as something they considered irksome in the practice of their profession. In recent years there has been a major shift in the way out-of-hours service is provided by GPs, with small-scale groups of GPs operating rota systems being replaced by large-scale cooperatives.

Fewer home visits

Another way to handle more contacts within a shorter time frame is reducing the number of home visits. In the past decades, a decrease in home visiting rates has been found in most European countries and North America (Aylin et al., 1996; Campion 1997; Meyer and Gibbons, 1997; Cardol et al., 2004). The decrease in home visits indicates that GPs apply more rigorous criteria for making home visits. However, GPs will still make, at least from their own point of view, responsible decisions as to doing home visits, taking into consideration the possible danger and discomfort to the patient.

Every home visit is the outcome of weighing the patients' discomfort and danger against the GP's discomfort, such as the amount of time spent. Better transport facilities for patients and an increase in the workload experienced over a period of time might have loaded the latter factor. The more serious the complaints, the less important these non-medical factors become and the less room the GP has for making medical and other decisions. Obviously, if a complaint appears to be very threatening, a home

visit is indicated and the decrease in home visits in such cases is expected to be low.

Consequences for the provision of care

Remuneration

The possible strategies to manage workload of course have consequences for the provision of care. For instance, the decision whether or not to do a home visit or limit consultation length may enable GPs to do more work in less time. Important consequences for patients relate to waiting time and the amount of time dedicated to their complaints. Although it is clear that somehow GPs deal with more medical problems within a shorter time frame, the way in which GPs manage workload may differ between them. As was mentioned above, income and leisure time are important goals. GPs' decisions about the provision of care may have a serious impact on their income. It is commonly assumed that the way in which GPs are remunerated affects their behaviour (Mechanic, 1975; Glaser, 1970; Donaldson and Gerard, 1989; Woodward and Warren-Bouton, 1984; Gosden et al., 2000; Greß et al., 2006; Hutten, 1998; Krasnik, 1990; Calnan et al., 1992; Iversen and Lurås, 2000). When GPs are paid per activity, i.e., on a fee-for-service basis (FFS), there is a clear relationship between the amount of work and income. More services generate more income. Under capitation conditions, this relationship is much weaker, since the annual capitation fee per patient is fixed. In this thesis we investigate the effects of remuneration on workload management by GPs and on the care provided.

Adherence to guidelines

Adherence to clinical guidelines is used in this thesis as an operationalisation of the quality of care. Obviously, providing high quality care is considered an important goal by most GPs. It is to be expected that, as professionals, GPs care for the well-being of their patients. Moreover, being a good doctor will yield social approval from both patients and colleagues. The ability, however, to follow guidelines might be restricted by workload and by a lack of time. Furthermore, adhering to guidelines can conflict with other goals, such as the need for leisure time. Since time may well be the most important resource, we expect that the extent to which guidelines are followed differ between GPs and between guidelines. Viz, GPs differ in their available time budget and some recommendations require a greater time investment than others.

1.4 Data, study design and methods

Data used in this thesis were derived from the second Dutch National Survey of General Practice (DNSGP-2) carried out between 2000 and 2002. It involved 104 general practices in the Netherlands, comprising 195 GPs accounting for 165.5 GP full-time equivalents, and a patient population of nearly 400,000 people. The GPs were representative for the Dutch GP population with respect to age, sex, and degree of urbanisation. Data were collected using questionnaires, diaries, videotaped consultations, practice administrations, and medical records for routine data. In some chapters, the results will be compared to the DNSGP-1 carried out in 1987. The study was carried out in keeping with Dutch legislation on privacy. Compliance with privacy regulations was approved by the Dutch Data Protection Authority. The DNSGP was funded by the Dutch Ministry of Health.

The data collections used in this thesis are briefly described below. In the different chapters, the variables used are described in more detail.

Electronic medical records
The participating GPs kept electronic medical records of all patient contacts during one year, as part of the standard routine registration. The GPs recorded the diagnosis using the International Classification of Primary Care (ICPC), referrals and prescriptions using ATC-codes (Anatomical Therapeutical Chemical classification system). Because the type of contact (e.g. office consultation, home visit or telephone consultation) was not always routinely collected, all GPs were asked to do so during a six-week period for all contacts. In total, approximately 1.5 million contacts were recorded (van der Linden et al., 2004; Westert et al., 2005).

GP questionnaires
All GPs received two postal questionnaires covering a range of work-related topics, such as workload, job satisfaction, out-of-hours shifts, and general characteristics, such as age, sex, etc. The response to these questionnaires was 96% and 87%, respectively.

Diaries
The GPs kept detailed diaries of their time use. These diaries contained a registration of activity in 15 minutes intervals, during 24 hours a day, for 7 consecutive days.

Patient census
A brief, written questionnaire was sent to all listed patients. It included some characteristics which are not routinely registered in the practice administration, such as self-rated health. The response was 76.5%.

1.5 Outline of the book

This thesis consists of three parts. In the first part, chapter 2, we will describe how the workload of Dutch general practitioners developed in the period between 1987 and 2001. Next we will present the most important results of an extensive study we carried out within the framework of the DNSGP-2. In this chapter we will also describe briefly the explanations for the changes in workload.

In Part 2, chapter 3 to 6, we will analyse the above-mentioned explanations in more detail. Chapter 3 concerns the influence of feminisation, part-time working and cohort replacement. Chapter 4 deals with task delegation and the changed role of practice assistants. In Chapter 5 we will compare the workload related to OOH shifts of GPs organised in large scale GP coops with that of GPs functioning in small scale rota groups. Chapter 6 describes the changed patterns of home visiting and how these patterns differ between different diagnoses.

Part 3, consisting of chapter 7 and 8, focuses particularly on the consequences of workload for the provisions of care. In chapter 7 we will discuss how list size (as an indicator for workload) and remuneration affect GPs' decisions about the way in which they manage consultations. More specifically, we will focus on three outcomes: the length of consultations, waiting time to get an appointment, and the likelihood of GPs conducting home visits. Chapter 8 focuses on GP adherence to clinical guidelines. We will investigate whether GPs with a higher workload are less inclined to adhere to guidelines than those with a lower workload and whether guideline recommendations that require a higher time investment are less adhered to than those that can save time.

The final chapter (chapter 9) presents a summary and a discussion of the results of our study.

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Chapter 2

The workload of general practitioners in the Netherlands: 1987 and 2001

A shorter version of this chapter was published as:
Van den Berg M, Kolthof E, De Bakker D, Van der Zee J. *The workload of general practitioners in the Netherlands: 1987 and 2001*. in: Westert GP, Jabaaij L, Schellevis FG (ed.) Morbidity, performance and quality in primary care, Dutch general practice on stage. Oxford: Radcliffe Publishing, 2006

Abstract

It has often been stated that the workload of general practitioners in the Netherlands had increased. However, empirical evidence for this statement was lacking.

The aim of this study was to investigate the current workload of Dutch GPs, to determine whether their workload has changed in the course of time, and, if so, to explain these changes. The central question of this chapter is: did the objective and subjective workload of Dutch GPs change between 1987 and 2001?

We compared a range of workload measures between 1987 and 2001. Objective workload measures were derived from consultation registration, video observations and diaries kept by GPs. Subjective workload measures were derived from questionnaires filled out by GPs. Data about explanatory factors on patient level were collected via consultation registration and registration of socio-demographic characteristics.

The average number of working hours dropped significantly from 53 in 1987 to 44 in 2001. In this period the average list size and the average consultation rate both rose by some 10%. Home visiting rates decreased while the number of telephone consultations rose. The number of hours spent in out of hours services has been decreasing due to a new organisation of out of hours shifts. Access to care has become more regulated and GPs delegate more tasks to their practice assistants. While GPs became less satisfied with financial aspects, like practice costs and income, they became more satisfied with the time available for professional education and leisure time. This seems to reflect the changes in the objective workload that took place. GPs spend less time on working but still handle a bigger care demand.

2.1 Introduction

In 2004, we published an extensive study on General Practitioners workload in the Netherlands (Van den Berg et al., 2004a). This study was carried out in the framework of the second Dutch National Study of General Practice (DNSGP-2). The report of this study contains information on the work burden of GPs, the changes that have taken place in this respect since the late 1980s and factors that have impacted on it. The report was written in Dutch. Since the findings of this study are also interesting for an international public, in this chapter we will describe the study with the most important conclusions.

In the period this study was published, it had often been stated that the workload of general practitioners in the Netherlands had increased. However, empirical evidence for this statement was lacking. Additionally, most previous research focused on only one or a few aspects of workload, e.g. the number of working hours or the consultation frequency. In this study we described changes in objective and subjective workload using a range of workload measures.

In this chapter, we will describe our most important findings. Furthermore, we will describe how Dutch GPs managed to deal with an increasing number of medical problems within a shorter time frame.

Doctors' workload

Especially in health care systems in which general practitioners are paid per capita, workload is an important issue. Morrison and Smith (2001) summarised in an editorial contribution to the *British Medical Journal* the situation as follows: "Across the globe doctors are miserable because they feel like hamsters on a treadmill. They must run faster just to stand still". Morrison and Smith claimed that in many countries health care systems were inefficient and especially unfair on doctors, who have to keep on working harder without making any progress. In the same year, dissatisfaction reached a climax among Dutch GPs, which resulted in a series of nation-wide campaigns and even a one-day strike. Although many GPs perceive an increase in their workload, there is hardly any substantial evidence to justify this observation. Reacting on the above mentioned editorial, Mechanic (2001) showed findings of the UK and the USA that are in contrast with the idea of an increasing workload.

Workload is a complicated concept and can be defined and measured in many ways. In our study we distinguish between objective workload, which is the volume of work, the amount of time that certain activities consume or the frequency in which they take place (Groenewegen and Hutten, 1991), and job satisfaction, which can be seen as a subjective aspect of workload. The aim of this study was to investigate the current workload of Dutch GPs, to determine whether their workload has changed in the course of time, and, if so, to explain these changes. The central question of this chapter is: did the objective and subjective workload of Dutch GPs change between 1987 and 2001?

2.2 Method

Data we used were derived from the second Dutch National Survey of General Practice (DNSGP-2) DNSGP-2 was carried out between 2000 and 2002 among 104 general practices in the Netherlands, comprising 195 GPs and accounting for 165.5 GP full-time equivalents and a practice population of nearly 400,000 patients. The GPs were representative for the Dutch GP population with respect to age, sex and degree of urbanisation. Data were collected using questionnaires, videotaped consultations and routine data collection in medical records. Results were compared to the DNSGP-1, which was carried out in 1987.

For a more detailed description of the methods of the first and second Dutch National Survey of General Practice (DNSGP-1, 1987 and DNSGP-2, 2001), see previous publications (Westert et al., 2005; Schellevis et al., 2004). Specific for the study described in this chapter is the following.

Objective workload measures were derived from consultation registration, video observations and diaries (kept by GPs). Subjective workload measures were derived from questionnaires filled out by GPs. Data about explanatory factors on patient level were collected via consultation registration and registration of socio-demographic characteristics. We have compared the results of 2001 with data of the DNSGP-1 (1987). Table 2.1 shows the workload measures we have used, the sources and the number of valid cases in both years.

Table 2.1: Operationalisation, data sources and number of observations

	Source	1987	2001
Objective workload			
Number of weekly working hours	Diaries, (registration of activity 15 minutes intervals, during 24h a day, 7 consecutive days)	157 GPs	157 GPs
Consultation rate	Patient-survey (random sample of study population)	13014 patients	12699 patients
list size	Data practice-registration	154 GPs	189 GPs
FTE	Data practice-registration	159 GPs	188 GPs
Consultation length	video registration	442 consultations 17 GPs	2111 consultations 142 GPs
Proportion house calls/practice consultations/telephone	Contact registration	418,219 contacts	387,033 contacts
Subjective workload			
Overall job satisfaction (one item)	GP-survey	161 GPs	164 GPs
Satisfaction with material and financial circumstances (3 items)	GP-survey	161 GPs	164 GPs
Satisfaction with available time (4 items)	GP-survey	161 GPs	164 GPs
Satisfaction with inter-collegial contacts (3 items)	GP-survey	161 GPs	164 GPs

2.3 Main results

More patients per GP and higher consultation rates

The number of registered patients per full-time equivalent (FTE) GP increased by 10% between 1987 and 2001 (table 2.2).

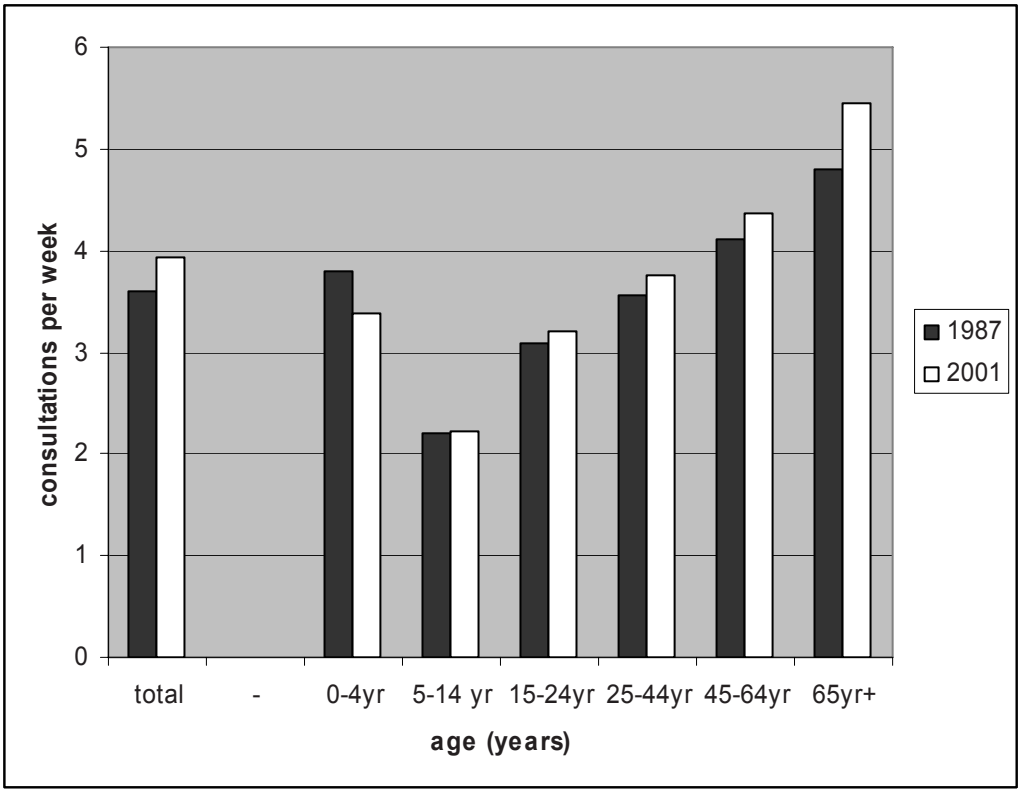
Table 2.2: Workload in 1987 and 2001 (mean, mean difference and observed significance level)

	1987 mean	2001 mean	Difference
List-size per FTE	2297	2529	232*
Consultation rate	3.59	3.94	0.35*
Weekly working hours	52.9	44.1	-8.8*
Direct patient-related working hours	37.0	31.0	-6.0*
FTE	0.94	0.84	-0.10*
Weekly working hours per FTE	58.6	53.4	-5.20*
Consultation length (minutes)	9.93	9.81	-0.12

* $p<0.05$.

Also, the number of consultations per patient increased by 10% in these years (figure 2.1). This rise is seen in all age groups, except for the youngest patients between 0 – 4 year. The oldest cohorts show the highest increase.

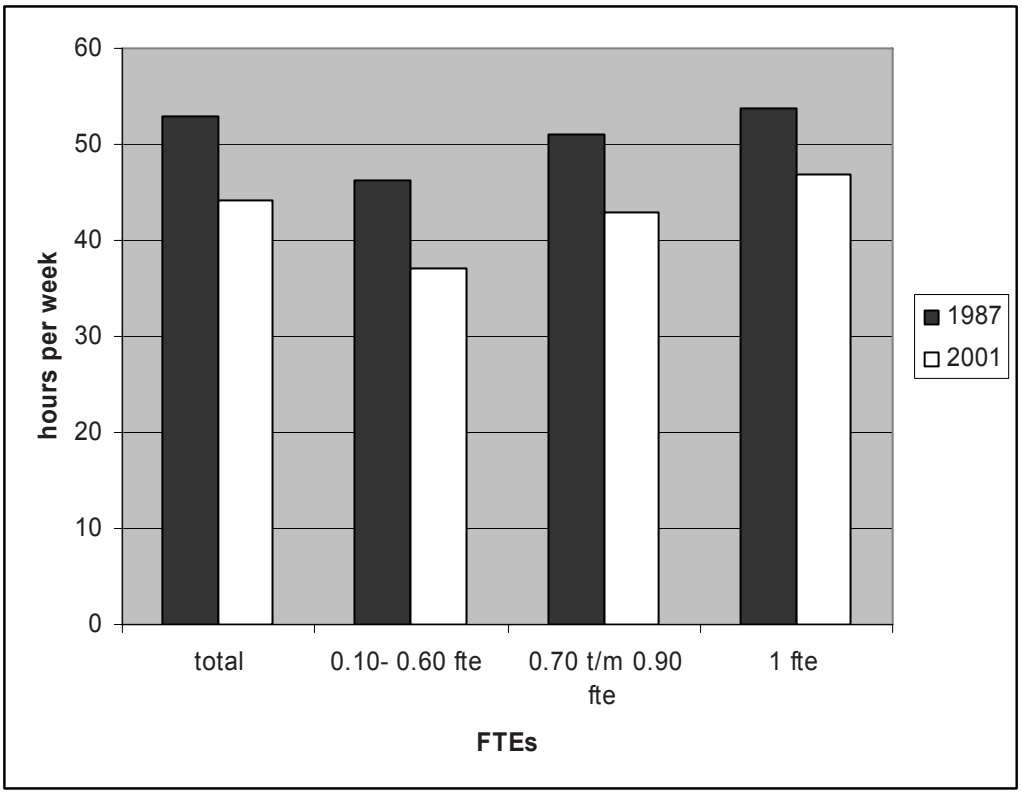
Figure 2.1: GP consultation rate of Dutch citizens, total and by age in 1987 and 2001



This means that the demand of care has increased considerably since 1987. Although the average list size per FTE has increased, the GP-density - the number of GPs divided by number of Dutch citizens - stayed more or less the same in this period. The rise in list size per FTE is mainly due to a decrease in the number of weekly working hours. Table 2.2 shows a distinct decline in the average number of weekly working hours from approximately 53 to 44 hours a week. Obviously, this decline is partly related to the rise in part-time working GPs. In 2001, part-time working has become very common. Over 40% of all GPs work part-time, while in 1987 approximately 10% of the GPs worked part-time. However, this is not the only explanation for the decreased number of working hours. Figure 2.2 shows

the average number of working hours in 1987 and 2001 for all GPs. The figure shows a decline for both full-timers and part-timers.

Figure 2.2: Mean number of weekly working hours of Dutch GPs, total and divided by FTE-categories in 1987 and 2001

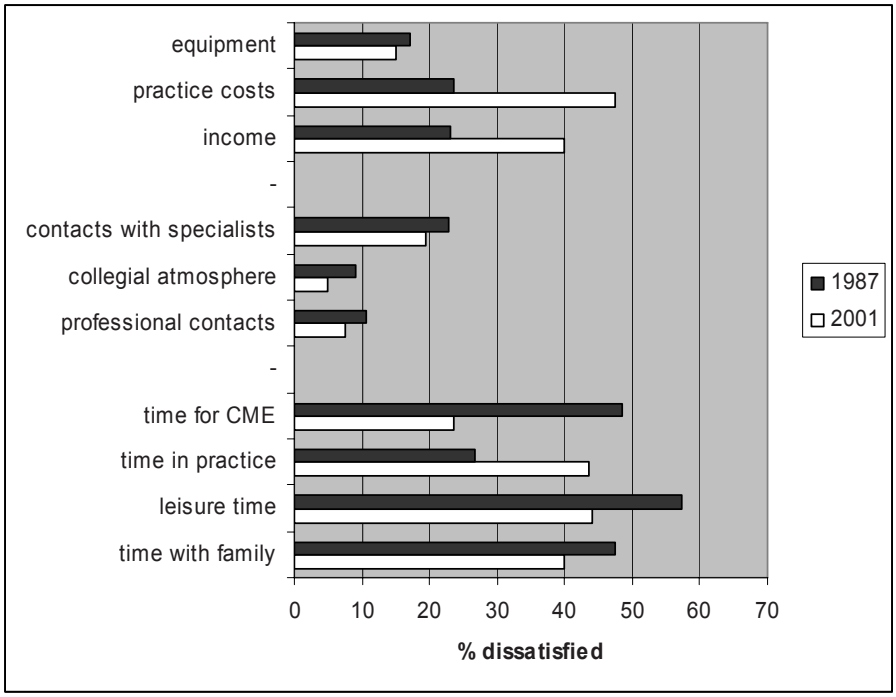


GPs are less satisfied with their job

The question: "How satisfied are you with your job in general?" was answered with 'satisfied' or 'very satisfied' by approximately three quarters in 2001. Compared with the situation fourteen years earlier, a distinct decline is noticeable: in 1987 88% were satisfied or very satisfied. The number of GPs who were dissatisfied with material and financial circumstances, such as practice costs and income, has increased with

respectively 24% and 17% (Figure 2.3). The number of GPs who were dissatisfied with contacts with others, like specialists and colleagues, seems to have decreased, but these changes are not statistically significant. Fewer GPs are dissatisfied with the time available for continuous medical education (CME), leisure time and time with the family. This is in sharp contrast with the number of GPs who were dissatisfied with time for the practice, which has increased by almost 17%. In general, in 2001 GPs are less satisfied about their work and more satisfied with the time available for private activities compared to 1987. Most of the dissension is related to a lack of time and money.

Figure 2.3: Proportions of GPs that were (very) dissatisfied with different aspects of their job, 1987 and 2001



How GPs handle more contacts within a shorter time frame

Our findings show that there is not a single and simple answer to the question whether or not workload has increased. Considering workload in terms of demand for care and list-size per FTE, we observe an increase. On the other hand, this increase of list-size per FTE is mainly due to GPs' own choice to reduce their number of working hours. GPs have found many effective strategies to handle more contacts within a shorter time frame. The picture of GPs developing strategies to improve their situation is in sharp contrast to the metaphor of rather passive hamsters that keep on running without making progress.

As other researchers have shown before (Groenewegen and Hutten, 1991; Hutten, 1998), these results indicate that workload not just depends on the level of care-demand, but is also affected by the supply-side. That is to say, workload is affected by the way this demand is managed. Focusing on only one of these aspects, e.g. the number of working hours or the consultation rate, can easily lead to false conclusions.

Looking for an explanation how GPs manage to see more patients in fewer working hours, we have found five important developments affecting workload in this period.

1. The nature of contacts has changed

The first, most likely, explanation was found in the nature of patient contacts. A clear shift has taken place towards fewer labour-intensive and time-consuming contacts. In 1987, over 16% of all contacts were house calls; in 2001 this percentage had dropped to 9% (see also (Cardol et al., 2004; Van den Berg et al., 2006)). At the same time, the proportion of telephone contacts has increased from 4.4% to 10.8% of all contacts. GPs have gained much time by these changes. Another possible way to attend to a greater number of patients in less time would be to reduce the consultation time. However, this turned out not to the case: the average duration of a consultation remains the same: almost ten minutes.

2. Access to the GP has become more regulated

Walk-in consultations are being increasingly replaced by consultations-by-appointment; some 50% of GPs adopt a policy of phone consultations by return phone call, and over half of the practice assistants independently advise by phone for a number of problems. These two aspects have

contributed to a reduction in the number of telephone calls between GPs and their patients. Assistants almost always ask the reason for requesting a house call. They also do so for fewer than half of the requests for an appointment at the surgery. Increasingly, patients cannot see their GPs on the same day of their requests. However, waiting times for an appointment in the Netherlands remain very short compared to international standards. For instance, data from the mid nineties show that in the Netherlands only 6% of the GPs reported more than two days between appointment and consultation. In Denmark, Belgium, the UK, and France this percentage is 45, 21, 31 and 12 respectively (Boerma, 2003).

3. Task delegation
Task delegation continues to be an important means to contain the workload of GPs and possibly to address the consequences of a future shortage of GPs. There has been a particularly significant increase in the number of technical medical tasks delegated to practice assistants. These include conducting cervical smears, reading blood pressure and treating warts (Van den Berg et al., 2004b).

4. Reorganization of out-of-hours work
GP cooperatives greatly alleviate the work load outside surgery hours. The emergence of GP cooperatives with centres for health care outside surgery hours is certainly one of the most spectacular organisational developments in GP care of the past fourteen years. From the perspective of reducing the work load, the GP cooperatives have certainly been a success. The number of shifts worked has been significantly reduced. GPs who participate in a cooperative spend up to 70% less time on shifts than GPs who operate an on-call rota (a difference of 5 hours versus 19 hours per week). GPs are also very satisfied with the cooperatives: they experience their services as less onerous, and are generally happy with the organisation of the services (Van den Berg et al., 2004c)

5. Task restriction
GPs can also respond to the increasing work burden by restricting the tasks they reckon among their duties. Care for psychosocial problems is one of these. In 2002, fewer GPs reckoned psychosocial care to their duties than 14 years previously. This does not mean that patients no longer can consult their GPs for psychosocial problems: GPs are now less likely to treat people who have, for instance, relationship problems, or problems at work. What is

actually taking place here is task delegation, mainly delegation to primary care psychologists and social workers. It reduces the GPs' work burden, because patients with psychosocial problems usually have frequent contacts with their GPs, and consultations of this nature tend to take up a lot of time.

2.4 Conclusions

The national strike of GPs in 2001 was the first in Dutch history. This event led us to infer that job satisfaction had decreased. The findings lent support to this assumption but not on all aspects of work. While GPs became less satisfied with financial aspects, like practice costs and income, they became more satisfied with the time available for professional education and leisure time. This seems to reflect the changes in the objective workload that took place. GPs spend less time on working but still handle a bigger care demand. Although they are more satisfied with the time available for other things than working, many of them apparently feel that improvements on the organisational level remain financially un-rewarded.

In contrast to previous research, a range of workload aspects in this study were analysed by relating them to each other, instead of relating them to one outcome measure. One shortcoming of this study is that trends were described on the basis of only two moments in time. Also, the GPs in 1987 and those in 2001 were not the same group, but both samples were representative for the Dutch GP population.

An increase in care demand forces GPs to work more efficiently. The question arises as to how quality and accessibility of care may have suffered under the pressure of developments, such as increased task delegation, the emergence of GP cooperatives and the shift from house calls to surgery appointments and from surgery appointments to telephone consultations. Although this was beyond the scope of this study, results from other studies carried out in the framework of the DNSGP-2 indicated that Dutch GPs remain low prescribers, show a great adherence to professional guidelines and have low referral rates (Cardol et al., 2004; Braspenning et al., 2004) Patient satisfaction with the content of care has increased slightly, although there are concerns about the accessibility of care outside surgery hours and about the willingness of GPs to make house calls (Braspenning et al., 2004).

There are only a few signs that the quality of care has suffered. Finally, this study did not address the question how organizational changes and workload affect the quality of care. Further research into the relation between quality-indicators (derived from professional guidelines) and workload-indicators (as described in this study) will provide a deeper insight into this matter. We intend to continue along this path in the period ahead of us.

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Chapter 3

The decline in GPs' working hours: the influence of feminization, part time working and cohort replacement

Abstract

In the Netherlands, and in many other western countries, the average number of working hours of GPs and, more specifically, hours spent on patient care has been declining. This decline is often associated with trends in the social composition of the workforce and changes in labour supply, especially feminisation and working in partnerships. The main objective of this study was to investigate to what extent the decrease in the number of working hours among GPs can be explained by 1) a cohort-effect 2) feminisation 3) part time working and 4) the rising number of partnerships. Time-registration data were used from the years 1987 and 2001. In both studies the GPs kept detailed diaries of their time use. These diaries contained a registration of activity in 15 minutes intervals, during 24 hours a day, 7 consecutive days. We investigated difference in the average number of working hours in 1987 and in 2001. Multilevel analyses were carried out to test the hypotheses. The models have two levels, 1: GP and 2: practice. Dependent variables were number of working hours and number of hours spent in patient care.

Two-third of the decline between 1987 and 2001 can be ascribed to the fact that the new, young cohorts work less. On top of that, a decline regardless of cohort differences took place. A part of the decrease in the number of working hours was initially caused by feminisation of the younger cohorts, but the effect of this factor declined significantly in the course of time. More women than men work part time, and this explains an important part of the sex-difference. However, part time working has become quite common, among men as well as women. Our main conclusion is that differences between the cohorts and between the sexes exist, but that these differences have become smaller in the course of time.

3.1 Introduction

In several countries, studies have reported significant changes in labour supply of general practitioners in the past decades. One of these trends is the decline in the average number of working hours of GPs and, more specifically, in hours spent on patient care. (Mechanic, 2001); Charles et al, 2004; Slade, 2002) Concerns about these trends are mainly related to manpower planning and expected imminent scarcity in the future. In recent years the number of places for GP-students in the Netherlands is enlarged because it is expected that more GPs will be necessary to manage the future care demand. The decline in number of working hours is often associated with trends in the social composition of the workforce and changes in labour supply that appear to be very similar in a range of western countries (Mechanic, 2001; Bass, 1998; Young and Leese, 1999; Sibbald, 2003; Crossley et al., 2009). The number of female GPs has been steadily rising, (Mc Kinstry et al., 2006; Boerma and van den Brink-Muinen, 2000; Denekens et al, 2002; Maiorova et al., 2007; Brooks, 1998; Notzer and Levi, 1991; Graham and De La Harpe, 2004). Moreover, the number of part-time workers is rising. Especially young doctors and women seem less likely to commit themselves to a fulltime job and prefer working in partnerships above an own practice (Kortenhoeven, 1990; Van den Hombergh et al., 2005; Maiorova et al., 2007; Young and Leese, 1999; Watson et al., 2006; Sibbald and Young, 2008).

Although these developments are commonly known, the relation between these trends is not so straightforward. It is unclear to what extent the growing number of part timers is caused by feminisation and whether the difference between the sexes is stable in the course of time. Research in the UK has shown that female GPs work shorter hours than men, even when they work full time (Gravelle and Hole, 2007; Levinson, 2004) . In this article we will test three possible explanations for the declining average number of working hours. These explanations are probably the most common explanations among policymakers and manpower planners and concern influences of cohort differences, sex-effects and the influence of part time working:

1a) The decline in number of working hours is caused by a cohort-effect: the older cohorts retire and are replaced by younger cohorts that work shorter hours.

1b) The alternative explanation: the decline in number of working hours is an overall decline, young as well as older GPs reduced their number of working hours.
2) The under 1a assumed cohort effect can be explained by the rising number of female GPs among the youngest cohorts, and these women work shorter hours than men.
3) The (under 2 assumed) sex-effect is due to a) the fact that women more often choose to work part-time, b)more often work in partnerships.

Since part time working and working in partnerships possibly lead to a different allocation of the work, this explanation will be tested separately for total working hours and for time spent on patients. Obviously, it is likely that the decrease is caused by a mixture of these effects. In that case, it is interesting to investigate how large the contributions of these effects are. The answers to this question have important consequences for how the trend of a decreasing number of working hours will develop over time. To answer the research questions, we will look at the differences between two years: 1987 and 2001.

3.2 Methods

Data

Data were used from the first and second Dutch National Survey of General Practice (DNSGP-1 and DNSGP-2). DNSGP-1 was carried out in 1987 among 103 practices in the Netherlands; comprising 161 GPs. DNSGP-2 was carried out between 2000 and 2002 among 104 practices, comprising 195 GPs. Westert et al. (2005) described in more detail the methods and data collection of the DNSGP.

The DNSGP contains several data sources. For this study we made use of time-registration data. In both studies the GPs kept detailed diaries of their time use. These diaries contained a registration of activity in 15 minutes intervals, during 24 hours a day, 7 consecutive days. Respectively 94% (DNSGP-1) and 80% (DNSGP-2) filled out a complete diary. Data about graduation year, sex, practice time and part-time working were derived from the national database of all GPs in the Netherlands (NIVEL).

Measures

Dependent variables:

- Number of working hours per week
- Number of working hours per week spent on direct patient care

Independent variables:

- Year of measure. DNSGP-1 was coded as 0, DNSGP-2 as 1.
- Graduation year: this variable was transformed by subtracting the minimum ('51 in 1987 and '66 for 2001), this simplifies the interpretation of the coefficients.
- Graduation year squared. Since explorative analyses showed a curvilinear relation between graduation year and number of working hours, this squared term was added.
- Sex. Men were coded as the reference category (0), women as 1.
- Practice type has three categories: group practices (reference category) duo practices and solo practices.
- Part time working has two categories: 0 (fulltime) and 1 (part time). Part time means less than 1 FTE. Most GPs are self-employed and thus, have no fixed number of compensable hours. Single handed GPs can usually be considered as full timers. GPs working in partnerships make an agreement with their colleagues about their number of FTEs and the corresponding remuneration. GPs who are employed with other GPs have contracts for a certain number of FTEs, just like other employers.

Means and standard deviations of all variables used are presented in table 3.1.

Table 3.1: Overview of variables used

	DNSGP-1 (n = 151)	DNSGP-2 (n = 156)
	Mean (sd) / %	Mean (sd) / %
Working hours per week	50.5 (11.1)	44.1 (12.6)
Hours spent on patients	33.8 (9.7)	31.0 (10.2)
Graduation year	72.2 (7.6)	82.8 (8.7)
Sex (female GPs)	15.2%	23.7%
Practice type (individual level)		
- Solo	32.5%	33.3%
- Duo	38.4%	23.7%
- Group / health centre	29.1%	42.9%
Part-time working	21.2%	41.7%

Analyses

Several Multilevel analyses were carried out to test the hypotheses. The models have two levels, 1: GP and 2: practice. First the year of measure (1987 or 2001) was used as an independent variable. In the subsequent models, the other variables were added step by step: graduation year, sex, practice type and part time working. By observing the change in the effect of year of measure and the change in the squared part-correlation of this variable in the different models, it becomes clear to what extent the decrease between the years is explained by the other variables. This squared part-correlation can be interpreted as the part of the total explained variance (R^2) that can be ascribed to a specific variable.

To gain more insight in the differences between the two years, the last four steps were repeated for the two years separately. The analyses were carried out two times, first with total number of working hours as dependent variable, second with only patient-related time as dependent variable. The analyses were carried out with the software package SPSS 14.0.

3.3 Results

Figure 3.1 shows the average number of working hours per week by graduation-cohort. The oldest cohort consists of GPs who graduated before 1965, the youngest cohort graduated after 1991. Obviously, the oldest

cohort was retired in 2001 and the two youngest cohorts were not yet graduated in 1987. The figure shows that in both years, the relation between graduation year and number of working hours was curvilinear, more or less an inverted-U. In both years the cohorts in the middle worked the highest number of hours. This is likely not only due to a cohort-effect but also to an age-effect. In other words, GPs reduce their number of working hours when they become older, regardless from the cohort they belong to. However, it is also clear that the younger cohorts in 2001 worked fewer hours than the younger cohorts in 1987. On top of this age effect and cohort effect, there was an overall decrease in number of working hours, regardless from age or cohorts.

For a better understanding of age-differences, we show the average number of working hours by age-group (figure 3.2). This figure shows that in all age-groups, the number of working hours was lower in 2001 than it was in 1987. Since the correlation between age and graduation year is very strong ($r=0.94$) age was left out of the other analyses.

We did not find a clear relation between graduation year and time spent on patients, although this variable also decreased between 1987 and 2001.

Figure 3.1: Average number of working hours per week by graduation-cohort (1987 n =151; 2001 n = 154)

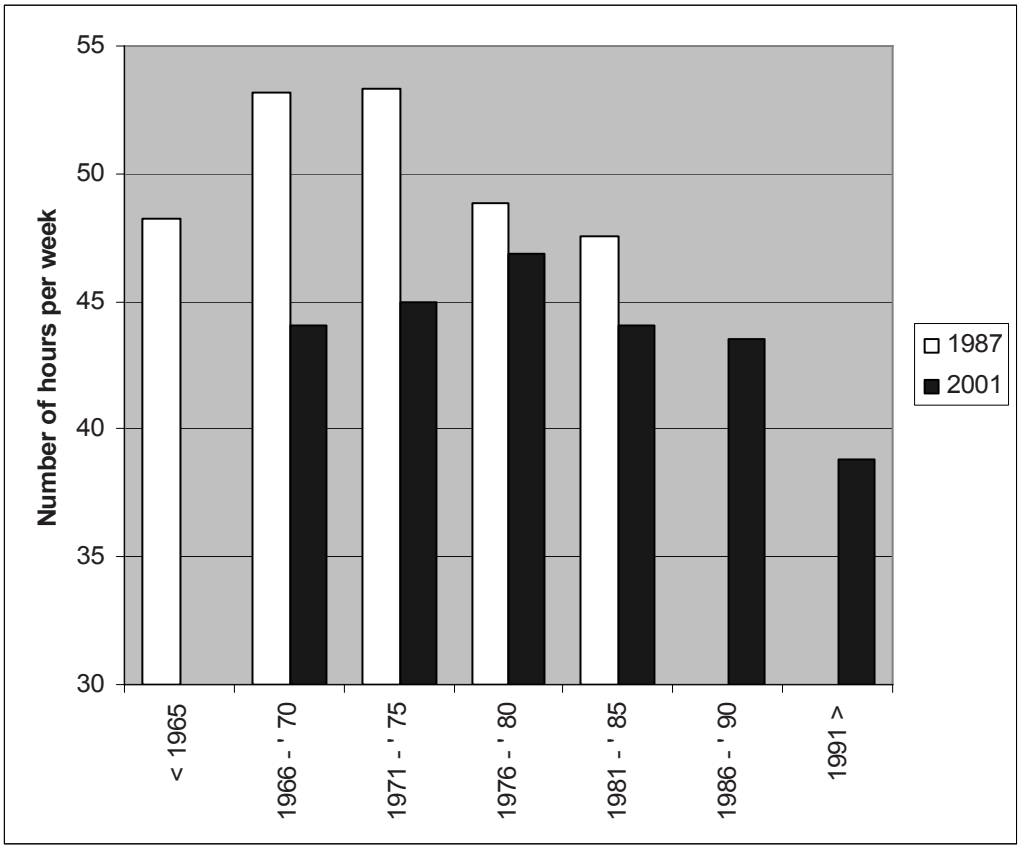
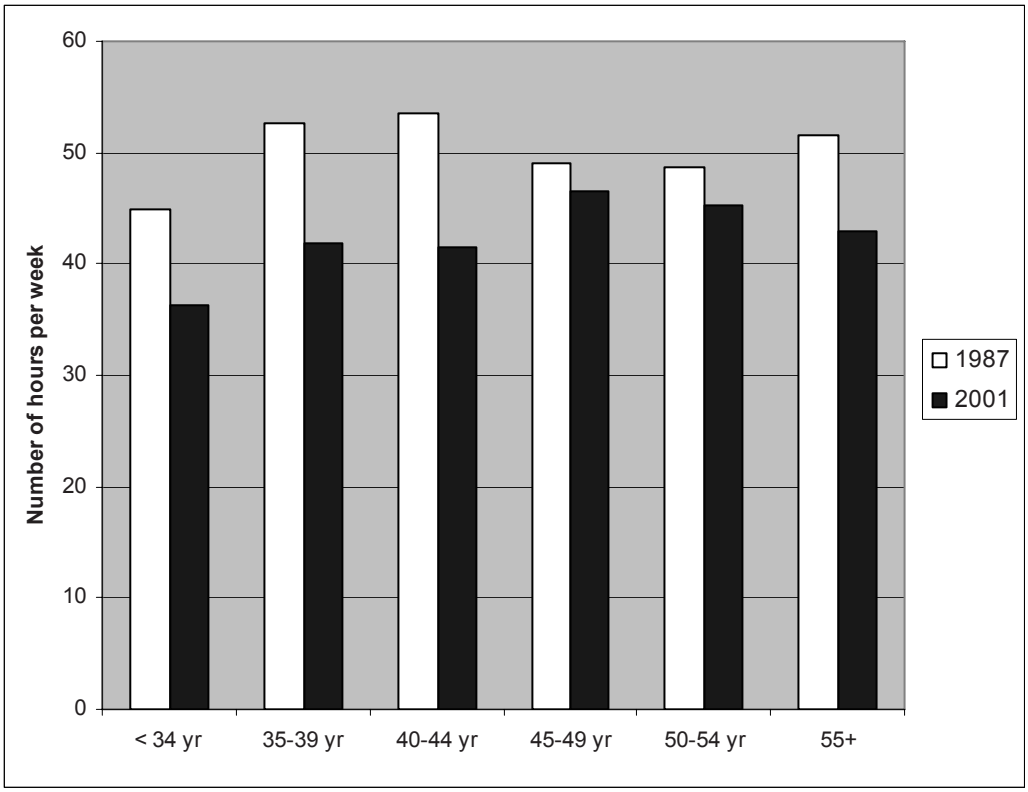


Figure 3.2: Average number of working hours per week by age-group. !987 and 2001 (1987 n=151; 2001 n=154)



Multilevel analyses

Total working hours

Table 3.2 shows the difference between 1987 and 2001, before and after adding the other variables to the model.

Table 3.2: Multilevel regression analyses of year of measure, graduation year, sex, practice type and part time working on number of working hours a week (Regression coefficients and squared part-correlation of year of measure) (N=307)

	Model 1 b	Model 2 b	Model 3 b	Model 4 b	Model 5 b
Intercept	50.70	47.08	48.19	46.05	46.54
2001 (ref=1987)	-5.92***	-4.22**	-4.48**	-4.51**	-4.17**
Year graduation		0.43	0.36	0.36	-0.38
Year graduation^2		-0.01**	-0.01*	-0.01*	-0.01*
Sex (female)			-5.82***	-5.33***	-3.79**
Practice type					
Group				Ref	Ref
Duo				1.81	1.67
Solo				3.40*	2.39
Part time (fulltime=ref)					-3.81**
Part-correlation ^{2} 2001	0.068	0.023	0.026	0.025	0.020
Reduction part-correlation ^{2}		66%	62%	64%	70%

* p<0.10; ** p<0.05; *** p<0.005; Ref = reference category.

Model 1 shows that the average number of working hours was 50.7 in 1987, this is represented by the intercept. In 2001 this was approximately six hours less. Model 2, in which we added the variable "year of graduation" (cohort) to the model, the squared part correlation of the variable "2001" was reduced by 66%. This means that two third of this difference between 1987 and 2001 can be ascribed to graduation year. There is a statistically significant, curvilinear relation between year of graduation and number of working hours, which can be characterised as an inverted-U that we also saw in figure 3.1.

In model 3, the cohort-effect is slightly reduced by sex. Women worked on average 5.8 hours less. However, the difference between the two years is not reduced by this variable. In model 4, we see that single handed GPs work 3.4 hours more on average than their colleagues working in partnerships. In model 5, finally, the sex-effect is partly explained by part-time work but a clear sex-difference remains. This implies that the fact that female GPs work fewer hours than their male counterparts, can only partly be due to the higher number of part time workers among female GPs. After adding all independent variables to the model, the squared part correlation of "2001" was reduced by 70%. This means that 70% of the difference between 1987

and 2001 can be ascribed to our explanatory variables together. A statistically significant difference of 4.2 working hours per week remains.

Table 3.3 shows four multilevel models for 1987 and for 2001. The cohort-effect appears to vary between the years. In 1987 the relation is curvilinear, while in 2001 no statistically significant relation between year of graduation and number of working hours was found. Looking at the models for 1987 first, it appears that the only important variable is sex. Female GPs worked around a whole working day less than male GPs. Surprisingly, only a small part of this difference can be ascribed to the factor part-time working (4a).

Table 3.3: Multilevel regression analyses of graduation year, sex, practice type and part time working on number of working hours a week, 1987 and 2001 (regression coefficients)

	Model 1a		Model 2a		Model 3a		Model 4a	
	'87	'01	'87	'01	'87	'01	'87	'01
	b	b	b	b	b	b	b	b
Intercept	43.92	44.58	45.34	45.56	44.66	42.63	45.29	43.23
Year graduation	0.99*	0.37	0.88*	0.27	0.78	0.29	0.73	0.51
Year graduation^2	-0.03**	-0.02	-0.02*	-0.01	-0.02	-0.01	-0.02	-0.02
Sex (female)			-8.65***	-3.67	-8.26***	-3.00	-7.18**	-1.26
Practice type								
Group					Ref	Ref	Ref	Ref
Duo					0.20	4.42	0.27	3.93
Solo					2.75	3.77	2.53	1.69
Part time (fulltime=ref)							-2.31	-4.93*

* p<0.10; ** p<0.05; *** p<0.005; Ref = reference category.

In 2001, however, the situation is entirely different: the difference between men and women is much smaller and not statistically significant. The only important explanatory variable here is part-time working (4a) with a coefficient of -4.9.

Time spent on patient-related activities

Table 3.4 shows the same analyses as table 2, yet, now the dependent variable is not the total number of working hours but only the time spent on patients.

Table 3.4: Multilevel regression analyses of year of measure, graduation year, sex, practice type and part time working on number of hours spent on patients per week. (Regression coefficients and squared part-correlation of year of measure) n=307

	Model 1c b	Model 2c b	Model 3c b	Model 4c b	Model 5c b
Intercept	34.00	35.28	35.39	34.98	36.11
2001 (ref=1987)	-2.69**	-2.52*	-2.84**	-3.19**	-2.41*
Year graduation		-0.02	-0.17	0.16	0.12
Year graduation^2		0.00	0.00	0.00	0.00
Sex (female)			-6.20***	-5.54***	-2.31
Practice type					-7.97***
Group				Ref	Ref
Duo				-0.40	-0.76
Solo				3.54**	1.36
Part time (fulltime=ref)					-7.97***
Practice level	0%	0%	6%	11%	40%
GP-level	15%	15%	3%	8%	14%
Part-correlation ^{2} 2001	0.02	0.01	0.02	0.02	0.01
Reduction Part-correlation ^{2}		45%	20%	20%	58%

* p<0.10; ** p<0.05; *** p< 0.005; Ref = reference category.

As expected, the number of hours spent on patients is lower in 2001. Furthermore, the number of hours is lower among female GPs (model 3c) and higher among single handed practices (model 4c). The larger part of the differences between the sexes and between solo practices and partnerships can be ascribed to part-time working. The final model (5c) shows that part time working is the most important variable which explains an important part of the difference between the years, between men and women and between solo-working GPs and GPs in partnerships. However, a difference of 2.4 hours remains.

Table 3.5 shows the four models for 1987 and for 2001. In 1987, there was a significant, curvilinear cohort effect (model 1) this effect decreases after adding the variable sex to the model (model 2). The difference between the sexes is large (over ten hours). Model 4 shows that an important part of the difference is explained by part-time working. However, even after adding this variable a strong and significant difference between male and female GPs remains.

Table 3.5: Multilevel regression analyses of graduation year, sex, practice type and part time working on number of hours spent on patients per week, 1987 and 2001. (regression coefficients)

	Model 1a		Model 2a		Model 3a		Model 4a	
	'87	'01	'87	'01	'87	'01	'87	'01
	b	b	b	b	b	b	b	b
Intercept	29.36	33.77	31.45	34.69	31.67	32.54	33.56	33.57
Year graduation	0.77*	-0.41	0.54	-0.51	0.35	-0.51	0.20	0.16
Year graduation^2	-0.02*	0.01	-0.01	0.02	-0.08	0.02	-0.03	0.01
Sex (female)			-10.44***	-3.33*	-9.53***	-2.74	-5.34**	-0.02
Practice type								
Group					Ref	Ref	Ref	Ref
Duo					-2.01	2.45	-1.79	1.65
Solo					3.68*	3.44	2.95	0.05
Part time (fulltime=ref)							-8.04***	-7.91***

* p<0.10; ** p<0.05; *** p<0.005; Ref = reference category.

In the models for 2001, there is no significant cohort-effect and only a small difference between the sexes (3.3). This difference can almost entirely been ascribed to the fact that female GPs more often work part-time. In 2001, only part-time working explains some of the variation in patient-related hours. The finding that in model 2a the difference in the coefficients of sex is much larger than the difference between the intercepts, means that the number of patient-related hours decreased among male GPs but increased among female GPs.

3.4 Discussion

The main question in this article was to what extent the decrease in the number of working hours among GPs can be explained by 1) a cohort-effect 2) feminisation 3) part time working and 4) the rising number of partnerships. Our main conclusion is that differences between the cohorts and between the sexes exist, but that these differences have become smaller in the course of time. Part time working still plays an important role, since this has become more popular among men as well as women. We will go into the four hypotheses separately.

Is the decline in number of working hours caused by a cohort-effect? Our results showed indeed, an important cohort effect. Two-third of the decline between 1987 and 2001 can be ascribed to the fact that the new, young cohorts work less. However, on top of this cohort-effect, a decline regardless of cohort differences took place (1b). Approximately one-third of the difference between the years can be ascribed to this overall decline regardless of cohorts. When we just look at patient-related time, the cohort-effect is much smaller and, in our analyses, not statistically significant.

Is this cohort effect that we found due to the rising number of female GPs among the youngest cohorts? We can conclude that part of the decrease in the number of working hours was initially caused by feminisation of the younger cohorts. However, we also saw that the importance of this factor declined significantly in the course of time. In 1987, we found a difference of around a whole working day a week between men and women, while for 2001 no significant difference was found. Although this is possibly due to a lack of statistical power, it is clear that the difference declined sharply. The difference between the working week of men and women decreased even more if we look at patient-related time only. So, it seems no longer plausible to consider feminisation of the workforce as problematic with regard to workforce supply.

Can the difference in number of working hours between the sexes be explained by the higher number of part time workers among women? More women than men work part time, and this indeed explains an important part of the sex-difference. However, in 1987 female GPs worked significantly less, even when the factor part time working was taken into account. The difference between male and female GPs that still exists, is due to the higher

number of part-time workers among women. The number of part-time workers rose significantly in the course of time and part time working became a more important factor. Yet, while in the late eighties mainly women worked part time, nowadays part time working has become quite common, among men as well as women. These findings are supported by statistics from the national registration of General practitioners. In the period 1997 – 2007 the proportion of part time workers among female GPs rose from 74% to 87%. However, the proportion of male part time workers more than doubled in that period: from 19% to 41%. In the same period, the proportion of female GPs increased from 23% to 35% (Hingstman and Kenens, 2008). Although this is a sharp rise, it is clear that the development towards part time working among men has had much more influence. In previous studies, Watson et al., (2006) and Crossley et al., (2008) came to the same conclusion for Canada.

Some limitations of this study should be taken into account while interpreting the results. First, we got only two years of measurement. Therefore, there was little possibility to separate age-effects from cohort-effects. The more measuring-moments the better these things can be separated. We chose not to put age as a variable in our models because of a collinearity with graduation year. Second, the dataset was relatively small, this might leads to an underestimation of relations. Probably, a statistically significant difference between the sexes would also have been found in 2001 with more statistical power.

What are the implications of these findings? First, we saw that the factor part time working plays an important role in the number of working hours of GPs, especially in the number of patient-related hours. Sex-differences also play a role, but this role has become smaller in the course of time. And in the future, this factor might become irrelevant. When developing models for the estimation of future required workforce supply, it is more important to focus on trends in part time working among both sexes than on feminisation. An example of overestimating the effect of feminisation is extrapolating the average number of working hours of men and women to the future sex-distribution of the workforce. After all, this passes over the fact that the number of patient related hours is rising among female GPs. Moreover, it is not obvious that the decrease in the average number of working hours leads to a proportional decrease of time for patients.

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Chapter 4

Professionalisation of the practice assistant enables task delegation: 1987-2001

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Abstract

The practice assistant is a typical Dutch phenomenon. It is a job on intermediate vocational level and combines routine medical activities and administrative tasks. Since the first practice assistants appeared in Dutch general practice, this function has developed from the doctor's wife without specific education to a function with a clear task and educational profile. In this chapter we describe how the role of practice assistants changed in the period 1987 -2001, and how this affects the workload of GPs. Data were used from the first and second Dutch National Survey of General Practice (DNSGP-1 and DNSGP-2). DNSGP-1 was carried out in 1987 among 103 practices in the Netherlands. DNSGP-2 was carried out between 2000 and 2002 among 104 practices. Surveys were carried out amongst all participating GPs and practice assistants (see table 4.2). The response rate was 95% for the GPs and 91% for assistants in 2001. We have compared the results of the DNSGP-2 with comparable data of the DNSGP-1 (1987) and data from 1990. To test the statistical reliability of our findings, we have used T-test for two independent samples, tests for two proportions and linear regression analysis. Results indicated that practice assistants have professionalised over the period studied. The number of practice assistants with vocational training increased, and a rising number of practice assistants have a contract, a separate working area and a clearly defined package of responsibilities. From a list of 23 medical tasks, derived from the official occupational profile of the practice assistants, 15 were significantly more often performed by practice assistants in 2001 than in 1987. The number of working hours of assistants and GPs were positively correlated, (unstandardised regression-coefficient (b)= 0.36), which means over 21 additional minutes GP working time per assistant-hour.

Introduction

In 2004, we published an extensive study on General Practitioners workload in the Netherlands (Van den Berg et al., 2004a). This study was carried out in the framework of the second Dutch National Study of General Practice (DNSGP-2). The report of this study contains information on the work burden of GPs, the changes that have taken place in this respect since the late 1980s and factors that have impacted on it. The report was written in Dutch. In this chapter we discuss the role of practice assistants in Dutch general practice.

Under pressure of a rising demand for care and a growing shortage of GPs, policy makers and GPs develop strategies to improve the efficiency in general practice. Delegation of tasks is generally considered as a suitable strategy. Reduction of GPs' workload is one of the most important reasons to delegate tasks and, in addition, delegation can improve the quality of care (Van den Berg et al., 2003). By delegating routine-activities, GPs can concentrate on more complicated tasks. Which tasks may be delegated to whom and under what circumstances? This depends on the complexity of the tasks on the one hand and the expertise of the person who has to carry out these tasks on the other hand. This expertise can be achieved by education, but for effective delegation it is also important that GPs and patients acknowledge the need of delegation and accept it.

Fifty years ago, the organisational structure of an average Dutch general practice was fairly simple: a single-handed practice with a GP, assisted by his wife or practice assistant with no specific education. Nowadays, the practice becomes more and more an organisation with a range of disciplines with different tasks and responsibilities. The practice assistants have been the GPs' right hand since the sixties. In recent times they have received an education at intermediate vocational level and their tasks are widely ranged: routine medical work (such as treating warts, removing stitches, blood pressure readings), administration, intake/counter activities, making appointments, cleaning instruments, management activities and triage. Table 4.1 summarizes the tasks and educational level of the GP, the practice nurse and the practice assistant. Although the practice assistant has the least complex tasks, he or she is, quantitatively, still the far most important person next to the GP. Every Dutch general practice employs one or more practice assistants, around 40% employs a practice nurse. In this study we

have investigated the role the practice assistants play in the practice nowadays: in what respect this role has been changing since the late 1980s, and which factors determine task delegation to practice assistants. Besides, information about practice nurses will be presented. Previously, we found that in the period 1987 – 2001, GPs Carry out more tasks and serve more patients within a shorter time frame (Van den Berg et al., 2004). In this same period, practice assistants have become better educated. Therefore, we expect that between 1987 and 2001, the number of medical tasks that GPs delegated to practice assistants rose. Moreover, it is to be expected that this delegation will affect the workload of GPs and that GPs work fewer hours when there is more assistance available.

Table 4.1 Staff in Dutch General Practice, 2001

Function	Tasks	Education
General practitioner	- Responsibility for the care process - Important decisions regarding prescriptions, referrals, etc. - Gatekeeper in Dutch healthcare system	University, medical training 9 years
Practice nurse (since late 1990s)	Taking care for chronically ill (diabetes, asthma/COPD) check-ups, instructions and information (about use of drugs, smoking-, drinking- and eating habits).	Higher vocational
Practice assistant (since 1960s)	Routine medical activities (such as treating warts, removing stitches, blood pressure readings. Administration, intake/counter activities, making appointments, cleaning instruments, management activities	Intermediate vocational

Methods

Data were used from the first and second Dutch National Survey of General Practice (DNSGP-1 and DNSGP-2). DNSGP-1 was carried out in 1987 among 103 practices in the Netherlands. DNSGP-2 was carried out between 2000 and 2002 among 104 practices. Westert et al. (2005) described in more detail the methods and data collection of the DNSGP.
Specific for the study prescribed in this chapter is the following. To investigate task delegation and attitude towards delegation, surveys were carried out amongst all participating GPs and practice assistants (see table 4.2). The response rate was 95% for the GPs and 91% for assistants in 2001. We have compared the results of the DNSGP-2 with comparable data of the DNSGP-1 (1987) and data from Nijland et al. (1990; 1991). Response-rates in these surveys were 96% in 1987 (only assistants) and 76% in 1990 (only GPs). Practice nurses did not participate in these surveys. Instead, GPs were questioned about their opinion on delegation to a practice nurse (only 2001). To test the statistical reliability of our findings, we have used T-test for two independent samples, tests for two proportions and linear regression analysis. The operationalisations, data sources and numbers of valid cases are summarised in table 4.2.

Table 4.2: Survey of GP staff, variables, data sources and number of cases

	Operationalisation	Source	DNSGP-1, N=	DNSGP-2, N=
Practice assistant				
Profile	Age, education, fte, number of working hours	Questionnaires among assistants	158	246
Tasks	list of (medical) tasks			
General practitioner				
Attitude towards delegation and hampering factors	Statements about delegation, workload, quality	Questionnaire among GPs	436*	185
Workload	Number of working hours week	Diaries; registration of activities every quarter of an hour during one week		157
List size	Total list size, distributed by fte	DNSGP-2 practice-database	154	189

* data Nijland et al., (1991).

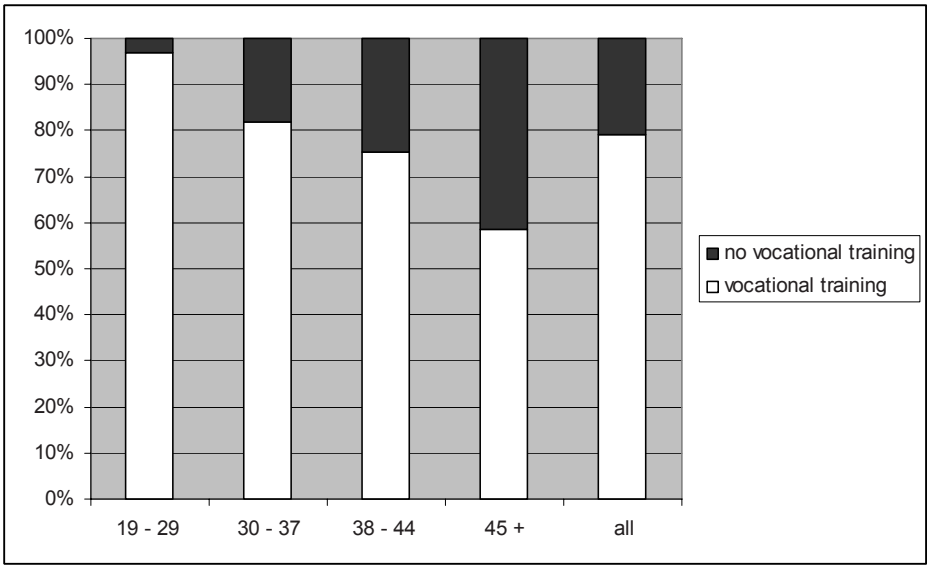
Results

In general, it appears that practice assistants have professionalised over the period studied. The number of practice assistants with vocational training increased, and a rising number of practice assistants have a contract, a separate working area and a clearly defined package of responsibilities.

Education

The proportion that was trained as a practice assistant increased from 56% in 1987 to 79% in 2001. Figure 4.1 shows the number of practice assistants with an official vocational training in 2001. There is a clear relationship between the assistants' age and education: from the oldest assistants (45 years and older) less than 60% took part in vocational training while in the youngest category, practice assistants without vocational training have become an exception. In 1987 only one third of the oldest cohort had received vocational training (not in figure).

Figure 4.1: Percentage of assistants with/without vocational training classified by age-quartiles (2001) (n=246)



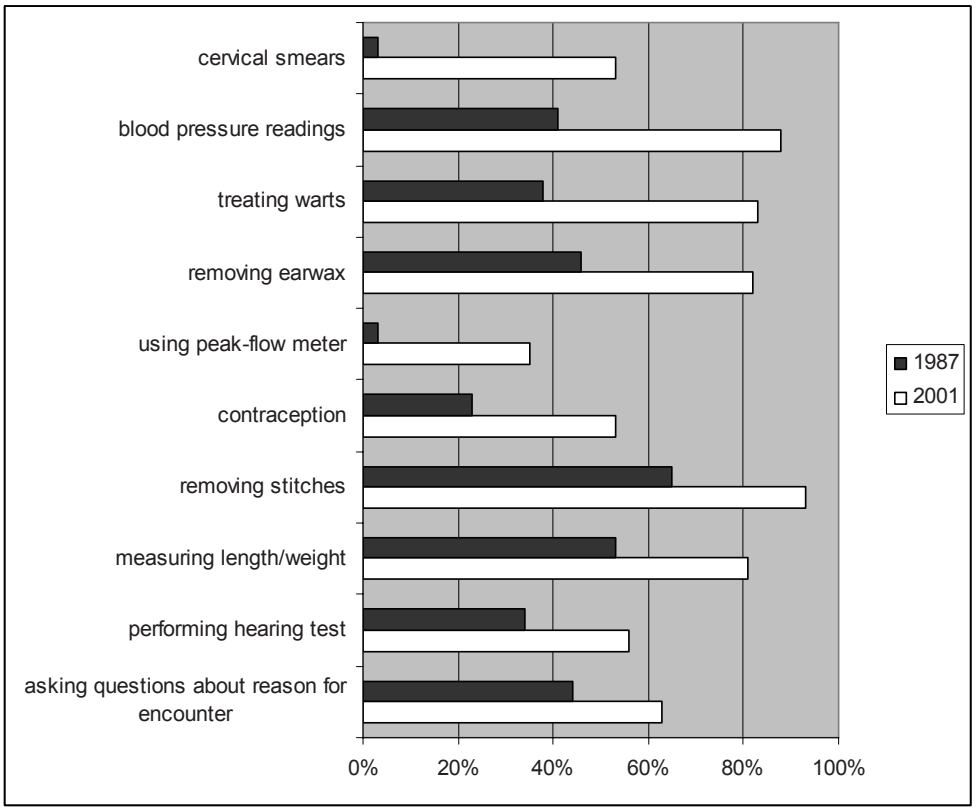
Performance of medical tasks

From a list of 23 medical tasks, derived from the official occupational profile of the practice assistants, 15 were significantly more often performed by practice assistants in 2001 than in 1987. Figure 4.2 represents the ten tasks with the largest shifts. The proportion of practice assistants that conducts cervical smears has increased from 3% to 53%. However, in 2001 smears were usually taken in the GP's practice which was not yet the case in 1990. The proportion of practice assistants that measured blood pressure has risen from 41% to 88%. Other remarkable shifts were those in treating warts and removing earwax. In 2001, 53% of the practice assistants had their own consulting hour (not in figure).

GPs' attitude towards delegation

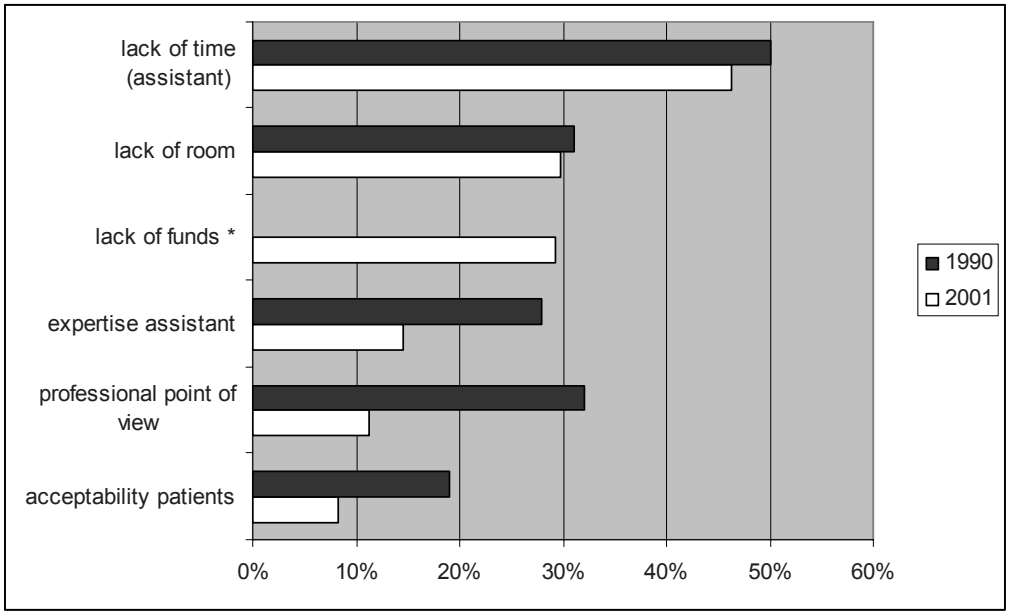
Most GPs had a favourable opinion about delegation. Eight out of ten GPs saw task delegation as a means to reduce their workload. In addition, 70% believed that task delegation increases their job satisfaction. Moreover, 77% assumed it saves time. The proportion of GPs that believe delegation increases their job satisfaction increased from 1990 to 2001 by 16% ($p<.01$).

Figure 4.2: Ten medical tasks and the percentage of assistants that carried out these tasks in 1987 (N=158) and in 2001 (N=246)



Most GPs would prefer to delegate more to their practice assistants; more than half of the GPs (52%) was dissatisfied with the amount of assistance, they wanted more assistance, would this be possible. Approximately the same percentage was found in 1990 (Nijland et al., 1990). However, GPs mention some factors that hamper task delegation (see figure 4.3).

Figure 4.3: Factors which are seen by GPs to hamper task delegation in 1990 and 2001 (N= 436 and 185 respectively) * not asked in 1990



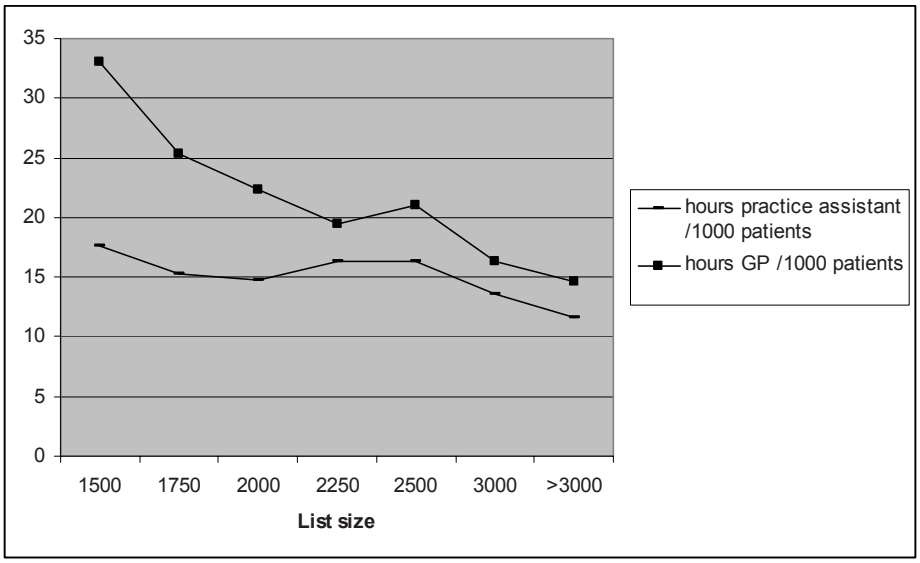
The most important factors were a lack of the practice assistant's time (mentioned by 46%), room (30%) and funds (29%) (not asked in 1990). This seems to be an old problem: in 1990 the same drawbacks were mentioned. Factors that became far less important in the course of time are lack of expertise on the side of the practice assistant (decrease from 28% to 15%), the GP wanting to keep control (from 32% to 11%) and the acceptance by patients (from 31% to 11%).

Number of working hours

Considering the results so far, it could be expected that GPs work fewer hours when they have more assistance available. After all, they can save time by delegating activities. However, we have found that the more hours an assistant works, the more hours the GP works. The (unstandardised) regression-coefficient (b) is 0.36, which means over 21 additional minutes GP working time per assistant-hour, (these data were only available for

2001). Nevertheless, multivariate analyses showed that this relationship can be attributed to the list size. The number of hours worked per week by the GP (per 1000 patients) and the number of hours worked by the practice assistant (per 100 patients) both decline with list size (see figure 4.4). For the number of hours worked by the GP this relationship is the strongest. There has been a slight increase from 0.84 fte assistants per practice of 2350 patients in 1987 to 0.90 in 2001.

Figure 4.4: Number of hours worked by GPs and practice assistants per 1000 patients, per week by list size, 2001



The practice nurse

In 2001, one quarter of the practices (25 out of hundred) employed a practice nurse. Practice nurses worked approximately 0.20 fte (approximately one day a week) in a practice of 2350 patients. The practice nurse did not seem to thwart the activities of the assistants; the number of assistance-hours did not differ between practices with a practice nurse and practices without a practice nurse. Moreover, the number of hours worked by the GP does not differ either. So, it seems that in the practices with a practice nurse, some work is done that would have to wait being done

otherwise. GPs are also very positive about task delegation to practice nurses: 73% of the GPs believe that a practice nurse reduces the workload of the GP, another 73% think it saves time and 78% think it improves the job satisfaction of the GP (not in figure). However, the same hampering factors were mentioned as described above: a lack of time, room and funding. These aspects were mentioned by respectively 31%, 29% and 35% of the GPs (not in figure)

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Chapter 5

GP out-of-hours cooperatives and workload

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Abstract

GP out-of-hours cooperatives and workload: a study of the differences between objective and experienced workload caused by out-of-hours shifts in GP cooperatives and rota groups.

In recent years there has been a major shift in the way out-of-hours service is provided by GPs, with small-scale groups of GPs operating rota systems being replaced by large-scale cooperatives. This article describes the degree to which out-of-hours cooperatives affect the objective and subjective workloads caused by out-of-hours shifts and results indicate that GPs working in out-of-hours cooperatives spend approximately 70% less time on out-of-hours shifts than others. In addition, they experience their out-of-hours shifts as less onerous and they are more satisfied than other GPs with the way out-of-hours work is organized. The reduced number of hours spent on out-of-hours work cannot, however, be the sole explanation of this greater satisfaction. Participation in a cooperative explains more of the variance in experienced workload than the number of hours spent on out-of-hours work.

5.1 Introduction

GP care is still under pressure as the demand for care is rising steadily and will continue to do so in the coming years (Van der Velden and Hingstman, 2001). Not only the demand for care, but also the existing shortage of GPs will continue to rise in the coming years, a process which is affected by a number of developments within the profession. GPs are more often choosing to work shorter hours or to work part-time and they are leaving their profession at a younger age (Heiligers et al., 1997; Van den Berg et al., 2003). In addition, there will be an outflow of a large group (approximately 34%) of GPs on account of retirement in the period between 2000 and 2010 (Van der Velden and Hingstman, 2001).

The increased pressure translates into higher occupational disability, an increasing number of cases of burn-out, and dissatisfaction within the profession (Post et al., 2002). The number of GPs who became unfit for work rose by 10% between 1995 and 2000 and the prospect of returning to work decreased by half in this period. Psychological complaints increased in particular, and it is estimated that the number of cases of burnout among GPs almost doubled in the second half of the nineteen-nineties (Ankoné, 1999), while the average age at which this occurred decreased from 49.5 to 45 years (Van Thiel, 2001).

Working evenings, weekends and overnight (out-of-hours or OOH shifts) is generally regarded as one of the most onerous aspects of the profession of general practitioner. GPs are regularly disturbed in their sleep and are more often confronted with threatening situations and 'spurious' requests for help. In addition, these OOH shifts also constitute a substantial restriction of freedom of movement. In a study of burn-out among GPs by Van Dierendonck et al. (1992), 30% referred to out-of-hours shifts as something they considered irksome in the practise of their profession. This study also found a relation between working out-of-hours shifts and burn-out. In a study of GPs in Rotterdam, 80% of them found working out-of-hours onerous, including 35% who even considered it very onerous (Schuller and De Bakker, 1996). The aspects mainly described as onerous were demanding behaviour and spurious requests for help from patients and the strain that is put on family life. It emerged from a recent study that the demands of OOH shifts are a major influence on a GP's decision on

whether or not to stop work before his or her sixtieth birthday (Visser, 2002).

It is not surprising, therefore, that one of the most important initiatives to ease GPs' workload focuses on these same OOH shifts and is the establishment of large-scale GP out-of-hours cooperatives.

GP out-of-hours cooperatives

There has been a rapid shift in recent years from smaller rota groups to larger-scale GP out-of-hours cooperatives. GPs in central GP out-of-hours cooperatives cover much larger populations than used to be the case. According to recent figures, the average population of a GP out-of-hours cooperative comprises 123,224 patients (range 27,000 – 286,000) and an average of 54 GPs are registered with the cooperative (LHV, 2003). Although there have been a number of large-scale out-of-hours structures in the Netherlands for many years, such as those in the Hague (since 1942) and 's-Hertogenbosch (since 1979), the development of small-scale out-of-hours structures into large-scale ones did not really gain momentum until halfway through the nineteen-nineties. According to an estimate by the LHV (Netherlands National Association of General Practitioners), between 80 and 90% of GPs were registered with a GP out-of-hours cooperative in 2002. Great Britain and Denmark preceded the Netherlands in the move towards larger-scale out-of-hours structures (Jessop et al., 1997; Christensen and Olesen, 1998).

GP out-of-hours cooperatives are able to alleviate the objective workload of doctors by means of improvements in efficiency, as compared with 'traditional' joint locum schemes. There are three important differences between out-of-hours cooperatives and the traditional joint locum structure. In the first place, a locum in a GP out-of-hours cooperative covers a much greater population, causing an enormous decrease in the number of shifts worked per GP (Giesen et al., 2002; Grielen et al., 1999). In the second place, a lot of calls are handled by the assistant by means of telephone triage, with the assistant proving able to deal with approximately 40% of the problems by telephone (Van der Plas and Höppener, 2001; George, 1997). In the third place, there has proved to be a shift from home visits to consultations and from home visits and consultations to telephone contacts, in comparison with the old situation (Schuller and De Bakker, 1996; Christensen and Olesen, 1998). Working within a GP out-of-hours

cooperative generally offers many options due to the extra facilities and support staff that are present, such as a specially trained driver and a car with which home visits are made.

It is understandable why the first GP out-of-hours cooperatives actually developed in the cities. The pressure on GPs is known to be at its greatest in the cities and, furthermore, a city is more suitable for a large-scale out-of-hours structure, due to the high address density and the resulting shorter average distance between patient and GP out-of-hours cooperative. The local studies in which the effects of GP out-of-hours cooperatives were researched took place, therefore, in urban settings such as Rotterdam and Nijmegen (Giesen et al., 2002; Grielen et al., 1999) and these studies showed that GP out-of-hours cooperatives can reduce GPs' workload in both the objective and the subjective senses. In other words, not only the amount of work decreases, but the shifts are also experienced as less onerous.

Since GP out-of-hours cooperatives have mushroomed throughout the country, which means outside the cities as well, the question arises of whether the success stories previously reported are consistent with the national picture. Should this prove to be the case, after all, GPs can be expected to continue enjoying practising their profession for a longer time. The key research question was the extent to which the objective and experienced workloads due to OOH shifts by GPs working in GP out-of-hours cooperatives differ from those of GPs working in rota groups.

5.2 Data and method

Data

The analyses used data from the GP questionnaire from the second Dutch National Survey of General Practice carried out by NIVEL in 2001 (Schellevis et al., 2003; Westert et al., 2005). One hundred and sixty-seven of the 189 questionnaires sent were completed and returned. Respondents who did not answer the relevant questions or did not answer them in full were excluded from the analysis and this also applied to a number of GPs who worked no out-of-hours shifts at all. It finally proved possible to use 135 questionnaires (71%) for the analyses, and these 135 GPs were spread over 81 practices. The GPs in question were representative of the Dutch GP population in terms of age, gender, degree of urbanity and region. In 2001,

the year in which the data were collected, the development of rota groups into GP out-of-hours cooperatives was still in full progress; precisely two-thirds (n=90) of the respondents were registered with a rota group and one third (n=45) with a GP out-of-hours cooperative. Table 5.1 shows the background characteristics of the two groups.

Table 5.1: GPs in rota groups and in GP out-of-hours cooperatives: background characteristics

	Rota group (n=90)	GP out-of-hours cooperative (n=45)
Age: mean (sd)	46.4 (6.7)	46.7 (6.7)
GP fte worked: mean (sd)	0.86 (0.21)	0.82 (0.21)
Gender		
Male	74%	67%
Female	26%	33%
Type of practice		
Solo practice	24%	36%
Duo practice	29%	29%
Group practice	47%	36%
Urbanity **		
(Very) Strongly urban	20%	57%
Moderately urban	26%	4%
Mildly/not urban	54%	39%

** $p<0.005$ significant difference between the two groups.
Age and GP fte worked: mean, standard deviation in brackets.
Other characteristics: percentages in columns tally.

Method

The GP questionnaire asked about the frequency and duration of OOH shifts, the questions making a distinction between evening shifts on working days, night shifts on working days, day shifts at weekends, evening shifts at weekends and night shifts at weekends. The average number of shifts worked per week was calculated by dividing the number of shifts by the number of weeks. In addition, the number of hours worked in OOH shifts was calculated by multiplying the average number of shifts per week by the number of hours that each type of shift lasted. The total number of hours

per week spent on working out-of-hours shifts was calculated by adding up these scores for the five types of shift. Furthermore, the GPs were asked to indicate the workload experienced due to shifts on a scale from 1 (not onerous) to 5 (very onerous) and questions were also asked about satisfaction with the organization of the shifts (answer categories: very dissatisfied, dissatisfied, partly dissatisfied/partly satisfied, satisfied, very satisfied). The background characteristics of age, gender, GP fte worked, degree of urbanity and type of practice come from the NIVEL GP register, which includes practically every GP in the Netherlands.

The analysis was performed in two phases. First of all, a bivariate investigation (which did not control for other variables, therefore) was carried out on the differences between GPs in GP out-of-hours cooperatives and in rota groups. The differences in the number of shifts and the number of hours spent working out-of-hours shifts on a weekly basis were determined by means of t-tests for two independent samples. The differences in experienced workload due to shifts and satisfaction with the organization of the shifts were tested with a non-parametric test for two independent samples (Mann-Whitneytest), which was chosen because the items form ordinal scales. Spearman correlations were calculated to investigate the correlations between the different variables.

Following this, two multivariate analyses were performed using logistic regression. The dependent variables in these two models were the workload experienced due to shifts and the satisfaction with the organization of shifts. The fact of being registered with a GP out-of-hours cooperative or not and the number of hours of worked in out-of-hours shifts per week served as explanatory variables. Age, gender, degree of urbanity, type of practice and the GP fte worked were controlled for in all models. The dependent variables were dichotomized in order to be able to perform logistic regression, the two highest categories being coded as 1. This method is preferable to linear regression, because ordinal variables are involved. Multilevel analyses were performed initially, because the sample was a clustered one (GPs working in practices), but these results proved not to deviate in any way from an analysis by the traditional method, probably because there were relatively many clusters with few observations (mostly 1, 2 or 3).

The variables 'number of hours of shift work per week' and 'registered with a GPC' (GPC = GP out-of-hours cooperative) were strongly correlated. In order to make a clear distinction between these two effects, the 'number of hours of shift work' variable was split into two variables, viz. 'number of hours of shift work in a GPC' and 'number of hours of shift work in a rota group'. There is also a material reason for this distinction, incidentally, because the essentially different setting in which the work is done made it difficult to compare one hour of out-of-hours work in a GPC with one hour in a rota group. The GPC doctors, of course, had a missing value on the 'hours of shift work in rota group' variable and vice versa and these missing values were replaced by the mean for the doctors who did have a valid value (mean substitute). The consequence of this method is that the number of hours was calculated separately for the two groups. The average score did not alter the effect estimates, but prevented respondents from being omitted from the analysis because they had a missing value. Separate performance of the whole analysis for the two individual groups would have produced exactly the same result, except that all other effects would have to have been estimated separately for the two groups in that case. Both new variables were normally distributed.

5.3 Results

Bivariate relations

Objective workload due to shifts

There are great differences between the doctors who work shifts in a rota group and the doctors registered with a GP out-of-hours cooperative. The doctors who participate in a rota group have more than two OOH shifts per week (2.3) which take them approximately 19 hours per week on average. These numbers are considerably lower for the GP out-of-hours cooperatives, where the doctors work less than one shift per week (0.7), which occupies them for slightly more than five hours (5.1) on average. The total time spent working out-of-hours shifts by the GPs registered with a GP out-of-hours cooperative was more than 70% less than the time spent by the GPs in rota groups.

GPs in rota groups do not only work out-of-hours shifts more frequently, their shifts last longer as well. These differences are significant for the daytime and evening shifts at weekends.

The experienced workload due to shifts

There are also large differences with regard to experienced workload due to out-of-hours shifts (table 5.2). More than three out of ten GPs (31.3%) in GP out-of-hours cooperatives do not find the shifts all that onerous and give a score of 1 or (mostly) 2, while this figure is only 7.8% in the rota groups. In the GP out-of-hours cooperatives 37.6% of the doctors find the shifts onerous (score of 4 or 5), but the figure for the rota groups is no less than 64.1%, which is much higher. The differences proved to be significant ($Z=3.45$; $p<0.001$).

Table 5.2: Experienced workload due to out-of-hours shifts and satisfaction with the organization of shifts among GPs in rota groups and GPs registered with GP out-of-hours cooperatives in 2001 (percentages)

	GP out-of-hours cooperative %	Rota group %
How do you experience the shifts in general?		
1 Not onerous	2.1	1.1
2	29.2	6.7
3	31.3	28.1
4	31.3	50.6
5 Very onerous	6.3	13.5
How satisfied are you with the organization of the shifts?		
Very satisfied	26.5	1.1
Satisfied	51.0	16.7
Partly satisfied, partly dissatisfied	18.4	32.2
Dissatisfied	2.0	40.0
Very dissatisfied	2.0	10.0

Source: NIVEL; GP questionnaire DNSGP.

Satisfaction with the organization of the shifts

Satisfaction with the organization of the shifts is also noticeably greater among the GPs in GP out-of-hours cooperatives, with more than three-quarters of them (77.5%) saying that they were (very) satisfied, as against less than 18% of the rota group doctors. Precisely half of the GPs who

work out-of-hours shifts in rota groups said that they were dissatisfied and one in ten is even very dissatisfied. These differences also proved to be significant ($Z=7.12$; $p<0.001$).

Correlations

The above relations are also expressed in the strong correlations between GP out-of-hours cooperatives and number of hours worked in out-of-hours shifts, satisfaction and experienced workload due to shifts (see table 5.3). In addition, the weekly number of hours of shift work is associated with a higher experienced workload due to shifts and less satisfaction with the organization of these shifts. Satisfaction with the organization of shifts is linked to a lower experienced workload due to shifts. Finally, GPs proved more often to be registered with a GP out-of-hours cooperative the more urbanized the area in which their practices were situated.

Table 5.3: Bivariate correlations between number of hours worked in shifts per week, experienced workload due to shifts, satisfaction with the organization of shifts, satisfaction with the work in general, urbanity and registration with a GP out-of-hours cooperative (Spearman's Rho)

		1	2	3	4
1	Number of hours shift work per week				
2	Experienced workload due to shifts	0.23*			
3	Satisfaction with organization shifts	-0.54**	-0.38**		
4	Urbanity	-0.16	-0.04	0.16	
5	Registration with GPC	-0.73**	-0.30**	0.61**	0.30**

Source: NIVEL; GP questionnaire DNSGP.
*p<0.05; **p<0.005.
2 high score = highly demanding (1-5).
3 high score = high level of satisfaction (1-5).
4 1= not urban; 5 = very strongly urban.
5 0 = no; 1= yes.

Multivariate analyses

Table 5.4 shows the two logistic regression models and the odds ratios (OR), 95% confidence intervals and the explained Nagelkerke variance are given in each model.

Table 5.4: Effects of GP out-of-hours cooperative and weekly number of hours of shift work on experienced workload due to shifts and satisfaction with the organization of the shifts; (logistic regression analysis)

	1 Experienced work-load due to shifts [1]		2 Satisfaction with organization of shifts [2]	
	OR	95% BI	OR	95% BI
Registered with GPC	0.21**	0.07 – 0.61	11.58**	3.87 – 34.64
Weekly number of shifts in GPC[1]	1.07	0.87 – 1.32	0.84	0.67 – 1.07
Weekly number of shifts in rota group[1]	0.99	0.95 – 1.04	0.99	0.92 – 1.06
Degree of urbanity				
Little/not urban (ref)				
Moderately urban	0.78	0.24 – 2.58	0.21	0.04 – 1.21
(Very) strongly urban	0.50	0.30 – 1.85	1.41	0.30 – 4.63
Nagelkerke pseudo R^2	0.21		0.48	

Source: NIVEL; GP questionnaire DNSGP.
*p<0.05 ;**p<0.05 ; ref = reference category.
N=106 (listwise).
1: 1= (very) onerous.
2: 1= (very) satisfied.
[1] Missing values were replaced by arithmetic mean.
All models were controlled for age, gender, GP fte worked, and type of practice.

Model 1 shows that the bivariate correlation previously found between being registered with a GP out-of-hours cooperative and the experienced workload due to shifts was also confirmed after controlling for background characteristics. The chance that a GP in a GP out-of-hours cooperative finds the shifts onerous is much less than for a GP in a rota group (OR=0.21). The number of hours of shift work done proved to have no further influence within the setting of either a GPC or a rota group. The degree of urbanity also proved to have no significant influence. The pseudo-explained variance was 21%, which can be almost completely ascribed to the effect of the GP out-of-hours cooperative.

In model 2 an attempt was made to explain satisfaction with the organization of the shifts using the same predictors. Here too the GP out-of-hours cooperatives had a substantial effect; the chance that a GP registered with a cooperative is satisfied is much greater than it is for a GP in a rota group. In this case too the weekly number of hours worked in out-

of-hours shifts in a certain setting again provided no explanation and urbanity also had no significant effect. The explanatory power of the model is substantial; the Nagelkerke R^2 is 48%.

The degree of urbanity proved to have no influence in any of the models and also proved to produce no change when a stepwise logistic regression was performed and urbanity was later added to the model.

5.4 Conclusion and discussion

GPs who worked their shifts in a GP out-of-hours cooperative spent 70% less time doing so than GPs in rota groups. In addition, they much less often experienced their shifts as onerous and were satisfied, in general, with the way in which the shifts were organized, in contrast to the GPs in rota groups where there was great dissatisfaction in this respect.

An important objective in the formation of GP out-of-hours cooperatives is reduction of the workload for GPs and the results of this study seem to indicate strongly that this purpose has been achieved. Although this is a cross-sectional analysis and strictly speaking, therefore, no conclusions can be drawn about the development of the workload through time, it is very likely that the swift emergence of GP out-of-hours cooperatives has greatly reduced the workload of GPs during the OOH shifts.

A (bivariate) correlation was initially found between the number of 'hours of shift work' on the one hand, and the degree to which GPs experienced their shifts as onerous and the satisfaction with the organization of the shifts on the other. The multivariate analysis showed, however, that the number of hours in itself does not provide the sole explanation for these findings, when being registered with a GP out-of-hours cooperative or not is taken into consideration. Although a lower number of hours worked in OOH shifts is one of the most striking characteristics of GP out-of-hours cooperatives, there is apparently more added value as well.

These findings support the idea that the positive effects of the GP out-of-hours cooperatives are not only due to the reduction in the number of hours of shift work, but are due above all to the manner in which the shifts are worked. Illustrations of this are the better facilities and the extra staff

that the GP has at his disposal, such as a triage assistant and a specially equipped car with a specially trained driver. In addition, GPs in the 'old' situation were not infrequently called out of their beds, while doctors in a GP out-of-hours cooperative simply have to work the occasional night shift. The work is more concentrated and the division between private life and working hours has become clearer as a result. Furthermore, the GPs in rota groups often work on the day after a night shift, while GPs registered with a GP out-of-hours cooperative have a day off after a night shift.

GPs themselves can exert a certain amount of influence on the extent to which they work shifts. The shifts can be 'sold', which means that GPs pay a locum to cover their out-of-hours shifts, thus allowing GPs to reduce their own workloads. GPs who feel that their work is extremely demanding are likely to be more inclined to sell their shifts, which can suppress the effect (the more hours worked in shifts, the greater the burden) and Giesen (2002) already reported that GPs in a GP out-of-hours cooperative in Nijmegen were much less inclined to sell their shifts in the new situation.

The degree of urbanity had no significant effect in any of the three models. The established reduction of workload due to shifts is in line with findings in previous local studies in cities and appears to be consistent, therefore, with the national picture. It should be noted in this context, however, that differences between the various degrees of urbanity may not be significant as a result of the relatively small sample. The odds ratios diverged quite strongly from 1 and it is conceivable, therefore, that these differences will be more pronounced in a larger sample.

GP care still has to contend with increasing capacity problems. The outflow from the profession, of older GPs in particular, is one of the factors that contribute to an increasingly acute shortage of GPs, and a high workload, mainly due to out-of-hours shifts, invariably emerges from studies as one of the most important reasons for leaving the profession early. The advent of GP out-of-hours cooperatives would, therefore, seem to be a favourable development from this point of view, since it is very probable, after all, that a number of GPs will remain in the profession for longer as a result of the easing of the demands of OOH shifts. Furthermore, general practice will become a more attractive option for medical students, because it puts less pressure on private and family life.

At the same time, there is a lot of discussion at present about the methods of GP out-of-hours cooperatives, with their large-scale nature, accessibility and the telephone triage being particular subjects of criticism. In a recent publication, the Netherlands Healthcare Inspectorate pointed out a number of aspects that had proved to be in great need of improvement (IGZ, 2004). The geographical spread of the cooperatives, the (physical and telephone) accessibility and the triage apparently do not always meet the demands of good and responsible care. The situation before the introduction of the GP out-of-hours cooperatives is unknown, however, since no data on this are available. Although quality issues of this kind are really outside the context of this study, it may be assumed on the basis of these findings that GP out-of-hours cooperatives could also make a positive contribution to the care provided by GPs, as a result of the reduction in workload due to shifts. GPs are human beings, after all, and it is likely that GPs too will function more effectively in a pleasant working situation. This relationship between the manner in which OOH shifts are worked and the quality of the care provided could be an interesting question for further investigation.

In conclusion, the following remarks apply to the data used here and the research design. This study relates to a single measurement moment and it is not really possible, therefore, to derive longitudinal opinions from its findings. A longitudinal research design would be more suitable, therefore, for establishing how GP out-of-hours cooperatives have changed workload over time, but this is unfortunately not available on a national scale. The supposition that the advent of GP out-of-hours cooperatives has greatly reduced workload is very plausible, nevertheless, and is supported by previous local studies for which premeasurements and remeasurements were made (Giesen et al., 2002; Grielen et al., 1999). The value of the data in this study is that they were measured at a time when the shift from rota groups to GP out-of-hours cooperatives was actually in full progress and effective comparisons were possible as a result.

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Chapter 6

Changing patterns of home visiting in general practice: an analysis of electronic medical records

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Abstract

In most European countries and North America the number of home visits carried out by GPs has been decreasing sharply. This has been influenced by non-medical factors such as mobility and pressures on time. The objective of this study was to investigate changes in home visiting rates, looking at the level of diagnoses in1987 and in 2001.

We analysed routinely collected data on diagnoses in home visits and surgery consultations from electronic medical records by general practitioners. Data were used from 246,738 contacts among 124,791 patients in 103 practices in 1987, and 77,167 contacts among 58,345 patients in 80 practices in 2001. There were 246 diagnoses used. The main outcome measure was the proportion of home visits per diagnosis in 2001. Within the period studied, the proportion of home visits decreased strongly. The size of this decrease varied across diagnoses. The relation between the proportion of home visits for a diagnosis in 1987 and the same proportion in 2001 is curvilinear (J-shaped), indicating that the decrease is weaker at the extreme points and stronger in the middle.

By comparison with 1987, the proportion of home visits shows a distinct decline. However, the results show that this decline is not necessarily a problem. The finding that this decline varied mainly between diagnoses for which home visits are not always urgent, shows that medical considerations still play an important role in the decision about whether or not to carry out a home visit.

6.1 Background

Home visits are commonly seen as an important part of general practice. However, in the past decades, there has been a world-wide decrease in home visiting rates. Although there are strong variations between countries, as well as between GPs, this decrease was found in most European countries and North America (Aylin et al., 1996; Campion, 1997; Meyer and Gibbons, 1997; Cardol et al., 2004). How this decrease must be evaluated is debatable. On the one hand, this trend can be an indication of improved efficiency: GPs spend less time on less urgent home-visits, saving more time to treat patients in their practice. On the other hand, some are concerned that an essential part of general practice care might disappear and that this might lead to undesirable and dangerous situations.

Previous studies showed that home visiting rates are affected by demand, as well as supply-related factors. GPs will be more likely to visit patients who are seriously restricted in their ability to come to the practice. These restrictions can be related to age or disability but also to the complaint for which the GP is consulted. A non-medical reason for a home visit may occur if a patient has no transport.

On the supply-side, the GP's style of work has an influence. Some GPs will be more likely to address the wishes of their patients than others. The criteria for the level of discomfort that is acceptable for patients vary across GPs. Also workload related factors and the location of the practice have an influence. GPs in smaller practices make more home visits, and the proportion of elderly on the GP's list is also positively related to the number of home visits (Calnan and Butler, 1988; Boerma and Groenewegen, 2001, Groenewegen and Hutten, 1995). Furthermore, previous studies showed higher home visiting rates in rural areas than in urban areas (Calnan and Butler, 1988; Kersnik, 2000; Nakar et al., 1999; Verheij, 2004).

Although the decline in home visits is generally known, very little is known about the nature of this decrease. That is to say: How does this decrease vary across different diagnoses in proportion to their urgency? The purpose of the present study was to analyse and to quantify this decrease in more detail.

The decrease in home visits indicates that GPs have sharpened their criteria for home visiting. However, GPs will still make, at least in their own point of view, responsible decisions, taking into consideration the possible discomfort or danger for the patient. This means that some complaints give more possible options than others. If a complaint appears to be very threatening, it is clear that a home visit is indicated; therefore we expect that the decrease in home visits in such cases is low. However neither do less urgent cases, on the other hand, allow the opportunity for a strong decrease. This is simply because GPs never did carry out a home visit in these cases. In other words: there is a 'bottom-effect'. The most room for making a decision about whether or not a home visit should be done, and thus for a decrease, are those complaints that are in the middle, the doubtful cases. We expect, therefore, that the relation between the chance to get a home visit for a specific complaint and this same chance in the past is not a linear, but a *J*-shaped relation, indicating that the decrease is stronger in the middle and much smaller at the extreme points.

6.2 Methods

Data used in this study originate from two Dutch National Surveys of General Practice (DNSGP) (Westert et al., 2005). In the first DNSGP data were collected from April 1987 until March 1988 in a stratified sample of 193 general practitioners in 103 practices, who served 335,000 patients in total. In the second Dutch National Survey of General Practice data were collected during one calendar year (2001) in 104 representative general practices in the Netherlands, comprising of 195 general practitioners, who served 385,461 patients in total. The DNSGP was funded by the Dutch Ministry of Health. GPs and other care providers were asked to record every contact in an electronic medical record system. The data used in this study are the diagnosis, and the kind of contact, such as a phone call, surgery consultation, or home visit. The diagnosis was coded using the International Classification of Primary Care (ICPC). The type of contact was registered during six weeks in DNSGP-2 and during three months in DNSGP-1. Due to technical problems, some practices had to be excluded.

A selection of contacts was made based on two criteria. First, the diagnosis had to be registered 50 times or more in both databases. The reason for this is that under 50 percentages are determined too much by individual cases.

Second, the contact had to be a face to face contact. The decision to pay a home visit is considered a two-step process. First the decision is made whether it is necessary or not to see the patient, and if not, whether a telephone consultation is an alternative. Second, whether the patient should come to the GP or the GP to the patient. Therefore, we assume that the alternative for a home visit is usually a surgery consultation. A selection of 246,738 contacts, both home visits and surgery consultations, in 1987 and 77,167 contacts in 2001, remained.

Both files were aggregated by diagnosis (ICPC-code). The variable to be aggregated was home visit (yes=1, no = 0). In this way, for every diagnosis a proportion of home visits was computed for both years. This procedure resulted in 246 diagnoses varying from 0% to 86% home visits. Before aggregating, we weighted the data of 1987 on age and urbanization to the population of 2001. This was done to adjust for these factors, which are commonly known to influence home visits. This weighting had, however, very little influence. The un-weighted results are shown in appendix 6.1.

Statistical analyses

The analyses were done on the level of diagnoses. Two regression analyses were conducted, using the proportion of home visits in 2001 for a specific diagnosis as the dependent variable, and the percentage of home visits for that same diagnosis in 1987 as the independent variable. In the first analysis we estimated a simple linear regression-model. Since we hypothesized that this relation is rather curvilinear, *J*-shaped, instead of linear, in the next step we added a quadratic term to the model. The whole model can now be expressed by the following equation:

$$Y = ß_0 + ß_1x + ß_2x^2$$

Whereby Y represents the proportion of home visits within one diagnosis in 2001 and x the proportion of home visits in 1987. Both models will be presented.

6.3 Results

Some characteristics of the practices, patients and contacts involved in the analyses are presented in table 1. Of all face to face contacts that were

included, 14.1% was a home visit in 1987 and 7.4% in 2001. Previous studies showed that of all contacts approximately 17% was a home visit in 1987 and 9% in 2001 (Cardol et al., 2004). There were a few differences between both years. The percentage of urban practices was slightly higher, the average list size was higher, which is also the case in the National population, and lastly, the average age of the patients was also slightly higher.

Table 6.1: Characteristics of the practices, patients and contacts in the analyses, 1987 and 2001

	1987	2001
Registration period	13 weeks	6 weeks
Practices	N=103	N=80
% single handed	50.5 %	50%
% (very) urban	30.1%	42.5%
Average list size	3208	3883
Fte GP in the practice	1.4	1.6
% home visits of all face to face contacts	14.5%	7.6%
Average number of cases (contacts) in analyses	2396	964
Patients	N=124,791	N=58,345
Sex (% women)	59%	59%
Average age	39.0	42.3
Number of face to face contacts	1.98	1.32
Number of visits	0.28	0.10
Face to face contacts	N=246,738	N=77,167
% home visits	14.1 %	7.4 %

Home visits are still more often carried out with the elderly people. The older the patient, the higher the chance on a home visit. This is illustrated by figure 1. The most striking difference between both years was found among the youngest patients. In 1987 significantly more home visits were carried out with children. In the youngest cohort (0 through 5 years), the percentage of home visits decreased from 20% to 3%. The proportion of home visits is also smaller among the older cohorts, especially those between the age of 55 and 75. Above that age, the difference between both years gets smaller.

Figure 6.1: Proportion of home visits by age-cohort in 1987 and in 2001 (5-years cohorts)

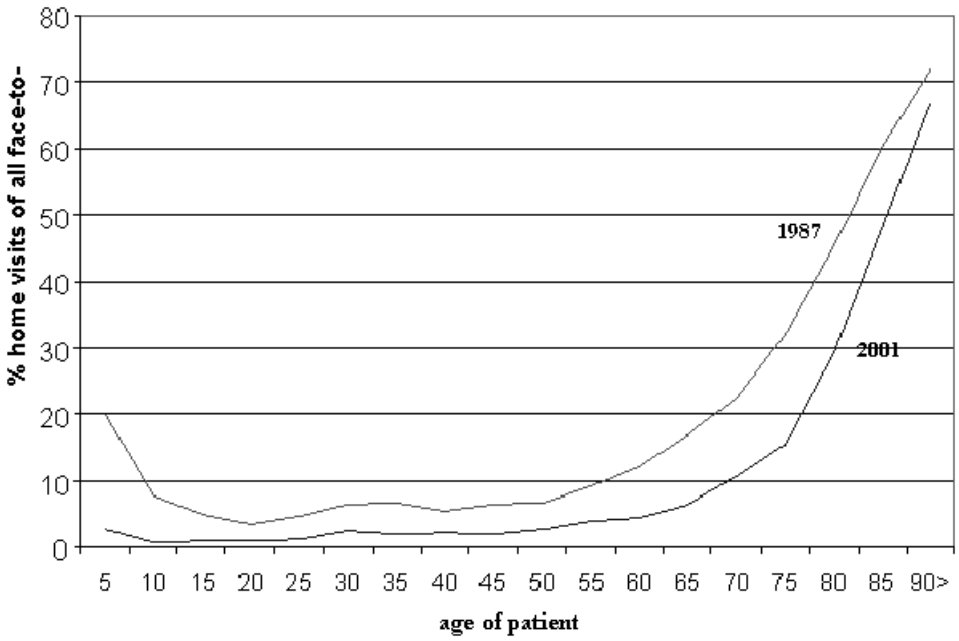


Table 6.2 represents the results of the regression analyses. In model 1, the linear coefficient of 0.78 was found to be significant at the 0.001 level. The estimated proportion of home visits for any diagnosis is approximately 75% of the proportion in 1987. The fit of the model is quite high: 79% explained variance. In model 2 the quadratic term was added and was also found to be significant at the .001 level. This leads to 4% additional explained variance. The proportion for 2001 can now be expressed as: 0.01+ 0.36 times the proportion in 1987, plus 0.66 times the square of this proportion. These results confirm the hypothesized *J*-shaped relationship.

To get a better insight, both regression lines are displayed in figure 6.2. When for a diagnosis only 20% of the contacts resulted in a home visit in 1987, in 2001 the estimated proportion is 11%. 40% in 1987 becomes 26% in 2001, 50% becomes 36%. At the level of 80% in 1987 there is still a decrease of 7% but when we reach 90% or more, there is hardly any decrease. Theoretically, at the proportion of 96%, the estimated proportion

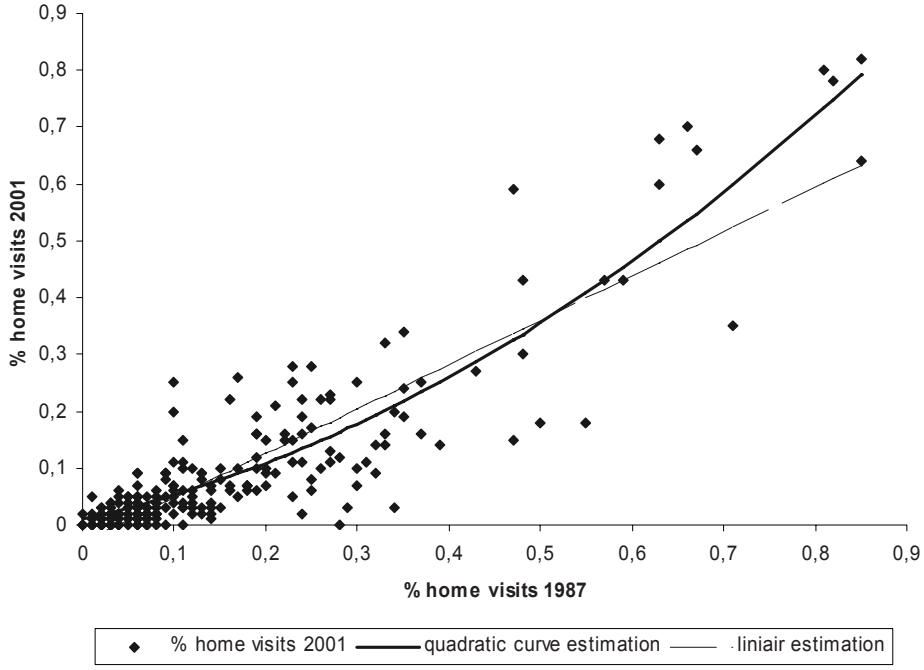
in 2001 exceeds the proportion in 1987. However, such high proportions do not really exist in the file.

Table 6.2: Relation between proportion home visits in 2001 (dependent) and the proportion of home visits in 1987 for a diagnosis (n=246 diagnoses) (regression analyses)

	Model 1a	Model 1b
Constant	-0.03	0.01
Proportion 1987	0.78**	0.36**
(Proportion 1987)^2		0.66**
R^2 (0 through 1)	0.79	0.83

* * p<0.001.

Figure 6.2: Scatter plot with quadratic regression curve of the proportion of home visits per diagnosis in 2001 in relation to the percentage of home visits in 1987 (n=246 diagnoses)



Obviously, some diagnoses are closer to their predicted value than others. Although the model fits very well, there are some diagnoses that show relatively high differences between both years. Table 3 shows the top-5 of diagnoses with the strongest decreases in the proportion of home visits. These are: fever; acute myocardial infarction; osteoporosis; concussion; and tonsillitis, angina, and scarlatina. In only a few diagnoses there is a contrast to the overall trend, a higher proportion of home visits in 2001 than in 1987. This was the case for 'generalized pain' (A01) and acute stress-reaction (P02).

Table 6.3: Five strongest decreases: (1987>2001)

	ICPC	Diagnosis	Proportion 1987	Proportion 2001	Difference*	Prevalence [1]
1	A03	Fever	0.55 (0.49-0.61)	0.18 (0.13-0.23)	-0.37	6.7
2	K75	Acute myocardial infarction	0.71 (0.63-0.79)	0.35(0.25-0.45)	-0.36	3.3
3	L95	Osteoporosis	0.50 (0.44-0.56)	0.18 (0.10-0.26)	-0.32	4.2
4	N79	Concussion	0.47 (0.42-0.53)	0.15 (0.05-0.25)	-0.32	1.8
5	R72	Tonsillitus/angina/ scarlatina	0.34 (0.26-0.42)	0.03 (0.0 -0.07)	-0.31	1.7

* All differences are significant; $p<0.005$.
[1] Prevalence per 1000 patients, per year in Dutch general practice in 2001 (Van der Linden et al., 2004).

6.4 Conclusion and Discussion

By comparison with 1987, the proportion of home visits shows a distinct decline. We expected that this decrease was not equal for all kind of diagnoses, but relatively stronger for the complaints 'in the middle', with median proportions, and smaller at the extreme points. Our findings lend support for this hypothesis.

One plausible explanation for this finding is that every home visit is the outcome of the weighting of discomfort and, or danger, for the patient on one hand and the discomfort, for example in the amount of time spent, for the GP on the other hand. Better transport facilities for patients and an increase of the workload experienced over a period of time might have loaded the latter factor. It is obvious that in very severe cases these non-

medical factors are of less importance. The more threatening a complaint, the less room the GP has for making medical and other decisions. This finding suggests that the decrease in home visits is not necessarily a problem. There seems to be no reason to assume that GPs take unacceptable risks since medical factors are still taken into consideration. In urgent cases, most GPs still visit their patients.

An explanation for some large decreases is that medical knowledge and commonly accepted ideas about specific complaints have changed. In the list of strongest decreases, fever, streptococcal infections and concussion can be traced back to altered views in medical management. Fever in itself is no reason for a visit, in the case of concussion, advice can often be given without seeing the patient. The reason that patients with a myocardial infarction have fewer visits, is likely to be related to the more active therapeutic approach adopted since 1987. Many of them undergo a PTCA within the first days after their infarction and within a week they leave the hospital. In 1987 the treatment was more often conservative, the patients stayed longer in the hospital and were discharged with restrictions on exercise. It is not plausible that the decrease involves the first emergency calls when a patient experiences chest pain. However, the design of our study does not differentiate between several types of visits. The place of osteoporosis in the top-five decreases is difficult to interpret within the limits of this study.

Although the results showed that the decrease in home visiting rates become smaller when the complaints become more urgent, there is a decrease in the overwhelming majority of the complaints. The finding that GPs do more visits when the patients report acute stress reactions or psychological symptoms, is surprising in the light of the declining number of visits. An explanation might be that in case of serious psychological symptoms, it is easier for the GP to visit these patients than receiving them in their practice. So, in such cases it is both in the interest of the GP and the patients to carry out a home visit. Moreover, when an emotionally stressed and possibly confused patient calls, it is often difficult to make an estimation of the urgency of the complaint.

What does this information mean for the GP? First, the results show that some complaints provide more room for manoeuvre in the choice of whether or not to carry out a home visit. Furthermore, in the discussion

about whether or not the decrease in home visiting is problematic, this information supports the claim that GPs who reduce their number of home visits do not necessarily make irresponsible decisions.

The purpose of this study was to describe the relationship between GPs and their patients in very broad outlines in order to get an insight into the overall pattern of the decrease in home visits on the level of complaints and diagnoses. Therefore we used aggregated data and created abstract research entities. The characteristics of patients, GPs, practices and their context have been shown to play an important role in home visiting but were beyond the scope of this study. However, more insight into the nature of the decrease in home visits can be an important point of departure for more explanatory studies.

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Appendix 6.1: Un-weighted results

Table 6.2a: Relation between proportion home visits in 2001 (dependent) and the proportion of home visits in 1987 for a diagnosis (n=246 diagnoses) (regression analyses, un-weighted data)

	Model 1	Model 2
Constant	-0.03	0.01
Proportion 1987	0.78**	0.32**
(Proportion 1987)^2		0.73**
R^2 (0 thru 1)	0.79	0.83

* * p<0.001.

Table 6.3a: Five strongest decreases: (1987>2001) un-weighted data

	ICPC	Diagnosis	Proportion 1987	Proportion 2001	Difference*	Prevalence [1]
1	A03	Fever	0.53 (0.47-0.59)	0.18 (0.13-0.23)	-0.36	6.7
2	R72	Tonsillitus/angina/ scarlatina	0.36 (0.27-0.45)	0.03 (0.0 -0.07)	-0.33	1.7
3	K75	Acute myocardial infarction	0.68 (0.59-0.77)	0.35(0.25-0.45)	-0.33	3.3
4	L95	Osteoporosis	0.48 (0.42-0.54)	0.18 (0.10-0.26)	-0.30	4.2
5	N79	Concussion	0.44 (0.38-0.49)	0.15 (0.05-0.25)	-0.29	1.8

* All differences are significant (p<0.005).

[1] Prevalence per 1000 patients, per year in Dutch general practice in 2001 (Van der Linden et al., 2004).

Chapter 7

Do list size and remuneration affect GPs' decisions about how they provide consultations?

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Abstract

Doctors' professional behaviour is influenced by the way they are paid. When GPs are paid per item, i.e., on a fee-for-service basis (FFS), there is a clear relationship between workload and income: more work means more money. In the case of capitation based payment, workload is not directly linked to income since the fees per patient are fixed. In this study list size was considered as an indicator for workload and we investigated how list size and remuneration affect GP decisions about how they provide consultations. The main objectives of this study were to investigate a) how list size is related to consultation length, waiting time to get an appointment, and the likelihood that GPs conduct home visits and b) to what extent the relationships between list size and these three variables are affected by remuneration.

Methods: list size was used because this is an important determinant of objective workload. List size was corrected for number of older patients and patients who lived in deprived areas. We focussed on three dependent variables that we expected to be related to remuneration and list size: consultation length; waiting time to get an appointment; and home visits. Data were derived from the second Dutch National Survey of General Practice (DNSGP-2), carried out between 2000 and 2002. The data were collected using electronic medical records, videotaped consultations and postal surveys. Multilevel regression analyses were performed to assess the hypothesized relationships. Our results indicate that list size is negatively related to consultation length, especially among GPs with relatively large lists. A correlation between list size and waiting time to get an appointment, and a correlation between list size and the likelihood of a home visit were only found for GPs with small practices. These correlations are modified by the proportion of patients for whom GPs receive capitation fees. Waiting times to get an appointment tend to become shorter with increasing patient lists when there is a larger capitation percentage. The likelihood that GPs will conduct home visit rises with increasing patient lists when the capitation percentage is small. Remuneration appears to affect GPs' decisions about how they provide consultations, especially among GPs with relatively small patient lists. This role is, however, small compared to other factors such as patient characteristics.

7.1 Background

Time is scarce in general practice. GPs must constantly choose how best to divide their time: between their patients, between patient care and other professional activities, and between their work and their private lives. These decisions are determined, among other variables, by their workload and the number of patients served (Groenewegen and Hutten, 1991; Hutten, 1998; Zantinge et al., 2006). In systems with fixed patient lists, such as in the Netherlands, list size (the average number of listed patients in a year) corrected for case mix is a good indicator for workload.

GPs' decisions about the provision of care can have important financial consequences, depending on the way in which they are paid. It is commonly assumed that the way in which GPs are remunerated affects their behaviour (Mechanic, 1975; Glaser, 1970; Donaldson and Gerard, 1989; Woodward and Warren-Boulton, 1984; Gosden et al., 2000; Greß et al., 2006; Krasnik et al., 1990; Calnan et al., 1992; Iversen and Lurås, 2000). When GPs are paid per item, i.e., on a fee-for-service basis (FFS), there is a clear relationship between the amount of work and income. More services generate more income. In capitation based systems, this relationship is much weaker, since the annual capitation fee per patient is fixed. In a salaried system, income is not directly related to the patient load.

Previous studies have shown that physicians who were paid under FFS conditions are more likely to have longer working hours, spend more time on patient-related activities, have higher contact rates, more treatments that attract additional remuneration and shorter consultations, and conduct more home visits. Moreover, any form of fund holding or capitation was shown to decrease the total volume of prescriptions written for patients (Gosden et al., 2000; Krasnik et al., 1990; Kristiansen and Holtedahl, 1993; Chaix-Couturier et al., 2000; Boerma et al., 2003).

Most of these studies were international comparisons or consisted of research that described the consequences of changes to the payment system. A problem pertaining to international comparisons is that besides the remuneration systems, there are many other differences between countries that are of influence. Boerma points out that little research has been undertaken on the effects of payment systems because it is difficult to investigate this in a single health care system (Boerma et al., 2003). The

Dutch data we use in this study, however, provide the unique possibility to investigate the relationship between remuneration and list size, because until 2006 Dutch GPs were paid on both a capitation-basis and an FFS-basis, depending on the insurance status of the patient. See appendix 1 for a more detailed clarification of the Dutch payment system (see appendix 7.1). In this article, we try to gain more insight into the relationship between remuneration, list size and decisions about how to provide consultations. The main objectives of this study were to investigate a) how list size is related to consultation length, waiting time to get an appointment and the likelihood that GPs do home visits and b) to what extent the correlations between list size and these three variables are affected by remuneration. An important difference vis à vis previous studies is that we investigate this within a single mixed system, which enables us to retain unobserved GP and system wide factors.

7.2 Hypotheses

A high workload can be managed by 'squeezing' or 'spreading' the work. In the first case the time investment remains the same while the GP handles more contacts. This can be done by keeping a close watch on the 'time budget'; avoiding time-consuming encounters such as home visits, and preventing an extension of the consultation length. In the second case, when the work is spread out, the total time investment rises when workload becomes higher.

The first relationship that we investigate is that between the list size and consultation length. Because of the economic advantage of 'squeezing', most GPs will try to avoid going 'overtime' (longer than the booked time slot), during the consultation. However, the greater the capitation share, that is the percentage of publicly insured patients in their practice, the bigger the economic need to keep control of the consultation length. Under capitation conditions, an extra time-investment just generates more work for the same income, whereas under FFS-conditions, there might be more of an incentive to conclude the consultation properly without regarding the time investment. After all, the patient is paying and it is known that patients often find consultations too short (Wilson, 1991; Howie et al., 1999). So, our first hypothesis (1) is that a large patient list is related to shorter

consultations, and (hypothesis 1a) that this relationship will be stronger when the capitation share (proportion of publicly insured) is larger.

Our second point of interest concerns waiting time to get an appointment. Delaying appointments enables GPs to plan and to spread the work better over the week. In an economic sense, delaying appointments for longer is especially attractive under capitation conditions. In addition, some less severe problems will disappear without treatment within a few days so that the amount of work may even fall slightly. Under FFS conditions this is unfavourable; the GP misses some, perhaps relatively simple, consultations and thus income. So (hypothesis 2), we expect that large patient lists are associated with longer waiting time to get an appointment and, (hypothesis 2a) we expect this relationship to be stronger when the capitation part is larger.

The third relationship to be investigated concerns that between list size and home visits. Reducing the number of home visits is profitable under both conditions. Accordingly, we expect a negative relationship between list size and the number of home visits (hypothesis 3). Yet, we expect this relationship to be stronger with a larger capitation share, because under FFS-conditions GPs are (at least partly) compensated for the extra time investment (Boerma and Groenewegen, 2001).

The above outlined expectations all imply some kind of 'strategic behaviour'. A relatively small list size, however, provides more room for decision-making in this respect. In other words, GPs with a large list simply have no choice but to be economical with time. Previous studies showed that the influence of list size on number of working hours levels off above a certain point (Boerma et al., 2003; Calnan and Butler, 1988). Therefore, we expect that the relationship between remuneration on the one hand, and the decisions about how they provide consultations on the other hand, are stronger for GPs with a relatively small weighted list size than for practices with a relatively large weighted list size.

7.3 Methods

7.3.1 Data

The data we used were derived from the second Dutch National Survey of General Practice (DNSGP-2) (Westert et al., 2005). DNSGP-2 was carried out between 2000 and 2002 among 104 general practices in the Netherlands, comprising 195 GPs and accounting for 165.5 GP full-time equivalents. These GPs were compared to a national database of all GPs and they appeared to be representative of the Dutch GP population with respect to age, sex and urbanisation (Westert et al., 2005). The GPs were primarily selected on basis on the quality of their electronic medical records. A previous study showed no differences in practice style between GPs participating in a registration network and those who are not (Westert et al., 2002). Data were collected using questionnaires, videotaped consultations and routine data collection. The study was carried out in keeping with Dutch legislation on privacy. Compliance with privacy regulations was approved by the Dutch Data Protection Authority. According to Dutch legislation, neither obtaining informed consent nor approval by a medical ethics committee was obligatory for this observational study.

Since the DNSGP-2 contains many different datasets, we will briefly describe the six datasets used. These datasets are also summarised in Table 1; Westert et al. (2005) have described the methods and data collection of the DNSGP in greater detail.

Table 7.1: Datasets of DNSGP-2, used in this study

Dataset	Variables used	Identifiers	N
Videotaped consultations	Consultation length	Unique patient code Unique GP code	1,967 consultations
Postal GP questionnaire	Waiting time to get an appointment	Unique GP code	184 GPs
Recording of type of contact in Electronic Medical Files (six weeks)	Home visit (yes or no)	Unique patient code Unique GP code	67,709 consultations
Practice administration	Insurance status Sex of patients Age of patients List size Zip code (for selection of deprived areas)	Unique patient code	399,068 patients
Patient questionnaire	Self-rated health	Unique patient code	294,999 patients
Database of all participating GPs in DNSGP	Age of GP Sex of GP Practice type	Unique GP code Unique practice code	195 (GPs who participated in DNSGP)

Videotaped consultations

142 of the GPs (73%) in the DNSGP-2 gave permission for the consultations in their surgery to be videotaped. These GPs were likewise representative of the Dutch GP population with respect to age, sex and urbanisation (Van den Brink-Muinen et al., 2004). Of the patients, 88% gave informed consent to participate in the study. Approximately 20 consultations of every GP were recorded. To avoid bias due to the camera, the first five consultations were excluded. In total, 2,095 videotaped consultations were observed afterwards and used for research on communication (Van den Brink-Muinen et al., 2004; Zantinge et al, 2007). In this study we will only use the clocked consultation length.

GP questionnaire
All GPs received a postal questionnaire covering a range of topics about their work. The response to this questionnaire was 96%, with 184 GPs (94%) answering the questions that we used for the waiting time to get an appointment.

Electronic medical records
All participating GPs kept electronic medical records of all contacts. Because the type of contact was not always routinely registered, all GPs were asked to record this aspect during a six-week period for all contacts. The result was a successful data collection of 67,709 contacts for 122 GPs in 83 practices.

Practice administration
The practice administration of all participating practices contains a short list of all patient characteristics on the practice list: sex, date of birth, insurance status and postal code. There were almost 400,000 patients in the DNSGP-2.

Patient questionnaire
A brief written questionnaire was sent to all listed patients. This included some characteristics which are not registered in the practice administration, such as self-rated health. The response was 76.5%.

National database of all GPs
Since 1974, NIVEL has been keeping a national database of all GPs. This database is updated yearly with new graduates. In this database some basic characteristics are collected such as date of birth, sex, graduation year etc. The database contained data of 7,763 GPs, of who 195 participated in the DNSGP-2.

All these files were merged using patient, GP and practice codes as unique identifiers.

7.3.2 Measures

Dependent variables
- Length of consultations
  This variable was based on the videotaped consultations. The consultation length was measured using a stopwatch, starting at the first verbal expression and stopping after the last verbal expression. Interruptions to

the consultation were subtracted from the total consultation length. After listwise deletion, 1,967 consultations were left.

- Waiting time to get an appointment
  This variable was measured in the GP-questionnaire with the question: 'How long does it take to get an appointment with you?' GPs were asked to give two answers to this question: firstly when the patient calls in the morning, and secondly, when the patient calls in the afternoon. Response categories were: same day; next day; later. Since these answers can be arranged in a logical, hierarchical order, it was possible to create a Guttman-scale (Guttman, 1960). The answers were recoded into a scale from 0, indicating the same day, even when a patient calls in the afternoon, to 3, indicating a later date, even when the patient calls in the morning. Of all GPs, 8% scored 0; 64% scored 1; 24% scored 2; and 4% scored 3. A previous study showed that this scale correlates significantly (R=0.54) with other aspects of accessibility that patients report from these practices (Van den Berg et al., 2005). This concerns mainly regular appointments for office consultations and not the emergency cases. Office consultations include approximately 75% of all contacts (Cardol et al., 2004).
- Whether or not patients received a home visit
  This is a dichotomous variable. For all contacts between a GP and a patient this variable has either 0, no home visit, or 1, a home visit, as an outcome. For this variable, electronic medical records were used.

List size

List size was used as an indicator for workload. List size was computed by averaging the number of patients on the list at the beginning of the year and at the end (based on practice administration). This list size at practice level was divided among the GPs within one practice in proportion to their full-time equivalents (FTE), which was derived from the GP questionnaire. For example, a practice has a mid-time population of 5000, two full-time working GPs (1 FTE) and one GP who works 0.5 FTE, the full-time working GPs have a list size of 2000 and the part-timer, one of 1000. As was mentioned in the introduction, some patients incur a higher care demand than others. List size is especially higher for older patients and in deprived areas. To take these differences into account, we transformed list size into a 'weighted list size'.

The weight of a patient was:
1 for patients younger than 65 years and not living in a deprived area,
1.18 for patients older than 65 years and not living in a deprived area,
1.10 for patients younger than 65 years living in a deprived area,
1.28 for patients older than 65 years living in a deprived area.
To compute the weighted list size, the number of patients was multiplied with these weights and added up. These weights are the same as those used for the differentiation in capitation fees (Verheij et al., 1999). The definition of deprived areas was derived from the literature on the identification of these areas in the U.K., particularly the Jarman-index (Jarman, 1983). The Dutch identification of deprived areas is based on the average income level and unemployment rate (Verheij, 2001). To make the interpretation of coefficients and of the intercept easier, this variable was divided by 1000 and centred around the mean.

Independent variables at patient level
The following variables were derived from the practice administration:
- Insurance status, was coded as 0 (privately insured) or 1 (publicly insured)
- Age (years)
- Sex, coded as 0 (male) or 1 (female)

- Self-rated health, (0=very good to moderate) (1= bad or very bad)
  This variable was derived from the patient questionnaire and was originally measured on a scale from 1 (very good) to 5 (very bad); this was recoded as a dichotomous variable. Scores 1 to 3 were recoded as 0, and scores 4 and 5 (bad and very bad) as 1.

Independent variables at GP level
- Age and sex of GP
  Age and sex of all participating GPs were derived from the national database of GPs.

Independent variables at practice level
- Proportion of publicly insured patients
  To compute this variable, the insurance status of all listed patients in the practice administration was aggregated to practice level. The proportion indicates the share of the patient population for which GPs receive a capitation payment. This variable was also centred around its mean.
- Degree of urbanisation and practice type

These variables were derived from the national database of GPs and were based on the addresses of the practices.

- Proportion of patients with low self-rated health.
  The health status of all patients was asked about in the patient questionnaire and was aggregated to practice level on basis of the valid response.

Means and standard deviations of all variables used are presented in table 7.2.

Table 7.2: Mean and standard deviation of used variables

	Mean	Sd
Dependent		
Consultation length (contact level)	9.66	4.64
Waiting time to get an appointment (GP level)	1.18	0.59
Home visit (contact level)	8%	
Independent		
Practice level		
% publicly insured (per practice) [1]	65%	4.00
% self-rated health low (per practice) [1]	18%	4.26
Practice type		
- Single-handed	34%	
- Dual practice	16%	
- Group	50%	
Urbanisation		
- Urban	44%	
- Suburban	20%	
-Rural	36%	
GP level		
List size	2017	639
Weighted list size	2080	651
Age	46.08	6.46
Sex (female)	24%	
Patient/contact level		
Age	43.85	23.52
Sex (female)[2]	60%	
Insurance type patient (1=public) [2]	73%	
Self-rated health low[1]	20%	

[1] All listed patients.

[2] Since the lowest level concerns contacts, these data only contain individual data of patients that visited their GP during a six-week period. Consequently, there are more women, publicly insured and people with relatively low self-rated health than in the whole population because these categories contact their GP more often.

7.3.3 Statistical analyses

To explore the relationships between the most important variables, correlations were computed (Pearson's R). Multilevel regression and logistic multilevel regression analyses were carried out to assess the hypothesized

relationships. The analyses were carried out with the software package MLwiN.

Analysis of consultation length

To analyse consultation length, we used a multilevel model with three levels: contacts (1), GPs (2) and practices (3). No separate patient level was included because more contacts with the same patient rarely occur in the data. This means that level 1 is a contact level as well as a patient level. First, a null-model was estimated. This empty model showed a statistically significant variance at practice level (5% of all variance; $p<0.005$) and a significant variation at GP level (5%; $p<0.05$). Second, the explanatory variables and the other practice, GP and patient characteristics were added to the model, including two interaction variables: (list size * proportion of patients with public insurance) and (list size * insurance status). These interaction variables are necessary to test hypotheses 1a, 2a and 3a concerning the effect of the proportion of publicly insured on the relationship between list size and the outcome measures. The difference between the two interaction variables is that the first measures an effect of a patient population characteristic, irrespective of whether an individual patient is publicly or privately insured; whereas the second interaction variable measures the effect of the insurance status of a specific patient when this patient contacts the GP.

The analysis of waiting time to get an appointment

For this variable, (multilevel) regression models were estimated with the GP as level 1 and practice as level 2. In the first step, a null-model was estimated. This model showed an intraclass-correlation of 50% ($p<0.005$).
In the second step, we added the other practice and GP characteristics to the model.

Analysis of home visits: Yes or No

Home visit (yes or no) was measured at a contact level and has a dichotomous outcome. Therefore, we estimated a logistic multilevel regression model with four levels: contacts (1); patients (2); GPs (3); and practices (4).

We estimated four logistic models, starting with a null model with random intercept. This intercept could vary between patients, GPs and practices. The model showed a statistically significant variance at patient level, practice

level and GP level (all $p<0.005$). The major part of the variation appeared to be between patients (92% of level 2, 3 and 4 together). In the second step we added the other variables, including the two interaction terms.

Since in our last hypothesis we stated that the relationship between remuneration on the one hand, and the decisions about how they provide consultations on the other hand, are stronger for GPs with a relatively small weighted list size than for practices with a relatively large weighted list size, we conducted six additional analyses in order to find out whether the coefficients of list size and remuneration differ according to practice list size. This means that the final models for all of the three variables were repeated for GPs with smaller (below median) and larger (above median) weighted lists. All models were also estimated without the interaction variables. Since we are especially interested in the interaction between list size and remuneration, these models are not reported in the tables, but will be discussed in the text where relevant.

7.4 Results

Correlations

Table 7.3 shows the correlations between the dependent variables, list size and the proportion of patients in the population for which GPs receive a capitation payment. List size is negatively correlated with consultation length (-0.09). The number of home visits is negatively related to the length of the waiting time to get an appointment, ($R = -0.18$). Consultation length is weakly but statistically significantly correlated with the proportion of patients for which GPs receive a capitation payment.

Models with explanatory variables

Models with explanatory variables are shown in table 7.4. In the model for consultation length, the main effect of list size is negative and statistically significant. This coefficient represents the relationship between list size and consultation length subject to the condition that the proportion of publicly insured is average and the patient is privately insured. The interaction of list size and proportion of publicly insured shows no significant coefficient. However, when the interaction variables were left out, the coefficient of list size dropped to -0.74 and was no longer statistically significant. Older people and those with low self-rated health get longer consultations. At

practice level, low self-rated health is negatively related to consultation length.

Table 7.3: Correlations between dependent variables, list size and % capitation payment (Pearson's R)

		1	2	3	4
1	List size (weighted)				
2	% Capitation payment (publicly insured)	-0.03			
3	Consultation length	-0.09**	-0.06*		
4	Waiting time to get an appointment	-0.08	0.07	0.03	
5	Number of home visits	-0.09	-0.02	-0.13	-0.18*

*p<0.05; **p<0.01 (two-tailed).

In the model for waiting time to get an appointment, no significant relationships were found.

No significant relationships were found between the likelihood of a home visit and practice, and GP characteristics (including list size). Several patient characteristics, however, show statistically significant coefficients. Women have a higher chance of a home visit than men: exp-b=1.3; and age and low self-rated health are positively related to the chance of a home visit. Especially the poor self rated health makes a major difference: exp-b = 1.57. The interaction between insurance status and list size is not statistically significant. Leaving out the interaction variables made little difference.

Table 7.4: Regression of remuneration, list size and other practice, GP, and patient characteristics on consultation length, waiting time to get an appointment, and home visit (yes/no) (multilevel regression analysis and logistic regression analysis)

	Consultation length (minutes) b	Waiting time to get an appointment (0 through 3) b	Home visit yes (1)/ no (0) Exp-b
Intercept	11.794	0.904	0.002
Practice characteristics			
Proportion of publicly insured (capitation share)	0.034	0.000	1.007
Proportion self-rated health low	-0.192**	0.022	0.994
Urbanization (ref=urban)			
Suburban	-0.970	0.011	1.168
Rural	-1.957**	-0.019	1.405
Practice type (ref=solo)			
Dual	-0.248	0.066	1.097
Group	-0.071	0.289	0.777
GP characteristics			
Age	0.020	-0.005	1.002
Sex (female)	0.157	0.002	0.963
Weighted list size	-1.014*	0.065	0,967
Weighted list size * proportion of publicly insured	0.002	-0.004	1.008
Patient characteristics			
Insurance status (1=public)	-0.465		0.999
Age	0.032**		1.061**
Self-rated health low	1.065**		1.570**
Sex (female)	0.327		1.300**
Weighted list size * public insurance	0.400		0.900
Variance components			
Practice level	0.943	0.176	0.086
Reduction compared to null model	38%	14%	60%
GP level	1.048	0.209	0.102
Reduction compared to null model	0%	0%	32%
Patient level	18.225		2.130
Reduction compared to null model	5%		46%
N	1,967	184	67,709

* $p<0.05$; ** $p<0.01$.

Smaller and larger practices

Table 7.5 shows the models 1, 2 and 3 again and the same analyses for GPs with smaller (model 1b, 2b, 3b) and larger practices (model 1c, 2c, 3c). A comparison between smaller and larger practices yielded some remarkable differences. In the separate analyses of consultation length, a negative main effect for list size was found in small as well as in large practices, but only in the latter was this coefficient statistically significant.

This negative correlation also remained in a model without interaction variables (coefficient of -1.96). No significant interaction effects were found. Furthermore, the variables *practice type* and *urbanisation* show remarkably different coefficients between small and large practices. In the small practices, the consultations appear to be shorter in the suburban and rural areas, which is not the case among the large practices. Among the small practices, dual practices have longer consultations, whereas this coefficient is negative for the larger practices.

Table 7.5: Regression of remuneration, list size and other practice, GP, and patient characteristics on consultation length, waiting time to get an appointment, and home visit (yes/no) controlled for practice, GP and patient characteristics. Overall, smaller and larger practices (multilevel regression analysis and logistic regression analysis)

	Consultation length			Waiting time to get an appointment (0 through 3)			Home visit no (0)/ yes (1)		
	1a All B	1b Small list B	1c Large list B	2a All B	2b Small List B	2c Large list B	3a All Exp-B	3b Small list Exp-B	3c Large list Exp-B
Intercept	11.794	13.597	6.196	0.904	1.789	-0.045	0.002	0.004	0.002
Practice characteristics									
Proportion of publicly insured (capitation share)	0.034	0.057	-0.014	0.000	0.012	-0.015	1.007	0.998	1.017*
Proportion of self-rated health low	-0.192**	-0.204*	-0.097	0.022	-0.009	0.066**	0.994	0.978	0.986
Urbanisation (ref=urban)									
Suburban	-0.970	-1.649*	0.242	0.011	-0.096	0.305	1.168	0.655	1.282
Rural	-1.957**	-1.957*	-0.411	-0.019	-0.547*	0.676**	1.405	1.332	1.21
Practice type (ref=solo)									
Dual	-0.248	2.038*	-1.308*	0.066	-0.017	-0.096	1.097	0.723	1.038
Group	-0.071	1.512	-0.338	0.289	0.077	0.141	0.777	0.412**	1.261
GP-characteristics									
Age	0.020	-0.034	0.084*	-0.005	-0.003	-0.006	1.002	0.992	1.007
Sex (female)	0.157	-0.651	1.306	0.002	0.053	-0.157	0.963	1.368	0.416**
Weighted list size	-1.014*	-1.346	-2.663*	0.065	-0.046	0.218	0.967	0.842	0.724
Weighted list size * proportion of publicly insured	0.002	0.057	0.036	-0.004	-0.041*	0.012	1.008	0.874**	0.966

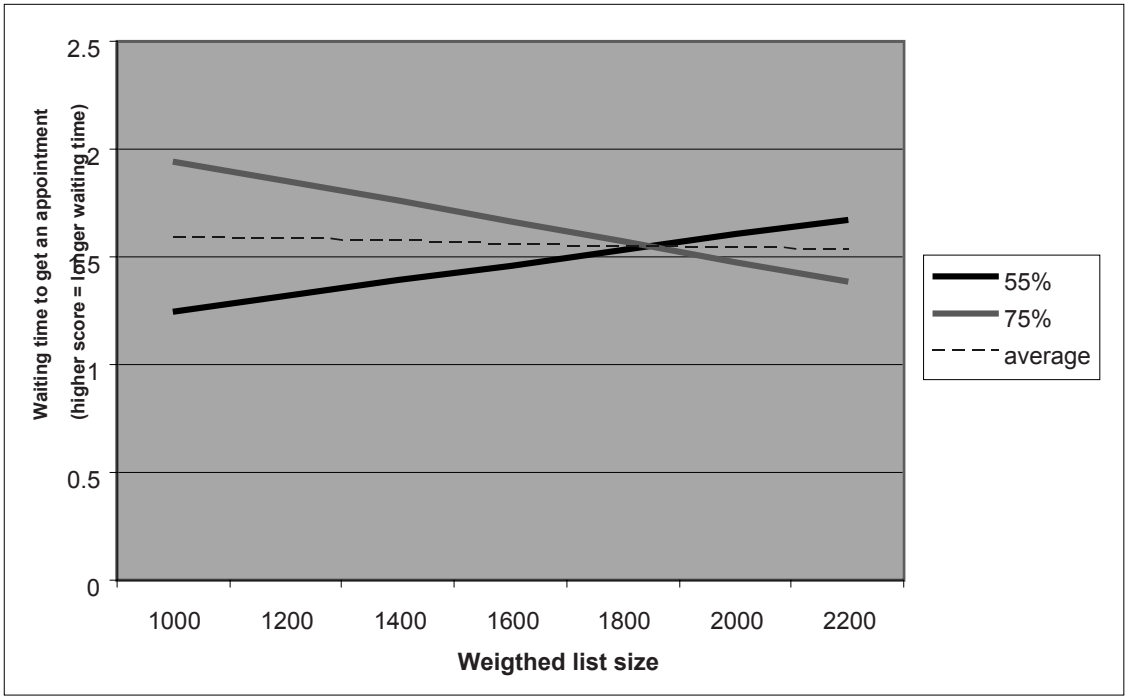
Table 7.5 continued

	Consultation length			Waiting time to get an appointment (0 through 3)			Home visit no (0)/ yes (1)		
	1a All B	1b Small list B	1c Large list B	2a All B	2b Small List B	2c Large list B	3a All Exp-B	3b Small list Exp-B	3c Large list Exp-B
Patient characteristics									
Insurance status (1=public)	-0.465	-0.451	-0.451				0.999	1.094	0.949
Age	0.032**	0.031**	0.033**				1.061**	1.066**	1.059**
Self-rated health low	1.065**	1.084**	1.077**				1.570**	1.423**	1.660**
Sex (female)	0.327	0.537	0.132				1.300**	1.302*	1.230**
Weighted list size * public insurance	0.400	1.263	1.283				0.900	1.132	0.975
Variance components									
Variance practice level	0.943	0.000	1.884	0.176	0.151	0.086	0.086	0.004	0.000
Variance GP level	1.048	1.280	0.000	0.209	0.218	0.207	0.102	0.090	0.116
Variance patient level	18.225	18.982	17.297				2.130	2.390	2.130
N	1,967	996	971	184	92	92	67,709	22,430	45,279

* $p<0.05$; ** $p<0.01$.

The models for waiting time to get an appointment also differ between smaller and larger practices. There is a negative effect of the interaction between list size and proportion of patients who are publicly insured among GPs with small practices. To clarify the interpretation, this relationship is displayed in figure 7.1.

Figure 7.1: The relationship between list size and waiting time to get an appointment for small practices with 55% publicly insured patients, small practices with 75% publicly insured patients and small practices with 65% publicly insured patients (average) (male GP in urban group practice, all other variables are average)



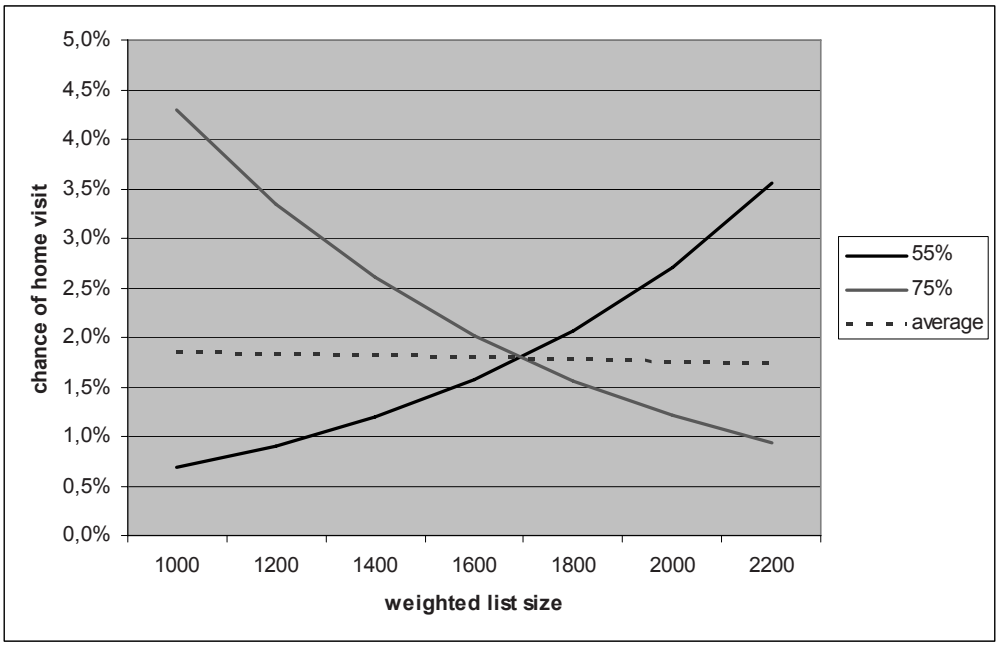
The figure shows the correlations between list size and waiting time to get an appointment, for small practices with 55% publicly insured patients (which is 10% below average), and small practices with 75% publicly

insured patients, (10% above average) and small practices with an average percentage of publicly insured.

The figure refers to male GPs in urban group practices; all other variables were given average scores. Roughly, waiting times get longer with the list size in practices with relatively few publicly insured patients, but shorter in practices with relatively more patients who are publicly insured.

In the models for home visits (3), we also found a significant interaction between list size and the proportion of publicly insured patients in the small practices (3b). This relationship is displayed in figure 7.2. It shows that the likelihood of a home visit rises with increasing list size when the proportion of publicly insured patients is relatively small. When this proportion is relatively high, this likelihood decreases with an increasing list size. Yet, it must be noted that the overall chance of a home visit is small in the Netherlands.

Figure 7.2: The relationship between list size and likelihood of a home visit for small practices with 55% publicly insured patients, small practices with 75% publicly insured patients and small practices with 65% publicly insured patients (average) (male GP in urban group practice, female, publicly insured patient with good self-rated health, other variables are average)



Although the sex of the GP has no significant coefficient in the overall model (3a), the models for small and large practices show remarkably different results: a positive odds ratio for female GPs among the small practices and a negative odds ratio among the large practices.

7.5 Discussion and conclusion

The main questions in this article were: a) how is list size related to consultation length, waiting time to get an appointment, and the likelihood that GPs conduct home visits? And b) to what extent are the relationships between list size and these three variables affected by remuneration?

Our results indicate that list size is negatively related to consultation length, especially among GPs with relatively large lists. A correlation between list size and waiting times and list size and likelihood of a home visit was only found for GPs with small practices. These correlations are modified by the proportion of patients for whom GPs receive capitation fees. The associations are, however, relatively weak compared to correlations with patient characteristics such as sex, age and health.

Our theoretical approach led us to assume that, in general, a large patient list would be associated with shorter consultations, longer waiting times and fewer home visits. We expected these correlations for all GPs, because these are ways to manage patient care and maintain control of their workload. We expected these correlations to be stronger when the financial consequences are more favourable. These financial consequences are determined by the share of the population for which GPs receive payment based on FFS. We also expected these interaction effects to be stronger in smaller practices than in larger practices, because small lists provide more room for decision-making.

The consultation length correlates negatively with list size. This finding was in line with hypothesis 1. The relation is, however, weak: a difference of approximately 1 minute per 1000 listed patients. Previous studies also found a negative relationship between consultation length and measures of workload (Hutten, 1998; Deveugele et al., 2002). Hypothesis 1a was not confirmed: the relationship between list size and consultation length seems not to be affected by remuneration. Contrary to our expectations, the relationship between list size and consultation length was stronger and only statistically significant among GPs with large practices. In most studies where the relationship between workload and consultation length was investigated, list size was used as workload measure. In these studies, conflicting results have been reported (see for an overview Wilson et al., 1991 and Hofman-Okkes, 1991). Many of these studies showed that

consultation length is not, or only weakly, related to list size. It has been shown that some other doctor-related factors affect consultation length positively; these include a positive attitude towards the profession and job satisfaction. Mechanic found that those with a high level of job satisfaction were prepared to 'let the patient talk for half an hour or more' (Wilson, 1991; Mechanic, 1968). Another interesting finding is that low self-rated health is positively related to consultation length. The proportion of patients with low self-rated health is, however, negatively related to consultation length. This probably illustrates the effect of choices that have to be made with respect to the division of time between patients. Obviously, patients with bad health often require more time, but when there are many of them, there is less time per patient.

The hypothesis (2) that the list size lengthens the waiting time to get an appointment, was not confirmed. The interaction-coefficient that we found is in contrast with our hypothesis (2a). We did find a significant interaction between list size and proportion of publicly insured only among the GPs with small practices. This negative interaction indicates that waiting times tend to become shorter with increasing list size when there is a high proportion of publicly insured patients. This finding is remarkable. After all, longer waiting times seem to be more attractive in the case of publicly insured patients for whom GPs only receive capitation fees.

Home visits are more often carried out with female patients, older patients and patients who are relatively unhealthy. Hypothesis 3 was not confirmed. The finding that home visiting is not related to the list size in our total model is in line with previous findings (Groenewegen et al., 1992). In the smaller practices we found a slight negative interaction between list size and the proportion of publicly insured patients. This means that the likelihood of a home visit rises with increasing list size when the proportion of publicly insured is relatively low. This is in line with our hypothesis (3b). Patient characteristics seem to be the most important determinants of home visiting rates. Especially those with a poor self rated health have a substantially higher chance to be visited. Obviously, people with a poor health more often suffer with complaints that restrained them to go to the practice. Calnan and Butler (1988) did find a negative relationship between list size and home visiting rates, but did not take population characteristics into account.

We hypothesized that the relationship between remuneration on the one hand, and indicators for decisions about how they provide consultations on the other hand, are stronger for GPs with a relatively small list size than for those with a relatively large list size. This is partly confirmed by our findings. In the analyses of waiting times and of home visits we did find a significant interaction among the small practices and not among the large practices. A possible explanation for the finding that remuneration seems only to have a small influence might be that Dutch GPs earn a high income compared to most other countries, and therefore, earning enough income is not much of an issue (OECD, 2005; Fujisawa, 2008). Another explanation for the absence of the expected relationships is that the influence of their payment is small compared to the other factors that influence GPs' behaviour such as medical assessments and the care for the patients' wellbeing. It is also possible that the workload of most GPs is simply so high that they cannot afford to base their decisions on remuneration factors. After all, beyond a certain limit, all GPs will try to reduce their workload no matter whether the extra work is compensated for or not. Another explanation could be that the effect of factors related to morbidity was insufficiently taken into account. Publicly insured patients are on average less healthy than privately insured patients. We tried to correct for this by controlling for self-rated health but more detailed corrections may be possible.

Some shortcomings of this study include the following. First, the design of the study is not ideal for investigating coping behaviour. Obviously, since the study is cross-sectional, we can only talk about statistical relations, and real causal relations cannot be shown. Yet, theoretically grounded hypotheses that are tested in a cross-sectional study are at least strong indications for causal relations. Furthermore, as in all studies that use routinely collected data, the data can be biased by the recording behaviour of GPs. However, the type of data that we used contains relatively simple data such as consultation type (home visit, office consultation). Moreover, the data collection was intensively controlled by field workers. In our analyses of the likelihood of a home visit, we dichotomised the dependent variable into 1 (home visit) and 0 (office consultation or telephone consultation). Another way to analyze this is to estimate a multinominal model which compares the three types of contacts. This would be an interesting approach for future research. However, we were especially interested in home visits, because we assume that this issue is of greater

importance for patients. It is very unlikely that a GP would refuse an office consultation if the patient asks for it, but with regard to the decision to conduct a home visit, GPs are much stricter. A last shortcoming that should be pointed out concerns the waiting time to get an appointment. We asked this in a GP-questionnaire, which means that we only have one measure per GP. Obviously, it would be better to ask patients after every consultation. Yet, as we mentioned earlier, this measure appeared to correlate strongly with other measures for accessibility that were measured on patient level. This indicates that the answers GPs gave were fairly reliable.

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Appendix 7.1: General practice in the Netherlands

- Almost all Dutch citizens were registered with a GP.
- In 2001, there were 6,438 FTE general practitioners working in the Netherlands. In that year the Dutch population was 15,983,103. This represents a GP density of 2,483 in 2001. The most recent numbers show a density of 2,331 (Hingstman and Kenens, 2007).
- GPs in the Netherlands have a gatekeeper function. Nearly all medical complaints are first presented to a GP. Consulting secondary care hardly ever happens without a referral from the GP. Approximately 96% of all presented health problems were treated by GPs.
- Around 60% of the population was publicly insured in 2001, the remainder was privately insured. The insurance status depends on income. Above a certain income level, people had to insure themselves privately.
- Since GPs received a capitation payment for publicly insured patients, these patients had to be listed in a practice. The GP receives a fixed amount of money per year for every listed (publicly insured) patient. This amount is slightly higher for elderly (above 65 and for patients living in deprived areas.
- Privately insured patients didn't have to register with a practice. Yet, practically all privately insured were registered with a GP. For these privately insured patients, GPs were paid on a fee-for-service basis. This fee varies according to the type of contact. It comprises a factor 1 for office-consultations, 0.5 for telephone consultations and 1.5 for home visits. Privately insured patients could opt for a deductible excess in exchange for a lower premium.
- It was possible to change one's GP. This was, however, easier for privately insured patients than for publicly insured.
- All GPs had a mixed population of publicly as well as privately insured patients. Since insurance type is strongly related to income, the ratio between these two varies across areas. GPs in deprived areas have a vast majority of publicly insured patients on their lists, while those in more wealthy areas have more privately insured patients.
- In 2006, the Dutch health insurance system was changed fundamentally. Today, all Dutch citizens have a mandatory private health insurance. GPs get a capitation fee for all listed patient and fee-for-service on top of that.

Chapter 8

Labour intensity of guidelines may have a greater effect on adherence than GPs' workload

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Abstract

Physicians' heavy workload is often thought to jeopardise the quality of care and to be a barrier to improving quality. The relationship between these has, however, rarely been investigated. In this study quality of care is defined as care 'in accordance with professional guidelines'. In this study we investigated whether GPs with a higher workload adhere less to guidelines than those with a lower workload and whether guideline recommendations that require a greater time investment are less adhered to than those that can save time. Data were used from the Second Dutch National survey of General Practice (DNSGP-2). This nationwide study was carried out between April 2000 and January 2002. A multilevel logistic-regression analysis was conducted of 170,677 decisions made by GPs, referring to 41 Guideline Adherence Indicators (GAIs), which were derived from 32 different guidelines. Data were used from 130 GPs, working in 83 practices with 98,577 patients. GP-characteristics as well as guideline characteristics were used as independent variables. Measures include workload (number of contacts), hours spent on continuing medical education, satisfaction with available time, practice characteristics and patient characteristics. Outcome measure is an indicator score, which is 1 when a decision is in accordance with professional guidelines or 0 when the decision deviates from guidelines. On average, 66% of the decisions GPs made were in accordance with guidelines. No relationship was found between the objective workload of GPs and their adherence to guidelines. Subjective workload (measured on a five point scale) was negatively related to guideline adherence (OR=0.95). After controlling for all other variables, the variation between GPs in adherence to guideline recommendations showed a range of less than 10%. 84% of the variation in guideline adherence was located at the GAI-level. Which means that the differences in adherence levels between guidelines are much larger than differences between GPs. Guideline recommendations that require an extra time investment during the same consultation are significantly less adhered to: (OR=0.46), while those that can save time have much higher adherence levels: OR=3.13). Recommendations that reduce the likelihood of a follow-up consultation for the same problem are also more often adhered to compared to those that have no influence on this (OR=3.13).No significant relationship was found between the objective workload of GPs and adherence to guidelines. However, guideline recommendations that require an extra time investment are significantly less well adhered to while those that can save time are significantly more often adhered to.

8.1 Background

Physicians' heavy workload is often cited as posing a threat to the quality of care and as a barrier to the implementation of measures to improve quality (Hutten, 1998; Groenewegen et al., 1991; Rundall et al., 2002; Patterson et al., 2004; Cranney et al., 2001). Although this has often been stated, relatively little effort has been devoted to analysing the relationship between workload and quality of care. In this study we analyse this relationship in a general practice setting. We define workload as the number of consultations handled by GPs within one week. Good quality of care was defined as care in accordance with professional guidelines.

Several studies have cited high workload as a barrier to guideline implementation (Cabana et al., 2006). However, these studies focus on guideline adherence in general and did not investigate the underlying relationship. Empirical studies on the nature of the relationship between guideline adherence and workload are scarce.

The study of Hutten (1998) formed an important first step on this path. However, the data were collected in 1987, when guideline development was still at an early stage. In the past decades the number of professional guidelines has been rising rapidly, so that a better test is possible. More insight into the relationship between workload and guideline adherence can offer valuable information to policy makers and professionals as they strive towards quality improvement.

The purpose of the present study was to investigate the relationship between workload and adherence to professional guidelines. In this we distinguish between the effects of GP workload and the labour intensity of guideline recommendations. We will discuss some theoretical considerations as to why such a relationship is to be expected. This study was carried out in the Netherlands. In the Netherlands guidelines are developed by the Dutch College of General Practitioners. This organisation has a prominent and influential position among GPs. Most Dutch GPs are members of this association and receive all its guidelines and revisions of guidelines.

Moreover, the guidelines are published on the internet and are therefore accessible to all who are interested.

The relationship between stress and job performance

The most plausible assumption appears to be that if workload and guideline adherence are correlated, this correlation will be negative. Workload may be considered to be an indicator for stress due to a lack of time (Jex et al., 1992). Psychological research has shown that there is an optimal stress level for workers to perform well (Selye, 1975; Muse et al., 2003). A stress level below or above this optimum negatively affects job performance. A number of studies have confirmed the effect of fatigue in clinical settings (Vroom, 1964; Firth-cozens and Greenhalgh, 1997; Gaba and Howard, 2002). Consequently, we expect that GPs' workload is negatively related to adherence to professional guidelines.

Why do some physicians adhere better to guidelines than others?

The acceptance of and adherence to guidelines depends, among other things, on who develops and disseminates them and how this is done (Grol, 2001; Butzlaff et al., 2006; Francke et al., 2008). The existence of guidelines alone is no guarantee for a change in physicians' behaviour. According to Pathman et al., (Pathman et al., 1996) the process from becoming aware of a guideline to adhering to it, follows four steps: (preawareness)→ Awareness→ Agreement→ Adoption→ Adherence. Along this path, the process can be hindered. First, a GP must be aware of the existence of the guideline and familiar with the information contained in it (knowledge). Second, the GP must agree with the guideline and be motivated to implement it (attitude). Indeed, some physicians have negative attitudes towards guidelines in general, because they fear these might promote *'cookbook medicine'* or decrease their autonomy. Third, physicians must, in practice, be able to act in accordance with guidelines; this can be restricted by external barriers (Cabana et al., 1999). Workload and time pressure are such barriers that negatively affect the first step in the awareness-to-adherence process, because time is needed to stay informed. GPs with a high workload might spend more time on patient care at the expense of time spent on continuing medical education (CME) or reading specialist literature. Accordingly, they might be less informed about the exact content

of guidelines. Therefore, we investigated a possible correlation between hours spent on CME and guideline adherence and whether this modifies the relationship between workload and guideline adherence.

According to the theory about the stress-job-performance relationship, this relationship depends on an individual response to 'environmental' events. However, different individuals might perceive and experience the same amount of objective workload differently. Not only will the objective workload be of influence but also the experienced workload. This subjective workload may result in a feeling of being in a rush and not having enough time. This experienced lack of time could be more important than the (objective) amount of available time. Therefore, it is to be expected that experienced high workload also negatively affects guideline adherence and probably modifies the relationship between workload and guideline adherence.

Why are some guidelines better adhered to than others?

Previous research shows that one of the most important characteristics of a guideline to influence compliance is complexity. Guidelines that are easy to understand, can easily be tried out, and do not require specific resources or skills have a greater chance of being used (Rogers, 1995a, 1995b; Grilli and Lomas, 1994; Francke et al., 2008). It has also been shown with regard to guidelines about prescriptions, that so-called 'don'ts' are better adhered to than 'dos'. Don'ts are recommendations that say *not* to prescribe something while dos recommend specific drugs (Braspenning et al., 2004). We assume that there is a logical link between the complexity of a guideline and the amount of workload that following this guideline will incur. Since time is scarce for GPs, they will be more likely to adopt guidelines that are simple and less time-consuming. Moreover, GPs with a high workload develop habits and routines to cope with their workload (e.g. spending less time per patient) and might be less likely to change this behaviour even if these routines are in conflict with guidelines. In our study, we also investigate whether guidelines are better adhered to when recommendations are less time-consuming, and whether the negative correlation between workload and guideline adherence is stronger when following the guideline is more time-consuming. Time-consumingness of guidelines was measured as time

investment during the same consultation and the chance of return by the patient for the same complaint.

Our research question is: "to what extent is workload an important determinant of guideline adherence?" In this we distinguish between the effects of GP workload and the labour intensity of the guideline recommendations.

8.2 Methods

Study population
Data were used from the Second Dutch National Survey of General Practice (DNSGP-2) (Westert et al., 2005). This nationwide study was carried out between April 2000 and January 2002, in 104 general practices in the Netherlands, comprising 195 GPs and nearly 400,000 listed patients. In each practice, information about patients, contacts, diagnoses, interventions, referrals, prescriptions etc. were recorded during one year. The data of eight practices were excluded from our analyses because they were deemed insufficient. The study was carried out in keeping with Dutch legislation on privacy. Compliance with privacy regulations was approved by the Dutch Data Protection Authority. The methods and data collection of the DNSGP have been described in greater detail by Westert et al (2005).

Data and measurements
The data file used was created by merging several files with data on different levels. This resulted in a dataset with a multilevel structure. The lowest level consists of decisions by GPs, mostly regarding prescriptions or referrals. This is the dependent variable and will be further clarified under 'measures'. These decisions are nested within patients. This means that every decision was made with regard to a patient, and that more decisions can be made concerning the same patient, but that a specific decision never refers to more than one patient. Patients, in turn, are nested within a GP (every GP has more patients, but a patient always has one GP); GPs are nested within practices. The units at the lowest level (decisions) were not only nested within a specific patient, but also within a specific guideline adherence indicator (GAI), which, for instance, indicates that the decision belongs to the indicator 'referring knee complaints to orthopaedist' or 'prescribing

antibiotics for sinusitis'. The data structure of this cross-classified model is visualised in appendix 8.1.

We will briefly describe the datasets used in this study. These datasets are also summarised in Table 8.1:

Electronic medical records
All participating GPs kept electronic medical records. In these records GPs registered the diagnosis using the International Classification of Primary Care (ICPC), and referrals and prescriptions using ATC-codes (Anatomical Therapeutical Chemical classification system).

Patient questionnaire
A one-page written questionnaire was sent to all listed patients. This included some characteristics which are not registered in the practice administration, such as self-rated health. The response was 76.5%.

Practice administration
The practice administration of all participating practices contains a few items of information on all patients on the practice list: sex, date of birth, insurance status and postal code. There were almost 400,000 patients in the DNSGP-2.

GP questionnaires
The GPs received two written questionnaires. The first covered a range of topics about their work. The response to this questionnaire was 96% (188 GPs). The second questionnaire dealt with workload-related issues and job satisfaction. The response to this second questionnaire was 87% (164 GPs).

Diaries
The GPs kept a detailed log of their time use for every quarter of an hour in a representative working week. The diary had a pre-structured form with categories such as 'consultation', 'administration', and 'CME'.

National database of all GPs
Basic characteristics such as date of birth, sex, single-handed practice or partnership, etc. were retrieved from the national database of GPs (NIVEL).

Expert panel
Finally, a panel of three practicing general practitioners, working in different practices, was asked to fill out a questionnaire to decide whether a certain decision is associated with a higher or a lower time investment.

All files were merged using unique patient, GP and practice codes for cross-reference between the files. After merging all files, a file with 170,677 records remained, each record representing a decision that was either in accordance with or against a guideline.

All variables used are shown in table 8.1. In the third column, the type of data source is presented. We will clarify these measures here.

Table 8.1: Variables used in the analyses: mean / % and standard deviation

	Mean / %	Sd	Type of data source
Dependent			
Adherence to guideline	58.7%		Electronic medical records
Independent			
Practice level (n=83)			
% publicly insured (per practice)	65.8%	10.1%	Practice administration
% elderly (per practice)	6.0%	2.8%	Practice administration
% ethnic minorities (per practice)	6.3%	11.7%	Patient questionnaire
Nat. logarithm % ethnic minorities	-3.38	1.4	Patient questionnaire
% self-rated health poor (per practice)	19.0%	5.2%	Patient questionnaire
Practice type			National database
- Single-handed	57.8%		
- Dual practice	20.5%		
- Group	12.1%		
- Health centre	9.6%		
Urbanization			National database
- Very urban	20.5%		
- Urban	24.1%		
- Suburban	16.8%		
- Rural	20.5%		
- Very rural	18.1%		
Dispensing practice	10.9%		GP questionnaire 1
GP-level (n=130)			
Workload	114.6	35.4	Electronic medical records
Age	47.4	6.15	National database
Sex (female)	21.5%		National database
List size	2018.3	545.6	Practice administration and GP questionnaire 1
Hours of CME per week	3.2	3.4	Diaries
Satisfaction with available time	2.9	0.7	GP questionnaire 2
Patient level (n=98,577)			
Age	39.8	24.0	Practice administration
Sex (female)	56%		Practice administration
Public insurance	71%		Practice administration
Self-rated health poor	18.3%		Patient questionnaire
Self-rated health unknown	22.1%		Patient questionnaire
Non-western ethnic minority	4.6%		Patient questionnaire
Ethnicity unknown	17.8%		Patient questionnaire
GAI level (n=41)			
About referrals	32.0%		Electronic medical records
Short-term time investment greater	32.8%		Expert panel
Short-term time investment smaller	22.1%		Expert panel
Long-term time investment greater	19.1%		Expert panel
Long-term time investment smaller	28.6%		Expert panel

Outcome measure: decision in accordance with guideline

Electronic medical records were used for the construction of the dependent variable. This variable is dichotomous and indicates whether a decision is in accordance with the guideline (1) or not (0). This was based on a list of 41 Guideline Adherence Indicators (GAI) which were developed by IQ-healthcare (Braspenning et al., 2004; Braspenning et al., 2006). These indicators were based on clinical guidelines developed by the Dutch College of General Practitioners. Each decision refers to an episode, a patient or a contact. The guidelines refer to a specific diagnosis (e.g. acute sore throat). We will illustrate this with an example: A GP notes as diagnosis 'acute sore throat'. The guideline 'Acute sore throat' advises against the use of antibiotics (Zwart et al., 2007). If the GP prescribed antibiotics during an illness-episode with the diagnosis 'acute sore throat', this decision is coded '0' (against guideline) on our dependent variable. If no antibiotics were prescribed, this is coded as '1' (in accordance with guideline). Obviously, a complete guideline cannot be reduced to one dichotomous variable. Guidelines contain a range of recommendations and considerations that are related to each other and that are often ordered in a decision tree. The GAIs measure specific decisions under certain conditions that play a central role in the guideline and that are relatively simple to measure. The selection of these decisions was done by GPs using an iterative consensus procedure. This method was extensively described elsewhere (Braspenning et al., 2004; Braspenning et al., 2007; Campbell et al., 2002).

In this way, 213,758 decisions were coded referring to 41 GAIs, mainly about prescribing and referrals. These 41 GAIs were derived from 32 different guidelines. We wanted to be sure that all GAIs referred to situations that happen frequently enough to be relevant and to discriminate between GPs. Therefore, a selection was made on the basis of three criteria:

- the numerator must exceed 100 (in the whole database);
- the indicator must be available for more than 50 practices;
- the denominator divided by the number of practices (which is the average number of times something occurs in one practice) must be higher than 10.

After this selection, 170,677 records (80%) remained.

Workload and exactingness of guideline recommendations

- Expected workload effect in actual consultation
  The expert panel rated all GAIs on the expected workload in the actual consultation. Every GAI was written as a decision, e.g.: 'prescription of antibiotics to patient with sore throat'. Response categories were 'amount of work in actual consultation is likely to be: greater / equal / smaller'. Some items prescribed a decision that was in accordance with guidelines, other items prescribed a decision that was against the guideline. Answers were recoded into 1, 2 and 3, in such a way that 1 = higher time investment in actual consultation if the guideline is adhered to and 3 = smaller time investment in actual consultation if the guideline is adhered to. All GAIs were given the score on the basis of the majority of the expert ratings (two or three). In the case of three different scores, the GAI was scored as 2. This was the case for one indicator. In 32% there was full agreement between the experts and in 66% two respondents agreed with each other.
- Expected long-term workload effect
  This variable was measured in the same way as expected workload effect in actual consultation. The expert panel was asked to rate the likelihood that the patient will return after this decision (greater / equal / smaller). Agreement between the experts was somewhat less. In 10% there was complete agreement, in 68% two experts agreed and in 22% three different ratings were given. The GAIs for which there was no agreement, were scored as 'equal' (2).
- Objective workload of GPs
  We measured the workload in terms of the average number of consultations during one week. We extracted these data for one year from the electronic medical records of all listed patients.
- Experienced workload (satisfaction with available time)
  This variable is an indicator for subjective workload. In the questionnaire, the GPs filled out a job satisfaction scale originally derived from Cranie et al. (1982). Factor analyses showed that four items formed a scale for satisfaction with available time. This scale consists of the four items: satisfaction with time for family, amount of leisure time, time costs of the practice, available time for CME. Response categories were: very dissatisfied, dissatisfied, partly dissatisfied/partly satisfied, satisfied, very satisfied. The higher the score, the higher the satisfaction with the available time. This scale shows reasonable internal consistency (Cronbach's alpha = 0.78) (Van den Berg et al., 2004).

- Number of hours per week spent on Continuing Medical Education (CME)
  GPs recorded the number of hours spent on CME in the diaries. CME covers doing courses, visiting conferences or reading professional literature.
- List size was computed by averaging the number of patients on the list at the beginning of the year and at the end. This list size on a practice level was divided among the GPs within one practice in proportion to their full-time equivalents (FTE). Since a proportion of the GPs work part time, it is important to control for list size. Table 8.2 shows the correlations between the workload related variables on GP level. Only workload (weekly number of consultations) and list size were significantly correlated: 0.58.

Table 8.2: Bivariate correlations between list size, workload, satisfaction with available time and hours spent on CME

		1	2	3
1	List size			
2	Workload (weekly number of consultations)	0.58**		
3	Satisfaction time	-0.11	-0.07	
4	Hours of CME	0.10	0.05	0.09

* p<0.05; **p<0.005

Variables at patient level

Since decisions made in clinical practice are also affected by patients, we controlled for five patient characteristics: insurance status, age, sex, self-rated health and ethnicity. We used insurance status, age and sex because these variables are always recorded in the medical file and because they are clearly related to care demand in general. Insurance status was coded as 0 (privately insured) or 1 (publicly insured). Insurance status can be considered as a proxy for social economic status, since until 2006, people above a certain income level were insured privately and people below this income level were insured publicly. Publicly insured people, women and elderly have a significantly higher use of care (LINH). Moreover, self-rated health was included because people with low self-rated health will more often suffer from more than one disease and will often have more

complicated problems. This can be a reason to deviate from guidelines. Self-rated health was originally measured on a scale from 1 (very good) to 5 (very bad); this was recoded into a dichotomous variable. Scores 1 to 3 were recoded into 0, and scores 4 and 5 (bad and very bad) into 1. Since this variable has many missing values due to non-response, an extra dummy for 'not known' is used in our analyses. Ethnicity was included in the same questionnaire. This was because previous studies have reported ethnic inequalities in the quality of received care (Urbanus-van Laar, 2007) and differences in received prescriptions (Van Dijk, 2003). Moreover, there can be good reasons to deviate from guidelines when ethnic differences are taken into account (Manna, 2003).

Background variables at GP level

Age and sex of all participating GPs were collected at the start of the study and were used as controlling variables.

Variables at practice level

Dispensing practices, urbanization and practice type were used as controlling variables on practice level. Whether the practice was a dispensing practice was included in the models because many of the GAIs deal with prescriptions. In previous research, it has been shown that GPs in dispensing practices prescribe a broader range of drugs (De Bakker et al., 2007). The degree of urbanization was measured on the basis of the addresses of the practices. There are five categories, varying from very urban to rural. Practice type has four categories: single-handed, dual, group and health centre.

Since the work style of GPs and the presented morbidity might also differ according to case-mix and the composition of the patient population, we added four case-mix variables:

Proportion of publicly insured patients, proportion of elderly (>65+), the proportion of patients with a low self-rated health and the proportion of non-western ethnic minorities. To compute these variables, we aggregated the characteristics of all listed or responding (in case of ethnicity and self-rated health) patients. Since the distribution of ethnic minorities was considerably skewed to the left (indicating that ethnic minorities are highly concentrated within a limited number of practices), this was transformed to a natural logarithm.

Controlling variable at GAI-level

Prescription / referral: Most GAIs involve prescriptions or referrals. Only three GAIs are related to other decisions. We coded all GAIs as either 0 (prescription or other) or 1 (referral).

Statistical Analyses

As explained under 'measures' adherence to 41 separate GAIs was combined within one outcome variable. A score of '1' on this variable means that a GP made a decision that was in accordance with a guideline, a score of '0' means that a GP decided something that was against a guideline. Yet, since we expect that some recommendations are better adhered to than others, we also computed the adherence per GAI. To get an initial impression of the variance in guideline adherence between GAIs and the differences between GPs with a relatively high and a relatively low workload, the proportion of guideline adherence was investigated per GAI and per workload-quartile.

In our multivariable analyses we used a cross-classified logistic multilevel model.

Our dependent variable refers to acting in accordance with guidelines (1) or deviating from guidelines (0). Explanatory variables were added to the model in five steps:

Model 1: Workload

Model 2: Workload + background variables of GPs, practices and patients

Model 3: Model 2 + hours spent on CME per week and satisfaction with available time

Model 4: Model 3 + GAI-characteristics

Model 5: Model 4 + interaction terms (workload * workload effect in actual consultation) and (workload * workload effect in long term).

The analyses were carried out in the software programme MLwiN.

8.3 Results

Of all decisions in our data, 59% were in accordance with the guidelines. Figure 8.1 displays the proportion of cases that was in accordance with guidelines per GAI. In the figure, the average proportion of all GPs is

shown, the upper workload quartile (GPs with the highest workload) and the lowest workload quartile (GPs with the lowest workload). Clearly, the variation in adherence between the GAIs is large: between 8% and almost 100%. There is also variation between GPs, but this variation is smaller. The variation among GPs differs between GAIs with standard deviations between 1.6 and 39.8. In 44% of the GAIs (18) the adherence was higher among the lowest workload quartile, in 34% (14) the adherence was higher among the highest workload quartile, in 22% there was no difference. Accordingly, no clear correlation between workload and guideline adherence was found.

Figure 8.1: Proportion of cases in accordance with guidelines, per GAI; mean, GPs with relatively high workload (upper quartile) and GPs with relatively low workload (lowest quartile)

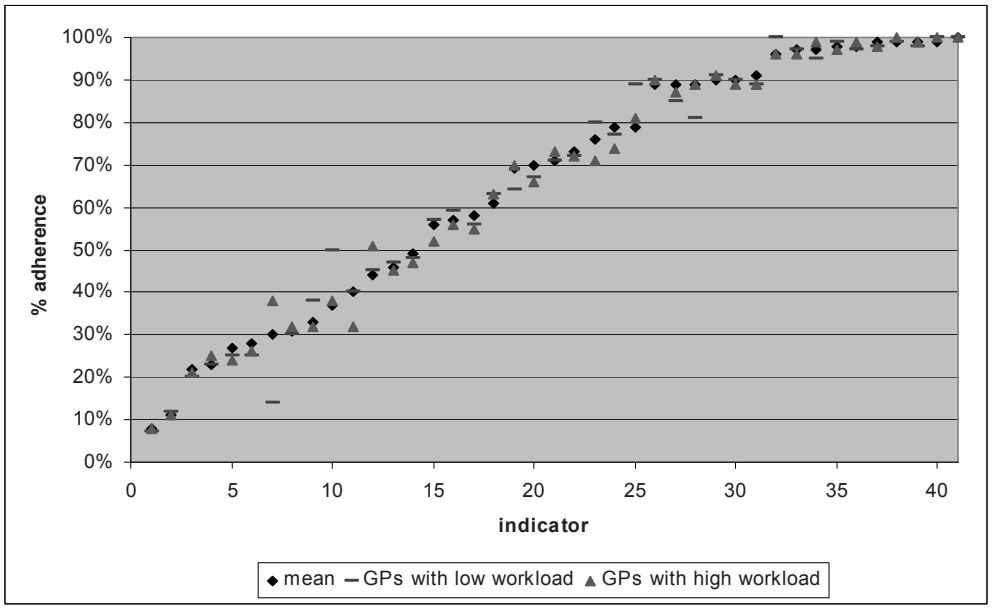


Table 8.3 shows the multilevel models. Model 1 shows no correlation between adherence and the GPs' workload. In the other models too, no correlation between objective workload and guideline adherence was found. Likewise, the expectation that the time spent on CME is related to guideline adherence was not confirmed since no significant relationship was found. However, a correlation between subjective workload and adherence was indeed found. In contrast to our expectations this correlation is negative (odds ratio of 0.95). Remarkably, the more satisfied GPs are with their available time, the lower their adherence.

Some strong and statistically significant relationships were found between the required time investment of recommendations and guideline adherence. We expected that recommendations that require an extra time investment during the same consultation would be less well adhered to. This is supported by our findings. Recommendations that require more time in the same consultation are less adhered to: (OR=0.46, compared to the 'equal' category). Those that can save time are much better adhered to: (OR=1.55). Also an expected time investment in the long term is of influence. Recommendations that reduce the likelihood of a follow-up consultation for the same problem are also often adhered to compared to those that have no influence on this (the 'equal' category) (OR=3.13). Yet, recommendations that increase the chance of a follow-up consultation are also more often followed (OR=2.10). Recommendations that deal with referrals are significantly more often followed than those concerning prescriptions (OR= 15.35).

Table 8.3: Multilevel logistic regression analyses of GP-characteristics, practice characteristics, patient characteristics and indicator characteristics on adherence to guidelines

	Model 0 OR	Model 1 OR	Model 2 OR	Model 3 OR	Model 4 OR	Model 5 OR
Constant	1.893	1.893	1.893	1.066	0.657	0.654
GP- characteristics						
Age			1.001	1.002	1.004	1.004
Female GP (ref=male)			1.007	1.021	1.022	1.024
List size			0.952	0.953	0.952	0.947
Workload		1.001	1.000	1.000	1.000	1.000
Hours of CME per week				0.996	0.996	0.996
Satisfaction with available time (1-5)					0.954*	0.954*
Practice and population characteristics						
Proportion of elderly 75+			1.024**	1.024**	1.044**	1.045**
Proportion of publicly insured			1.004	1.004	1.007*	1.007*
Proportion of ethnic minorities (Nat. Logarithm)			1.035	1.035	1.067*	1.068*
Proportion of self-rated health poor			0.985*	0.986	0.972**	0.972**
Practice type (ref= single-handed)						
- Dual			1.025	1.016	1.027	1.031
- Group			1.037	1.015	1.008	1.006
- Health centre			1.024	1.010	1.030	1.033
Urbanization (ref=very urban)						
- Urban			1.050	1.053	1.017	1.020
- Moderately urban			1.102	1.114	1.110	1.111
- Rural			1.008	1.006	0.992	0.999
- Very rural			1.062	1.075	1.106	1.119
- Dispensing practice			0.999	0.984	0.933	0.931
Patient characteristics						
Age			1.001**	1.001**	1.002**	1.002**
Female (ref=male)			1.043**	1.043**	1.069**	1.069**
Publ. Insured			1.016	1.015	1.020	1.020
Self-rated health poor			0.967**	0.967**	0.956**	0.956**
Self-rated health unknown			0.962*	0.962*	0.941*	0.941*
Non-western migrant (ref=western)			0.979	0.979	0.956	0.955
Ethnicity unknown			1.030	1.030	1.050*	1.050*

Table 8.3 continued

	Model 0 OR	Model 1 OR	Model 2 OR	Model 3 OR	Model 4 OR	Model 5 OR
GAI-characteristics						
Short-term time investment (ref=equal)						
Greater					0.458**	0.461**
Smaller					1.547**	1.550**
Long-term time investment (ref=equal)						
- Greater					2.104**	2.104**
- Smaller					3.133**	3.155**
About referrals (ref=prescriptions and other)					15.333**	15.348**
Interaction workload* time investment short greater						0.999
Interaction workload* time investment short smaller						1.000
Interaction workload* time investment long greater						1.000
Interaction workload* time investment long smaller						0.999
Variance components						
Practice level	0.002	0.001	0.000	0.000	0.00	0.000
Reduction [1]		50%	100%	100%	100%	100%
GP-level	0.005	0.003	0.003	0.003	0.007	0.007
Reduction [1]		32.3%	32.3%	40.2%	0%	0%
Patient level	0.000	0.000	0.000	0.000	0.285	0.287
Reduction [1]						
GAI level	1.965	1.889	1.970	1.971	1.516	1.519
Reduction [1]		4%	0%	0%	22.8%	22.8%

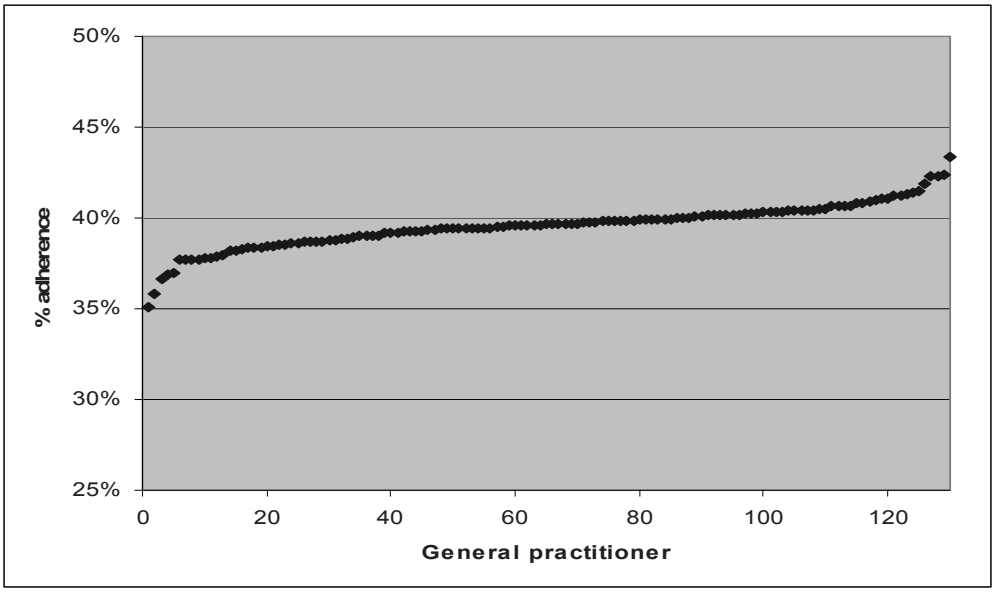
OR = exp-b (odds ratio); *p<0.05, **p<0.005; 1= compared to empty model (model 0).

No interaction effects were found. This means that the effects found for the GAI recommendations do not differ between GPs with a higher and those with a lower workload. After controlling for all variables, guideline adherence varied between 35.1% and 43.3% among GPs.

At the bottom of table 3 the variance components are shown; over 99% (1.965) of the higher level variance was located at the GAI level. After adding the other variables, some shifts took place between the different components. In our final model, still 84% of the variance was located at the GAI level; the remaining part was located at the patient level. Figure 8.2 shows the percentage of adherence, per GP, after controlling for all other variables. As we can see, the differences are relatively small: a range of less than 10% between the extremes. Note that the scores in the figure are

estimated on the basis that all other variables equal 0. For most variables this was the average score, but also the variables 'about referrals' have values of 0 in the equation, which means that the score is estimated on the basis that the decision is not related to referrals.

Figure 8.2: Proportion adherence to guidelines per GP, after correction for all variables



8.4 Discussion and conclusions

The main question in this study was whether there is a relationship between workload and guideline adherence. We did not find any differences in guideline adherence between GPs with a higher and those with a lower objective workload. However, we found marked differences between guideline recommendations that require a time investment and those that require no extra time. Recommendations that require an extra time investment were less well adhered to.

The expectation that the time spent on keeping up to date influences guideline adherence was not confirmed. Again, this is in line with previous results (Hutten, 1998). A possible explanation for the absence of this relationship is that the Netherlands has a mandatory credit points based system for CME. A minimum of 40 hours per year is required to retain registration as a GP. Besides, the recommendations in the guidelines are clearly described, easily accessible and mostly deal with frequently occurring complaints.

We did observe a small but statistically significant relationship between experienced lack of time (subjective workload) and guideline adherence. However, the finding runs contrary to our expectation: higher satisfaction with available time is found to be correlated to lower guideline adherence. Zantinge et al. (2007) found that GPs who experience a lack of time are less patient-centred. This could possibly lead to a tendency to fall back on guidelines and to provide more 'standard' care. The relationship is, however, very small. A better understanding of this relationship requires further investigation.

The relationship that we found between short-term time investment and adherence is in line with our expectation: recommendations that require more time investment are followed significantly less often; those that reduce the time investment are more often followed. These correlations are quite strong and are statistically significant. We also found that recommendations that are less likely to induce follow-up consultations are more often adhered to. Contrary to our expectation, recommendations that are likely to lead to follow-up consultations are likewise more often followed compared to the 'equal' category. Of course, the GP's choice whether or not to follow guidelines is constrained by medical considerations. Workload is only one factor in the decision process and despite their workload, GPs are obviously concerned for the wellbeing of their patients. This probably explains why recommendations that incur follow-up consultations are better adhered to.

Two important methodological considerations will be discussed here. First, we want to underline the importance of the cross-classified modelling we used. If we had not included the GAI-level, we would have concluded that some GPs have a higher adherence rate than others, without noticing that this is due to the simple fact that some GPs have a higher number of contacts that are related to GAIs that are better followed in general. We

checked this by repeating the analyses without including GAI-level, which resulted in a considerable variation between GPs.

Second, in the literature about guideline adherence, sometimes a distinction is made between so-called 'dos' and 'don'ts'; recommendations that advise to do something and those that advise *not* to do something. It may appear obvious that doing something will generate more workload than *not* doing something and thus, that our expert panel rated the dos as more burdensome than the don'ts. This was, however not the case. Prescribing, for instance, often generates less workload than explaining why the patient does not get a prescription. There was no clear relationship between the expected workload and whether the recommendation was a 'do' or a 'don't'.

Some remarks will be made about the limitations of this study. First, it should be noted that guideline adherence is only a part of the quality of care. Many aspects of quality, such as communication style and organisation are beyond the scope of this study. There is no one-on-one relationship between guideline adherence and quality. In some cases, there are good reasons to deviate from guidelines. These reasons will often be related to patients or to morbidity, but not to GPs and practices. Previous studies have shown that comorbidity can be a reason to deviate from guidelines (Francke et al., 2008). This factor was not controlled for in this study. It is, however, unlikely that comorbid conditions will vary strongly between GPs or practices after controlling for age and self-rated health. Second, our data contain only cases that could be measured by an indicator. The content of the guidelines encompasses many more recommendations that were not measured, due to the simple fact that not all GPs actions are recorded in a file. Third, in our analyses, workload was considered a stable characteristic at individual GP level, i.e. some GPs are consistently busier than others. At the same time, workload can also vary between days. Consequently, it seems plausible that the same GP might make other decisions on busy days than on less busy days. To determine how busy a GP was on a specific day, one needs the number of contacts on that day as a numerator and the number of working hours as a denominator. The latter was, however, not known. Fourth, the data used in this study are relatively old. It was, however the most recent database available with this specific information. When more recent data are available, it should be investigated whether the relations that we found have been changing over time. Fifth, there are possibly factors that were not included in our analyses but do influence adherence. These

might be individual preferences of patients or specific conditions in the situation of patients that can not be derived from electronic records.

The finding that the required time investment incurred by a recommendation was strongly correlated with adherence, in combination with the fact that an overwhelming proportion of the variance was located on the GAI level, leads to two important conclusions. First, in the Netherlands, adherence to guidelines seems to depend on the content of the guidelines to a far greater extent than on the GPs. As described in the introduction, a great effort has already been made in the Netherlands to promote and disseminate the guidelines. It is therefore likely that in countries where guidelines have a less firm position, more variation between GPs will be found and that thus, there is more to gain by encouraging GPs to adhere to and to adopt guidelines. Second, when developing guidelines, it seems sensible to take the required time investment of recommendations into account, since this may affect the likelihood that recommendations are followed.

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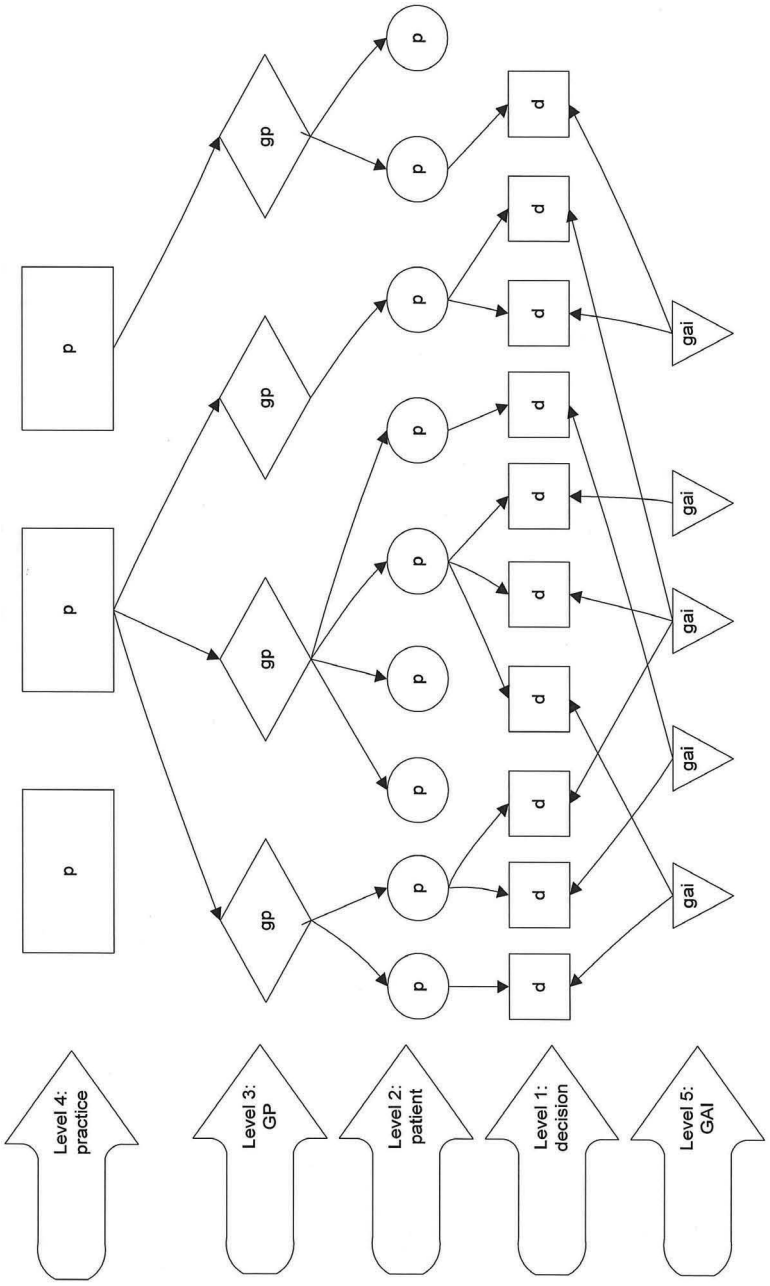
Appendix 8.1

Cross-classified multilevel model with decisions nested in GAIs and in patients, patients in GPs and GPs in practices



Chapter 9

Summary and discussion

9 Summary and discussion

9.1 Introduction

In this book the workload of Dutch GPs and the way workload affects their performance were investigated. In 2001, the year that the idea for this thesis was born, many physicians complained about their high and increasing workload. Morrison and Smith (2000) contributed to the international debate on physicians' workload by writing an editorial in British Medical Journal, in which they stated that in many countries health care systems were inefficient and especially unfair on doctors, who have to keep on working harder without making any progress. Morrison and Smith called this 'hamster healthcare' referring to a hamster in a treadmill. In that same year, it became clear that many Dutch GPs recognized themselves in this picture. The dissatisfaction among GPs led to a series of nationwide campaigns and even to a one-day strike. Were GPs really victims of an unfair system, tiring them out without rewarding them sufficiently? Or were they just becoming more demanding?

The possible adverse consequences for GPs of a high workload were, however, not the only reason to be interested in the workload-issue. GPs, being the gatekeepers to the system, play a very central role in Dutch health care. They function as family doctors, are gate keepers to secondary care and are generally the first to be contacted for any medical problem. When the workload of GPs reaches too high a level, this could very well lead to undesired consequences for patients.

Although it was clear that many GPs perceived an increase in their workload, there was hardly any substantial evidence to justify this observation. Mechanic (2001) responded to Morrison and Smith by observing that in the UK and the USA workload was decreasing rather than rising. The absence of clear figures on the exact development of workload was not least because of difficulties in defining and measuring workload.

The second Dutch National Survey of General Practice, which was carried out in 2001, provided an excellent opportunity to investigate the workload of GPs in the Netherlands and how it evolved over time. On top of many routinely collected data, additional data were gathered. The first national

survey, performed in 1987, enabled us to investigate the development of workload over time and ultimately to draw quite a complete picture with a wide variety of aspects of workload, using data on consultations, patients, GPs, practices, working hours, etc.

9.2 Research questions

This thesis addressed three main questions. The first one is a descriptive question:

1 *Did the workload of GPs change in the course of time (1987 – 2001), and if so, in what respect did it change?*

The second main question, building further on the results of question 1, addresses possible explanations for the results.

2 *Between 1987 and 2001 the average number of GPs' working hours decreased while the number of contacts per patient increased. How can these (paradoxical?) findings be explained?*

The third question addresses the possible consequences of workload for the provision of care.

3 *(To what extent) are the provision of care and the quality of care affected by the workload of general practitioners?*

The first question is answered in part 1 of the thesis, chapter 2. In this chapter we described how the workload of Dutch general practitioners developed in the period between 1987 and 2001. Moreover, in this chapter we present the most important results of an extensive study that we carried out within the framework of the second Dutch National Survey of General Practice. In this chapter we also described briefly the explanations for the changes in workload.

In Part 2, chapter 3 to 6, question 2 is answered. In this part we analysed possible explanations in more detail. Chapter 3 concerns the influence of feminisation, part-time working and cohort replacement. Chapter 4 deals with task delegation and describes the changed role of practice assistants. In chapter 5 we compared the workload caused by OOH shifts of GPs who are organised in large scale GP coops with those who function in small scale rota groups. Chapter 6 describes the changed patterns of home visiting and describes how these differ between different diagnoses.

Part 3, chapter 7 and 8, answers the third main question, about the impact of workload on the provisions of care. In chapter 7 we discussed how list size (as an indicator for workload) and remuneration affect GPs' decisions about how they provide consultations. More specifically, we focussed on three outcomes: the length of consultations, waiting time to get an appointment and the likely hood that GPs conduct home visits. Chapter 8 concerns the adherence to clinical guidelines. Here we investigated whether GPs with a higher workload adhere less to guidelines than those with a lower workload and whether guideline recommendations that require a higher time investment are less adhered to than those that can save time.

9.3 Theoretical approach

To answer the research questions, we formulated hypotheses using a theoretical model of goal-oriented behaviour. In this model, which is based on the Social Production Function theory, we expect that like all humans, GPs strive after physical and social well-being. Important resources to produce physical well-being are income and leisure time. To achieve social well-being, the main instrumental goal is the care GPs give to their patients. Appropriate care, at least when it is evaluated as good, will be approved by patients and colleagues and thus yield social approval. In the eyes of patients, an appropriate amount of time available for a patient will be appreciated. Time is a resource to produce appropriate care which, in turn produces social approval. GPs must try to find an optimal balance between spending enough time to an individual patient and availability accessibility for all patients. Colleagues are also an important source for social approval. Next to provision of good care, spending time and energy on other activities can contribute to one's status and approval. For example, the improvement of skills and knowledge by CME might lead to a higher status among peers.

The opportunities to realize the goals are determined by available resources and constraints. These are situated at three levels: the healthcare system, the GP and his practice and the consultation (Groenewegen, 1996). An important structural condition is the type of payment system. In a fee for service system, working more hours is a more attractive option since an increasing workload means more income in contrary to a capitation based or salaried system. On the second level, restrictions are related the GP and

the practice. GPs in single-handed practices are more dependent on their patients for social approval, whereas GPs in partnerships also receive approval from their colleagues (Freidson, 1973). Furthermore, personal resources and restrictions like knowledge and skills are of influence. The third level contains restrictions related to an actual consultation, more specific, the health problem that is presented and characteristics of the patient. For some health problems the course of action is quite determined, while for others there is a wide range of possible actions.

9.4 Data and study design

To answer the research questions, data were obtained from the first and second Dutch National Survey of General Practice (DNSGP-1 and DNSGP-2). DNSGP-1 was carried out in 1987 among 103 GP practices in the Netherlands, comprising 161 GPs. DNSGP-2 was carried out between 2000 and 2002 among 104 GP practices, comprising 195 GPs.

Several data sources of the national surveys were used, including electronic medical records containing information on diagnoses, referrals, prescriptions, etc., GP questionnaires covering a range of work-related topics such as workload, job satisfaction, out-of-hours shifts, and general background characteristics such as age and sex, and diaries in which activities were registered in 15 minutes intervals, during 24 hours a day, for 7 consecutive days. We also used census data of all listed patients including some characteristics which are not routinely registered in the practice administration, such as self-rated health and ethnicity.

All data could be interlinked using unique identifiers.

9.5 Main findings

The change in workload of GPs in the Netherlands: 1987 – 2001 (chapter 2)
Chapter 2 covers research question 1. In this chapter we compared a range of workload measures for both years. This comparison led to paradoxical findings. People in almost all age categories consulted their GP more often; between 1987 and 2001 the use of GP care rose by 10% on average. The

average duration of an office consultation remained more or less the same (10 minutes), while the list size per full-time working GP rose from 2297 to 2529 patients. Hence GPs had to deal with a higher number of contacts. Surprisingly, while the use of care rose, in that same period the average number of working hours per GP dropped by almost 17%, the number of part-time workers rose, and the full-time workers worked fewer hours. The proportion of time spent on treating patients, however, did not change; 70% in both years. The remaining 30% was spent on paper work, education, meetings, organisational tasks, etc.

If the quality of care (which we will discuss later) remained more or less equal, GPs must have improved their efficiency. If so, the question arises as to how this improved efficiency was realized. We found several possible explanations, three of which were elaborated in three consecutive chapters of the second part of this thesis. The first explanation is that the number of time consuming contacts, like home visits, decreased due to GPs making less house calls and more telephone consultations. Second, GPs delegated more tasks, especially to their practice assistant. Third, the organisation of out-of-hours shifts (OOH) changed radically and became far more efficient. Small-scale rota-groups were increasingly substituted by large-scale coops.

In chapter 2, we concluded that the number of working hours for an average GP dropped significantly. Apart from the organisational changes mentioned above, there are also other reasons for this phenomenon. Such reasons include the growing number of part-time workers and thereby the growing number of female GPs. Working shorter hours is not only the outcome of the amount of work that has to be done, but it is also the effect of a conscious choice to work part-time. In chapter 3, we analysed the influence of feminisation and working part-time in more detail. In chapter 4 to 6 we investigated the effects of the three organisational changes in more detail.

The influence of feminisation of the medical profession, part-time working and cohort replacement on the number of working hours (chapter 3)

In chapter 3, we set out to explain the decreased number of working hours of GPs by 1) a cohort-effect (the younger cohorts work fewer hours than the older cohorts), 2) feminisation, 3) part-time working and 4) the rising number of partnerships. We concluded that there are differences between

the cohorts and between the sexes; younger cohorts work fewer hours than older cohorts and female GPs work fewer hours than male GPs. However, these differences have become smaller in the course of time. Working part-time has become more popular among male as well as female GPs.

Table 9.1 summarizes the hypotheses that were tested in chapter 3. In hypotheses 1 and 2, two opposing explanations for the decline in working hours were tested. Hypothesis 1 assumes that the decline can be explained by a cohort effect; older cohorts with long working hours retire and are replaced by young cohorts that work fewer hours. Hypothesis 2 assumes that there is an overall decline, with young as well as old GPs reducing their number of working hours. Both hypotheses held up, but approximately two thirds of the decline in working hours can be ascribed to a cohort effect. One third of the reduction occurred independently of the cohort effect. In line with hypothesis 1a the cohort effect we found could be explained by a rising number of female GPs among the younger cohorts. This hypothesis was also confirmed. Female GPs work shorter hours than their male counterparts and there are more female GPs in the younger cohorts. However, we also saw that the impact of this factor declined significantly in the course of time. In 1987, we found a difference of around a whole working day per week between men and women, but in 2001 the difference was no longer significant. Hypothesis 1b, in turn, gives two explanations for the sex-effect: the higher number of part-time workers among female GPs and the higher number of female GPs that work in partnerships compared to single-handed practices. Both explanations held up. The number of part-time workers rose significantly in the course of time and working part-time became a more important factor in general. Nevertheless, while in the late eighties mainly women worked part-time, nowadays working part-time has become quite common among men as well as women. Hardly any female GP works in single-handed practices, but also less and less young male GPs prefer to work in single-handed practices.

Table 9.1: Feminisation, part time working and cohort replacement as explanations for the decline in number of working hours. Hypotheses and test results

Nr	Hypothesis	Chapter	Method of testing	Result
1	The decline in number of working hours is caused by a cohort-effect: the older cohorts retire and are replaced by younger cohorts that work shorter hours	3	Regression coefficients and squared partial correlations of year of measurement (1987 / 2001) and of year of graduation were observed	Confirmed (explains 2/3 of the decline)
1a	The under 1 assumed cohort effect can be explained by the rising number of female GPs among the younger cohorts	3	Regression coefficients and squared partial correlations of year of graduation and sex were observed	Confirmed, but difference between male and female GPs decreased over time
1b	The under 1a assumed sex effect is due to a) more women working part-time, b)more women working in partnerships and working shorter hours than solo-workers	3	Regression coefficient of sex was observed before and after adding 'working part-time' and 'practice type' to the model	a) Confirmed b)Confirmed
2	The decline in number of working hours is a population-wide phenomenon; young as well as older GPs reduced their number of working hours	3	Regression coefficients and squared partial correlations of year of measurement (1987 / 2001) before and after controlling for year of graduation were observed	Confirmed (explains 1/3 of the decline)

Delegation; the changing role of practice assistants (chapter 4)

Although in recent years, the role of other health care professionals is gaining importance, the practice assistant still plays a central role in general practices. The job of practice assistant has substantially changed within the period studied. The doctor's wife who without any specific training acted as his assistant was replaced by a practice assistant with an official job description and educational profile. The practice assistant is a typical Dutch phenomenon. It is a job on an intermediate vocational level and combines routine medical activities with administrative tasks. Table 9.2 summarizes the hypotheses that were tested in chapter 4. Hypothesis 3, assuming that a rising number of medical tasks would be delegated to practice assistants was confirmed. From a list of 23 medical tasks, derived from the official occupational profile of the practice assistants, 15 tasks were significantly more frequently performed by practice assistants in 2001 than in 1987.

These tasks include doing smear tests, removing stitches, removing earwax, treating warts, etc. Since task delegation seems a logical way to reduce one's working hours, we hypothesized that GPs with more hours of assistance worked shorter hours. This hypothesis was tested in hypothesis 4. This hypothesis was, however, not confirmed. A quantitative relation between delegation and workload could not be demonstrated.

Table 9.2: Delegation of tasks to practice assistants. Hypotheses and test results

Nr	Hypothesis	Chapter	Method of testing	Result
3	Between 1987 and 2001, the number of medical tasks that GPs delegated to practice assistants rose	4	For a list of 23 medical tasks, derived from the official occupational profile of the practice assistants, we compared the proportion of assistants that performed these tasks regularly	Confirmed
4	GPs work fewer hours when there is more assistance available	4	Regression analysis of number of hours worked per week by practice assistant on number of hours worked by GPs (controlled for list size)	Not confirmed

GP-cooperatives for out-of-hours shifts (chapter 5)

Many studies have shown that working in out-of-hours (OOH) shifts is traditionally seen as one of the most strenuous aspects of the work of GPs. Since the late 1990s, there has been a rapid shift from smaller rota groups to larger-scale GP out-of-hours cooperatives (coops) in the Netherlands. GPs organized in central GP out-of-hours coops cover much larger populations than used to be the case. These GP-coops have contributed to a dramatic increase in efficiency, and have largely improved the situation of GPs. In 2001, Dutch general practice was in the middle of a shift from rota-groups to coops. We found enormous differences between these two categories, both in objective and subjective workload. We tested four hypotheses concerning the effect of GP-coops on workload. The results are summarized in table 9.3.

We found, as formulated in hypothesis 5, that GPs participating in OOH-coops work fewer hours in OOH shifts than GPs working in rota groups. The GPs who participate in a rota group have to work more than two OOH shifts per week (2.3), equalling approximately 19 hours per week on average.

These numbers are considerably lower for the GP out-of-hours cooperatives; GPs work less than one shift per week (0.7), that is slightly more than five hours (5.1) per week on average.

GPs participating in OOH-coops also experienced a lower workload due to shifts (in accordance with hypothesis 6). In the OOH-coops 37.6% of the GPs found the shifts onerous (score of 4 or 5 on a five-point Likert scale) versus 64.1% in the rota groups. This difference also held after controlling for age, gender, fte worked, and type of practice. Not surprisingly, hypothesis 7 was also confirmed. We hypothesized that GPs who participate in OOH-coops are more satisfied with the organisation of OOH shifts. Over 77% was satisfied against only 27% in the rota groups.

In hypothesis 8, we expected that the lower experienced workload and the higher satisfaction among GPs working in OOH-coops would be explained by the lower number of hours worked in shifts. However, this hypothesis was not substantiated. The findings support the idea that the positive effects of the GP OOH-coops are not only due to the reduction in the number of hours of shift work, but above all to the more convenient way in which the shifts are organised. Examples are better facilities and extra staff the GP has at his disposal, such as a triage assistant and a specially equipped car with a trained driver.

Table 9.3: Organisation of out-of-hours shifts in GP-cooperatives and in rota groups. Hypotheses and test results

Nr	Hypothesis	Chapter	Method of testing	Result
5	GPs participating in OOH-coops work fewer hours in OOH shifts than GPs working in rota groups	5	Comparison of hours spent on shifts between GPs in GP coops and GPs in rota groups	Confirmed
6	GPs participating in OOH-coops experience a lower workload due to shifts than GPs working in rota groups	5	Logistic regression analysis of organisation (OOH-coop or rota group) on self reported workload due to shifts.	Confirmed
7	GPs participating in OOH coops are more satisfied with the organisation of OOH shifts than GPs working in rota groups	5	Logistic regression analysis of organisation (OOH-coop or rota group) on satisfaction with organisation of OOH-shifts.	Confirmed
8	The under 6 and 7 expected lower experienced workload and higher satisfaction is explained by the lower number of hours worked in shifts by GPs working in OOH-coops	5	Logistic regression analysis of organisation (OOH-coop or rota group) and number of hours working in OOH-shifts on experienced workload and satisfaction	Not confirmed

The advent of GP-coops also contributed to reduce capacity problems. Because of the improved situation of GPs, many older GPs keep working in GP-coops instead of retiring as they would have done under the old conditions (Lugtenberg et al., 2006).

Changing patterns of home visiting (chapter 6)

Chapter 6 deals with the decrease in home visiting rates. Obviously, home visits take more time than office consultations. So doing office consultations instead of home visits is an obvious way to reduce workload. In the past decades, a decrease in home visiting rates was found in most European countries and North America (Aylin et al., 1996; Camion, 1997; Meyer and Gibbons, 1997; Cardol et al., 2004). In the Netherlands between 1987 and 2001, the number of home visits, as a proportion of all contacts, decreased from over 16% to 9% (Cardol et al., 2004). Moreover, office consultations are increasingly replaced by telephone consultations.

The decrease in home visits indicates that GPs have sharpened their criteria for home visiting. In our theoretical approach we expected GPs to make

responsible decisions, taking into consideration the possible discomfort or danger to the patient. If a patient has complaints that seriously hinder his walking abilities, it is clear that a home visit is indicated; therefore we expected the decrease in home visits in such cases to be low. Likewise, we did not expect a decrease in home visits to patients who can easily come to the practice simply because GPs did not use to make home visits in such cases. In other words, there is a 'bottom-effect'. For complaints between these two extremes, coming to the practice will cause some discomfort to the patient, but it is not impossible or irresponsible. Such complaints allow GPs more room for making decisions about doing home visits.

Therefore, we hypothesized that the decrease in home visit rates differs between diagnoses, depending on the room for decisions that a certain diagnosis allows. We expected a J-shaped (curvilinear) relation between the chance to get a home visit for a specific diagnosis in 1987 and 2001 (hypothesis 9 in table 9.4). This hypothesis was confirmed.

Table 9.4: Changing patterns of home visits 1987 – 2001. Hypotheses and test results

Nr	Hypothesis	Chapter	Method of testing	Result
9	The decrease in home visit rates differs between diagnoses, depending on the room for decisions that a certain diagnosis gives. So, the relation between the chance to get a home visit for a specific diagnosis and this same chance in the past has a *J*-shaped relation	6	Regression analysis of proportion of home visits within diagnoses in 1987 on this proportion of that same diagnosis in 2001	Confirmed

Although it is understandable that GPs restrict home visits to necessary cases, it gives rise to an important question regarding the quality of care. In chapter 6 we compared home visiting rates for several medical complaints. This led to the conclusion that diagnoses with the strongest decrease in home visits could often be traced back to advances in medical knowledge. For example, in 1987 for complaints like a myocardial infarction, a concussion or fever it was common practice to stay in bed and rest. Nowadays, doctors adopt a more active therapeutic approach and it is advised to get up and start being active again as soon as possible.

The effect of remuneration (chapter 7)
Doctors' professional behaviour is influenced by the form of remuneration (Mechanic, 1975; Glaser, 1970; Gosden et al., 2000; Greß et al., 2006). When GPs are paid per activity, i.e., on a fee-for-service basis (FFS), there is a clear relationship between workload and income: more work means more money. With capitation-based payment, i.e. the fees per patient are fixed, there is no direct relation between workload and income. In capitation-based systems with fixed patient lists, the income of the GP depends on his list size. In chapter 7, we investigated whether consultation length, waiting time for an appointment and the likelihood of GPs conducting home visits were affected by list size (as an indicator for workload) and remuneration.

The main objectives were to investigate a) how list size is related to consultation length, waiting time for an appointment and the likelihood of GPs doing home visits, and b) to what extent the correlations between list size and these three variables are affected by remuneration.

In table 9.5, the hypotheses and test results are summarized. The hypotheses were tested for all GPs together and separately for those with relatively small lists and those with relatively large lists. We expected the relationship between remuneration and the decisions about how GPs provide consultations to be stronger for GPs with a relatively small list size, because a small list provides more room for decision-making in this respect. In other words, GPs with a large list simply have no choice but to be economical with time. Previous studies confirmed this assumption in relation to number of working hours (Boerma et al., 2003; Calnan and Butler, 1988).

Shortening consultation times is a simple measure to serve more patients within the same timeframe. Hypothesis 10, assuming that large patient lists are associated with shorter consultation times, was confirmed, although the association was weak. This finding was in line with previous studies (Calnan and Butler, 1988; Hutten JBF, 1998).
In our theoretical approach, we assumed that workload can be managed by 'squeezing' or 'spreading' the work. 'Squeezing' implies that the GP handles more contacts within the same time frame. 'Spreading' implies that the total time investment rises with an increasing workload. Although some squeezing will be necessary for all GPs, under capitation conditions, an extra time-investment just generates more work for the same income,

whereas under FFS-conditions, there may be more of an incentive to conclude the consultation properly without regarding the time investment. After all, the patient is paying and it is known that many patients find consultations too short (Wilson, 1991; Howie et al., 1999). In 2001, around 60% of the Dutch population was publicly insured, the remainder was privately insured. The insurance status depended on income. Above a certain income level, people had to take out private insurance. Publicly insured patients had to be listed in a GP practice and the GP received a fixed amount of money per year for every listed patient. Privately insured patients didn't have to register with a practice, but practically all of them did so. For these privately insured patients, GPs were paid on a fee-for-service basis. We hypothesized that the correlation between list size and consultation length would be stronger with a larger capitation share (proportion of publicly insured). This hypothesis 10a was, however, not confirmed.

The expected positive association between list size and waiting times (hypothesis 11) was confirmed, but only for GPs with small lists. Again, remuneration appeared to have no influence, hypothesis 11a, which stated that this relation would be stronger with a larger proportion of publicly insured patients, was not confirmed.

Hypothesis 12 concerned the association between list size and home visiting rates. This hypothesis was not confirmed either. Still, for the GPs with small lists we found a significant interaction between the proportion of publicly insured patients and home visiting rates. That is to say that home visiting rates rise with increasing list size and a relatively small proportion of publicly insured patients. This confirmed hypothesis 12a, but only for the GPs with small lists.

Table 9.5: Relations between workload (list size), remuneration and provision of care (waiting times, consultation length and home visits). Hypotheses and test results

Nr	Hypothesis	Chapter	Method of testing	Result
10	Large patient lists are associated with shorter consultations	7	Multilevel regression analysis of list size on consultation length	Confirmed
10a	The under 10 expected relationship between patient lists and consultation length is stronger when the capitation share (proportion of publicly insured) is larger	7	Multilevel regression analysis of list size and interaction of list size and % of publicly insured patients on consultation length	Not confirmed
11	Large patient lists are associated with longer waiting time to get an appointment	7	Multilevel regression analysis of list size on average waiting time	Confirmed only for GPs with relatively small practices
11a	The under 11 expected relationship is stronger when the proportion of publicly insured patients is larger	7	Multilevel regression analysis of list size and interaction of list size and % of publicly insured patients on average waiting time	Not confirmed
12	Large patient lists are associated with a lower home visiting rate	7	Logistic multilevel regression analysis of list size on home visit (yes or no)	Not confirmed
12a	The under 12 expected relationship is stronger when the proportion of publicly insured patients is larger	7	Logistic multilevel regression analysis of list size and interaction of list size and % of publicly insured patients on home visit (yes or no)	Confirmed for GPs with relatively small practices

In general, we concluded that remuneration appeared to play a minor role compared to other factors such as patient characteristics.

Adherence to guidelines (chapter 8)

Physicians' heavy workload is often mentioned as posing a threat to the quality of care and as a barrier to the implementation of measures to improve quality of care (Hutten, 1998; Groenewegen and Hutten, 1991; Rundall et al., 2002; Patterson et al., 2004; Cranney et al., 2001). We investigated the relation between workload and the adherence to professional guidelines, distinguishing between workload at an individual level (the workload of the GP) and workload at the level of the guideline recommendations (the labour intensity of the recommendations). We

expected workload at the individual level to act as a barrier in the process from awareness to adherence. This assumption was based on the stress-theory and on the idea that GPs with a high workload spend less time on keeping their professional knowledge up to date. Table 9.6 summarizes the hypotheses that were tested in chapter 8. Hypothesis 13 assumed the GPs' workload to be negatively related to adherence to professional guidelines. However, we did not find any differences in guideline adherence between GPs with a higher and those with a lower average objective workload. This means that hypothesis 13 was not confirmed. Hypothesis 14, in which we expected that experienced workload is negatively associated with adherence, was not confirmed either. We found a small but statistically significant relation between experienced lack of time (subjective workload) and guideline adherence. The finding was, however, inconsistent with our expectation that a higher satisfaction with available time is correlated to lower guideline-adherence.

Although the workload of the GP appeared to have little impact, we did find significant correlations between the labour intensity of recommendations and the adherence to these recommendations. In hypothesis 15 we expected that GPs are less likely to follow guideline recommendations that require a higher time investment in the actual consultation. This hypothesis was confirmed. We found a rather strong relation; an odds ratio lower than 0.5 for recommendations that require a higher time investment and an odds ratio above 1.5 for recommendations that require a smaller time investment. Theses categories were compared to a 'neutral' category, i.e. recommendations of which no specific workload effect was expected.

We also tested the relation between adherence and workload effects in the long term, that is the likeliness that adhering to the guideline induces a follow-up consultation. We hypothesized that GPs would be less likely to follow guidelines when the likelihood that the patient will return after this decision is greater. This hypothesis 16 was confirmed. Recommendations that are likely to induce follow-up consultations were less often adhered to than the 'equal' category (those recommendations of which no workload effect was expected) an odds ratio of 2.1 was found. In contrast to our expectation, also recommendations that are likely to lead to follow up consultations were more often followed compared to the 'equal' category.

Table 9.6: Relations between workload (number of consultations) labour intensity of guidelines and guideline adherence. Hypotheses and test results

Nr	Hypothesis	Chapter	Method of testing	Result
13	GPs' workload is negatively correlated with adherence to professional guidelines	8	Logistic multilevel analysis of number of hours worked per week on guideline adherence indicators (GAI)	Not confirmed
14	Experienced high workload is negatively related to adherence to professional guidelines	8	Logistic multilevel analysis of scale for satisfaction with available time on GAI	Not confirmed
15	GPs are less likely to follow guideline recommendations that require a higher time investment in the actual consultation	8	The expected workload effect of recommendations was rated by an expert panel. The effects of these ratings were estimated in a logistic multilevel analysis	Confirmed
16	GPs are less likely to follow guidelines when the likelihood that the patient will return after this decision is greater	8	The expected workload effect of recommendations was rated by an expert panel. The effects of these ratings were estimated in a logistic multilevel analysis	Confirmed, but only compared to 'equal' category

9.6 Scientific implications of the results

This thesis builds further on previous studies on GPs' workload, especially on the study of Hutten, which was based on the first DNSGP. Partly, this study confirms the findings of Hutten. Thanks to the availability of new data, the second DNSGP and computers with the capacity to perform complex multilevel analyses, this thesis yielded new insights into GPs' workload. These new insights concern especially three issues: the development of workload over time, the complexity of measuring workload in the context of general practice and the relation between workload and the content of care.

The comparison of different workload measures between 1987 and 2001 is interesting in the light of the so-called 'hamster-health care'. It appears that, at least in the Netherlands, the metaphor of a helpless hamster as a victim of an unfair system does not reflect the actual situation. Instead of just running blindly, GPs remained in control and managed their workload. Our

findings also yield insight into the nature of the phenomenon of workload. The definition of workload as "the amount of work that has to be done" seems simple enough. This concept is, however, not as straightforward as it seems. In the literature on workload a diversity of definitions and operational measures is used for this concept. In most of these studies, few words are spent on why specific measures were used. Hutten defined the problem more precisely by distinguishing workload (as the number of consultations) and the allocation of time.

The developments between 1987 and 2001, which were reported in chapter 2, seemed contradictory. It appeared that different measures can lead to different conclusions, and that a complete figure of GPs´ workload can only be made by observing different aspects of workload in relation to one another. The explanation for this is that it is not possible to measure workload as a complete exogenous variable, as an a separate entity which exists independently from the GP and the organisation of the GP practice. Workload for GPs does by no means equal a number of boxes that need to be filled. Our findings in the first and second part of this thesis show that GPs have much influence on their workload. Workload is the outcome of an ongoing interaction between demand-related and supply-related factors. For example, a GP may decide to limit his list size because he does not want to work more than three days per week or he can decide to extent his number of working hours because the patient list grows. Also during consultations, many health complaints give the GP room to decide how the patient is treated.

The complexity of the concept of workload in relation to GPs makes this phenomenon difficult to analyze. The results of chapter 2 show that for a complete description of workload and for the empirical underpinning of statements about how workload developed over time, it is essential to compare different measures simultaneously and to relate these measures to one another. This is especially true for self-employed GPs, who still make up the majority of the workforce.

The reciprocal relation between demand-related and supply-related factors has important consequences for research on workload. First, it could partly explain why the influence of workload on the content of care seems weak. From a common sense point-of-view it seems reasonable that a high workload will affect the content of care. However, previous studies as well

as this thesis reported mainly weak relations. A plausible explanation is that when GPs get the feeling that the care they provide suffers from their workload, they will take measures to control this workload. Depending on capability, experience, character, etc. some GPs are better able to deal with a higher workload than others. Second, this reciprocity leads to methodological problems in modelling independent and dependent variables. To validly estimating regression models it is necessary that the relation between independent en dependent variables has one causal direction. When there is a clear two-way relationship (e.g. the effect of working hours on number of consultations and vice versa) the variables form a recursive model. To solve this problem, one can use so called instrumental variables or look for other independent variables that are as little as possible influenced by the dependent variable (Pearl, 2000).

We confirmed results from previous studies concerning the relation between workload and the quality of care, although the relation seems weak. Apart from the explanation given above, there are a number of reasons for the absence of a strong relation. First, it can be concluded that the decisions that GPs make concerning the content of care are mainly determined by medical considerations and by patient characteristics. GPs primarily want to provide appropriate care, as was shown in several chapters. In chapter 6 we saw that, although the average number of home visits decreased, medical considerations still played an important role in the decision whether or not to visit a patient at home. In chapter 7, we saw that consultation length and the decision to do a home visit are strongly related to the age and the health status of the patient and that these factors are of more importance than workload and remuneration. In chapter 8, finally, we found that adherence to guidelines did not differ much between GPs when patient characteristics and contact characteristics were taken into account. In the decision making process of GPs, workload is only one of the contextual factors.

Although we did not find a relation between GPs' individual, objective workload and their adherence to guidelines, we did find a relation between short-term time investment and adherence which is a strong indication that workload plays a role in the decisions GPs make. Recommendations that require more time investment are followed less often than those that reduce the time-investment. In chapter 8, we showed the importance of the cross-classified modelling we used. Without including the guideline level as an

extra level in the multi level model, we would have overestimated the variation between GPs.

9.7 Implications for policy

There are three policy issues for which workload is of importance. First, the accessibility and availability of GP-care for all citizens, second, a fair payment system and third, the quality of care. We will discuss these issues briefly.

There is wide consensus that easily accessible GP-care in one's own neighbourhood is essential to good health care. Especially in the Dutch system where the GP stands at the main gate to the health care system. When GPs´ workload reaches too high a level, this could very well cause a shortage of GP care. GPs will, obviously, respond to a higher workload by increasing their efficiency, but also by reducing their number of working hours, putting a stop to their patient list, or retiring earlier. As a result, GPs´ workload is not only a problem of GPs, but it also concerns patients and policy makers. Favourable working conditions will stimulate GPs to work longer hours and postpone retirement. This was illustrated by an example discussed in chapter 5 on GP coops for OOH shifts. Supposedly, the advent of GP OOH-coops would be a favourable development in relation to the capacity problem. For it is highly likely, that a number of GPs will remain professionally active as a result of the less demanding OOH shifts. And, this was exactly what happened in the years that followed. Many older GPs who stopped with their own practice, kept working in GP-posts (Lugtenberg et al., 2006). Presently, no severe shortage is expected in the upcoming years. It is, however, uncertain how the trend in part-time working will continue.

In the period 1987 - 2001, the number of part-time workers increased considerably. Although working part-time is quite common in the Netherlands, this could also partly be a response high work pressure. Obviously, working three days under high pressure is less demanding than doing so five or six days a week. Although the decision to work part-time is a rational one at the individual level, at the macro level, it adds to the workload problem, especially when the use of care is rising. From an economic point of view, this is an interesting policy issue since the costs of

training a GP are the same, regardless of the decision to work two or five days a week.

The fairness of the payment system is one of the main issues in the debate on workload. In a fair system, income reflects the amount of work and an additional workload without a financial reward is very demotivating. In the old payment system, used until 2006, GPs received a capitation fee for only two thirds of their population. In 2006 the system was changed into a system with a capitation part for all patients and a fee per consultation on top of that. This has improved the fairness of the payment system somewhat, since there is a direct relation between the number of consultations and income.

In relation to the quality of care, our most important finding concerns the adherence to guidelines. The availability of so many guidelines shows that GPs and organisations like the Dutch College of General Practitioners have put much effort into improving quality. In chapter 8, it was shown that the adherence to guideline recommendations differs according to the workload due to these recommendations. This may not be a sensible argument from a medical point of view, but it certainly is worth taking into account while developing guidelines.

Other aspects that are indirectly related to the quality of care are consultation length and home visiting rates. On the basis of this study, we cannot conclude that the quality of care is seriously threatened by the relatively short consultations and low home visiting rates. Nevertheless, from a patient perspective it would definitely be a quality improvement if patients had more say in it. Since 2005, the Dutch government has taken a number of measures to stimulate market forces in the health care sector with the aim to make health care more demand-oriented. Doing home visits or spending more time per patient could very well be means to attract patients. Still, there are few incentives for Dutch GPs to engage in serious competition. The GP/patient ratio in the Netherlands is extremely low compared to comparable countries. In 2009, there were on average 2322 listed patients per GP. This is more than two times the number of patients per GP in most other European countries: e.g. 1600 in the UK,1027 in Germany, 860 in Belgium and 605 in France (Kroneman et al., 2009). As a result, managing workload is a bigger challenge for Dutch GPs than

attracting new patients. Serious competition requires a substantial extension of the number of GPs.

9.8 Implications for practice

GPs have found several effective strategies to handle a higher number of patient contacts within a shorter time frame. The picture of GPs developing strategies to improve their situation is in sharp contrast to the metaphor of the rather passive hamster that keeps on running without making any progress. We concluded that in the course of time patients consulted their GP more often. While the use of GP-care per patient rose, the number of working hours dropped dramatically.

In this thesis, data were used for the period 1987 – 2001. During and after this period, many things have changed in the organisation of general practice (Bongers, 2009). In the 1980s, the dominant organisational model for general practice was fairly simple: a full time working single-handed GP, assisted by a practice assistant. These GPs served all patients themselves and many of them also did deliveries. In the period 1990 – 2008, the proportion of GPs that worked in a single-handed practice decreased from 47% to 20%. In that same period, the proportion of GPs working in partnerships rose from 19% to 51% (Hingstman and Kenens, 2008). Surveys among young, newly graduated GPs show that most of them prefer to work part-time in a partnership.

The development from single-handed practices towards partnerships goes hand in hand with organisational changes in primary care. The Dutch College of General Practitioners and the Dutch association of General Practitioners (LHV and NHG, 2003) described the new organisational structure as the 'general practice facility'. General practice care is no longer provided by just a GP, but by a team of practice assistants, practice nurses, and health care professionals like psychiatric nurses, physiotherapists, and sometimes nurse practitioners and physician assistants. This type of organisation may provide an economy of scale, especially when it comes to organisational and administrative tasks, but it also introduces new challenges, for instance with regard to the continuity of care and patient satisfaction. Against this backdrop, research as well as policy related to workload should focus more on the distribution of work between the

various health care providers in a team. Task delegation may enable GPs to spend more time on complex care. Yet, this new organisational structure also generates new tasks for GPs, like supervision and management of other care providers. Moreover, it is not straightforward that adding new disciplines reduces the workload of GPs, since some of these care professionals provide supplemental care rather than substitutional care (Laurant et al., 2004). New organisational structures also underscore the need for managing care demand. This could be done by promoting self care, telephone triage or by narrowing task profiles.

Another important factor that raises new questions are recent changes in the financing of care. Since 2006, GPs have received a capitation fee plus a consultation fee for all listed patients. Next to the increase in partnerships, the number of GPs in employment has been on the rise. Between 2001 and 2008, the number of salaried GPs rose from 6% to 14% (Hingstman and Kenens, 2008). For these salaried GPs there is no direct relation between workload and income. In 2010, a new way of financing care for the chronically ill was introduced, which is called integrated financing. Thus, all standard care services for diabetes patients are financed through a 'bundled payment system'. A contracting party receives a fixed amount of money for the bundle of standard services per patient. This contracting party coordinates the care and can outsource care services to subcontractors (e.g. dieticians). GPs have assumed a central role, in that they tend to be the main contractor and care coordinator with new (non-medical) tasks and a likely increase in workload.

9.9 Recommendations for future research

One of the most important objectives of this study was to gain insight into the relation between workload and the quality of care. Quality of care is a broad, multidimensional concept and has been defined in several ways. Commonly accepted aspects of quality of care are effectiveness, safety, timeliness, and demand orientation. In this study, we focused on some variables that we consider to be related to quality. The most important variable is adherence to guidelines, especially in relation to effectiveness. Although we believe that guideline adherence is a good indicator for effectiveness, this variable merely provides information about the process of care and not about health outcomes and patient evaluation. In clinical

practice, there can be good reasons to deviate from guidelines. Nevertheless, if adherence to guidelines were not related to effectiveness of care, developing them would make little sense. Other dependent variables that we used, such as home visits, waiting time to get an appointment and consultation length, say something about the provision of care, but are only indirectly related to quality of care. As a result, we must conclude that this thesis enhances our insight into the workload – quality relation, but that more work still needs to be done.

The data were derived from GP practices all over the country. It should be noted that these GPs participate in the Netherlands Information Network of General Practice and in the DNSGP as a consequence of which the data may be biased due to self selection. It might well be that the most stressed GPs were less inclined to participate in an extensive study next to their professional activities. Although the problem of self selection can never be solved entirely, NIVEL has put much effort into making the research population representative on relevant variables like age, sex, practice form, etc. (Schellevis et al., 2004). The cross-sectional design of this study inevitably raises problems that are inherent to this method. We found statistically significant relations, but are less certain about the causality of these relations. We managed to solve this problem partly by postulating hypotheses that were based on a theoretical rationale and subsequently test them.

More insight into the causal relationships between workload and the content of care can be gained by using a longitudinal design, for instance, by the use of longitudinal panel data. However, it should be noted that although longitudinal data provides more information on causality, such a design is not necessarily better than a cross sectional design. Selective response, self selection and selective loss of respondents need special attention because it is to be expected that GPs with the highest workload are more likely to be lost.

We conclude this chapter with some recommendations for future research. After 2001, many things have changed. Not only in general practice, but also in the Dutch healthcare system in general. These changes raise new questions for future research. We would like to point out four important issues:

First, more than in many other countries, the expansion of teams in Dutch general practice is stimulated, for instance by the introduction of financial incentives (Schoen et al., 2009). As we pointed out above, general practice care is, in most cases, provided by a team of GPs and other health care providers. Future research should focus on the workload of these teams and the way in which tasks are divided within these teams. Interesting issues relate to the economic consequences: how to divide tasks efficiently? under what conditions does task delegation generate more demand? and, how do patients evaluate general practice care provided by non-physician clinicians?

Second, future research should focus on how health care system characteristics affect GPs workload. This was difficult to investigate in this thesis, because this requires international data. System characteristics for the Netherlands include large patient lists, the mixed payment system (a capitation fee and a fee for service on top of that for all listed patients) and the GP's role as gatekeeper to secondary care.

Third, in recent years several non-medical tasks of GPs have changed in the Netherlands. As described earlier, several reforms were introduced in the financing of health care. GPs are expected to negotiate with health care insurers about contracts and since integrated financing for chronic diseases has been introduced, they also have a role as purchasers of health care. An important question is how these extra management and administrative tasks affect their workload.

Fourth, this thesis provides more insight into the relation between workload and quality of care. However, much of this relation is still unknown because not all dimensions of quality were investigated. In research on quality of care, Donabedians model of structure, process and outcome variables is often used (Donabedian, 1980; 1985). To get a better insight into the relation between workload and the quality of care, it is recommendable to use process as well as outcome measures as dependent variables. Examples of such outcome variables are avoidable hospital admissions, clinical parameters and patients' experiences. These outcome variables allow for a more detailed investigation of other aspects of quality, such as safety and demand orientation.

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Samenvatting
(Summery in Dutch)

Samenvatting (Summary in Dutch)

In dit proefschrift staat de werkbelasting van huisartsen centraal. In de verschillende deelstudies wordt beschreven hoe de werkbelasting van huisartsen zich ontwikkelde in de periode 1987 – 2001 en welke invloed werkbelasting heeft op de zorg die huisartsen verlenen. Het boek bestaat uit drie delen. Het eerste deel omvat de hoofdstukken 1 en 2. Het eerste hoofdstuk bevat een introductie, een beschrijving van de vraagstellingen en een uitleg van het studiedesign. Hoofdstuk 2 geeft de ontwikkeling van werkbelasting van huisartsen in Nederland weer in de periode 1987 – 2001. Het hoofdstuk vat een eerdere studie naar werkbelasting samen die ik samen met andere onderzoekers uitvoerde in het kader van de tweede Nationale Studie naar Ziekten en Verrichtingen in de Huisartspraktijk (Van den Berg et al., 2004). In die studie stelden we vast dat in de periode 1987 – 2001 het gebruik van huisartsenzorg toenam terwijl het aantal werkuren van huisartsen afnam; zij zijn dus meer gaan doen in minder tijd. Vervolgens beschrijven we een aantal ontwikkelingen die kunnen verklaren hoe huisartsen meer in minder tijd zijn gaan doen. In het tweede deel van dit proefschrift, dat de hoofdstukken 3 tot en met 6 omvat, ga ik dieper op deze ontwikkelingen en hun relatie met werkbelasting in. Achtereenvolgens komen aan bod: de feminisering van het beroep en de toename van deeltijdwerken (hoofdstuk 3), de delegatie van taken naar praktijkassistenten (hoofdstuk 4), de opkomst van de huisartsenposten voor avond-, nacht-, en weekenddiensten (hoofdstuk 5), en de afname van het aantal visites (hoofdstuk 6). Het derde gedeelte, tenslotte, wordt gevormd door de hoofdstukken 7 en 8 en gaat in op de relatie tussen werkbelasting en de inhoud en kwaliteit van de huisartsenzorg. In hoofdstuk 7 wordt beschreven in hoeverre de beslissingen die huisartsen nemen, als ze worden geconfronteerd met een hogere werkbelasting, worden beïnvloed door de manier waarop zij worden betaald. In hoofdstuk 8 staat de vraag centraal of werkbelasting van invloed is op de naleving van richtlijnen. Hoofdstuk 9 tenslotte, bevat een samenvatting en discussie van de resultaten en de implicaties hiervan voor wetenschap, beleid en praktijk.

Hieronder volgt een samenvatting per hoofdstuk.

Introductie en vraagstellingen (hoofdstuk 1)

Achtergrond en vraagstellingen

Er zijn twee hoofdredenen waarom beleidsmakers en onderzoekers geïnteresseerd zijn in werkbelasting van artsen. Enerzijds is dat de vraag in hoeverre de inkomsten van huisartsen in een reële verhouding staan tot hun werkbelasting. Vooral in systemen waarin gewerkt word met een (gedeeltelijke) abonnementenhonorering is deze vraag van belang. Tegenover een hogere werkbelasting zou in een eerlijk systeem immers ook een hogere vergoeding moeten staan. Een tweede reden is dat de veronderstelling dat het niveau van de werkbelasting van invloed is op de inhoud en de kwaliteit van de zorg. Anders gezegd, als de werkbelasting te hoog wordt, zou dat wel eens kunnen leiden tot slechtere zorg.

In 2001 was er in de huisartsenwereld veel te doen om werkbelasting. Veel huisartsen constateerden een oplopende werkdruk en vonden dat zij daar onvoldoende voor werden beloond. Dit leidde tot een serie acties en zelfs tot een staking.

Doel van dit proefschrift was om meer inzicht te verschaffen in hoe de werkbelasting van huisartsen zich had ontwikkeld. Hoe die ontwikkelingen zijn te verklaren en welke consequenties werkbelasting heeft voor de zorg.

De volgende hoofdvraagstellingen staan in dit proefschrift centraal:

1. Is de werkbelasting van huisartsen in de loop der tijd veranderd, en zo ja, in welk opzicht?
2. Tussen 1987 en 2001 nam het gemiddelde aantal werkuren van huisartsen af, terwijl het gebruik van huisartsenzorg toenam. Hoe kunnen deze (tegenstrijdige?) bevindingen worden verklaard?
3. In hoeverre worden de inhoud en de kwaliteit van de zorg beïnvloed door de werkbelasting van huisartsen?

Hoewel werkbelasting eenvoudig kan worden omschreven als 'de hoeveelheid werk die door iemand moet worden verzet' blijken er vele manieren te zijn om dit concept in te vullen en te operationaliseren. In de literatuur worden dan ook verschillende indicatoren voor werkbelasting gebruikt. Vaak worden objectieve en subjectieve werkbelasting onderscheiden. Het eerste kan worden uitgedrukt in het aantal werkuren, aantal contacten of

bijvoorbeeld het aantal ingeschreven patiënten al dan niet gewogen naar relevante kenmerken als leeftijd en geslacht. Subjectieve werkbelasting wordt bijvoorbeeld gemeten door te vragen naar symptomen van burn-out en vermoeidheid of naar de tevredenheid over beschikbare tijd. In dit proefschrift komt objectieve werkbelasting nadrukkelijker aan de orde dan subjectieve.

Afhankelijk van welke variabele men kiest, zal men komen tot ander conclusies. Om daarom een compleet beeld te geven van ontwikkelingen in de tijd, heb ik gebruik gemaakt van verschillende maten en die in samenhang geobserveerd. Voorbeelden van zulke maten zijn het aantal ingeschreven patiënten, de contactfrequentie, de gemiddelde duur van contacten en het aantal werkuren per week. Bij het meten van het effect van werkbelasting op de zorg is steeds gekozen voor een aspect van werkbelasting dat relevant is én dat methodologisch gezien kan worden gebruikt om te komen tot een goed model. Hierbij valt bijvoorbeeld te denken aan het voorkomen van simultaniteit, het verschijnsel waarbij onafhankelijke en afhankelijke variabelen elkaar wederzijds beïnvloeden.

Theorie

Om hypothesen te formuleren over het gedrag van huisartsen is gebruik gemaakt van theoretische uitgangspunten uit een meer algemene theorie die menselijk gedrag tracht te verklaren vanuit het principe van doelgericht handelen. Deze theorie heet de sociale productie functie theorie en is vertaald naar de situatie van huisartsen.

Mensen, en dus ook huisartsen, streven uiteindelijk naar sociaal en fysiek welbevinden. Om dit te bereiken staan hen verschillende hulpbronnen ter beschikking, ontplooien zij activiteiten om hun doelen te verwezenlijken en moeten daarbij handelen binnen de beperkingen die zij op hun weg tegen komen. Belangrijke hulpbronnen voor fysiek welbevinden zijn inkomen en vrije tijd. Een belangrijke hulpbron van huisartsen voor sociaal welbevinden is de zorg die zij geven aan hun patiënten. Wanneer een arts goede zorg verleent, genereert dit immers professionele status en waardering binnen de beroepsgroep en waardering van patiënten. Naast de inhoud van de zorg, speelt tijd hierin een belangrijke rol. Patiënten zullen de zorg vermoedelijk beter waarderen wanneer er voldoende tijd aan hun probleem wordt besteed. Aan de andere kant zijn huisartsen hierin ernstig beperkt, want de tijd voor de ene patiënt gaat ten koste van de tijd voor de andere. Als teveel

tijd aan de ene patiënt wordt besteed, moet een andere patiënt wachten. Zo moet dus steeds worden gezocht naar een balans tussen het belang van de individuele patiënt en de patiëntenpopulatie. Naast patiënten vormen collega's een bron van sociale waardering. Door tijd te besteden aan bijvoorbeeld bijscholing en zo de deskundigheid en vaardigheid te vergroten, neemt de status toe.

De beperkingen of juist stimulerende factoren die huisartsen tegenkomen bij het verwezenlijken van hun doelen, zijn gelegen op drie niveaus: dat van het zorgsysteem, dat van de directe werkomgeving (de praktijk) en dat van het consult. In de verschillende hoofdstukken zijn hypothesen getoetst waarbij we er steeds van uit gingen dat huisartsen streven naar een balans tussen het verlenen van goede zorg, het verdienen van een goed inkomen en het economisch omgaan met tijd.

Data en methoden

Om de onderzoeksvragen te beantwoorden, zijn data geanalyseerd van twee Nationale Studies naar ziekten en verrichtingen in de huisartspraktijk. De eerste Nationale Studie werd uitgevoerd in 1987 in 103 huisartspraktijken, waarin bij elkaar 161 huisartsen werkten. De data voor de tweede Nationale Studie werden verzameld in de periode 2000 – 2002 in 104 huisartspraktijken, waarin 195 huisartsen werkten. De Nationale Studies omvatten verschillende dataverzamelingen, zoals gegevens uit elektronische medische dossiers van patiënten waarin contacten, diagnoses, prescripties, verwijzingen, etc. werden genoteerd. Daarnaast werden enquêtes afgenomen onder huisartsen over onder andere de organisatie van hun praktijk, werkbelasting en tevredenheid met hun werk. Ook hielden de huisartsen gedurende een week een tijdsregistratie bij. Hierbij noteerden zij zeven dagen lang alles wat ze deden op een kwartier nauwkeurig. Ook gebruikten we data uit de patiëntenregistratie waarin achtergrondkenmerken leeftijd, geslacht en verzekeringsvorm waren genoteerd. Deze gegevens zijn aangevuld met een korte aanvullende vragenlijst waarin ook o.a. de etniciteit van de patiënt werd vastgelegd. Alle data konden onderling worden gekoppeld met unieke patiënt-, huisarts- en praktijkcodes.

Verschillende analysetechnieken werden gebruikt om de data te analyseren. Omdat het om twee meetmomenten gaat met een tussenpose van veertien jaar, zijn de analyses crossectioneel, maar konden we wel resultaten tussen

1987 en 2001 vergelijken. We maakten gebruik van onder andere regressie-analyse en multilevelanalyse.

De werkbelasting van huisartsen: 1987 – 2001 (hoofdstuk 2)
In hoofdstuk 2 is een aantal variabelen vergeleken tussen 1987 en 2001. In 2001 waren er 2529 ingeschreven patiënten per fte huisarts. Dat waren er 232 meer dan in 1987. Gemiddeld deden deze patiënten ook nog eens vaker een beroep op de huisartspraktijk, de contactfrequentie nam met ongeveer 10% toe van ongeveer 3,6 naar bijna vier contacten (3,9) per jaar. De duur van een gemiddeld spreekuurconsult bleef vrijwel gelijk: ongeveer tien minuten. Terwijl de vraag naar en het gebruik van huisartsenzorg dus flink toenam tussen 1987 en 2001, werd de werkweek van de meeste huisartsen juist korter. In 1987 werkten huisartsen gemiddeld nog ongeveer 53 uur per week. In 2001 was dat een hele werkdag minder: 44 uur. In beide jaren besteedden huisartsen ongeveer 70% van hun tijd aan direct patiënt-gerelateerde activiteiten. De rest van hun tijd besteedden ze aan nascholing, administratie, overleggen, etc. We stellen in dit hoofdstuk dus vast dat huisartsen tussen 1987 en 2001 steeds meer zorgvraag zijn gaan afhandelen in steeds minder tijd. Daarmee is de eerste onderzoeksvraag beantwoord.

Verder beschrijven we in dit hoofdstuk vijf veranderingen die de schijnbaar tegenstrijdige ontwikkelingen in het werklastplaatje van huisartsen kunnen verklaren.

1. Er heeft een verschuiving plaats gevonden van meer naar minder tijdsintensieve contacten. Er vonden vaker spreekuurcontacten plaats in plaats van huisvisites en meer telefonische contacten in plaats van spreekuurcontacten. Het aandeel visites nam af van 16% naar 9% van de contacten. Tegelijkertijd nam het aantal telefonische consulten toe van ruim 4% naar bijna 11% van de contacten.
2. De toegang tot de huisarts is in de loop der tijd meer gereguleerd. Steeds minder huisartsen hielden inloopspreekuren en gingen in plaats daarvan alleen nog op afspraak werken. Ook telefonische spreekuren zijn vaker zo georganiseerd dat de huisarts zelf de patiënten terugbelt. Bovendien zijn assistenten steeds vaker gaan vragen naar de reden van het contact en zij zijn ook vaker zelf telefonisch advies gaan geven.
3. Huisartsen delegeren kleine medisch-technische handelingen steeds vaker naar praktijkassistenten. Hierbij valt te denken aan oren uitspuiten, hechtingen verwijderen, uitstrijkjes maken e.d. Praktijkassistenten zijn steeds vaker opgeleid voor deze taken.

4. De manier waarop huisartsen avond-, nacht-, en weekenddiensten draaiden, veranderde sterk sinds eind jaren '90. Vroeger werkten huisartsen in kleine waarneemgroepen van rond de zes huisartsen. Deze waarneemgroepen hebben in toenemende mate plaats gemaakt voor grootschalige en veel efficiënter georganiseerde huisartsenposten. Hierdoor is de werkbelasting door ANW-diensten flink afgenomen.
5. Ook de taakopvatting van huisartsen is veranderd, vooral op het gebied van psychosociale klachten. In de loop der tijd zijn huisartsen vooral sociale problematiek steeds minder tot hun takenpakket gaan rekenen. Juist dit type klachten droeg behoorlijk bij aan de werkbelasting.

De afname van het aantal werkuren van huisartsen; de invloed van nieuwe cohorten, feminisering van het beroep deeltijdwerken (hoofdstuk 3)

In dit hoofdstuk toetsen we een aantal mogelijke verklaringen voor de afname van de gemiddelde werkweek van huisartsen. Hierbij gaat het niet zozeer om werkinhoudelijke zaken maar vooral om veranderingen in de huisartsenpopulatie en de andere keuzes die deze huisartsen maken. De verklaringen die worden getoetst zijn:

1. De afname wordt veroorzaakt door een cohorteffect; de oudere cohorten stromen uit door pensionering en worden vervangen door nieuwe, jonge cohorten die minder werken dan de ouderen.
2. De afname komt doordat huisartsen over de hele linie (zowel oudere als jongere) korter zijn gaan werken.
3. Het onder 1 omschreven cohorteffect kan op zijn beurt worden verklaard doordat de jongere cohorten steeds meer vrouwen bevatten, en vrouwen minder werken dan mannen.
4. Het verschil in werkuren tussen mannen en vrouwen komt doordat a) vrouwen er vaker voor kiezen om deeltijd te gaan werken b)vrouwen vaker in duo- en groepspraktijken werken en in zulke praktijken huisartsen minder uren draaien dan solisten.

Inderdaad blijkt er sprake te zijn van een cohorteffect. Ongeveer twee derde van de afname in werkuren komt doordat de jongere cohorten inderdaad veel minder werken dan de oudere. Daarbovenop echter, is er over de gehele linie een afname waarneembaar die niet gerelateerd is aan specifieke cohorten. Aanvankelijk werd het cohorteffect voor een aanzienlijk deel veroorzaakt door de instroom van jonge vrouwen in het beroep. In 1987 werkten vrouwen gemiddeld ongeveer een dag minder dan mannen. In 2001

echter, was dit nog maar zo'n drie uur. Het belang van geslacht is dus in de loop der tijd afgenomen. Het verschil in werkuren tussen mannen en vrouwen vloeit voor een belangrijke deel voort uit het grotere aantal deeltijd werkers onder vrouwen. Echter, in 1987 werkten vrouwen aanzienlijk minder dan mannen, zelfs als deze factor mee werd genomen. Anders gezegd: een voltijd werkende mannelijke huisarts werkte meer uren dan een voltijd werkende vrouwelijke huisarts. In 2001 was dit verschil geheel verdwenen. Vrouwen werken nog altijd vaker in deeltijd dan mannen. Echter, het aantal in deeltijd werkende mannen is in de loop der tijd ook sterk toegenomen en omdat er nog altijd meer mannelijke dan vrouwelijke huisartsen zijn, legt dit meer gewicht in de schaal. Er werd geen effect gevonden van het werken in meermanspraktijken.

Delegatie van taken naar praktijkassistenten (hoofdstuk 4)
De praktijkassistente (of doktersassistente) is sinds de jaren '60 een vertrouwd gezicht in de huisartspraktijk. Vroeger was dit vaak de vrouw van de dokter die haar man assisteerde met allerlei eenvoudige zaken die moesten gebeuren in de praktijk. In de loop der tijd is deze functie echter uitgegroeid tot een beroep met een eigen opleiding en een duidelijk afgebakend beroepsprofiel. De meeste assistenten zijn vandaag de dag gediplomeerd en daarmee ook opgeleid om medisch-technische handelingen te verrichten. De praktijkassistenten van de praktijken die participeerden in de twee Nationale Studies gaven op een lijst van 23 taken aan of en hoe vaak zij deze uitvoerden. Vijftien taken werden in 2001 vaker uitgevoerd door praktijkassistenten dan in 1987. In de meeste gevallen ging het om forse verschillen. Zo maakte in 2001 53% uitstrijkjes, in 1987 was dat nog 3%. Het meten van bloeddruk werd gedaan door 88% tegen 41% in 1987. Andere taken die praktijkassistenten vaker zijn gaan uitvoeren, zijn onder andere oren uitspuiten, wratten aanstippen en het doen van longfunctiemetingen.

Een inmiddels zeer gangbaar, maar in 2001 nog betrekkelijk nieuw fenomeen was de praktijkverpleegkundige of ondersteuner op hbo-niveau. In een kwart van de praktijken in de Nationale Studie werkte een dergelijke ondersteuner.

We stelden tevens vast dat huisartsen zeer positief zijn over het delegeren van taken. Het liefst zouden zij meer delegeren naar assistenten en ondersteuners, maar gebrek aan tijd, geld en werkruimte belemmert dit.

Huisartsen zijn er veelal van overtuigd dat delegatie hun werkbelasting verlicht. Toch blijkt het aantal werkuren van huisartsen niet lager te zijn naarmate ze meer assistentie in hun praktijk hebben. In tegendeel: de werkuren van de assistente en die van de huisarts hangen positief samen en worden vooral verklaard door het aantal ingeschreven patiënten.

De organisatie van avond-, nacht- en weekenddiensten (hoofdstuk 5)
Avond-, nacht- en weekenddiensten worden doorgaans beschouwd als één van de meest belastende aspecten van het beroep van huisarts. Tot en met de jaren '90 organiseerden huisartsen deze diensten in waarneemgroepen van rond de zes huisartsen. Volgens een rooster namen zij dan om de beurt waar voor de patiënten van hun collega's. Destijds was het niet ongebruikelijk dat een huisarts enkele keren op een nacht uit bed werd gebeld en op weg moest naar een patiënt om de volgende ochtend vervolgens gewoon weer een spreekuur te draaien. In verschillende studies gaven huisartsen aan diensten als zeer belastend te ervaren en het werd zelfs genoemd als een van de belangrijkste redenen om vervroegd met pensioen te gaan. Toen eenmaal de eerste huisartsenposten ontstonden, vond dit snel navolging. In huisartsenposten nemen huisartsen waar voor veel grotere populaties dan in waarneemgroepen, dit kan oplopen tot honderdduizenden patiënten. Tijdens hun diensten worden huisartsen ondersteund door assistenten die de zorgvraag triëren. Aan de telefoon bepalen ze in samenspraak met de patiënt of deze bezocht moet worden, zelf naar de huisartsenpost moet komen of voldoende heeft aan een telefonisch advies. Voor het afleggen van visites is een speciaal toegeruste auto met chauffeur aanwezig.

We vergeleken de objectieve en subjectieve werkbelasting die wordt gegenereerd door ANW-diensten tussen huisartsen die hun diensten organiseerden in waarneemgroepen (twee derde van de huisartsen) en huisartsen die waren aangesloten bij een huisartsenpost (een derde) in 2001.

De resultaten lieten zien dat de komst van huisartsenposten de werkbelasting door diensten substantieel heeft verminderd. Huisartsen in huisartsenposten besteedden gemiddeld 70% minder tijd aan ANW-diensten dan huisartsen in waarneemgroepen, respectievelijk 5 en 19 uur. De laatsten draaiden vaker en langere diensten. Ook bleken huisartsen in huisartsenposten hun diensten minder vaak als belastend te ervaren dan hun collega's in waarneemgroepen (respectievelijk 38% en 64% kwalificeerde de diensten als (zeer) belastend). Tenslotte gaf 78% van de huisartsen in huisartsen-

posten aan dat zij tevreden waren met de wijze waarop hun diensten waren georganiseerd tegen nog geen 18% van de huisartsen in waarneemgroepen.

Veranderingen in het afleggen van huisvisites (hoofdstuk 6)
Tussen 1987 en 2001 zijn huisartsen steeds minder huisvisites gaan afleggen. Huisartsen maken regelmatig een afweging tussen de patiënt naar de praktijk laten komen voor een spreekuurconsult en het afleggen van een visite. Hierbij moet een afweging worden gemaakt tussen enerzijds mogelijk ongemak of zelfs medische risico's als de patiënt zelf naar de praktijk moet komen, tegen anderzijds de tijdsinvestering en ongemak voor de huisarts. Met het toenemende zorggebruik is de laatste factor mogelijk zwaarder gaan wegen. Deze afwegingen passen in het theoretische model dat is beschreven in hoofdstuk 1. Binnen deze theoretische redenering valt te verwachten dat de kans dat een huisarts een huisvisite aflegt, niet voor alle zorgproblemen in gelijke mate is afgenomen. Huisartsen willen immers goede zorg blijven bieden en de beslissingruimte is bij sommige diagnoses beperkter dan bij andere.

In dit hoofdstuk vergeleken we voor 246 symptomen en diagnoses het percentage face-to-face contacten waarbij de huisarts een visite aflegde. We probeerden daarbij het percentage in 2001 te voorspellen op basis van het percentage in 1987 met een regressiemodel. De relatie bleek curvelineair met een positief kwadratisch effect. Met ander woorden: zaken waarvoor huisartsen in 1987 al nauwelijks visites aflegden, leidden in 2001 evenmin tot een visite, bij de zorgproblemen waarvoor in 1987 juist veel visites werden afgelegd was evenmin een sterke afname, hiervoor legden huisartsen in 2001 nog steeds veel visites af. De sterkste afname zat in de middengroep, waarbij de beslissingsruimte waarschijnlijk het grootste was.

Toen we keken naar de diagnoses waarbij de sterkste afnamen waarneembaar waren, bleek dat deze afnamen zeer goed verklaarbaar waren vanuit medisch oogpunt. Het ging veelal om gezondheidsproblemen waarover de inzichten in de medische wereld in de loop der tijd sterk zijn veranderd. Deze veranderende inzichten komen er op neer dat vroeger vaker belang werd gehecht aan het houden van rust en werd aanbevolen het bed te houden terwijl later juist vaker een activerende remedie werd aanbevolen of men in ieder geval van mening was dat het geen kwaad kon over straat te gaan. Voorbeelden daarvan zijn hersenschudding en herstel na een myocardinfarct. De sterkste afname werd gevonden voor koorts.

De invloed van de praktijkgrootte en honoreringssysteem op de zorgverlening (hoofdstuk 7)
In dit hoofdstuk onderzoeken we in hoeverre consultduur, gemiddelde wachttijd voor een afspraak en het wel of niet afleggen van een visite worden beïnvloed door praktijkgrootte (het aantal ingeschreven patiënten) en door de wijze waarop huisartsen worden betaald. Praktijkgrootte dient hier als een indicator voor werkbelasting. Een groter aantal ingeschreven patiënten zal immers doorgaans ook meer werk met zich meebrengen omdat sommige patiënten natuurlijk een veel groter beroep doen op de zorg dan anderen. Hiervoor is gecorrigeerd met een weging waarbij oudere patiënten en patiënten die in een erkend achterstandsgebied woonden iets zwaarder werden meegeteld.

Het beperken van de consultduur, inbouwen van een wachttijd en het beperken van het aantal visites zijn manieren om werkbelasting in de hand te houden. Naast gevolgen voor de werkbelasting kunnen deze strategieën echter ook gevolgen hebben voor het inkomen van de huisarts. Deze gevolgen hangen af van de manier waarop huisartsen worden betaald. In 2001 ontvingen huisartsen gemiddeld voor ongeveer twee derde van hun patiënten een abonnementenhonorering, dat waren de ziekenfondsverzekerden. Dit bedrag was gelijk, ongeacht het aantal contacten of de aard van deze contacten. Voor de rest, de particulier verzekerde mensen, ontvingen huisartsen een bedrag per consult, dat iets hoger was bij visites en iets lager bij telefonische contacten.

Hoewel we veronderstellen dat huisartsen in de eerste plaats handelen in het belang van hun patiënten, was de verwachting dat huisartsen met veel ziekenfondsverzekerden meer geneigd zouden zijn om hun werkbelasting in te perken door de hierboven beschreven strategieën dan huisartsen met relatief veel particulier verzekerden.

In de analyse hebben we een uitsplitsing gemaakt tussen huisartsen met een bovengemiddeld aantal ingeschreven patiënten en huisartsen met een aantal patiënten dat onder het gemiddelde lag. Het bleek dat de eerste groep iets kortere consulten had, naarmate het aantal ingeschreven patiënten hoger lag. Dit verband bleek echter niet te worden beïnvloed door het aandeel ziekenfondsverzekerden. We vonden geen direct verband tussen praktijkgrootte en wachttijden. Wel bleek dat huisartsen met relatief veel ziekenfondspatiënten juist kortere wachttijden hadden naarmate ze meer patiënten

hebben. Dat was tegengesteld aan de hypothese, aangezien deze patiënten juist geen extra inkomen genereren. Ook bleken praktijkgrootte en de kans op een huisvisite niet samen te hangen. Alleen in de relatief kleine praktijken vonden we dat de kans op een huisvisite toenam met praktijkgrootte als de huisarts veel particulier verzekerde patiënten had.

Algemene conclusie is dat het beloningssysteem de beslissingen die huisartsen nemen in hun werk beïnvloed. Deze invloed leek echter, in ieder geval voor de Nederlandse situatie, zeer beperkt, zeker wanneer deze wordt vergeleken met de invloed van patiëntkenmerken zoals leeftijd en gezondheidstoestand.

De relatie tussen werkbelasting en het naleven van richtlijnen (hoofdstuk 8)

Werkbelasting wordt vaak als een bedreiging gezien voor de kwaliteit van zorg. Hoewel dit in verschillende studies zijdelings aan de orde komt, is er nog weinig onderzoek gedaan naar deze relatie. In dit hoofdstuk gebruikten we de mate waarin huisartsen werken volgens professionele richtlijnen als indicator voor de kwaliteit van de zorg die zij verlenen. Deze richtlijnen zijn ontwikkeld door het Nederlands Huisartsen Genootschap en zijn beter bekend als NHG-standaarden. In deze standaarden worden aanbevelingen gedaan over onder andere diagnostiek, voorschrijven, verwijzen. De standaarden zijn zoveel mogelijk *evidence-based* en anders gebaseerd op professionele consensus.

In dit hoofdstuk analyseerden we ruim 170.000 beslissingen, genomen door 130 huisartsen. Deze beslissingen verwezen naar 41 aanbevelingen die op hun beurt weer werden afgeleid uit 32 NHG-standaarden. Iedere beslissing werd gecodeerd als 0 (afwijkend van de richtlijn) of 1 (volgens richtlijn). De objectieve werkbelasting van huisartsen werd gemeten aan de hand van het aantal contacten per week, de subjectieve werkbelasting aan de hand van de mate waarin huisartsen tevreden waren over hun beschikbare tijd. Naast de individuele werkbelasting scoorden we alle aanbevelingen op de mate waarin zij bijdragen aan de werkbelasting op de korte termijn (werk tijdens het consult) en op langere termijn (kans op vervolgcontact). Hiervoor werden aanbevelingen gescoord door een expertpanel bestaande uit drie praktiserende huisartsen. Voor de verwachte tijdsinvestering op de korte termijn onderscheidden we drie categorieën: aanbevelingen die een extra tijdsinvestering vragen tijdens hetzelfde consult, aanbevelingen die juist tijds-

besparend werken en een neutrale categorie. Bij deze laatste categorie is niet in zijn algemeenheid te zeggen welk effect ze op tijdsinvestering hebben, of waren de oordelen van de experts niet eensluidend. Verder werd van iedere aanbeveling bepaald of deze een grotere kans geeft op een vervolgcontact of de kans op een vervolgcontact juist verminderde. Ook hierbij werd weer een neutrale categorie opgenomen.

Van alle beslissingen die we onderzochten, was 59% in overeenstemming met de bijbehorende richtlijn. Dit percentage verschilde echter sterk tussen de aanbevelingen. Het percentage naleving varieerde van 8% tot bijna 100% tussen aanbevelingen. Er waren weliswaar ook verschillen tussen huisartsen, maar deze waren aanzienlijk kleiner en besloegen slecht een range van ongeveer 10%. We vonden geen relatie tussen de objectieve werkbelasting van huisartsen en de mate waarin zij volgens richtlijnen werkten. Wel vonden we een relatie met subjectieve werkbelasting, maar deze was in strijd met de hypothese. Huisartsen die meer tevreden zijn over de beschikbare tijd, leven richtlijnen minder na. Dit verband bleef overeind na controle voor andere huisartskenmerken als leeftijd, geslacht en praktijkgrootte.

Hoewel de individuele werkbelasting van huisartsen weinig invloed leek te hebben, bleek de mate waarin een bepaalde aanbeveling werklast genereerde, wel van invloed op de kans dat deze werd opgevolgd. Aanbevelingen die extra tijd kosten tijdens een consult werden beduidend minder nageleefd vergeleken met de neutrale categorie, terwijl aanbevelingen die juist tijd konden besparen vaker werden nageleefd. Deze relaties waren substantieel: tot uitdrukking komend in oddsratio's van respectievelijk 0,46 en 1,55. Ook aanbevelingen die de kans op een vervolgcontact verminderen werden veel vaker nageleefd dan de 'neutrale' categorie. Verrassend was echter dat dit ook gold voor de aanbevelingen die de kans op vervolgcontacten vergroten. Een mogelijke verklaring voor deze laatste bevinding is dat het in bepaalde gevallen vanuit medisch oogpunt noodzakelijk is dat een patiënt nog een keer terugkomt en dat deze noodzaak in veel gevallen zwaarder weegt dan het belang van huisartsen om hun werkbelasting te reduceren.

Samenvatting en discussie (hoofdstuk 8)
In dit laatste hoofdstuk wordt een samenvatting gegeven van de conclusies. Daarnaast komen achtereenvolgens aan bod: de wetenschappelijk implicaties van de bevindingen, de implicaties voor het beleid, de implicaties voor de praktijk, de beperking van de studie en tot slot enkele aan-

bevelingen voor vervolgonderzoek. Hieronder volgt een korte beschrijving van deze zaken.

Wetenschappelijke implicaties

In het eerste hoofdstuk beschreven we een theoretisch model, gebaseerd op het idee van doelgericht handelen, waarmee we probeerden het gedrag van huisartsen te beredeneren. Hierin stelden we dat, zoals alle mensen, huisartsen streven naar fysiek en sociaal welbevinden (status en waardering). Onder deze 'ultieme' doelen kunnen weer enkele instrumentele doelen worden geschaard, zoals inkomen en vrije tijd voor fysiek welbevinden en het verlenen van goede zorg aan patiënten voor sociaal welbevinden.

In de periode 1987 – 2001, maar natuurlijk ook daarna, is de samenleving veranderd en is de samenstelling van de huisartsenpopulatie veranderd. Deze veranderende omstandigheden hebben er toe geleid dat huisartsen vandaag de dag andere keuzes maken dan vroeger. Tijd is een belangrijke hulpbron. Hoe huisartsen hun tijd besteden, hangt niet alleen af van hun werkomstandigheden maar ook van hun privé-leven. Het belang van tijd is in de periode die in dit proefschrift wordt beschreven duidelijk veranderd. Dat blijkt uit de bevinding dat huisartsen van nu er voor kiezen minder tijd in hun vak te steken dan de huisartsen van vroeger. Hieruit spreekt vermoedelijk niet zozeer een afgenomen belang dat wordt gehecht aan het vak maar eerder het toegenomen belang van andere rollen die men naast dit werk vervult. De toegenomen arbeidsparticipatie van vrouwen, zowel in het beroep van huisarts als daar buiten, speelt daarin ongetwijfeld een rol. Waar vroeger de huisarts vaak alleen het huishoudinkomen verdiende, doen partners dat nu veelal samen. Dit brengt bovendien met zich mee dat zorgtaken verdeeld moeten worden en nu dus ook een beslag leggen op de tijd van beide partners.

Ten opzichte van tijd, is het belang van inkomen als instrumenteel doel om fysiek welbevinden te bereiken, afgenomen omdat huisartsen steeds minder vaak de enige kostwinner zijn. Essentieel verschil is immers, dat in een tweeverdienermodel ten opzichte van het traditionele kostwinnersmodel het huishoudinkomen wel hoger kan worden, maar dat de totale hoeveelheid beschikbare tijd uiteraard altijd gelijk blijft. In de verschillende studies die in dit boek zijn beschreven, zijn op tal van plekken aanwijzingen te vinden dat huisartsen gemotiveerd zijn tijd te winnen. Dit blijkt echter niet zozeer ten koste van de inhoud van de zorg te gaan. Richtlijnen worden vaak nageleefd

en kenmerken van patiënten en hun zorgproblemen blijken veruit de beste voorspellers voor beslissingen die huisartsen nemen in hun werk.

Implicaties voor beleid

Er zijn drie belangrijke beleidsonderwerpen waarbij werkbelasting van huisartsen een rol kan spelen. In de eerste plaats de beschikbaarheid van huisartsenzorg voor iedereen, in de tweede plaats de eerlijkheid van het beloningssysteem en in de derde plaats de kwaliteit van zorg. We gaan kort op deze zaken in.

Er bestaat een brede consensus over dat een goed toegankelijke huisartsenzorg in de eigen buurt van groot belang is voor een goede gezondheidszorg. Vooral in een zorgsysteem zoals het Nederlandse, waarin de huisarts doorgaans het eerste contact is en waarin huisartsen tevens fungeren als poortwachters naar medisch specialistische zorg. Wanneer nu de werkbelasting van huisartsen te hoog wordt, zullen zij daarop reageren door bijvoorbeeld efficiënter te gaan werken, maar mogelijk ook door niet langer nieuwe patiënten te accepteren en door minder tijd aan patiënten te besteden. Op deze manier kan er een schaarste ontstaan aan huisartsenzorg. Een hoge werkbelasting voor huisartsen is daarom niet alleen een probleem van huisartsen zelf, maar ook van zorggebruikers en daarmee voor beleidsmakers. Het creëren van werkomstandigheden die werkbelasting verlichten, kan er voor zorgen dat huisartsen meer uren werken, langer in het vak blijven en meer tijd hebben voor hun patiënten. Een voorbeeld daarvan zagen we bij de invoering van huisartsenposten. De komst van huisartsenposten heeft de werkbelasting substantieel verlicht en heeft, zo bleek uit later onderzoek, een bijdrage geleverd aan het het oplossen van het schaarsteprobleem doordat huisartsen langer diensten blijven draaien dan aanvankelijk werd verwacht.

In de periode 1987 – 2001 zagen we het gemiddelde aantal werkuren van huisartsen afnemen. Hoewel dit niet is aangetoond in dit proefschrift, is het zeer goed mogelijk dat huisartsen die geconfronteerd worden met een hoge werkbelasting, afzien van een voltijdbaan en minder uren per week gaan werken. Drie dagen per week onder hoge druk werken is immers minder belastend dan dit vijf of meer dagen per week doen. Hoewel deze oplossing voor een individuele arts rationeel en begrijpelijk is, draagt dit op het macroniveau juist bij aan een groter wordende schaarste. Vooral vanuit economisch perspectief vormt deze problematiek een interessant beleidsthema.

De kosten om een huisarts op te leiden zijn immers gelijk, ongeacht of deze huisarts later voltijd of deeltijd gaat werken.

Een eerlijk beloningssysteem is een veel terugkerend onderwerp in debatten over werkbelasting. De meeste mensen zullen een systeem als eerlijk ervaren wanneer verschillen in inkomen tussen huisartsen een afspiegeling vormen van de verschillen in de hoeveelheid werk die zij verzetten. Tot 2006 kregen huisartsen een abonnementenhonorering voor ziekenfondsverzekerden. Dit was gemiddeld twee derde van hun patiëntenpopulatie. Hoewel er enige differentiatie was aangebracht naar leeftijd van patiënten en de sociaal economische status van de buurt waarin patiënten woonden, was er geen directe relatie tussen de hoeveelheid werk die een patiënt met zich meebracht en het inkomen van de huisarts. Sinds 2006 is deze relatie er wel omdat er naast een vast tarief een tarief per consult is vastgesteld voor alle patiënten. Meer werk genereert dus ook meer inkomen.

Met betrekking tot de kwaliteit van zorg hebben de belangrijkste bevindingen te maken met het naleven van richtlijnen. In Nederland worden vanuit de beroepsgroep veel inspanningen verricht om systematisch te werken aan kwaliteit dit blijkt uit het grote aantal richtlijnen (NHG-standaarden) dat inmiddels ontwikkeld is door het Nederlands Huisartsen Genootschap. Bij het opstellen en implementeren van richtlijnen is het de moeite waard om eventuele effecten die aanbevelingen hebben op werkbelasting, in overweging te nemen. Vanzelfsprekend staat hier de medische noodzaak van beslissingen voorop.

Zaken die meer indirect verband houden met kwaliteit zijn de duur van contacten en de mogelijkheid tot het afleggen van huisvisites. Op basis van deze studie kan niet worden gesteld dat de kwaliteit van zorg ernstig wordt bedreigd door de betrekkelijk korte consulten en het beperkte aantal huisvisites. Toch zou het vanuit het perspectief van patiënten een verbetering zijn als zij hierop meer invloed zouden hebben. Sinds 2005 heeft de Nederlandse overheid een reeks maatregelen genomen om marktwerking te stimuleren in de gezondheidszorg. Met deze beleidswijzigingen wil de overheid vooral bereiken dat de zorg meer vraaggericht en dus kwalitatief beter wordt. Ruimhartiger omgaan met het afleggen van visites en meer tijd besteden per patiënt dan collega's zou voor huisartsen een logische manier zijn om patiënten aan te trekken en te concurreren. Echter, er zijn nauwelijks prikkels voor huisartsen om te concurreren of om actief patiënten aan

te trekken. Het aantal huisartsen is in Nederland, vergeleken met de meeste andere Europese landen extreem laag. In 2009 waren er gemiddeld 2322 inwoners per fte huisarts. Dat is meer dan twee maal zoveel als in de meeste andere Europese landen; bijvoorbeeld 1600 in het Verenigd Koninkrijk, 1027 in Duitsland, 860 in België en 605 in Frankrijk. In Nederland staan huisartsen dus vooral voor de uitdaging hun werklast beheersbaar te houden, en is concurrentie om de gunst van de patiënt geen serieuze optie.

Implicaties voor de praktijk

In dit proefschrift is gebleken dat huisartsen verschillende effectieve strategieën hebben ontwikkeld om meer zorgvraag af te handelen in een kortere tijd.

In dit proefschrift is gebruik gemaakt van data die zijn verzameld in 1987 en 2001. In deze periode is er veel veranderd in de huisartsenzorg. In de jaren '80 was de meest gebruikelijke organisatievorm voor huisartspraktijken eenvoudig: een voltijd werkende solistische huisarts (vaak een man) met een doktersassistente. De huisarts deed vrijwel alle patiëntenzorg zelf en deed er bovendien vaak bevallingen bij. In de loop der tijd is het aantal solowerkende huisartsen sterk afgenomen. In 2008 werkte nog maar 20% van de huisartsen in een solopraktijk. Groepspraktijken zijn inmiddels de dominante organisatievorm geworden. Deze ontwikkeling is hand in hand gegaan met een toename van deeltijdwerkende huisartsen en vrouwelijke huisartsen. Daarbij is de huisarts allang niet meer de enige die zorg verleent; steeds meer (hoog opgeleid) assisterend en ondersteunend personeel heeft zijn intrede gedaan in de huisartspraktijk: praktijkondersteuners, praktijkverpleegkundigen en later de nurse practitioners en physician assistants. Naast deze nieuwe disciplines werken huisartsen vaak intensiever samen met ander eerstelijnsdisciplines zoals fysiotherapeuten, diëtisten, enz. In 2003 omschreven de Landelijke Huisartsen Vereniging en het Nederlands Huisartsen Genootschap de toekomstige organisatiestructuur als de 'voorziening huisartsenzorg'. In deze voorziening worden patiënten geholpen door een team van zorgverleners waarbinnen de huisarts een centrale rol speelt en de meer complexe zorg op zich neemt. Binnen deze context zouden onderzoek maar ook beleid dat zich richt op (omgaan met) werkbelasting zich niet zozeer moeten richten op de werkbelasting van de huisarts maar op de verdeling van de werklast tussen de verschillende disciplines. Dit levert ook weer nieuwe vragen en problemen op. De mogelijkheid om meer werk over te laten aan andere zorgverleners geeft de

huisarts weliswaar de gelegenheid om meer tijd te besteden aan de meer complexe zorg. Daar staat echter tegenover dat deze grotere organisatie ook nieuwe taken genereert voor huisartsen die niet of alleen indirect gerelateerd zijn aan patiëntenzorg. Hierbij valt vooral te denken aan supervisie en management van ander zorgverleners. Verder leidt het toevoegen van andere disciplines aan de huisartspraktijk niet vanzelfsprekend tot een afname van de werklast van de huisarts. In sommige gevallen blijkt er niet of nauwelijks substitutie op te treden, maar voegt de nieuwe zorgverlener eerder iets toe aan de al bestaande zorg. Er kan zelfs meer zorgvraag worden gegenereerd. Dit levert tal van vragen op over de effectiviteit en doelmatigheid van de inzet van ondersteunende disciplines en over de beste organisatievormen.

Een andere belangrijke factor die nieuwe werklastgerelateerde vragen met zich meebrengt zijn recente veranderingen in de wijze waarop huisartsenzorg wordt gefinancierd. Sinds 2006 is het onderscheid tussen ziekenfondsverzekerden en particulier verzekerden vervallen en krijgen huisartsen voor iedere ingeschreven patiënt een vast inschrijftarief met daarbovenop een consulttarief. Met de toename van meermanspraktijken zien we ook een toename van huisartsen in loondienst. Momenteel bedraagt dit ongeveer 14% van de huisartsen. Wanneer deze huisartsen werken voor een vast salaris, is er voor hen geen relatie tussen werkbelasting en hun inkomen. Sinds 2010 is ook gestart met een nieuwe wijze van financieren van de zorg voor chronisch zieken, de zogenaamde integrale bekostiging. De meeste ervaring is inmiddels opgedaan met diabeteszorg en in de toekomst wordt dit uitgebreid naar andere ziekten. In dit systeem wordt alle zorg voor een diabetespatiënt ondergebracht in een keten-dbc (diagnose-behandelingscombinatie). De zorgverzekeraar betaalt een vergoeding voor de gehele keten-dbc uit aan een hoofdaannemer, meestal een huisarts. Deze hoofdaannemer is er voor verantwoordelijk dat de patiënt alle zorg krijgt die nodig is. Deze kan hij zelf verstrekken, maar doorgaans zal daarnaast ook zorg moeten worden ingekocht bij onderaannemers (diëtisten, oogartsen, enz.). Omdat huisartsen meestal als hoofdaannemer fungeren, nemen zij nu naast zorgverlener ook de rol van zorginkoper op zich. Dit brengt uiteraard allerlei nieuwe taken met zich mee in de sfeer van coördinatie, onderhandelingen en mogelijk administratie, wat ook weer zijn gevolgen zal hebben voor de werkbelasting.

Aanbevelingen voor vervolgonderzoek

Hoofdstuk 9 is afgesloten met een viertal aanbevelingen voor vervolgonderzoek. Deze vloeien voor een belangrijk deel voort uit de al hierboven beschreven beschouwing.

1. Meer dan in de meeste ander landen wordt in Nederland de uitbreiding van teams en het delegeren van werk naar andere zorgverleners gestimuleerd. Bijvoorbeeld door hier specifieke vergoedingen voor te verstrekken. Zoals gezegd, wordt huisartsenzorg steeds meer verstrekt door een team van zorgverleners. Toekomstig werklastonderzoek zal zich vooral moeten richten op de werkbelasting van de teams in de voorziening huisartsenzorg. Interessante onderzoeksthema's daarbij zijn de economische consequenties van organisatievormen; hoe kunnen taken efficiënt worden verdeeld? Onder welke omstandigheden leidt taakdelegatie tot een vermindering van de werklast en wanneer trekt het juist nieuw zorg aan?
2. Toekomstig onderzoek zou zich bovendien moeten richten op de vraag hoe kenmerken van het zorgsysteem van invloed zijn op de werkbelasting. Deze vraag is in dit proefschrift beperkt aan de orde geweest, omdat hiervoor internationale datasets nodig zijn. De systeemcondities zijn immers voor huisartsen binnen Nederland gelijk. Typisch voor Nederland zijn de poortwachterrol van huisartsen, de zeer grote aantallen ingeschreven patiënten per huisarts en het gecombineerde betalingssysteem dat deels uit een inschrijftarief, deels uit vergoedingen per contact of verrichting bestaat.
3. Door verschillende veranderingen in de organisatie van praktijken en door veranderingen in het betalingsysteem, hebben huisartsen er meer, vaak niet-medische, taken bij gekregen. Belangrijke vragen zijn hoe deze nieuwe taken en rollen van invloed zijn op de objectieve en subjectieve werkbelasting.
4. Dit proefschrift biedt weliswaar meer inzicht in de relatie tussen werkbelasting en kwaliteit van zorg. Echter, veel van deze relatie is nog altijd onbekend en niet alle dimensies van kwaliteit zijn aan de orde gekomen. In onderzoek naar kwaliteit van zorg wordt vaak gebruik gemaakt van Donabedians model van structuur-, proces- en uitkomstvariabelen. Om een goed zicht te krijgen op de kwaliteit van zorg is het aan te bevelen gebruik te maken van proces- en uitkomstvariabelen naast elkaar. Voorbeelden van uitkomstvariabelen die zouden kunnen worden gebruikt, zijn vermijdbare ziekenhuisopnamen, klinische parameters en patiëntervaringen. Door gebruik te maken van dit soort uitkomstmaten kunnen

ook andere dimensies van kwaliteit worden onderzocht, zoals veiligheid en vraaggerichtheid.

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Het dankwoord is vaak het eerste en soms het enige dat mensen lezen in een proefschrift, zo gaat het verhaal. Ik kan me dat niet voorstellen; een dankwoord is immers vaak een triviale opsomming van open deuren. En wie verkiest dat nou boven negen hoofdstukken vol hypothesen, statistische analyses en wetenschappelijke inzichten? Toch is het goed om te vermelden dat dit boek niet alleen mijn verdienste is, maar dat ik veel dank verschuldigd ben aan al die mensen die hieraan hebben bijgedragen.

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Curriculum vitae

Michael van den Berg was born in Tiel, The Netherlands. Between 1995 and 1999, he studied social work at the Hogeschool van Arnhem en Nijmegen. After finishing his bachelor's degree, he studied sociology at the Katholieke Universiteit Nijmegen (currently the Radboud Universiteit Nijmegen) which he completed in 2002. In the period 2001 – 2002, he worked as a marketing researcher. In 2002, Michael started working at NIVEL (Netherlands Institute for Health Services Research), where he worked on a study on GPs workload which resulted in this thesis. In the same period he carried out several other studies, especially on organization of General Practice. Since 2006, he was involved in the Dutch Healthcare Performance Report. For this monitoring study, he reports about the quality of the Dutch healthcare system. Michael is still working on this project. Since 2009, he is employed to the Netherlands Institute for Public Health and the Environment (RIVM).