

## Physician Payment Systems and Cost Control

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# Physician Payment Systems and Cost Control

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(met een samenvatting in het Nederlands)

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# Physician Payment Systems and Cost Control

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# 1. INTRODUCTION

## 1.1. Introduction

" The great equation in medical economics involves the control of expenditures (E) which equal price (P) times quantity (Q). All payers desire to control E by trimming P and constraining Q. "  
(Eastaugh, 1991, p. 56)

According to Reinhardt (1992, p. 31) there are two basic beliefs when it comes to controlling health care expenditures:

" Canadians and Europeans still appear to believe that the best way to control overall health spending is to (a) constrain the *physical* capacity of the health system, (b) control prices, and, for good measure, (c) impose something as close as possible to global monetary budgets on the entire system. [...] By contrast, the American proponents of *managed care and managed competition* believe -and the proper word is *believe*- that, by paying for everything that *is* beneficial, but denying payment for everything else, the nation can avoid setting an arbitrary global budget and will, in the end, devote the 'right' percentage of the GNP to health care. "

The difference between the Canadian-European and the American cost containment strategies might also be characterized as follows: the Canadian-European method consists roughly of interventions focusing directly on the macrolevel of health care expenditures, whereas the American approach consists of interventions focusing on changing the microlevel<sup>1</sup>, which in turn will have to result in different macro outcomes of the system. Reinhardt (1992) expects a convergence of both types of strategies in the near future. In fact, the convergence is visible already, given for example, that since 1991 general practitioners<sup>2</sup> (GPs) in the United Kingdom can become fundholders, managing a budget from which they can purchase specified services<sup>3</sup> for their patients. The GP fundholding scheme is very much inspired<sup>4</sup> by the American managed care concept (Weiner & Ferriss, 1990, Glennerster et al, 1992). At the same time, in the United States the use of expenditure targets<sup>5</sup> - in Reinhardt's words "something as close as possible to global monetary budgets" (1992, p. 31) - no longer seems to be anathema, considering the fact that Congress adopted targets for Medicare expenditures, called Medicare Volume Performance Standards (Ginsburg & Lee, 1991), following the recommendations of the Physician Payment Review Commission<sup>6</sup>. Hurst (1991) is convinced that the use of global budgets is very effective in controlling total health care expenditures on the macrolevel<sup>7</sup>, but that, at the same time, global budgets may interfere with efficiency on the microlevel. For example, the combination of

global budgets with salaries - according to Hurst (1991, p. 16) - gives perverse incentives to providers, encourages waiting lists and a take-it-or-leave-it attitude among providers towards minor illness. As to the effectiveness of interventions on the microlevel, both Groenewegen<sup>8</sup> (1992, p. 17) and Reinhardt fear that the managed care and managed competition concept will not lead to macroeconomic cost containment, mainly because consumers "are easily seduced into assuring themselves even of marginally useful high-tech care, even at ever mounting prices" (Reinhardt, 1992, p. 31).

Clearly, health care systems consist of all types of interdependent subsystems, in which no single change can be made without other parts or the system as a whole being affected. Changes on the macrolevel, such as a change in payment systems for providers, can have their consequences for decisions taken on the microlevel of individual providers in their contacts with individual patients, and vice versa. It is this relationship between the macrolevel and the microlevel in health care that forms the core of this study, the basic theme being: how should the provision of medical care be structured (institutionally) in order to obtain efficiency on the microlevel and cost control on the macrolevel?

## 1.2. Research questions

This question is of scientific interest, because it deals with the relationship between individual actions and collective phenomena. In studying this relationship, according to Wippler & Lindenberg (1987), two problems arise: the bridge problem, and the transformation problem. According to Wippler & Lindenberg, the bridge problem can be solved by using rational choice theory:

" Rational choice theory has basically three elements: wants, subjective probabilities, and alternatives. The bridge problem consists of formulating propositions about the influence of social conditions on these three elements and of formulating propositions under which conditions they are subject to individual initiative. For example, it can be argued that individuals have basic *wants* but that institutions and the social structure provide the 'production function' [...] for these wants. "  
(Wippler & Lindenberg, 1987, p. 145).

Which are these basic wants that individuals are supposed to have? According to Lindenberg (1990, p. 741-742):

" Taking the lead from Adam Smith, it was assumed that there are at least two ultimate goals: physical well-being and social approval. They are aspired by everybody, and therefore the means people have to reach these goals are of utmost importance to them [...]. "

However, people differ with regard to their resources for attaining (or 'producing') physical well-being and social approval. The means (which can also be described as elements in a so-called social production function<sup>9</sup>) people have to reach the two ultimate goals differ with social position and institutional arrangements (Lindenberg, 1990, Lindenberg, 1991).

Whereas it is thus possible to explain social behaviour, e.g. the professional behaviour of physicians under a particular payment system, this explanation does not cover the question of how individual social behaviour results in collective phenomena.

For example, knowing and being able to predict which decisions with regard to utilization of health care will be taken by individual physicians when they are paid a fee per item of service, will not help in predicting the collective effect of physicians' behaviour on health care expenditures. To that end one needs to know, for example, whether or not global budgets are in effect. This problem is referred to by Wippler & Lindenberg (1987) as the transformation problem. Background knowledge, among other things, is essential for solving the transformation problem<sup>10</sup>.

In a sense the bridge problem and the transformation problem are akin to a general problem that policy makers may encounter: how to get people to behave in a certain way, and how to reach the desired collective result without causing negative and unexpected side effects. From this point of view, political scientists are interested in the micro-macro problem. Lindblom (1977), for example, in his study on political-economic mechanisms, distinguishes between three types of social organization: social organization through authority, through persuasion, or through exchange and markets. The main problem with social organization through authority is described by Lindblom (1977, p. 66) as "a general problem of achieving rational choice and a special problem of achieving economic choice"<sup>11</sup>. According to Lindblom, the incentives of authority systems are often too crude, whereas in a market system

" [...] the consumer does not merely *know* his choices, he is *motivated* to choose rationally because he can obtain services and commodities only by surrendering money claims on other resources. "  
(Lindblom, 1977, p. 73-74)

Apart from being crude, incentives in authority systems can be conflicting. People can be instructed to do things that they do not want to do, and

" [...] the punishments of authority systems are sometimes more effective in teaching respondents how to escape them than in motivating them to do what they are authoritatively instructed to do [...]. "  
(Lindblom, 1977, p. 74)

Market systems, on the other hand, are not suited to solve every problem society is confronted with. Lindblom refers to the well-known list of market deficiencies, of which,

in the case of medical care, the information a-symmetry between provider and consumer is of particular importance<sup>12</sup>.

The third system described by Lindblom, apart from authority systems and market systems, are persuasion systems. In these types of social organization "not the gun but the word is the symbol of authority" (Lindblom, 1977, p. 52). Persuasion exists in both authority systems (e.g. in the form of political indoctrination) and market systems (e.g. in the form of advertising), but when it is the main tool for social control, Lindblom speaks of a "preceptorial" system<sup>13</sup>. Lindblom pictures the preceptorial system in a rather appalling way, using Chinese communism as an example. Persuasion in this type of system is aimed primarily at a transformation of personality, at creating the "new man". Basically, in preceptorial systems:

" 'Education' tries to create men who will 'autonomously' serve collective interests, that is, who will do on their own initiative what in other societies they must be commanded or induced to do. "

(Lindblom, 1977, p. 56)

Lindblom analyses the political-economic systems of the world. He is interested in "the fundamental questions about government and politics, about market systems, and about the relation between the two" (1977, p. ix). These types of questions are of course beyond the scope of this book, but Lindblom's characterizations of different types of social organization are rather universal and can be very useful, even when applied to the organization of health care. They have, for example, also been recognized in the theory of policy instruments, developed and described by Bressers & Klok (1987). Their theory of policy instruments aims at predicting the effectiveness of specific policy tools that can be used by policy makers in order to change individuals' behaviour. In this theory, Bressers & Klok distinguish between three types of (governmental) control: control by legal tools (commanding individuals), control by economic tools (inducing individuals), and control by moral tools (persuading or educating individuals). Using legal or economic tools, policy makers try to change social conditions, which, consequently, change people's social production functions upon which, in turn, their social behaviour rests. Using moral tools implies that one tries to change social production functions directly.

The basic question of this study - how should the provision of medical care be structured in order to obtain efficiency on the microlevel and cost control on the macrolevel - can now be rephrased into the following more detailed research question: How should social conditions in health care be shaped in order to ensure that

- (1) physicians' social production functions lead to efficiency on the microlevel, and
- (2) physicians' professional behaviour on the microlevel results in cost control on the macrolevel?

This question will be addressed with respect to the Dutch health care system in particular, but comparisons will also be drawn with other Western countries. The social

conditions to be studied are different payment systems for physicians and utilization review.

### 1.3. Contents of the book

In this book the study of the microlevel will predominantly take place by using data on the behaviour of Dutch GPs. In order to gain an insight into the institutional arrangements on the macrolevel that influence their behaviour on the microlevel, in *chapter 2* an outline will be given of Dutch health care; in particular as regards the insurance system, the position of physicians in the health care system, physician payment system and their relations with third-party payers and government. This chapter is also important considering the need for background knowledge with regard to solving the transformation problem, which was described as: how does individual social behaviour result in collective phenomena?

Both the bridge problem (how do institutional arrangements and social conditions affect people's wants, subjective probabilities and alternatives?) and the transformation problem shall be addressed in *chapter 3*. In that chapter, the relationship between the payment system used (fee-for-service, capitation, salary) and physicians' social production functions will be explored, as well as the relationship between peer review, audit and feedback (as elements of utilization review) and social production functions. Building on theories developed by Evans (1984) and subsequently by Flierman (1991), physicians will be modeled as incomplete professional agents<sup>14</sup>: it is assumed that physicians act in their patients' interest, but the greater the uncertainty about which health care is in a patient's interest given his health status, the more room physicians have to pursue their own goals without encountering ethical constraints. As far as the transformation problem is concerned, it is argued that from the point of view of society, the sum of all fees paid to physicians amounts to a certain proportion of the total health care expenditures; whereas, from the point of view of individual physicians, the sum of all fees paid to them amounts to the total gross revenue. The microlevel and the macrolevel, therefore, almost literally meet in negotiations between physicians and third-party payers. The institutional arrangements with regard to these negotiations in combination with the payment system used, largely determine how third-party payers can control health care expenditures, and how physicians can pursue an income.

The chapters 4 through 8 then, will be devoted to two features of physician payment systems: the unit of payment and the level of payment per unit. Both aspects are derived from Reinhardt (1985), who regards physician payment systems as consisting of three dimensions: 1) the base on which compensation is made (fee-for-service, capitation, salary), 2) the process by which the level of compensation per unit of that base is determined and, 3) the institutional framework through which money flows from patients to physicians. These three dimensions could be rephrased as: for doing what

is the physician being paid<sup>15</sup>, how much is he being paid (how is the level of fees determined), and who pays him (patient, health insurance organization or government). The third dimension, who pays the physician, will not be addressed separately in this book, but only and insofar as it affects physicians' decisions with regard to utilization of care.

In *chapter 4* the effects of different units of payment (fee-for-service, capitation or salary) on the quantity of services provided and/or costs of care, as well as reactions of physicians to changes in their level of income, will be analysed by means of a review of the literature. With regard to physicians' reactions to changes in the level of income, special attention will be paid to the theory of supplier-induced demand, which states - in short - that under fee-for-service payment a physician will try to maximize his income by performing unnecessary services and that he<sup>16</sup> is able to do so because of the information asymmetry between doctor and patient<sup>17</sup>.

Quite the opposite of supplier-induced demand is the assumption that GPs under capitation payment would be inclined to refer patients unnecessarily to medical specialists, because it is in their interest to minimize their amount of work. In *chapter 5* a large dataset on interventions in Dutch general practice<sup>18</sup> will be used for analyzing how much room Dutch GPs actually have to generate unnecessary referrals. Much along the same lines followed by Flierman (1991) in assessing the diagnosis-determinedness of specific services - i.e. the extent to which a particular procedure is determined by a patient's health status - professional uncertainty with regard to referrals will be analyzed. The more a referral is determined by a patient's health status, the less discretion there is left for GPs to either refer a patient or not. If referrals are determined fully or to a large extent by patients' health status, the payment system cannot, or only to a limited degree, be of any influence on GP referral rates. In *chapter 6*, the effects of 1) the introduction of fee-for-service, compared with 2) the use of peer review, audit and feedback on GP referral rates to medical specialists are assessed in a secondary analysis of data from two regional Dutch experiments.

Chapters 5 and 6 thus deal with the microlevel of individual physicians who take decisions with regard to individual patients. Chapters 7 and 8, in contrast, deal with the transformation problem, and in these chapters not individual physicians, but OECD-countries are the unit of analysis. In *chapter 7* the focus will be on negotiations between physicians and third-party payers. Attention will be paid to different methods that were and are still being used in several OECD-countries to calculate physician fees, as well as to the effect of different methods of cost control on the macrolevel. Four ways of determining the level of physician fees are distinguished: market forces (fees are subject to supply and demand), negotiations directly on the level of fees, the use of expenditure targets or caps (in which case fees are determined so as to reach budgetary goals), and the use of target incomes (in which case fees are determined so as to reach a certain level of income per physician). In *chapter 7* it will be argued that a fee-for-service payment system for physicians that is not combined with global



monetary budgets or the use of target incomes, offers little or no opportunity for cost control on the macrolevel. The health care sector is sometimes compared to a balloon, in which squeezing down the level of fees may result in an increased quantity of services provided. In that case, cost control is hampered by physician behaviour which is aimed at earning an acceptable income rather than at containing health care costs. The relationship between the four methods of determining fees and physicians' revenues will be explored in *chapter 8*. In this chapter a number of OECD-countries will be compared with regard to the development of the GPs' revenues over time and the social conditions contributing to this development. Finally, in *chapter 9* the findings in the different chapters will be related to the basic theme of the study: how should the provision of medical care be structured (institutionally) in order to obtain efficiency on the microlevel and cost control on the macrolevel?

## Notes

1. Focusing on the "microlevel" in health care, implies that one pays attention to decisions taken by individual consumers e.g. with regard to health insurance, and decisions taken by individual providers in their contacts with individual patients e.g. with regard to utilization of health care. In contrast, the notion "macrolevel" refers to the aggregated result - in terms of e.g. health care expenditures or total use of provisions - of all these individual decisions (on the level of a whole country or large regions within a country).
2. That is, as far as they are in group practices with a list size of over 9,000 patients (for practices that have applied in 1991 and 1992) or over 7,000 patients (for practices that have applied for the third batch in 1993).
3. Crump et al (1991, p. 1582) distinguish four main types of expenditures that are covered by the budget: staff employed by the practice, drugs prescribed, outpatient care (including medical specialists' consultations and paramedical treatment), and inpatient care for a specific list of elective surgical procedures.
4. As Weiner & Ferriss (1990, p. 5) put it: "The budget holding scheme is uniquely British. However, educated observers have noted that many components of the plan were crafted with an eye directed across the Atlantic. Most aspects of the scheme, now only contemplated in the UK, have functioned for years in American health maintenance organisations (HMOs)."
5. "Expenditure targets are designed to stimulate collective efforts on the part of the medical community to contain costs. The stimulus is a formula by which annual updates in fees depend on a comparison between the rate of growth of expenditures and a target rate of increase." Ginsburg & Lee, 1991, p. 88.
6. The Physician Payment Review Commission (PPRC) was created by law in 1986 to advise the U.S. government on the Reform of physician payment under Medicare. The PPRC had noticed that, during the period in which the federal government had tried to moderate the growth of Medicare expenditures by constraining fee levels, physicians' services per beneficiary had increased substantially. Gabel & Rice (1985, p. 595) eloquently referred to this phenomenon as "the price of paying less". In 1985 already, they noted that "[...] freezing or reducing payment levels is not effective in controlling program expenditures, because physicians responded by increasing the quantity and complexity of services provided". In order to control the volume of services together with the price of services, the PPRC recommended a national expenditure target for physicians' services that "[...] would be set to reflect inflation and increases in practice costs, growth in the number of enrollees, and a decision on the appropriate rate of increase in service volume per enrollee. If expenditures exceeded the target for a given year, the allowed fees for the following year would be appropriately reduced; if expenditures were below the target fees, the fees would be adjusted upward the next year." (Iglehart, 1989, p. 1159)
7. Hurst (1991) examined health care reforms in Ireland, the United Kingdom, Spain, France, Germany, Belgium and the Netherlands. With regard to the effectiveness of cost containment in these countries he concludes: "All seven countries in this study experienced considerable success with cost containment during the 1980s, compared with the 1970s [...]. Extra cost sharing imposed on patients within public schemes [...] played a minor role in containing costs. Two factors contributed more substantively: partial or complete capping of third-party payments to providers, and determined government policies to use such mechanisms to contain costs." (1991, p. 17).
8. Groenewegen (1992, p. 17) states that consumers cannot assess the cost-effectiveness of medical care. Believing that the more care they receive the better, they will choose an insurance scheme that offers a broad range of benefits. Groenewegen's expectation is, therefore, that managed competition will eventually lead to an upward shift in the provision of services.

9. A social production function reflects the maximum of social goods (such as physical well-being and social approval) that can be produced given the production means.
10. The transformation of individual actions into collective phenomena is not governed by rational choice. Therefore, Wippler & Lindenberg argue that background knowledge on rules, procedures and other relevant institutional conditions play an important role in solving the transformation problem. "To specify constellations of social conditions under which certain actions do or do not result in a particular collective effect is required for the completeness of deductive arguments in sociological analyses" (Wippler & Lindenberg, 1987, p. 147).
11. The problem of economic choice in an authority system follows from the impossibility to express the factors that have to be weighed in a decision quantitatively, using a common denominator (prices) for comparison with each other. In the absence of price as an aid to rational choice, ranking priorities, allocating resources and controlling enterprises is extremely difficult (Lindblom, 1977, p. 68-73).
12. The other market deficiencies are: uncounted costs and benefits, costly transactions, the problem of monopolies, and public goods.
13. From the word "preceptor", which means teacher (Lindblom, 1977, p. 54).
14. The incomplete professional agency relation refers to the doctor-patient relation. As a complete professional agent, the doctor would be expected to act only and fully in the best interest of his patient. The agency relation is, however, incomplete, because physicians cannot know for certain what health care is in their patients' best interest, given their health status.
15. In the case of fee-for-service payment, the physician is paid for every specific procedure he carries out. Under capitation payment, he is paid for the contractual obligation to provide medical care for a specific patient who is enlisted with him for a certain period of time. Salary implies that payment takes place according to the number of hours a physician has worked.
16. In this book, physicians will be referred to as males, since the majority of physicians are still males and the use of "he" and "his" is more readable than the consequent use of "he/she" and "his/her".
17. In many cases patients lack the ability to assess the type of medical care and the actual amount of care they need. This implies that they will have to rely on the decisions their doctor takes for them, or the advice he gives them in his capacity as their (incomplete) professional agent.
18. The Dutch National Study on morbidity and interventions in general practice (Bensing et al, 1991), which was carried out from April 1987 through March 1988 in a randomly stratified sample of 161 Dutch GPs.

## **2. FINANCING HEALTH CARE AND HEALTH CARE POLICY IN THE NETHERLANDS**

### **2.1. Introduction**

In this chapter attention will be paid to Dutch health care and health policy. The purpose of this chapter is to provide information about the institutional arrangements that affect the behaviour of Dutch GPs on the microlevel. This background information is also useful for solving the "transformation" problem as far as Dutch health care is concerned. According to Wippler & Lindenberg (1987, p. 147), background knowledge on rules, procedures and other relevant institutional conditions play an important role in explaining the transformation of individual actions into collective phenomena. In the following sections, therefore, the insurance system and physician payment systems will be described (section 2.2.), as well as the history of health care policy in the Netherlands (section 2.3.).

### **2.2. Financing health care in the Netherlands and physician payment systems**

In 1991 8.3% of Gross Domestic Product (GDP) was spent on health care, 73.1% of which can be classified as "public spending"<sup>1</sup>. This leaves the Netherlands somewhere in the middle range of OECD-countries: for example, as a percentage of GDP it spends more on health care than Belgium, Denmark and the United Kingdom, exactly as much as Germany, but less than Sweden, France, Canada and the United States. The public spendings percentage is low compared with Sweden, Denmark, Belgium and the United Kingdom, about as high as in Germany, France and Canada, and considerably higher than in the United States.

As far as public health care expenditures are concerned, funds are raised by means of two major insurance schemes:

- 1) A public health insurance scheme (established in 1941 by the German occupiers and based on the Bismarckian system), which covers 61% of the population (employees and their dependents, people living off welfare, pensioners, and other groups earning an income below a certain level<sup>2</sup>) and offers a broad range of benefits<sup>3</sup>.
- 2) A national insurance scheme (introduced by law in 1968) which initially covered "catastrophic illness" (providing such benefits as longterm care), but gradually expanded to cover more common - that is, less "catastrophic" - types of care (e.g.

mental health care, community nursing; and since 1991 the scheme also covers prescription medicines<sup>4</sup>).

In both cases funds are raised largely by means of income-related premiums which are deposited in a national fund, from which they are distributed among some thirty sickness funds<sup>5</sup> and private health insurance companies to cover, for example, expenses for prescription medicines that fall under the national insurance scheme.

Private health insurance still plays an important role in the Dutch system. About 39% of the population, earning an income above the critical limit for public insurance, is privately insured. They pay insurance premiums that are not related to income but to perceived risk (as indicated by factors such as age, sex and medical history). Differences between public and private insurance include more than the types of premiums to be paid. As far as private insurance is concerned, financing of care is based on - what Hurst calls - the reimbursement model (1992, p. 10), characterized by consumers being free to see any doctor of their choice<sup>6</sup> and indirect payment (the patient pays the physician and is then reimbursed). Physicians, general practitioners (GPs) as well as medical specialists, are paid on a fee-for-service basis. As far as public insurance is concerned, the Dutch health care system is characterized by a limited access to hospital and specialist care, with the GP serving as a gatekeeper. Patients receive medical care in kind and are obliged to be on the list of a GP of their choice, who is paid a capitation fee for every patient on his list. Until recently, sickness funds were obliged to contract with any qualified provider applying. Medical specialists are paid on a fee-for-service basis for publicly insured patients, much the same way as they are for privately insured patients.

In the Netherlands fees are negotiated between providers and insurers, after which the outcome has to be officially approved by a central body on tariffs in health care (COTG). The existence of the central body is based on a law on tariffs in health care<sup>7,8</sup> enacted in 1982. The central body on tariffs in health care is of a corporate nature. Its members are representatives of government, trade unions, employers organizations, health care providers and health insurers<sup>9</sup>. The law on tariffs in health care (WTG) assigns the following tasks to the central body:

- to create guidelines for the assessment of tariffs;
- to advise on tariffs, and
- to approve and thereby validate (or disapprove and thereby invalidate) tariffs set in negotiations.

Physician fees are based on an income policy as far as GPs are concerned and on expenditure targets as far as medical specialists are concerned. The implementation of income policy for self-employed physicians has been described by Baayens (1988). She outlines the history of income policy for self-employed professionals in general and GPs and medical specialists (among other professions) in particular. Before 1981 there was no law enabling the Dutch government to conduct an income policy towards self-employed physicians, although GP fees had been based on a 'normative' or 'target'

income since 1966, after a long and harsh conflict between GPs and sickness funds about the level of capitation fees (IJsbrandy, 1979, p. 129-152). In 1980, the government tried to apply a general law on prices to modify medical specialists' fees. In reaction to this decision, specialists filed a law suit against the government, which they won in November 1980. In July 1981, however, a temporary law on income policy for self-employed professionals<sup>10</sup> was enacted, providing a legal basis for income policy (Baaijens, 1988, p. 37-74). In theory, the temporary law affected both GPs and medical specialists, but Baaijens (1988, p. 89-107) describes how, in the period between 1981 and 1985, medical specialists managed to postpone the imposition of any true fee controls based on an income policy, whereas GPs were brought under legal fee control almost immediately. GP fees (capitation fees as well as fees for services) are calculated in such a way that roughly speaking the average GP - that is, a GP with a normative list size<sup>11</sup> - is able to earn the normative income<sup>12</sup>.

The technique of calculating fees based on a normative income is described in detail by Heesters (1983) and Baaijens (1988, p. 59). The general idea is to determine both a normative income (N) and the quantity of care delivered (Q). In principle, the level of fees is then determined by dividing N by Q. In the case of Dutch general practitioners, quantity of care (Q) consists partly of the number of publicly insured patients (for whom GPs receive a capitation fee) and partly of the number of services<sup>13</sup> provided for privately insured. This number of services provided for privately insured patients is quite difficult to determine<sup>14</sup>, and negotiations on the figure to be used for calculating fees have not always been peaceful<sup>15</sup> (Groenewegen et al, 1991, p. 96). The number of publicly insured people is, of course, relatively easy to establish. An interesting feature of the Dutch capitation fee for GPs is that GPs receive full compensation, formally covering practice expenses as well, for the first 1,600 patients on their list only. For every patient over and above this number practice expenses are no longer reimbursed, so for every patient beyond the 1,600th GPs receive a reduced tariff. With respect to the formal reason for differentiating the capitation fee according to list size, the Dutch system is different from the British system of "loadings"<sup>16</sup> that used to be in effect before 1966. The result, however, is the same: it discourages individual GPs to expand their list size beyond what is considered an appropriate level.

Recently the law on income policy for self-employed professionals has been repealed. The target income for GPs was fixed on the 1987 level and is upgraded annually to account for inflation. Formally, fees can also be adjusted by the Ministry of Health if expenditures for general medical care exceed the targets set by government, but in practice this situation has not yet occurred (De Bakker, 1993, p. 6).

Medical specialists, as mentioned earlier, managed to avoid the income policy that government so effectively inflicted<sup>17</sup> upon GPs. Baaijens (1988, p. 92) gives four possible explanations for this difference: firstly, GPs had already accepted the idea of an income policy before the 1981 temporary law (TWN) was enacted. Secondly, since

GPs are partly paid by capitation (as far as publicly insured patients are concerned) they profit from a guaranteed level of income, whereas specialists (paid on a fee-for-service basis) can raise the level of their income by increasing production in the absence of an income policy. Thirdly, due to the existence of many different medical specialties, an income policy for specialists is technically difficult to devise. Finally, since 1974 health policy in the Netherlands had been aimed at strengthening primary care, which may have caused GPs to behave cooperatively towards government. The bargaining position of specialists was fundamentally different from the position of GPs. Among other things, the government needed the specialists to be cooperative in order to introduce global budgets for hospitals in 1983<sup>18</sup> (Baaijens, 1988, p. 92). Specialists consented to the budget system in the so-called 'general agreement', signed by hospitals, specialists<sup>19</sup> and government. The general agreement lasted till 1986, when sickness funds called for incorporation of medical specialists' incomes in the budget system for hospitals; an idea that was also included in proposals (that will be discussed in more detail in the next section) launched by an advisory committee in 1987 (Commissie Structuur en Financiering Gezondheidszorg, 1987, p. 75). Specialists reacted by denouncing the general agreement, and went on strike<sup>20</sup> for nine days in 1987.

The conflicting parties did not enter negotiations until 1989, when (under heavy governmental pressure) the Dutch association of medical specialists (LSV) agreed<sup>21</sup> to freeze expenditures for their services on the 1989 level for the next three years. They agreed that if in a particular year the target would be exceeded, the loss would be compensated by a reduction of the fees in the next year. In 1990 - the first year - specialists exceeded the target by almost a hundred million guilders, half of which could be regained by a fee reduction in 1991. In 1991 and 1992, specialists exceeded their target even more, resulting in other fee reductions and conflicts between specialists and the department of health.

### **2.3. History of Dutch health care policy**

With the outline of income policy for physicians, some aspects of Dutch health care policy have already been highlighted. In this section, an overview will be given of health care policy in the Netherlands since 1974. The year 1974 is chosen because in that year a White Paper on the structure of health care (the Memorandum on the Structure of Health Care) was published, which constituted one of the first attempts of Dutch government to play an important role in structuring the development of the health care system<sup>22</sup>. Action had become necessary due to the explosive development of health care expenditures that had taken place - as in other Western countries - roughly between 1965 and 1975<sup>23</sup>. The White Paper published in 1974 advocated government planning as an effective means of structuring the health care system and it influenced Dutch health policy for the decade to follow. In 1987, a total shift in policy occurred

when an advisory committee proposed the introduction of competition and market forces in health care.

### **Government planning**

The Memorandum on the Structure of Health Care called for the establishment of a hierarchical system of three horizontal layers: tertiary health care (nursing homes and specialized hospitals), secondary care (general hospitals and specialist care), and primary care (general practitioners, community nursing and other disciplines). The purpose was to increase coherence and cooperation within each of these three layers. Furthermore, in order to reduce health care costs, the balance was to be shifted away from hospital and specialist care towards primary care. Higher hierarchical levels should only be accessible after a referral at a lower level. In line with these aims two policy goals were proposed: regionalization and decentralization on the one hand, and increasing horizontal coherence and strengthening primary care on the other hand.

Regionalization and decentralization were to result primarily in integration of the planning and financing health care, as this was considered to be a necessary condition for cost containment. A legal system was outlined with regard to health care tariffs, health care planning and health insurance. For political reasons the health insurance part (consisting of proposals for a compulsory, tax-based health insurance that was to cover the whole population) was not realized at the time. In 1982 the legal system on tariffs was described in the law on tariffs in health care (WTG<sup>24</sup>) mentioned in section 2.2. In the same year a law on facilities in health care (WVG<sup>25</sup>) was passed by parliament. The latter, however, has never been fully implemented. The law was designed as a framework, with different parts of it to be designed and implemented later. The only part that was actually implemented (in 1985) was a system of permits regarding the establishment of new general practices<sup>26</sup> (Groenewegen, 1991).

Apart from regionalization and decentralization, an increase in horizontal coherence within the three layers of health care and a strong primary care circuit were advocated during the planning phase of Dutch health policy, which was to result in substitution of primary care for hospital care and in substitution of self care for professional care as the ultimate goal. The need for substitution was stressed for two reasons. First of all, substitution of care can result in lower health care costs, because primary care is usually cheaper than hospital and specialist care. Secondly, from a more ideological point of view, substitution enables people to stay in their familiar surroundings as long as possible, thus avoiding unnecessary dependence on health care provisions.

In order to facilitate substitution, the capacity of primary care (in terms of manpower as well as in terms of knowledge and skills) was increased. This was accompanied by a reduction of the (bed) capacity of hospitals. A specific feature of strengthening primary care capacity was the stimulation of multidisciplinary cooperation within the primary care sector, focussing particularly on the (financial) stimulation of integrated community health centres.



In general, the planning system devised in the law on health care facilities was extremely complicated and detailed. In three regions experiments took place with respect to the implementation of integral planning of health care facilities. In evaluating these experiments a number of practical and tactical problems were detected<sup>27</sup>. Moreover, the clear-cut division into primary and secondary care, one of the major pillars of the health policy based on the 1974 Memorandum, appeared to cause problems in the field of continuity of care. This became particularly clear in the care for the chronically ill and in the field of hospital discharges. The average length of hospital stay had decreased over the years and a shift had taken place towards day surgery and short-stay surgery. Patients who are discharged from hospital quite often need some type of continued care<sup>28</sup>. The strict division into primary and hospital care hampers a smooth 'handing over' of discharged patients needing continued care to the responsible primary care providers, such as GPs and community nurses. Finally, an ageing population and a tendency towards smaller living units had caused an upward shift in demand. This, combined with a shortage in nursing home capacity and homes for the elderly, led to an increased need for professional home care to be provided by primary care.

### **Market forces**

As the problems just mentioned became more and more visible, the climate for change was favourable (Lapr , 1988, p. 31). A new approach in health care policy was outlined in proposals made by a committee that was to advise government on the future structure and financing of health care. The committee is commonly referred to as the Dekker Committee, after its chairman W. Dekker. Its proposals for change are subsequently called the 'Dekker Plan'. Apart from the plan to incorporate specialists' incomes in the hospital budget, the Dekker plan consisted of the following proposals (Lapr , 1988):

- Introduction of a basic insurance scheme, covering the whole population, with benefits determined by law, in addition to which people can take out supplementary insurance on a voluntary basis.
- Strengthening of market forces in the health care and social services system, at the demand side as well as at the supply side, and at the same time, a reduction in the degree of government regulation of the system.
- Termination of the public health insurers (sickness funds) being obliged to contract with any qualified care provider applying.
- Continuous stimulation of substitution of ambulatory for clinical care.
- Assuring quality of care by implementing standards and ensuring compliance with these standards, for example by obliging insurers to take quality of care into account when entering contracts with providers.

The idea was to let "the invisible hand"<sup>29</sup> create an optimal situation: compulsory national health insurance should, according to the Committee, cover roughly 85% of all

insurance benefits. This basic part of the insurance scheme would have to be financed through taxation. The individual citizen, however, would be free to take out additional health insurance for the remaining 15% of the benefits, for which insurance premiums should have to be determined by market forces. Competition among health insurers would lead them to offer low-cost additional insurance policies. In order to do so, insurers would have to be cost conscious when entering into contracts with health care providers. Thus, competition among insurers would engender both competition among providers and cost-efficiency.

Although the Committee's report (Commissie Structuur en Financiering Gezondheidszorg, 1987), the title of which can be translated as "Willingness to Change", announced a complete turn of direction in health care policy, according to Lapré (1988, p. 30-31) this change was not fully unexpected in governmental spheres:

" It can be concluded that when the government set up the Committee on the Structure and Financing of the Health Care System, selected those who would sit on the committee and formulated its terms of reference, it was making important tactical moves that would have far-reaching consequences. [...] Thus the direction proposed in their advice did not come as a surprise. [...] due to the nature of the committee's composition and its terms of reference the options for change in a certain direction were actually formulated on paper. "

It is hardly surprising therefore, that the major outlines of the Dekker Plan were adopted by government and laid down in a government paper, titled 'Change Assured'<sup>30</sup> (Ministerie van Welzijn, Volksgezondheid en Cultuur, 1988). In principle, decisions have been taken for a gradual reform of the current public and private insurance into a national health insurance. As a first step in 1991, the provision of prescription drugs<sup>31</sup> was transferred to the national health insurance scheme<sup>32</sup>, and, allowing for the introduction of more market elements, sickness funds are no longer obliged to contract with any qualified provider who applies, and they are now also allowed to work outside their traditional working areas (in which they used to have monopolies) (Groenewegen, 1992). Many of the details of the reform, however, are still to be worked out. Moreover, further introduction of the planned changes has been postponed in 1993. Recent proposals for change in Dutch health care, that have been made by the Sickness Fund Council and by yet another advisory committee, the Dunning Committee (also named after its chairman), move more in the direction of what Reinhardt (1992) called the American approach to cost containment: paying for everything that is beneficial (and stimulates appropriate care) and denying payment for everything else; in other words, limiting the benefits package in public insurance (Commissie Keuzen in de Zorg, 1991, Ziekenfondsraad, 1993).

## Payment of physicians

With the Dekker proposals the issue of physician payment systems in the Netherlands suddenly regained relevance. Government plans to merge public and private insurance into one national health insurance raised the question, especially for GPs, of which system to choose for physician remuneration: public capitation payment, private fee-for-service payment or a combination of the two? Before the Dekker proposals, however, the dual payment system for GPs had already been arousing feelings of discontent among the GPs themselves and among policy makers.

Firstly, for GPs, the fact that they are reimbursed in two different ways for publicly and privately insured, causes administrative complexity. Secondly, from a GP's point of view, the way capitation payment is applied in the Netherlands can be a slightly unfair method of payment in that it does not account for differences in workload. Unlike the British differential capitation fees, for example, capitation fees are neither adjusted for the age distribution of the practice population, nor for differences in sex distribution. Thirdly, for policy makers the main problem with the payment system lies in the financial incentives of capitation payment. Capitation payment is generally thought to provide physicians with a financial interest in a low production and, in avoidance of sheer neglect of patients' needs, a high referral rate (Glaser, 1970, p. 139). Medical specialists, in turn, are paid on a fee-for-service basis, providing them with an interest in performing services (Glaser, 1970, p. 255). It is especially this combination of capitation paid gatekeepers and fee-for-service remunerated medical specialists, who generally deliver far more expensive care than GPs do, that is thought to hamper efficiency and cost control in Dutch health care.

In the late eighties, therefore, the introduction of a mixed system of capitation payment and fee-for-service for GPs was seriously contemplated, assuming that if GPs could be induced to provide more services themselves, they would have to refer fewer patients to medical specialists. As a result the Dutch GP association (LHV) and the association of sickness funds (VNZ) agreed, in 1990, in principle on the introduction of fees for a set of seventeen services, to be paid on top of the capitation fee. This agreement was never implemented, although it did spark off an experiment with the GP payment system that shall be described in chapter 6. In 1993 the Dutch GP association suggested to reform the GP payment system by introducing a mixed system of capitation and fee-for-service (mainly fees per session) in a ratio of 60-40% of GP income. A committee, commonly referred to as the Biesheuvel Committee (again: after its chairman), that was to advise the secretary of state for health care, however, recommended a capitation fee for GPs that is differentiated according to patient's age (younger than 65, 65-74, and 75 and older) (Commissie Moderniserend Curatieve Zorg, 1994). With regard to specialists, the Biesheuvel Committee proposed to change their fee-for-service payment into a salary, to be financed out of the hospital budget.

## 2.4. Conclusion

The purpose of this chapter was to provide information on the institutional arrangements influencing the behaviour of Dutch GPs on the microlevel. Background knowledge was also considered essential for solving the transformation problem, that was described as: how does individual social behaviour result in collective phenomena?

Essential in the Dutch health care system is that - for the publicly insured - GPs act as gatekeepers to higher specialized care, which is provided by medical specialists. Medical specialists are, in general, self-employed practitioners working in hospitals, who are paid on a fee-for-service basis. For reasons of cost containment Dutch health care policy has since the mid-1970s been aimed at substituting care provided by GPs for specialist and hospital care.

It has been recognised that both the GP payment system and the specialist payment system is not fully compatible with that policy goal. Therefore, many proposals have been made throughout the 1980s and early 1990s for a change of both the GPs' capitation payment and the specialists' fee-for-service payment. The Dutch GP association (LHV) is in favour of a mixed system of capitation and fee-for-service for GPs. The latest proposals made by the Biesheuvel Committee, however, call for an age-differentiated capitation payment for GPs. Apart from that, a number of committees in the past decade proposed to incorporate specialists' revenues in hospital budgets. Until today this has met with fierce opposition from the largest association of medical specialists (LSV). Therefore, none of the proposals made have as yet resulted in actual changes in the physician payment systems.

## Notes

1. Expenditures in 1991:

	Total health care expenditures as % of GDP	Public health care expenditures as % of GDP	Public health care exp. as % of tot. exp.	Health care expenditures per capita (PPP\$)*
United Kingdom	6.6	5.5	83.3	1035
Denmark	6.5	5.3	81.5	1151
Belgium	7.9	7.0	88.9	1377
The Netherlands	8.3	6.1	73.1	1360
Germany	8.5	6.1	71.8	1659
Sweden	8.6	6.7	78.0	1443
France	9.1	6.7	73.9	1650
Canada	10.0	7.2	72.2	1915
United States	13.4	5.9	43.8	2867

\* PPP\$ = purchasing power parities in US dollars, current prices

Source: OECD Health Data 1993

2. In 1993 the critical level was an annual income of 56,650 Dutch guilders.
3. E.g. ambulatory medical care, provided by GPs and medical specialists in the outpatient department of the hospital (after referral by the GP), all types of inpatient care (not exceeding a period of one year), paramedical care such as physiotherapy (after referral by the GP), obstetrical and maternity care.
4. There are plans to gradually expand this national insurance scheme to come to a national health insurance that covers 100 percent of the population and offers a broad range of benefits. In fact, the expansion of the scheme with prescription medicines has been the first step on the way to national health insurance. In section 2.3. more attention will be paid to the proposed changes that have as yet not been implemented.
5. Due to proposed changes towards managed competition among providers and health insurers (to be discussed in section 2.4.) a large number of sickness funds have merged in anticipation. In 1985, there were 53 sickness funds. By December 1991 this number had decreased to 31 and it is still gradually decreasing (Groenewegen, 1992, p. 37).
6. Most private health insurance companies officially require that patients have been referred by a general practitioner when consulting a medical specialist. In practice, however, they vary greatly in the extent to which they adhere to this official requirement (Stokx et al, 1992b, p. 57).
7. Hospital tariffs have been subject to control since 1939. Until 1965 this control was exerted by the minister of Economic Affairs and was based on a general law on price control (Van der Poel, 1987). In 1962 a central body on hospital tariffs was installed (COZ - Centraal Orgaan Ziekenhuistarieven), composed of representatives of hospitals and health insurers, that gained the authority in 1965 to approve tariffs set in negotiations. Only tariffs approved by the central body could be reimbursed. The procedure, of course, only applied to hospital tariffs.
8. The 1982 law applies to all tariffs, and its purpose is to control maximum tariffs.
9. This type of structure is typical of Dutch social security. De Swaan (1988, p. 210-216) describes how, since 1901, Protestant and Catholic political parties have occupied a pivotal position in Dutch parliament and government. "In order to maintain this pivotal position and keep their

heterogeneous electorate together, Christian politicians from the beginning sought a tripartite, consensual basis for a cautious social policy. To them, social security was in the first place an instrument to build corporatist structures in which workers and employers would work together, guided by the tenets of denominational inspiration and organization." (De Swaan, 1988, p. 211).

10. "Tijdelijke Wet Normering inkomens vrije beroepsbeoefenaren" (TWN)
11. In negotiations between the Dutch association of general practitioners (LHV) and third-party payers agreed on the normative list size that would be used in order to calculate fees. The conflict in 1966, leading to the introduction of target incomes, was settled by an agreement on an intended gross revenue of DFL 81,617 based on a normative list size of 2,600 patients (Jsbrandy, 1979). During the 1980s this desired normative list size has decreased three times: from 2600 patients to 2500 in 1983, from 2500 patients to 2400 in 1985, and to 2350 patients in 1986 (Baaijens 1988, De Hoog, 1988).
12. The normative income was set so that GPs' earnings were comparable to those of senior civil servants (Heesters, 1983).
13. Mainly consultations, see note 8.
14. The number of services provided for privately insured patients differs with the source of information used. For example, in 1987 privately insured patients had 3.2 contacts with their GPs per year according to the results of a survey of a representative sample of the Dutch population (CBS, 1988, p. 89). According to a registration by 161 Dutch GPs in the National Study on Morbidity and Interventions in General Practice (Groenewegen et al, 1992) privately insured patients contacted their general practice (the GP himself or the practice assistant) 3.7 times a year. The latter figure includes telephone contacts, which are not included in the figure of 3.2 mentioned above. However, if we correct for the number of contacts by telephone (constituting about half of all the contacts with the practice assistant and about 4% of all the contacts with the GP himself) the number of contacts would be close to 3. All in all, the differences are not very large when looking at individual privately insured patients. But when these differences are aggregated to the level of a whole practice in which, on average, about 900 privately insured are enlisted a difference of 0.5 contacts per patient per year adds up to 450 contacts a year. On a total of 2880 (900 times 3.2) or 3330 (900 times 3.7) contacts a year, this makes a substantial difference.
15. In 1986 there was a conflict between the Dutch association of general practitioners (LHV) and the government about the number of services performed for privately insured patients (De Hoog, 1988, p. 217).
16. Since 1966 the British capitation fee has been differentiated according to patients' age (under 65, 65-74 and over 75) (Fleming, 1988). Previously, the capitation fee was differentiated according to the number of patients on a doctor's list (in order to stimulate list sizes that were considered to be acceptable). So-called loadings were paid in addition to the regular capitation fee for each patient from the 501st to the 1700th for a doctor in a partnership and from the 401st to the 1600th for a single-handed GP (Hogarth, 1963, p. 48).
17. That is, if we assume with Wilsford (1991) that physicians - as if by nature - prefer a situation in which they have freedom to set their own fees to a situation in which "[g]overnments and insurers everywhere pursue reforms that restructure and redesign the supply side of the health care system. These reforms eventually curb clinical autonomy and contain physicians' income in every advanced, industrial democracy. Well-organized groups of providers (physicians) may delay reforms in some countries [...] [b]ut in no country will physicians avoid these reforms forever because the huge costs underlying the fiscal imperative in health care will eventually override even the most aggressive professional arguments." (Wilsford, 1991, p. 4)
18. Before 1983, hospital payment was based on a price per item of production (inpatient days and special services). The global budgets that were introduced in 1983 were based on hospital expenditures in the previous year. However, in 1984-1985 a new budget formula was introduced. The new formula distinguishes between fixed costs (related to the number of beds and specialties)

and variable costs (related to the level of production). Fixed costs are still based on historical data (Rutten & Freens, 1986, p. 316-317).

19. Medical specialists are generally self-employed. They have their practice in hospitals and their fees are not covered by the hospital budget. However, by using hospital facilities they generate costs that do have to be paid out of the budget. For this reason, specialists are a vital party, whose cooperation was needed for successfully introducing the system.
20. Treating emergency cases only, as they would do on Sundays and holidays.
21. In negotiations with the organizations of hospitals and health insurers.
22. Before 1974, government deliberately chose not to become involved in the development of the health care system (De Roo, 1988, p. 218). Instead, it left the provision of health care entirely to community-based initiative. As a result, by 1970 an inextricable network had developed of semi-private local and regional organizations of Catholic, Protestant and neutral denominations. Like the provision of care, the financing of health care has long done without political attention in the Netherlands. In the first half of this century various governments tried to establish a health insurance scheme for employees by law. Laws were proposed in 1904 and 1910, but were never passed. Conflicts arose on issues of physicians remuneration, the income ceiling for compulsory health insurance and free choice of doctors. Health insurance, much like health care provision, thus continued to be the domain of community-based initiative. Between the World Wars this caused endless debate and friction between physicians and sickness funds: workers organized health insurance in so-called sickness funds. These organizations would then employ physicians to provide medical care for the enrolled, much to the dissatisfaction of physicians' associations, which favoured self-employment of doctors. As a result physicians established their own sickness funds in which people could enroll. Despite the establishment in 1925 of a committee in which all parties involved (such as physicians and trade unions) were represented, the quarreling continued until 1941, when the German occupiers imposed a Bismarckian system of national health insurance as a part of their programme of "Gleichschaltung" within the Reich (Janssen, 1987, pp. 133). This system in its basic form has existed until today, with an obligatory public insurance for people earning an income below the sickness fund ceiling and voluntary private insurance for the remaining part of the population.
23. Health care expenditures as a percentage of GDP rose from 4.4% in 1965 to 6% in 1970 and 7.6% in 1975 (OECD Health Data).
24. Wet Tarieven Gezondheidszorg.
25. Wet Voorzieningen Gezondheidszorg.
26. GPs who wanted to establish in general practice needed a permit from municipal authorities, who based their decision on the GP to population ratio in the municipality and the spatial distribution of practices. The decree has been in effect until 1991.
27. De Bakker (1989) and Groenewegen (1991a) mention some of these problems. Firstly, it appeared to be difficult to operationalize loose goals, such as 'planning facilities while taking into account the needs of the population'. Furthermore, planning procedures were rather complicated and problems arose about the division of tasks and responsibilities between municipalities (responsible for primary care provisions) and provincial authorities (responsible for hospital and specialist care). Moreover, local authorities lacked experience in health care planning. Apart from that, there was opposition within the field of health care against the planning procedures. And lastly, planning of health care and financing care continued to be separated: planning falling under the jurisdiction of local and provincial authorities and financing being in the hands of public and private health insurers.
28. Kersten et al (1989) estimated the number of patients needing continued professional care after hospital discharge at nearly 10% of all discharges. Kerkstra et al (1990) found that over 50% of

hospital patients need some kind of home care after discharge. About 25% of discharged patients actually receive professional aftercare.

29. Taken from Adam Smith (The Wealth of Nations, 1776). Of course, because of market deficiencies, health care will always require substantial regulation in order to prevent "the invisible hand" from creating adverse effects in the field of equity and accessibility.
30. The title is a reaction, of course, on the title 'Willingness to Change'. However, it cannot be properly translated, because in Dutch there is one verb which means both 'to assure' and 'to insure', therefore the title refers to the Dekker report as well as to changes in the insurance system.
31. Before 1991 prescription drugs were part of the insurance benefits that publicly insured received in kind. The privately insured were reimbursed for (part of) the costs of prescription drugs, if and insofar as drugs were part of their insurance benefits.
32. As carrier for the newly to build national health insurance an existing insurance scheme was chosen, which initially mainly covered longterm care (see section 2.2.).



### 3. INSTITUTIONAL ARRANGEMENTS, PHYSICIAN BEHAVIOUR AND COST CONTROL

#### 3.1. Introduction

In this chapter the bridge problem and the transformation problem will be addressed. The bridge problem was described by Wippler & Lindenberg as formulating propositions about the influence of social conditions on wants, subjective probabilities and alternatives (1987, p. 145). It is assumed that all individuals have the same basic wants, but that institutions and the social structure shape the 'production function' for these wants (Wippler & Lindenberg, 1987, p. 145). Lindenberg argues that all individuals have *universal* preferences (identical for all human beings) and *instrumental* preferences for the means that lead to the ultimate goals of physical well-being and social approval (1990, p. 741-742). The question to be answered in this chapter is: which instrumental goals (means) do physicians have that lead to physical well-being and social approval? It can be argued that both the pursuit of an income and the pursuit of leisure (in some optimal mix of the two) are instrumental goals (or means) for the 'production' of physical well-being. Social approval can be 'produced' by physicians by gaining approval from their patients or by gaining the respect of society as a whole, which is for example impersonated by their peers. How physicians, in turn, can obtain an income depends on their payment system. Similarly, how they can obtain approval from patients or peers depends on social conditions such as working in a group practice or single-handedly, or participating in peer review.

In section 3.2. the institutions and social conditions that affect the physicians' social production function will be described; starting with conditions that affect physicians in general, followed by conditions present in different payment systems and in different organizational settings, and ending with - most specifically - conditions that GPs in the Netherlands are subject to. With regard to the latter, hypotheses will be formulated about how social conditions in health care should be shaped in order to ensure that physicians' production functions lead to efficiency on the microlevel.

The transformation problem (how does individual social behaviour result in collective phenomena?) will be addressed in section 3.3. The question to be answered with regard to the transformation problem is: how should social conditions in health care be shaped, in order to ensure that physicians' professional behaviour on the microlevel results in cost control on the macrolevel? Section 3.3. will end with the formulation of hypotheses.

### **3.2. The bridge problem: physicians' social production functions**

Social conditions that affect the physicians' social production function in general, stem from distinct economic aspects of health care and the consequences of these aspects for the physicians' roles in the provision of medical care. Therefore, attention will first be paid to the aspects of medical care as an economic good. Subsequently, it shall be described how physicians can 'produce' physical well-being and social approval under different payment systems and in different organizational settings. Finally, from this general model predicting physician behaviour under different conditions, specific hypotheses will be formulated with regard to Dutch GPs.

#### **Economic aspects of health care and the physicians' position**

" Rising health care costs are universally believed to be a bad thing. This is quite unlike the case in other sectors of the economy, where greater sales are universally believed to be a good thing. [...] Why is it, then, that rising health care costs have generated such concern? "

(Davis et al, 1990, p. 4)

The reason for this concern is, according to Davis et al, a basic belief that spending on health does not result in benefits (e.g. improved health, patient satisfaction) commensurate with the resources required to provide care. Yet, allocative efficiency - defined by Davis et al (1990, p. 4) as the allocation of a nation's resources in such a way as to generate the most valued mix of outputs - is the goal of most economies. In other words:

" The philosophical basis of most economies is utilitarianism. This is manifested in the fundamental tenet of economics that resource allocation should be aimed at maximizing the benefits to society from the resources available. "

(Mooney & McGuire, 1988, p. 6)

The maximization of benefits to society is, according to Mooney & McGuire, based on an aggregation of the benefits gained by individuals from the resource allocation process, in other words, social welfare is an aggregation of individuals' utilities. In 'ordinary' economic transactions, a consumer's willingness to pay depends upon his perception of the expected utility that arises from the consumption of a particular commodity. The assumption is that consumers are sufficiently informed to make rational choices between alternatives. This is where the health sector<sup>1</sup> is different, because

" [...] the nature of both health and health care are such that consumers are faced with major uncertainties because of their ignorance of health states, the availability of

treatments, and their likely effectiveness. As a result they have to rely much more upon the supplier, normally the doctor, to assist them in determining their demands. " (Mooney & McGuire, 1988, p. 8)

The doctor thus acts as a professional agent on behalf of the patient. However, the agency relationship between doctors and patients is incomplete, because a complete professional agency relationship would imply the physician to act only and fully in the interest of his patient. In fact, however, physicians cannot know for certain what health care is in the patient's best interest, given his health status. Evans (1984, p. 89) was aware that:

" There remains [...] a broad zone of uncertainty in which optimal treatment and the limits of efficacy have not been scientifically established. "

Apart from not knowing exactly what health care is required, given the patient's health status, a physician, in most cases, finds himself in the position of being the one to provide this (uncertain amount of) required health care. This implies that, by providing health care within this "broad zone of uncertainty", a physician's income and leisure are affected. The doctor, however, is constrained by his acceptance of medical ethics in determining the supply of treatment through his role as agent and not for (financial) self-gain (Mooney & McGuire, 1988, p. 10).

In line with Evans' theory, Flierman describes the physicians' utility function as containing three elements (Flierman uses the word "arguments"), one of which constrains the trade-off between the other two (1991, p. 5). The constraining element is compliance with medical ethics and medical standards on when and how to perform specific services. The elements constrained are income (money) on the one hand, and leisure (time) on the other hand.

" Time and money operate more strongly as arguments in the utility function if certainty about task definition and standards is less. So doctors only exchange time for money, and vice versa, within the limits of the patients' interests. But the distance between these limits is larger if there is less certainty. " (Flierman, 1991, p. 5)

Flierman argues that physicians' choices are determined firstly by the constraining element in their utility function (compliance with medical ethics and standards) and the restrictions and resources they have to deal with, and secondly by the trade-off between income and leisure. Flierman describes the constraining element, compliance with medical ethics and standards, in a 'traditional' manner: doctors comply with medical ethics and standards in their role as professional agents, who act in their patients' best interests.

However, there are two types of professional ethics. The one is of a 'traditional' nature (Flierman's constraining element), and doctors comply with it because of their position

as professional agents: their main source of social approval is in that case provided by their patients. The other type of ethics is of a more social nature, and doctors comply with it as members of a profession that acknowledges its specific responsibility towards society as a whole. The difference between the two types of ethics is clarified by Ten Have (1988, p. 36):

" *Medical* ethics necessarily is concerned with the individual good. But it can only function within a more encompassing *health care* ethics which is primarily concerned with the common good. "

The second type of ethics, health care ethics or social ethics, has gained importance with the introduction of (public) health insurance. Since then professional ethics have evolved into a broader concept. According to Jennett (1988, p. 92) the possibility of expensively extending life of poor quality results in a dilemma that has both ethical and resource dimensions. With the introduction of public health insurance, society has come to expect physicians to work micro-economically efficient: to balance costs and benefits of a particular treatment for a specific patient<sup>2</sup>. Although this call for efficiency originates in a tax-paying society, it has been incorporated in professional ethics, perhaps because physicians have profited greatly from the introduction of health insurance and have in fact come to depend upon national health services or national insurance schemes for their living<sup>3</sup>. This has increased the need for a more comprehensive ethical framework for medical decision making that, according to Glover & Povar (1991, p. 15)

" [...] would not only include what one physician recommends and what one patient prefers, but also what the community can afford. "

Glover & Povar, therefore, argue that physicians as members of the medical profession, need to consider the principle of justice (requiring that unlimited spending by some should be limited if this spending puts at risk even the basic availability of resources for others) in medical decision-making<sup>4</sup>. If physicians take principles of justice as described above into account, their source of social approval is in fact society as a whole, which, however, may be impersonated by peers, a third-party payer, or (in the case of salaried physicians) an employer.

All in all, physicians' social production functions are now modeled as follows. Physicians have two ultimate, or universal, goals: physical well-being and social approval. They can achieve physical well-being through the pursuit of income and leisure. For social approval too physicians have two sources: their patients and society as a whole, represented by e.g. peers or an employer. This section has already touched upon the ways in which physicians might 'produce' social approval: in theory they can do so, for example, by acting in their patient's best interest. Later on,

however, it will be argued that, given the (financial) restrictions that are currently imposed on physicians throughout the Western world, it is getting more and more difficult for physicians to 'produce' social approval through their patients. The next subsection will deal more systematically with the means that physicians have under different social conditions (with different resources and restrictions) for achieving their ultimate goals of physical well-being and social approval.

### **Producing physical well-being and social approval under different conditions**

No exhaustive overview will be presented here of all types of social conditions that physicians can theoretically be exposed to. In describing social conditions, the focus will be on 1) circumstances that affect the trade-off between compliance with medical ethics (to act in an individual patient's best interest) and social ethics (to act in society's best interest), and 2) circumstances that affect the trade-off between income and leisure.

#### *Medical and social ethics*

With regard to the trade-off between medical and social ethics, Gillon argues that there are two simplistic stereotypes. One says that doctors have a moral obligation to their individual patients, such that

" [...] when other moral considerations, including a concern for justice, conflict with that overriding obligation to the individual patient, concern for the patient must *always* take precedence. "  
(1988, p. 114)

The other simplistic stereotype says that according to the ethics of health economics

" [...] the overriding moral obligation of doctors and other health care workers ought to be the maximization of overall welfare, such that when a doctor's special moral concern for his or her individual patient would interfere with the achievement of greater benefit to others then the latter must *always* take precedence over the doctor's concern for the patient. "  
(1988, p. 114)

Using several examples, Gillon shows that neither of these stereotypes fits the reality of medical practice, but that in fact the truth is somewhere in between the two extremes and that doctors show a special concern for their patients as well as some responsibility to balance that concern against its various costs to others (p. 133-134). More specifically, Gillon proves that if economic concerns prevail over individual patient's interests, the reason for this is that (from the physician's point of view) the benefits of treatment do not outweigh the costs. On the other hand, the fact that benefits do not outweigh costs does not necessarily imply that treatment is not provided: sometimes it

is, sometimes it is not. The question is: when exactly do economic concerns take precedence over an individual patient's health interest and why is that?

Mooney & McGuire (1988, p. 8) argue that a physician in his role of professional agent can identify the necessary level of care that a patient needs, although this is often surrounded by uncertainty. However, it is the patient only who can determine the utility derived from the consumption of health care. So, in any cost-benefit analysis that a physician carries out with regard to treating an individual patient, what is taken into account are the benefits to the patient as the physician himself perceives them.

Now, suppose a patient and his physician disagree on the perceived benefits of a particular action, for example: a patient (in a system without direct access to specialist care) insists on being referred to a medical specialist, because he expects the specialist, with his more specific knowledge, to be able to cure him, whereas the GP he is seeing suspects that a referral would not in any way be beneficial to the patient's health status, but would instead only lead to over-utilization of services and unnecessary medicalization. Which decision will this GP take? If he refers the patient, the GP will gain social approval from the patient. If he refuses to refer the patient, acting in compliance with societal or general interest and also in what he perceives to be the patient's best interest (which however, he cannot be sure of), the GP will be able to gain social approval only if there is a colleague around, or an employer, or a third-party payer, who witnesses the GP taking the "best" decision.

It can be argued, therefore, that the possibility of considerations of justice taking precedence over an individual patient's interest, will be greater for physicians who experience more social control (e.g. because they work in group practices or take part in utilization review) than for physicians who practice medicine on a rather solitary basis<sup>5</sup> without being checked by others. However, since quite often there is a considerable amount of uncertainty a physician has to deal with when assessing the benefits of a particular medical procedure for a specific patient, and since apart from that, social control is often not so strict as to outweigh the disadvantages of acting against an individual patient's best interest<sup>6</sup>, physicians will relatively infrequently choose to let societal interest prevail. Governments and health insurers have, therefore, tried to design payment systems that offer incentives to contain costs and provide services more efficiently (in terms of a just allocation of health care resources), thus trying to promote general or societal interest by making it compatible with the physician's own financial interest. This is where income and leisure become important as factors that form an integral part of the physicians' social production functions.

#### *Income and leisure*

With regard to income and leisure, Flierman assumes that doctors only exchange time for money (and vice versa) within the boundaries set by an individual patient's health interest (1991, p. 5). At the same time, Flierman acknowledges the fact that the distance between these limits is larger if there is less professional certainty. According

to Flierman, professional uncertainty can occur with regard to standards on when and how to perform a specific procedure and with regard to task definitions (between medical specialists or between GPs and specialists) describing who is to provide a specific service. Uncertainty about "when and how" mainly affects the physician's behaviour with regard to the performance of specific services, uncertainty about "who" mainly affects the physicians' referral behaviour. Since in reality there is neither full certainty about standards on when and how to perform services, nor on task definitions stating who is to perform a procedure, Flierman argues that, given a patient's health status, a physician has: 1) the choice to decide whether or not treatment is due, and, if he thinks it is, 2) the choice between providing the treatment himself or referring the patient to another physician<sup>7</sup>. Whatever the physician decides (with regard to treatment and referral) depends on the payment system used: in a fee-for-service system a physician maximizes utility if he decides that treatment is due and subsequently provides the treatment himself. Under capitation payment a physician acts rationally if he either decides that treatment is not due, or, if he thinks it is, refers a patient to another physician. In both cases he does not lose time (Flierman, 1991, p. 7). The financial incentives of a salary system, finally, resemble those of capitation payment to a certain extent. In any case, a salaried physician does not maximize utility by deciding that treatment is due and by providing the treatment himself. On the other hand, the argument that he may win time by deciding that treatment is not due or by referring a patient, is less strong than in capitated systems, because he has to work a specific amount of hours anyway. However, it may be argued that a salaried physician maximizes utility by minimizing workload<sup>8</sup> and therefore, in a salary system also, the physician acts rationally when he decides that treatment is not due or when he refers a patient to another doctor.

### **Hypotheses to be tested**

There are two basic underlying assumptions that follow from the former subsections. The first assumption can be defined as: physicians act in their own financial interest only within the limits defined by their individual patient's health interest. The second one can be defined as: physicians act in their individual patient's interest, unless this very obviously violates the principle of just allocation of scarce resources. Using these assumptions, hypotheses can be phrased that are to be tested in this study, at least as far as the bridge problem is concerned (how do social conditions influence wants, subjective probabilities and alternatives?). Hypotheses to be tested with regard to the transformation problem (how does individual social behaviour result in collective phenomena?) will be formulated in the next section.

It has been mentioned earlier that the bridge problem will be addressed in particular for Dutch GPs. That is, hypotheses will focus on the question of how to shape social conditions in Dutch health care in order to ensure that the GPs' social production functions lead to efficiency on the microlevel. In chapter 2 it was explained that in the Netherlands GPs act as gatekeepers to higher specialized care, provided by medical

specialists in hospitals, and that for reasons of cost containment Dutch health care policy has since the mid-1970s been aimed at substituting primary care provided by GPs (among others) for specialist and hospital care. This implies that Dutch health care is efficient if GPs do not provide more services than necessary given a patient's health status, and if GPs do not refer more patients to medical specialists than necessary given a patient's health status. In this statement a service/referral is regarded necessary up to the point where marginal benefits (to the patient) equal marginal costs (to society).

How can that be achieved? Given the GPs' social production function, there are three ways of changing the GPs' behaviour: through changes in the level of professional uncertainty, through changes in the organizational setting that determines the level of social control, and through changes in the GP payment system.

#### *Professional uncertainty*

Following Flierman's arguments, professional uncertainty is described here as (1) uncertainty as to when and how a service is provided (in Flierman's terms: uncertainty about standards of care), and (2) given that a service is necessary, uncertainty about when and to whom a patient should be referred (in Flierman's terms: uncertainty as regards task definition). Reducing professional uncertainty will not necessarily result in the provision of less services or in a lower referral rate. Only if the GPs agree that services or referrals are not beneficial given specific morbidity conditions, more certainty will reduce the number of services provided or the number of referrals made. If the GPs come to an agreement that, given certain morbidity conditions, a service or referral is beneficial, reducing professional uncertainty might actually lead to an increase the number of services or referrals. It should be noted that in these cases GPs do not behave inefficiently, but improve the quality of care.

#### *Organizational setting*

It was argued that the chances that physicians will not provide care of which the marginal costs exceed the marginal benefit, are greater for those who experience more social control (for example, because they work in group practices or take part in utilization review). On these theoretical grounds it is expected therefore, that increasing social control among GPs will increase efficiency on the microlevel. This is all the more probable because (Dutch) general practice is founded on the concept that a patient is healthy, until proven otherwise (cf. Verhaak, 1991). Social control will strengthen the meaning of that concept in daily practice, and prevent GPs from practising defensive medicine, providing services of which the benefits cannot objectively be identified, or making unnecessary referrals.

#### *Payment system*

For publicly insured patients (about 61% of the Dutch population), GPs are paid a capitation fee that is not differentiated according to a patient's age or sex. This



payment system encourages them to refer patients, rather than provide services. Introduction of fee-for-service will induce GPs into providing more services themselves and referring fewer patients to medical specialists, provided that two conditions are met. Firstly, after the introduction of fees for specific services GPs should provide these services more often instead of referring patients to a specialist, and secondly, the provision of a specific service by a GP should substitute for a referral to a medical specialist.

Flierman (1991, p. 7) predicts the substitution effect of a change in payment system from 100% capitation to a mixed or pure fee-for-service system as follows: If there is full certainty among GPs about when to perform a service and when to refer a patient, then changing the payment system will have no effect at all. The provision of services and referrals is completely dictated by the morbidity conditions the GPs encounter. If there is full consensus about when to refer, but no consensus about when to perform a service, then introducing fee-for-service will increase the number of services provided, but leave the number of referrals unaffected. If, on the other hand, there is no consensus about when to refer, but full consensus about when to perform a service, introducing fee-for-service will result in maximum substitution: GPs will perform more services themselves, instead of referring patients to medical specialist, but full consensus about when treatment is necessary prevents GPs from providing unnecessary services. In reality, Flierman argues, it is safe to assume that there is neither full consensus about task definition nor about performing services. In that case, he argues:

" [...] given a patient's state of health, a GP has a choice of whether or not to think that a service is due. And if he thinks that it is, he has a choice between either rendering it or referring the patient to a specialist to perform it. Now under capitation he maximizes utility by either deciding that the service is not due, or deciding that it is and referring the patient. [...]. After the introduction of a fee he maximizes utility by deciding that the service is due, and performing it."

(Flierman, 1991, p. 7-8)

Introducing fee-for-service with uncertainty about both performance and referral will result in an increase in services provided that outweighs the decrease in referrals.

From this general model the following hypotheses can be distilled that will be tested in this book (as far as Dutch GPs and their decisions on the microlevel are concerned). The first hypothesis refers to changing GP behaviour via professional uncertainty and social control:

1. Increasing certainty among GPs that - given specific morbidity conditions - a referral is not beneficial and increasing social control among GPs will result in lower referral rates.

The second through fourth hypotheses refer to changing GPs behaviour by changing the payment system. They more or less take the form of a logical argument in which

hypotheses 2 and 3 are premises and hypothesis 4 is the conclusion. Consequently, hypothesis 4 is true only if hypotheses 2 and 3 are true.

The second hypothesis is derived from the literature and reflects what is by now regarded as common knowledge. Yet, it is important to mention it separately here, because it is a premise for the fourth hypothesis:

2. Under fee-for-service payment doctors provide more services than under capitation payment or salary.

The third hypothesis is taken from Flierman's predictions about the substitution potential of services:

3. A service provided by a GP substitutes for a referral made to a medical specialists, and the more so when there is more certainty about when to perform these services and less certainty about when to refer for these services.

Given that hypothesis 2 and 3 are true:

4. Introducing fee-for-service in addition to GP capitation payment will reduce referral rates.

Hypotheses 1 and 4 are tested in chapter 6, in which GP referral rates are assessed in a secondary analysis on data from two regional Dutch experiments. Apart from that, hypotheses 1 is tested in chapter 5, as far as the effect of social control is concerned. Hypotheses 2 is, as has just been mentioned, regarded as common knowledge. Therefore, as such it will not be tested. In chapter 4, however, the literature will be searched in order to find out to what extent this widely accepted idea is indeed corroborated with empirical evidence. Hypothesis 3 is tested in chapter 5, in which professional uncertainty with regard to services and referrals is measured, and the substitution potential of services is tested cross-sectionally, using a large dataset on morbidity and interventions in Dutch general practice.

### **3.3. The transformation problem**

The transformation problem has been described as: how does individual social behaviour result in collective phenomena? The research question to be answered with regard to the transformation problem is: how should social conditions in health care be shaped in order to ensure that physicians' professional behaviour on the microlevel results in cost control on the macrolevel?

With regard to this problem it is important to note that from society's point of view the sum of all fees paid to physicians amounts to a certain proportion of total health care expenditures. However, from the physicians' point of view the sum of all fees paid to them amounts to total gross revenue. So, in pursuing their own personal income, physicians have a direct and an indirect influence on total health care expenditures.

Similarly, in trying to control health care costs, third-party payers directly or indirectly influence physicians' revenues. It was argued in chapter 1 that there are two ways in which third-party payers can control expenditures. The first method was described earlier as the Canadian-European method (referring to its origins rather than to its current use): constrain the physical capacity of the health care system, control prices, and impose a global monetary budget in the entire system (Reinhardt, 1992). The second method was described as the American strategy, and it was summarized by Reinhardt (1992, p. 31) as paying for everything that is beneficial, and denying payment for everything else. In this book, the focus will be on the Canadian-European method only, and its relation to physicians' incomes and cost control on the macrolevel.

Returning to "the great equation in medical economics", involving the control over expenditures (E) which equal price (P) times quantity (Q), it will be argued that controlling price (= physician fees) without constraining the quantity of care will under fee-for-service payment not be effective as regards controlling expenditures. This argument is not new. It has received considerable attention in the literature on the phenomenon known as supplier-induced demand. According to this theory, physicians under fee-for-service payment react to real or perceived decreases in their revenues (caused, for example, by fee freezes or fee reductions, or by an increase in physician density) by increasing the quantity of services provided. In contrast, under capitation payment an increase in physician density or a fee reduction would inevitably lead to lower average revenues per physician, because doctors have little opportunity for increasing the number of patients on their lists. If physicians are salaried employees, an increase in physician density could affect physicians' incomes only indirectly and delayed: that is, if increased density would seriously diminish the physicians' bargaining power in income negotiations. By now three important factors have been touched upon that are thought to affect physicians' incomes and hence have consequences for cost control on the macrolevel as well: physician density (the number of physicians relative to the population), negotiations and the physicians' bargaining power, and the possibilities of a volume response under fee-for-service payment to fee reductions or an increase in physician density.

The relationship between these factors has already been touched upon in chapter 1. There it was argued that in negotiations between physicians and third-party payers the microlevel and the macrolevel almost literally meet. Negotiations are entered by third-party payers primarily with a view to overall cost control. Physicians, on the other hand, enter negotiations primarily with a view to their future incomes. Whether the outcome of negotiations is a higher overall budget for health care and physician services, or a lower average physician income, depends in part on the bargaining power of the two parties involved. Powerful physician organizations may succeed in having a higher proportion of total available resources allocated to medical care. In contrast, physicians with less powerful organizations may have to experience a reduction in their earnings. Physicians' average income in a country is affected further by physician density, both directly as well as indirectly. Directly: a higher number of physicians implies that the

total available budget will have to be divided among more providers, so that each ends up with a smaller share. Indirectly: an increased density may negatively affect the physicians' collective bargaining power. The relationship between physicians' income, density and political power will be explored in more detail in chapter 8.

Since negotiations between physicians and third-party payers form the key to understanding the transformation problem, it is necessary to identify the different institutional arrangements with regard to negotiations, before hypotheses can be formulated. Four ways of determining the level of physician fees can be distinguished: market forces (fees determined by supply and demand), negotiations directly concerning the level of fees, the use of expenditure targets or caps (fees determined so as to reach budgetary goals), and the use of target incomes (fees determined so as to reach a certain level of income). The opportunities for cost control on the macrolevel are best in countries where expenditure targets/caps or target incomes are imposed, that is if third-party payers (governments or health insurance organizations) are prepared to use such mechanisms to contain costs (Hurst, 1991, p. 17). It was argued that if the political power or determination to strictly monitor expenditure targets or caps is lacking, physicians as a group may succeed in getting a greater share of total available resources allocated to medical care.

If fees are left to be determined by market forces, there is no control at all over the growth of expenditures. If negotiations are about fees directly (in terms of the equation, about P without constraining Q), especially under fee-for-service payment, price constraints can be compensated by an increased quantity of services provided. This can be summarized in the following hypothesis with regard to cost control:

5. If physicians are paid on a fee-for-service basis, they will react to a decrease in their revenues by increasing the quantity of services provided.

Therefore:

6. In countries where (a) fee-for-service payment is combined with negotiations directly on the level of fees (without constraining the quantity of care), third-party payers have less control over health care expenditures than do third-party payers in countries where (b) expenditure targets or caps, or target incomes for physicians are imposed, and where third-party payers have the political power and the determination to use these mechanisms for cost control.

Implicitly, it also follows that physicians who can compensate for reductions in the price of their service by increasing the quantity of services provided, will be better off in terms of the development of their income, than physicians who are subject to strictly monitored expenditure targets or income targets; and that - especially where expenditure targets, caps or target incomes are imposed - physicians who collectively have more (political) power, are better off in terms of the development of their income. Apart from opportunities for compensation and bargaining power, it was argued however, that physicians' average earnings also depend on physician density. A higher

physician density implies that more physicians will have to share the total budget, but it is also related to the physicians' bargaining power:

" An excess supply of physicians is likely to make physicians' groups less cohesive and individual physicians more willing to accept tougher conditions in their contracts."

(WHO, 1993, p. 62)

All in all, as far as physician income is concerned, three hypotheses will be tested in this book. This testing will take place in chapter 8, using data on the development of GP income between 1975 and 1990 in eight OECD countries. The hypotheses are formulated for GPs because the available data are in GP incomes, but the relationships are expected to exist for the revenues of any group of physicians. The first two hypotheses define relationships that are expected to exist cross-nationally with regard to both the level of the GP incomes and the development of their incomes:

7. The relationship between the number of inhabitants per GP and GP income is positive, such that: (a) GP income is higher in countries where the number of inhabitants per GP is higher, and (b) over time GP income increases more (or decreases less) in countries where the number of inhabitants per GP increases more (or decreases less).
8. The relationship between the GPs' collective bargaining power and GP income is positive, such that: (a) GP income is higher in countries where the GPs collectively hold a stronger position, and (b) over time GP income increases more (or decreases less) in countries where the GPs collectively hold a stronger position.

With regard to the development of GP income one last hypothesis can be added here, which refers to the GPs' opportunities for compensating for decreases in the level of their incomes due to an increase in the physician density by increasing the quantity of services provided:

9. If GPs can increase their income by increasing the quantity of services provided, the development of their income depends less on the development in the number of inhabitants per GP.

Hypothesis 5, summarizing the essential effect of the physicians' opportunities for inducing demand for their services, has been the subject of debate since the mid-seventies. In chapter 4 the literature on supplier-induced demand will be reviewed. Hypothesis 6 is tested in chapter 7, in which an overview will be presented of the different methods that were and are still being used in ten OECD-countries to negotiate physicians' fees. The methods of fee negotiation in the ten countries will then be related to the development of health care expenditures between 1981 and 1991. Hypotheses 6 through 9 are tested in chapter 8. That chapter will start with describing the relationship between physician density, physicians' collective bargaining power and physician income. Subsequently, the method of payment and negotiating GP fees is described,

as well as the GPs' position in the health care system in eight OECD countries. The hypotheses will be tested, using longitudinal data on GP incomes that were collected for the OECD.

## Notes

1. The health care sector is not the only sector in economy in which consumers are not sufficiently informed to make rational choices. Basically, this is the case with respect to all services that are provided by specially trained professionals such as lawyers, accountants or mechanics.
2. "Few of us, seeing ourselves as taxpayers as well as potential patients, would want doctors to feel free to spend as much of our tax-provided money as they liked on their patients, provided only that they thought there was *some* probability of benefit, no matter how small the benefit, no matter how small the probability, and no matter how great the cost." (Gillon, 1988, p. 133)
3. Compare Wilsford (1991, p. 8): "Physicians' incomes rose dramatically again during the post-World War II period because the state in both Western Europe and the United States began to pay physicians to treat populations not previously able to pay, principally the poor and the aged."
4. "Justice as fairness requires that whatever is spent on health care provides access to a basic level of care for everyone. Ensuring a just distribution of health care resources is the responsibility of each member of society and is intrinsic to every medical decision." (Glover & Povar, 1991, p. 24)
5. With regard to compliance with professional ethics in general, Wilsford recognizes the importance of contact among peers. Interest groups such as organized medicine suffer from the so-called free rider problem: no single member is motivated to join or support a group if he will enjoy the benefits provided by the group without joining (Wilsford, 1991, p. 94). According to Olson, this is the reason why many physicians' associations have tried to introduce compulsory membership (1974, p. 137-138). Wilsford, however, argues that for professional associations the free rider problem is less important, because: "[...] the profession itself provides a certain a priori solidarity. This solidarity is based on values, inculcated by common education (for example, medical schools) and **perpetuated by daily contact among members of the profession** (in hospitals, academic departments, judicial courts or law firms) and enforced by common sanctions (such as the ethics of medicine or law or standards of academic integrity)." (1991, p. 94, my emphasis)
6. A physician always acts against an individual patient's interest if he decides that the benefits of treatment do not outweigh the costs. If health care were not covered by health insurance, an individual patient would, according to microeconomic theory, act rationally if he would consume health care up to the point where marginal benefits and marginal costs are in equilibrium. However, since in the Western world health care costs are (mostly) covered by health insurance, marginal costs do no longer play a part in a patient's decision making: it is, therefore, in an individual patient's interest to receive health care up to the point where there are no more marginal benefits. This implies that, even if a physician perceives that the benefits of treatment do not outweigh the costs, he would act against his patient's best interest if he would not provide treatment, because to his patient it is worth receiving health care even if it is only marginally beneficial. According to Gillon (1988, p. 115-116), in theoretical arguments doctors tend to hold the "simplistic stereotype" that they always act in the patient's best interest, which, in practice, sometimes they do not.
7. In fact, Flierman gives this argument for GPs: they have a choice to decide whether or not treatment is due and if they think it is, to provide treatment themselves or to refer the patient to a medical specialist. In fact, however, every physician faces these two types of decisions. A medical specialist, as well, has theoretically a choice to decide whether or not treatment is due and, if he thinks it is, to treat the patient himself or refer the patient to another doctor. It depends on the type of health care system, how realistic these theoretical choices are. For example, in a system where there is no direct access to specialist care (such as in the Netherlands), it is quite difficult for medical specialists to decide that treatment is not due or to refer a patient back to the GP immediately. The fact alone that a patient has been referred to him leads the specialist (as well as the patient and his family) to believe that something is apparently wrong and, subsequently, that

something has to be done about it. This is an example of how the institutional structure of a health care system can influence the physicians' social production functions: in order to "produce" social approval, Dutch medical specialists have to provide at least a minimum level of services for a patient that has been referred to them, whereas in a system with direct access they might have decided for the same patient that treatment was not due.

8. As Eastaugh put it: "The salaried individual can try to come late and leave early and try to do a minimum amount of work per hour." (1991, p. 53). Calnan et al (1992) also suggest that salaried physicians handle increases in patient load not by working longer hours or reducing the time spent per patient, but by increasing waiting lists.



## **4. THE EFFECT OF DIFFERENT PAYMENT SYSTEMS ON PHYSICIANS' BEHAVIOUR: EVIDENCE FROM THE LITERATURE**

### **4.1. Introduction**

In chapter 3, two hypotheses were formulated, more or less as premises in a logical argument, that are regarded as common knowledge with respect to payment systems. Hypothesis 2 (under fee-for-service payment doctors provide more services than under capitation payment and salary), and hypothesis 5 (if physicians are paid on a fee-for-service basis, they will react to a decrease in their revenues by increasing the quantity of services provided) will therefore not be tested as such. However, since the two hypotheses act as important assumptions for the other hypotheses that will be tested in chapters 5 through 8, they deserve to be confronted with empirical findings that are reported in the literature.

This chapter, therefore, aims at finding empirical evidence - from research comparing doctors' behaviour under different payment systems - for the commonly held idea that doctors under fee-for-service payment provide more services than under capitation or salary. For this purpose, the literature on payment systems has been searched for reports on cross-sectional or over-time research comparing individual doctors' decisions with regard to the provision of care under fee-for-service payment with doctors' behaviour under capitation payment or salary.

With respect to hypothesis 5, special attention will be given to the theory of supplier-induced demand, which suggests that physicians under fee-for-service payment may - under some circumstances - provide unnecessary services in order to keep or reach a desired level of income. The questions to be answered in this chapter can be described as: To what extent do research findings come up with empirical evidence for the widely held idea that (1) physicians under fee-for-service payment provide more services than physicians under capitation payment and salary, and that (2) physicians under fee-for-service payment will react to a decrease in their revenues by increasing the quantity of services provided?

In the next section the method used for searching the literature will be outlined. Section 4.3 will briefly touch upon the theoretical concept of supplier-induced demand. In section 4.4 an overview of research findings with regard to the effect of payment systems on physicians' professional behaviour is presented. Results will be discussed in the section 4.5.

## 4.2. Method

In the international literature a search has been undertaken for reports on research findings concerning the effect of different payment systems on the decisions that individual physicians take with regard to the provision of care (more precisely, with regard to the type and amount of health care that is to be consumed by an individual patient). The feature of payment systems that will be studied in this chapter can be defined as the *unit* of payment. Units of payment are: single items of service (fee-for-service payment), patients on a doctor's list for a specified period of time (capitation payment), or a unit of time (salary). Despite the fact that the unit of payment is the basic independent variable under study, in describing research findings with regard to supplier-induced demand, attention will also be given to the effect on individual physicians' behaviour of changes in the *level* of payment. These research findings are, however, discussed in this chapter because supplier-induced demand is commonly considered to be inherent to fee-for-service payment. In other words, on the microlevel of decisions taken by individual physicians with regard to individual patients, the level of payment is a relevant factor only in combination with fee-for-service payment, where the units of payment are single items of service.

In looking at the effect of the unit of payment on doctors' behaviour one should preferably consider research findings in which the unit of payment has been isolated from other factors that might affect behaviour. Naturally, (quasi-)experimental designs, with a pre- and a post-test in both an experimental as well as a control group, in which the intervention consists solely of a change in the unit of payment, would demonstrate the effect of the unit of payment best. However, in the literature on payment systems, this type of research is expected to be rare, because payment systems are not easily changed for the sake of an experiment. For one thing, each payment system requires its own type of administration and its own organization of health care. For example, if there is no organization to employ doctors, a salary system cannot be experimented with, and if patients strongly claim the right to have free choice of and free access to physicians at any moment, capitation payment is out of the question. Apart from that, under any payment system, ultimately the sum of all units provided (be it items of service, patients enlisted or number of hours worked) results in income for the physician, which is not likely to increase physicians' willingness to engage in experiments with their payment system. Therefore, cross-sectional comparisons of physicians under different payment systems will also be included in the review presented here. An exception will, however, be made with regard to cross-sectional research comparing American doctors in health maintenance organizations (who often receive a salary plus percentage-payment) with doctors in the 'traditional' health system (predominantly paid on a fee-for-service basis). Research findings of this type will be excluded, because HMO-doctors differ from 'regular' American doctors both with regard to their payment system, but also with regard to the degree of social control

that they experience. HMO-doctors predominantly work in group practices and, more importantly, they are subject to different types of utilization review. This increased social control, it was argued in section 3.2., has - in itself - consequences for decisions that doctors take with regard to providing medical care. If differences are found between physicians' behaviour in HMOs and physicians' behaviour under traditional institutional arrangements, therefore, it is extremely difficult to determine which factor contributes to these differences: the payment system, or social control (compare e.g. Manning et al, 1984, Wright et al, 1984, Schut, 1986)<sup>1</sup>. It should be noted, that over-time comparisons of a change in payment system for HMO-doctors do not suffer from this problem. However, in the literature, only one example was found of an HMO in which primary care physicians changed from fee-for-service to capitation payment (Stearns et al, 1992).

Research reports have been searched for in Medline using the key-words "cost-and-cost-analysis" and "fees-medical" combined with "physicians" and "dentists". In addition to that, the files of the NIVEL-library<sup>2</sup> have been searched using the keyword "honorering"<sup>3</sup>. The Medline search has been carried out from January 1986 onwards, titles in the NIVEL-search date back as far as the 1960s, but the search is complete only from 1985 onwards. The searches together resulted in approximately 900 titles, of which the majority (over 80%) could be rejected from the analysis on the basis of the title and/or abstract. For instance, many selected titles referred to letters, to payment methods for hospitals (especially under Medicare Part A), to non-OECD-countries, or to subjects that have little or nothing to do with physicians' payment systems (for example, the key-word "cost-and-cost-analysis" also generated numerous cost-benefit analyses of treatment methods, new technologies or preventive screening).

Of the remaining articles and books on physicians' professional behaviour under different payment systems, many did not report on empirical research findings, but rather dwelled on the subject from a theoretical point of view (e.g. Reinhardt, 1985, Rosen, 1989, Harris, 1990, Casalino, 1992). In addition to that, a number of books and articles were concerned with macro-aspects of the *level* of payment (how much do physicians get paid, and how is the level of fees determined, how should relative values of services be set, and so on). These titles have been selected from the search for use in chapters 7 and 8, but will be entirely left out of the review that is presented here.

### **4.3. The theory of supplier-induced demand**

In 1970, Feldstein reported on his study of the price-elasticity of medical care, for which he had used aggregated time series of both the price and quantity of physicians' services. Feldstein characterized the results of his study as "surprising", and reports on his findings with some astonishment:

" The most striking feature is that the price elasticity of supply is negative. [...] the negative price elasticity of supply implies, contrary to the conventional model, that regulations which depress the physician's price (e.g fee schedules in insurance plans or government ceilings) will *increase* the quantity of services supplied. "  
(Feldstein, 1970, p. 130)

In the past two decades this phenomenon has been studied intensively as a symptom of supplier-induced demand, and, as Rice put it:

" There is, perhaps, no topic in health economics that has generated as much conflicting results, nor produced such strong disagreement. "  
(1983, p. 804)

Debate has focused on roughly three questions: 1) what is supplier-induced demand, 2) does supplier-induced demand exist, and if so, under which circumstances do physicians generate it, and, 3) provided that supplier-induced demand exists and sometimes it is generated, how can its effect be isolated in research from other factors that determine demand for physicians' services?

To begin with the first question, what is supplier-induced demand? Supplier-induced demand is thought to arise from the information asymmetry between physicians and patients. There are a number of definitions of the phenomenon, for example, Rice (1983, p. 803) characterized demand as supplier-induced

" [...] when a physician recommends or provides services that differ from what the patient would choose if he or she had available the same information and knowledge as the physician. "

Others (e.g. Hay & Leahy, 1982, Rosen, 1989) add to this definition that supplier-induced demand consists of

" services ordered by a physician for a patient, that the patient would refuse if he or she had the same medical knowledge and expertise as the physician, *but remained the same in all other respects.* "  
(Rosen, 1989, p. 548, my emphasis)

An even more comprehensive definition is given by Wilensky & Rossiter (1983), building on Pauly (1977) and Fuchs & Newhouse (1978), who include a patient's willingness to pay in their definition. Wilensky & Rossiter argue that the majority of medical care delivered is physician-initiated, but that

" [...] physician initiation is inducement only when services are recommended above and beyond what the patient would be willing to pay for if the patient knew as much as the physician. "  
(Wilensky & Rossiter, 1983, p. 259)

Implicitly, this definition touches upon the issue that has been outlined in chapter 3: whether or not, and if so, under which circumstances, physicians balance the benefits of treatment against the costs of treatment (which are usually borne by third party payers, at least to a certain extent). Evans (1984) suggests, that supplier-induced demand is much more likely to occur in situations where the physician is uncertain about the exact benefits of a specific service to his patient. According to Evans (1984) physicians are incomplete professional agents, acting in their patients' best interest for as far as they are able to determine which type of health care and how much of it, is required given a patient's health status. However, there is a zone of uncertainty in which it cannot be scientifically decided which treatment would optimally serve a patient's best interest. Within this zone, it was stated in chapter 3, a physician may act in his own financial interest. Under fee-for-service payment this implies that - within the zone of uncertainty - the physician provides services he would not provide if he were paid a capitation fee or a salary.

A second issue of debate has been the question as to when (under which circumstances) physicians generate demand for their services? It had been observed, for example, that if fees for physicians' services were frozen, physicians responded by increasing the quantity and complexity of services provided (Gabel & Rice, 1985). Initially, Evans (1974) explained this phenomenon stating that physicians aspire a certain target income. If, for some reason (such as a fee freeze) they are no longer able to earn their desired target income, they will start to create demand for their own services. Birch (1988, p. 132-135) argued that this theory is inconsistent with the general (neoclassical) economic model in which individuals are assumed to maximize utility at all times, instead of being content with a target income that - apparently - leaves room for improvement. Birch introduces a model in which time acts as a constraining factor on income, because the available time a physician can spend, is limited, whereas fees are usually fixed. Further, Birch assumes that marginal utility decreases with time spent, resulting in an equilibrium of income and leisure given a certain (fixed) fee level. The equilibrium can be altered by a change in the level of fees, and by an increase in the number of physicians relative to the population. An increase in physician density would improve access to medical care and diminish the time price of consulting a physician (cf. Escarce, 1992, Janssen, 1992). Therefore, this would in itself result in an upward shift of demand for physicians' services. However, if that upward shift is outweighed by the increase in supply (or if fees are reduced), physicians are no longer able to generate their optimal income-leisure equilibrium and start inducing demand for their services up to the point where marginal costs (=time) equal marginal utility (=income).

Birch's model includes the mechanism that an increased physician density in itself results in a higher demand for medical care, without any additional effect of supplier-inducement. A fee reduction would have the same result, if it would decrease the price

that consumers have to pay for physicians' services. Because the factors that are assumed to engender supplier-inducement of demand, would in the conventional economic model also cause an upward shift of demand, it is extremely difficult to distinguish where "normal" economic effects end and supplier-inducement begins (Reinhardt, 1978, Birch, 1988). A third issue of debate has therefore been, how to identify the occurrence of supplier-induced demand. Rice (1983), Birch (1988), Grytten (1991) and Escarce (1992) have tried to distinguish between conventional economic mechanisms and supplier-induced demand by looking at the intensity or complexity of services provided (which is largely determined by physicians' decisions) rather than, for example, the number of consultations (which also depends on patients' decisions to go and see a doctor or not). Escarce (1992, p. 404-405) for example, distinguishes between "first-occurrence" demand (a patient's decision to seek medical help), which is unlikely to be affected by inducement, and "intensity-of-care" demand, which is determined by decisions about the number and type of services provided by physicians to their patients. These decisions may well be influenced by physicians through the advice they give to patients or referring physicians.

Another problem in detecting supplier-inducement, is of a methodological nature and it refers to the type of data that are used in research. Quite often analyses are done on data aggregated on a regional or even national level (Feldstein, 1970, Shwartz et al, 1981, Barer et al, 1987, Birch, 1988, Schwartz & Mendelson, 1990, Rublee & Moser, 1991, Grytten, 1991, Hughes, 1991, Escarce, 1992). This can pose a specific problem if the independent variable explaining changes in utilization is physician density. Wilensky & Rossiter (1983, p. 254-256) describe this problem as the identification problem: it cannot be determined whether higher utilization of care in a region/country results from a high physician density (which could point to supplier-induced demand), or whether a high demand in the regional/national population - related to morbidity or to ability to pay for medical care - results in both a high utilization and in a high physician density.

## **4.4. Results**

### **4.4.1. Fee-for-service versus capitation and salary**

In this section results of two types of research will be presented. Firstly, attention will be given to cross-sectional comparisons of doctors under different payment modes (but, as far as the United States are concerned, within the traditional health care system), and secondly, two studies will be described in which the effect of changing the payment has been studied over time.

#### *Fee-for-service, capitation and salary compared cross-sectionally*

Of the three cross-sectional comparisons of fee-for-service payment with salary or capitation payment that could be detected in the search of the literature, one is

conducted in six different organizational settings (namely hospitals), among which one prepaid group practice of surgeons (a HMO-type); the rest consisting of non-HMO settings. This study, conducted by Wilson & Longmire (1978) investigates the relation between method of payment (full-time salary, salary plus a percentage profit sharing, and fee-for-service) on the one hand, and volume and quality of surgical care on the other hand. The study referred to 158 surgeons in six hospitals (two for each method of payment), and apart from abstracts from 1,724 patients' records included patient and surgeon questionnaires<sup>4</sup>. The 1,724 patients whose records were studied had undergone an appendectomy, hysterectomy, or cholecystectomy<sup>5</sup>. In their questionnaires, surgeons on a salary + percentage reported the highest number of operations performed on average per month, surgeons on a straight salary reported the lowest number. With regard to indicators of quality of care, Wilson & Longmire (1978) found that fee-for-service surgeons tended to operate earlier on an appendicitis, which resulted in fewer secondary complications, such as perforations.

The other two cross-sectional comparisons are interesting, because they are conducted within one organizational setting (thus controlling for differences related to this factor), although the number of physicians studied in both cases is quite low compared to Wilson & Longmire's 158 surgeons. Rosen et al (1978) studied three dentists, who treated patients for whom they were paid a capitation fee as well as fee-for-service patients. Data were analyzed with regard to a sample of 245 capitation patients and a matched sample of 245 fee-for-service patients. Capitation patients had significantly fewer visits with their dentist, but dentists performed significantly more procedures per visit<sup>6</sup>. Compared to fee-for-service patients, capitation patients received significantly more preventive and diagnostic care, and significantly fewer restorations were performed. The number of extractions were the same in both groups (Rosen et al, 1978, p. 188-190). Hickson et al compared 18 pediatric residents working in one clinic between September 1983 and June, 1984, who were randomly assigned to either fee-for-service payment or salary (1987, p. 346). Data were collected using a questionnaire for the 18 residents and patients' parents<sup>7</sup>, as well as from patient charts at the end of the study period. Results showed that fee-for-service physicians did not have significantly more total patient visits, but - since fee-for-service physicians enrolled fewer patients - they had significantly more visits per patient enrolled to them than salaried physicians, the difference being almost entirely due to a greater number of well-child visits (Hickson et al, 1987, p. 347). Apart from that, fee-for-service patients experienced a greater continuity of care; that is, they were more likely to be seen by their own, regular pediatrician when they visited the clinic or the emergency room, than patients of salaried physicians. Hickson et al (1987, p. 347) suggest that apparently

" [...] fee-for-service reimbursement provided an incentive for physicians either to schedule visits during their regular clinic hours or to attend personally to more patients at times other than their half-day-per-week clinic. "

### *Changes in physicians' payment system*

Over-time changes in physicians' method of payment have been studied by Hemenway et al (1990), Krasnik et al (1990), Flierman (1991), and Stearns et al (1992). Hemenway et al (1990) studied the introduction of a bonus system in a chain of ambulatory care centres in the United States. Until 1985, physicians working in the centres were paid a flat salary. In the middle of 1985 a bonus system was introduced, according to which physicians would receive either a flat hourly fee (depending partly on physicians' age and experience) or a percentage of the gross monthly charges they generated, whichever was higher (Hemenway et al, 1990, p. 1060). Hemenway et al (1990) compared the services provided and charges generated by fifteen physicians working at different centres from November, 1984 through January, 1985, and similarly, from November, 1985 through January, 1986. Unfortunately, the study had no control group except for national figures. In general, physicians increased the number of diagnostic tests ordered per patient visit (the number of x-ray films increased 16%, compared to 2.2% nationally, the number of laboratory tests 23%, compared to about 3% nationally). The number of office visits also increased by 12% (3.7% nationally). Physicians generated 7% higher charges per visit (in constant 1984 prices), whereas total charges per month rose by 20% (in constant 1984 prices). Six of the fifteen physicians generated enough charges for the volume incentive to take effect every month of the study period, seven never earned the bonus, and the remaining two earned bonuses during some months (Hemenway, 1990, p. 1060). A comparison of the two groups (always earning the bonus and never earning the bonus) revealed that the difference in charges generated, were predominantly the result of differences in the number of patients seen. Although the number of patient visits had increased by approximately the same amount, the group earning the incentive bonus had more patient visits at base line (352 per month compared with 246 in the group without bonus) (Hemenway et al, 1990, p. 1060).

Krasnik et al (1990) and Flierman (1991) studied a change in GPs' payment system in Copenhagen, Denmark. Before 1987, GPs in Copenhagen City were paid a flat capitation fee for every enlisted patient over 16 years of age, plus some fees for perinatal and family planning services and certification. In October 1987, Copenhagen GPs changed towards the payment system that had been in effect for the rest of the country since 1961, by which GPs are paid according to a mixed system of capitation and fees-for-services. Every doctor-patient contact (house call, consultation in office, telephone consultation or renewal of prescription) is referred to as a basic service, which is paid for separately (Flierman, 1991). In addition to basic services, fees are paid for a several diagnostic, curative, perinatal and family planning services, and for certification (Groenewegen et al, 1991). Krasnik et al (1990) and Flierman (1991) compare services provided by 72 Copenhagen GPs with services provided by a control group consisting of 329 general practices in Copenhagen County, using a quasi-experimental design. Data were collected in March 1987 (base line), March 1988, and



November 1988, both in the "experimental" group and in the control group. The number of office visits remained the same in both groups of GPs. However, between March 1987 and November 1988, the number of diagnostic services per 1,000 patients increased by 66% in the experimental group (11% in the control group), and the number of curative services per 1,000 patients increased by 80% (18% in the control group). Differences between experimental and control group were significant ( $p < .01$ ) (Flierman, 1991, p. 38). The increase in the number of performances was not equally distributed over separate diagnostic and curative services. In fact, the increase in the experimental group was significantly higher than in the control group for only six of twelve diagnostic services under study, and for only three of seven curative services. Flierman demonstrates a significant relation between professional uncertainty and change in the number of performances due to the new payment system. Professional uncertainty is measured in terms of indetermination of performance of a service by morbidity conditions assessed, the so-called diagnosis-determinedness. The higher the diagnosis-determinedness of a service (that is, the lower professional uncertainty), the smaller the increase in number of performances after the change in payment system (Flierman, 1991, p. 58). In terms of Evans (1984), if the "zone of uncertainty" is small (high diagnosis-determinedness), a GP has little room to increase the number of services provided in order to serve his own financial interest.

Finally, research findings that are particularly relevant with regard to Dutch health care (with GPs paid by capitation, and specialists by fee-for-service) are reported by Stearns et al (1992). They analyzed data from a natural experiment - taking place in 1984 - in which an HMO's primary care physicians changed from fee-for-service to capitation payment, whereas specialists remained to be paid on a fee-for-service basis (albeit against 50% reduced fees). If a financial surplus was left at the end of the year, firstly the capitation fee for primary care physicians would be increased, and secondly, fees for specialists would be increased. Data were derived from claims for the entire population enrolled in the insurance plan: 1,987 persons, receiving primary care from a total of 48 physicians (who continued to see fee-for-service patients as part of their practice as well). The study did not include a control group. However, all other arrangements with regard to patient's benefits and copayment rates within the health plan remained virtually the same. Stearns et al (1992, p. 420-423) found, among other things, that the number of referrals per enrollee per year from primary care physicians to specialists was significantly higher under the new capitation payment than under the previous fee-for-service system (a patient was likely to have 1.08 more referrals per enrollee year). The authors suggest that, if physicians are capitated for primary care, they must also be given incentives to control specialty care.

#### **4.4.2. Supplier-induced demand**

The second topic that is addressed in this chapter is supplier-induced demand. The hypotheses formulated in chapter 3, is that physicians under fee-for-service payment

will react to a decrease in their revenues by increasing the quantity of services provided.

In section 4.3., two types of circumstances (both affecting physicians' revenues) were described, under which physicians might possibly generate demand for their services: a fee freeze or reduction, and an increase in the number of physicians relative to the population. With regard to the type of data that are used to assess increases in the volume of services provided, Wilensky & Rossiter (1983) distinguished between data aggregated on the regional or national level (posing the "identification problem" when increases in physician density are taken as independent variable) and data that are analyzed on the level of physicians or households.

Studies that use aggregated data have been conducted by Feldstein (1970), Shwartz et al (1981), Barer et al (1987), Birch (1988), Schwartz & Mendelsohn (1990), Grytten (1991), Hughes (1991), Rublee & Moser (1991), and Escarce (1992). Both Birch (1988), Schwartz & Mendelsohn (1990), Grytten (1991) and Escarce (1992) took physician (or dentist) density as independent variable. Birch (1988) found a significant negative relation between the number of inhabitants per dentist in a region and the costs of dental care per inhabitant. In districts with a high density of dentists, the number of services provided per episode of treatment was significantly higher than in districts with a low density. The difference could not be attributed to differences in dental health status, suggesting that supplier-inducement had occurred in high-density districts (Birch, 1988). Grytten (1991) also found that dentist-initiated visits and costs per visit increased with a higher number of dentists per capita in Norwegian regions.

Schwartz & Mendelsohn (1990), however, found that a 21% increase between 1982 and 1987 in the number of hours that physicians invest in patient care, can be explained by demographic changes in the population, and is not due to a 16% increase in the number of physicians over that same period. Similarly Escarce (1992) found little evidence for demand-inducement. The effect of surgeon supply on "first-occurrence" demand (patients' initial decision to seek a surgeon's help) was positive and significant (the more surgeons, the higher demand). However, the effect of surgeon supply on "intensity-of-care" demand was negative for three out of four surgical subspecialties (though significant for only one subspecialty). Escarce (1992, p. 409) concludes that

" [...] the findings offer little support for the hypothesis that a substantial component of the additional utilization that occurs when surgeons are plentiful is due to physician-induced demand. "

The other authors address the effects of a fee freeze or fee reduction on the volume of services provided. Feldstein (1970) used aggregated time series and, much to his surprise, found that price elasticity of the supply of medical services is negative (supply increases if the price decreases). Shwartz et al (1981), on the other hand, reported a significant decrease in the number of tonsillectomies and adenoidectomies performed

after a reduction in Medicaid fees. Barer et al (1987) were surprised to find no changes in utilization during a seven-month period of fee freezes in British Columbia, which they attributed to the fact that the period of fee freezes was relatively short and that physicians' purchasing power did not actually decrease. Finally, both Hughes (1991) and Rublee & Moser (1991) analyzed trends in expenditures on physicians' services in Canada's provinces between, respectively 1975-1987 and 1982-1987. Hughes (1991, p. 2349) concludes that fee schedules (used in Canada to control physicians' fees)

" [...] can be effective in restraining the growth in the cost of physician services, but will likely be accompanied by increases in the volume of services. "

Physicians in Quebec, for example, experienced the most stringent fee constraints and also generated the largest increase in utilization per physician during the one year (1980) in which billing caps for GPs were not in effect. On the other hand, utilization per physician rose at about the same rate in both Ontario and British Columbia, whereas fees increased in Ontario and declined in British Columbia (Hughes, 1991, p. 2349). Rublee & Moser (1991) observed that between 1982 and 1987 the volume of services per physician slightly declined, but that the intensity of services provided increased. They conclude that

" Intensity, therefore, performed the role of the 'volume effect' of the income consequences of fee control. "  
(Rublee & Moser, 1991, p. 126)

Six studies have used non-aggregated data, either on the level of households (Glass, 1974, Wilensky & Rossiter, 1983) or on the level of physicians (Hadley et al, 1979, Rice, 1983, Christensen, 1992) or physiotherapists (Van Doorslaer & Geurts, 1987) to test hypotheses with regard to supplier-induced demand. Glass (1974) found a significant negative relation on the level of households, between physicians' average list size (reflecting physician density) and the number of office visits per patient per year. Similarly, Wilensky & Rossiter (1983) report a significant negative relation between the number of inhabitants per doctor and the number and average costs per inhabitant of ambulatory care visits to physicians. Hadley et al (1979) observed a 10% increase in the number of services provided by family physicians, surgeons and specialists in internal medicine as a result of fee reductions. Similarly, Rice (1983) reported that a 1% fee reduction results in a 61% increase in intensity and complexity of medical services provided, whereas a 1% reduction of surgical fees resulted in a 15% increase in the intensity of surgical procedures that are performed. Van Doorslaer & Geurts (1987) analyzed changes in the mix of physiotherapeutic services after a change in the relative price of procedures: highly paid services were substituted for services that were relatively poorly rewarded. Christensen (1992), finally, examined physicians' responses to both cuts and increases in real fees under Medicare. She reports that, when (in a

model) behavioural responses to both increases and decreases in price are constrained to be the same, the estimated volume response is negative and significant, with a value of approximately -0.5 (Christensen, 1992, p. 72). This implies that half of the gains that would result from a fee reduction, are offset by physicians' response in the form of increased quantity of services provided.

## 4.5. Conclusion

The question addressed in this chapter was: To what extent do research findings come up with empirical evidence for the widely held idea that (1) physicians under fee-for-service payment provide more services than physicians under capitation payment and salary, and that (2) physicians under fee-for-service payment will react to a decrease in their revenues by increasing the quantity of services provided?

With regard to the first part of the question, it must be concluded, that the number of research reports in which fee-for-service payment is, in a methodologically acceptable way, compared to salary or capitation payment is not overwhelming. The research that has been done, however, generally corroborates the notion that physicians under fee-for-service payment provide more services than salaried physicians or physicians under capitation payment.

The second part of the question is more difficult to answer, as was pointed out earlier in this chapter. Especially the observed increase in intensity and complexity of services reported by Rice (1983) and Birch (1988), and the shift in service profile noticed by Van Doorslaer & Geurts (1987), indicate that physicians (and dentists and physiotherapists) react as hypothesized to changes in the price of care or physician density, although Schwartz et al (1981), Barer et al (1987), Schwartz & Mendelsohn (1990), and Escarce (1992) provide counter-evidence. One of the questions that is - implicitly - of major importance in discussions on the phenomenon of supplier-induced demand, is to what extent physicians would be willing to provide medically unnecessary services in order to increase their revenues. In that respect, Evans (1984) linked supplier-inducement of demand to professional uncertainty about the benefits of treatment for a specific patient. Flierman's analyses, testing Evans' hypothesis, indicate that physicians under fee-for-service payment act in their own financial interest only, within the boundaries of medical ethics and standards on when and how to perform specific services. Within these boundaries, Flierman (1991) shows that physicians perform more services after their payment system is changed from 100% capitation to a mix of capitation and fee-for-service. This conclusion is consistent also, with Wilensky & Rossiter's remark that

" Physicians initiate medical care for their patients primarily because of their patients' health status modified by their patients' financial interests rather than in a way which is consistent *only* with their own self-interest. "  
(1983, p. 272)

## Notes

1. In the literature on HMOs, three aspects are usually mentioned on which HMO-doctors could differ from doctors in the traditional American health care system: 1) patient population (HMO-patients could be healthier than the average American), 2) quality of care (HMO-doctors could deliver qualitatively inferior care), and 3) organizational setting of health care delivery (working in group practices and participating in utilization review). In some research projects comparing HMO-doctors with physicians in the traditional fee-for-service system, a special effort has been made to control for possibly interfering differences with regard to patients' health states, and organizational setting. For example, Manning et al (1984) have compared utilization in a prepaid group practice (PGP - a specific HMO-type) with utilization in the traditional fee-for-service system meanwhile controlling for (self)selection of patients. A number of researches have also controlled for working in group practices (e.g Scitovsky, 1980, Wright et al, 1984, Epstein et al, 1986, Murray et al, 1992). However, though it is possible to control for working in group practices, the importance of utilization review cannot be assessed in these comparisons.
2. The files of the NIVEL library contain over 37,000 titles, of which some 26,000 consist of articles in about 120 national and international journals, on (primary) health care.
3. Honorering = Dutch for remuneration.
4. The questionnaires were responded by respectively 47% of the patients and 58% of the surgeons (Wilson & Longmire, 1978, p. 458).
5. Per hospital in principal 100 case abstracts per type of operation were reviewed, however, the patient records do not amount to 1,800 because one of the six hospitals was a Veterans Administration Hospital in which only 17 hysterectomies were performed (Wilson & Longmire, 1978, p. 460, table 3).
6. It should be noted, though, that analyses have taken place on the level of patients within the higher level of only three dentists ( $n=3$ ). Since in this chapter, the focus is on the behaviour of physicians, the number of doctors (or actually, dentists) under study here, is too low to generalize the results for physicians' behaviour under different payment systems; regardless of the fact that two samples of 245 patients are compared.
7. Residents were asked to complete a questionnaire to monitor interest in outpatient practice, in psychosocial pediatrics, career choice and so on. Apart from that, during each week of the nine-month study about 25% of the patients were selected randomly, after which their parents were contacted by phone to assess satisfaction with the most recent visit. Results of the residents' questionnaire indicated that the two groups (fee-for-service and salary) did not differ, except with regard to career choice (the salaried residents were more likely to plan a career in private practice than in academic medicine). Patients of the two groups did not significantly differ on variables such as age, mother's age, number of children at home, or single-parents homes (Hickson et al, 1987, p. 346).

## 5. DIAGNOSIS-DETERMINEDNESS OF REFERRALS AND SERVICES

### 5.1. Introduction

In chapter 2 it was explained that in the Netherlands the introduction of a mixed system of capitation payment and fee-for-service for GPs was contemplated in the late 1980s and early 1990s. In 1990, the Dutch GP association and the association of sickness funds even agreed in principle on the introduction of fees for a set of seventeen services to be paid on top of the capitation fee. This type of change in the GP payment system is assumed to induce GPs into providing more services themselves, thus referring fewer patients to medical specialists. At least two conditions will have to be met for this decrease in the number of referrals to occur: 1) after the introduction of fees for specific services, GPs should provide these services more often instead of referring patients to specialists, and 2) the provision of a specific service by GPs should substitute for a referral to a medical specialist.

The first assumption - GPs will provide more services under fee-for-service payment than under capitation payment - is generally corroborated by what little research has actually been undertaken in this field, as was shown in chapter 4. However, even fewer studies report on the validity of the second assumption: the provision of services by GPs as a substitute for referrals to specialists. After grouping the seventeen medical-technical procedures from the Dutch agreement mentioned above into two categories of either therapeutic services or diagnostic services, Groenewegen (1990) found a significant negative correlation between the number of therapeutic services provided per 100 episodes of illness and the number of referrals made per 100 episodes of illness ( $r = -.56$ ,  $p = .00$ ): GPs who provided more therapeutic services themselves referred less patients to a medical specialist. For diagnostic services the relation was not significant ( $r = -.06$ ,  $p = .26$ ). Groenewegen (1991b) also reports on a regional analysis conducted on the level of Danish provinces ( $n = 13$ ). In provinces where GPs perform more diagnostic, therapeutic and minor surgical services per 1,000 patients the number of ambulatory hospital visits per 1,000 inhabitants is significantly lower. Correlations are higher for therapeutic ( $r = -.74$ ,  $p = .00$ ) and minor surgical procedures ( $r = -.73$ ,  $p = .00$ ) than for diagnostic services ( $r = -.56$ ,  $p = .02$ ). According to Flierman (1991) the differences between diagnostic and therapeutic services arise from the generally larger professional uncertainty that is inherent to diagnostic services. As was argued in chapter 3, uncertainty leaves physicians with a broad zone in which they can exchange time for money (and vice versa) without encountering ethical constraints.

In this chapter the relationship between professional uncertainty, performing services and referring to medical specialists will be explored on the level of general practices for

26 therapeutic and diagnostic services, using data from a study on morbidity and interventions in general practice that were also used by Groenewegen (1990). These 26 services were used in a Dutch experiment (which will be described in the next chapter) in which a fee for providing these services was introduced for GPs. Before assessing the substitution effects of this experiment, the substitution potential of the services for which a fee was introduced will be examined in this chapter.

Two hypotheses are tested in this chapter: hypothesis 3 (a service provided by a GP substitutes for a referral made to a medical specialist, and it does so to a larger extent when there is more certainty about when to perform these services and less certainty about when to refer for these services) and hypothesis 1 (increasing certainty among GPs that - given specific morbidity conditions - a referral is not beneficial and increasing social control among GPs will result in lower referral rates) as far as the role of social control is concerned. Social control will be operationalized in this chapter as working in partnerships. It is expected that GPs who work in partnerships provide more services themselves and refer less patients to specialists than do GPs in single-handed practices. The effect of working in partnerships is expected to be larger for services with more professional uncertainty: in that case, GPs experience a zone of uncertainty in which they can exchange social approval from their peers for physical well-being in the form of leisure.

The questions to be answered in this chapter can be summarized as follows:

1. To which extent are the provision of services by GPs and referrals for these services by GPs determined by the diagnosis made?
2. Do GPs who provide more services themselves refer less often for the provision of these services?
3. Do GPs who work in partnerships provide more services and make less referrals than GPs in single-handed practices?
4. Is the effect of working in partnerships larger for services and referrals that are determined to a lesser extent by the diagnosis made?

## 5.2. Method

In this section attention will be paid, first, to the study on morbidity and interventions from which the data are derived for this chapter; second, to the data that are used in the analyses presented here; third, to the measure expressing professional uncertainty as developed by Flierman (1992), which will be used in this chapter as well to answer the first research question, and finally, to the analyses that have been carried out in order to answer questions 2 through 4.

## The Dutch National Survey

The four questions that have been formulated shall be answered using data from the Dutch National Survey on morbidity and interventions in general practice (Bensing et al, 1991, Van der Velden et al, 1992). This study was based on a random non-proportionally stratified sample of the 5,826 GPs practising in the Netherlands on January 1, 1987. The participating 161 GPs, working in 102 practices, were stratified by region, urbanization and distance to the nearest hospital. GPs and their practice assistants participating in the study recorded all their patient contacts during a three-month period (n= 387,250). In order to correct for seasonal variation, the participating GPs were subdivided into four groups which recorded contacts in subsequent three-month periods between April 1987 and March 1988. Apart from encounter data (nature of encounter, treatment and diagnostic tests provided, prescriptions and referrals made), reason(s) for encounter were registered, as well as the probability diagnosis or working hypothesis. Diagnoses and reasons for encounter were coded into ICPC (Lamberts & Wood, 1987) afterwards. A special effort has been made to construct episodes of illness<sup>1</sup> afterwards, using a combination of data including patient code, date of encounter, nature of encounter (first or repeat), reason for encounter and diagnosis. In constructing the episodes of illness, the diagnosis of the last encounter is adhered to as the diagnosis for the whole episode.

## Data used in this chapter

For this chapter, encounters were selected that belonged to an episode of illness in which GPs had made a diagnosis which is relevant for the 26 services under study. First the relevance of diagnoses for specific services was assessed, using protocols developed for the 26 services, in which, among other guidelines, indications for providing a service were listed. Subsequently the relevance of diagnoses after transformation into ICPC-codes was assessed by two separate physicians, who are familiar with the ICPC. And then, since the diagnoses selected will be used in the measure of professional uncertainty as developed by Flierman (1991), one additional criterion was introduced that had to be met by diagnoses in order to be regarded as 'relevant' diagnoses. Flierman (1991, p. 91) required that diagnoses were made in at least 2.5% of the instances in which a service was performed or a referral was made. Flierman's criterion will be modified in that for a diagnosis to be considered relevant it will be sufficient if it is made in either 2.5% percent of the instances in which a service is provided, or in 2.5% of the instances in which a referral is made. For example, the service "incision of an abscess" was performed 394 times by the 161 GPs in the Dutch National Survey, whereas 164 referrals were made with the diagnoses relevant for "incision of an abscess". However, the service was performed only once with a musculoskeletal abscess (ICPC-code L70.9). This amounts to only 0.3% of all 394 incisions, and for that reason musculoskeletal abscesses are not included in the regression analysis as a relevant morbidity condition for "incision of an abscess". On the other hand, with the diagnosis pilonidal cyst / fistula (ICPC-code S85) only 5



services were provided (which is 1.3% of the total number), but 19 referrals were made (11.6% of the total number of 164 referrals). Therefore, pilonidal cyst / fistula is included in the regression analysis as a relevant morbidity condition.

From all the encounters in the Dutch National Survey, those encounters in an episode of illness were selected when either the diagnosis for the whole episode (= the diagnosis made in the last encounter) was relevant, or when the diagnosis made in one of the separate encounters in an episode was relevant. For instance, for the analysis on 'excision of a sebaceous cyst' (one of the 26 services) all encounters were selected that belong to an episode of illness in which (in any of the encounters in that episode) the diagnosis was 'sebaceous cyst' (ICPC-code S93). Services were defined by a combination of a diagnosis and specific interventions recorded by GPs. The service 'excision of a sebaceous cyst', for example, was defined as a combination of the diagnosis 'sebaceous cyst' with the intervention 'minor surgery'. Some of service definitions are somewhat broader than the actual 26 services that were paid for in the Dutch experiment which will be described in chapter 6. For example, in the experiment GPs were paid for microscopic testing of the skin for candidiasis. This service, however, cannot be defined more strictly than a combination of 'examining the skin' (intervention) and 'candidiasis' (diagnosis).

After selecting relevant encounters, data were aggregated to the level of episodes and subsequently to the level of general practitioners (n=161) and general practices (n=102). All numbers that are used in this chapter, therefore, refer to total numbers (of episodes, services or referrals) per GP (n=161) or general practice (n=102) per three months. In table 5.1 for each of the 26 services, the total number of episodes with relevant diagnoses is listed, as well as the total number of services performed and referrals made with the specific diagnoses. Diagnoses printed in italic characters do not meet the criterion that they were made in at least 2.5% of the instances in which a service was performed respectively a referral was made.

### **Measuring professional uncertainty**

In order to assess the diagnosis-determinedness of services and referrals, data have been processed on the level of general practitioners (n=161). Diagnosis-determinedness is presented by Flierman (1991) and Flierman & Groenewegen (1992) as a measure of professional uncertainty. Flierman & Groenewegen (1992, p. 110) measure professional uncertainty

" [...] in terms of indetermination of performances of a service by morbidity conditions assessed. "

Table 5.1 Total number of times per three months that GPs have encountered patients with relevant diagnoses, the number of times a service was provided with a diagnosis, and the number of times a referral was made for a diagnosis

relevant diagnoses (ICPC-code + short title)	Diagnoses: number of times		
	encoun- tered	service provided	referral made
<b>(1) Stitching an open wound</b>			
A10 <i>bleeding, site nos</i>	42	5	3
A80 <i>accident/injury nos</i>	380	70	64
S19 <i>other injury skin/tissue</i>	1349	955	32
S18 <i>laceration/cut</i>	1674	1600	83
N80 <i>other head injury</i>	37	2	2
<b>(2) Therapy ingrown toenail</b>			
S94 <i>ingrown toenail</i>	479	320	63
<b>(3) Excision sebaceous cyst</b>			
S93 <i>sebaceous cyst</i>	999	331	148
<b>(4) Excision nevus/lipoma</b>			
S78 <i>lipoma of skin</i>	300	43	69
S79 <i>other benign neopl. skin</i>	616	259	81
S80 <i>unspec. neoplasma skin</i>	50	12	17
S82 <i>nevus/mole</i>	414	117	116
<b>(5) Incision abscess</b>			
A871 <i>complications (hematoma)</i>	32	2	1
A872 <i>complications (wounds)</i>	167	8	12
A879 <i>complications (NEC)</i>	110	0	15
D951 <i>anal fissure</i>	1	0	0
D952 <i>anal fistula</i>	1	0	0
D953 <i>perianal abscess</i>	4	0	2
L701 <i>Bornholm disease</i>	0	0	0
L702 <i>musculoskeletal abscess</i>	4	1	1
L709 <i>musculoskeletal infect.</i>	5	1	1
R73 <i>boil/abscess nose</i>	17	0	2
S09 <i>infected finger/toe</i>	655	203	55
S10 <i>boil/carbuncle/cellulit.</i>	886	169	42
S85 <i>pilonidal cyst/fistula</i>	63	5	19
X991 <i>absc. gland. Bartholini</i>	43	5	14

Table 5.1 continued

Diagnoses: number of times

relevant diagnoses (ICPC-code + short title)	encoun- tered	service provided	referral made
<b>(6) Puncture of bursa knee/elbow</b>			
L931 bursitis (excl. shoulder)	621	116	55
L10 elbow symptoms/complaints	69	3	11
L15 knee symptoms/complaints	554	4	91
<b>(7) Corticoid/lidocain injection of shoulder/elbow</b>			
L92 shoulder syndrome	1536	333	76
L932 lateral epicondylitis	814	210	47
L10 elbow symptoms/complaints	69	3	11
L08 shoulder symptoms/complt.	296	10	15
<b>(8) Puncture hydrocele</b>			
Y86 hydrocele	47	1	17
<b>(9) Conservative treatment of fracture</b>			
L764 rib fracture	65	5	6
L769 other+L17 (toe symptoms)	2	0	0
L765 claviculum fracture	70	7	28
<b>(10) Conservative treatment of dislocation toe/elbow/shoulder</b>			
L809 dislocation NEC	142	31	27
L801 dislocation shoulder	86	10	38
<b>(11) Bandaging a sprained ankle</b>			
L77 sprains/strains ankle(s)	1527	811	116
<b>(12) Puncture of cyst mamma</b>			
X88 chr. cystic dis. breast	170	0	29
X15 lump/mass breast	99	1	35
X16 breast pain	174	0	8
X17 other sympt. breast	512	2	59
<b>(13) Proctoscopy</b>			
D92 divertical dis. intest.	247	5	25
D94 chr.enteritis	295	2	50
K96 hemorrhoids	1146	5	67
D753 mal.neopl.colon/rectum	78	4	11

Table 5.1 continued

Diagnoses: number of times

relevant diagnoses (ICPC-code + short title)	encoun- tered	service provided	referral made
<b>(14) Examining vision (including tonometry and funduscopy)</b>			
F05 other vision problems	727	190	615
F91 refractive errors	1681	233	1530
F992 retinopathy	122	27	63
<b>(15) Treatment injury cornea</b>			
F76 foreign body in eye	681	132	51
F75 contusion/abrasion	288	2	37
F79 other injuries eye	104	1	14
<b>(16) Audiometry</b>			
H02 hearing complaints	174	77	80
H83 otosclerosis	27	17	7
H841 presbycusis	198	120	102
H842 acoustic trauma	32	25	8
H849 deafness NEC	172	91	89
H99 other dis. ear/mastoid	150	112	27
<b>(17) Paracentesis</b>			
H71 acute otitis media	2780	3	218
H72 serous otitis media	120	0	28
<b>(18) Removing foreign body ear/nose/throat</b>			
H76 foreign body in ear	47	11	3
R87 f.b. nose/larynx/bronch.	34	2	7
<b>(19) Diagnosing in-/subfertility</b>			
Y10 in-/subfertility	46	4	14
W15 infertility complaints	220	2	83
<b>(20) Adjusting IUD</b>			
W12 family planning (IUD)	491	236	32
<b>(21) Adjusting pessary</b>			
X871 uterovaginal prolapse	676	353	107
X872 stress-incontinence female	64	7	14

Table 5.1 continued

relevant diagnoses (ICPC-code + short title)	Diagnoses: number of times		
	encoun- tered	service provided	referral made
<b>(22) Examination of vaginal discharge</b>			
W04 vag. discharge during pregnancy	26	3	1
X11 menopausal sympt./complt.	381	55	20
X72 urogenital candidiasis, proven	1231	163	8
X73 urogenital trichomoniasis, proven	133	31	0
<b>(23) Allergy testing (skin)</b>			
R96 asthma	2908	6	134
R97 hayfever. allergic rhinitis	2081	5	77
R912 respiratory diseases NEC	2597	6	140
S87 atopic dermatitis/eczema	791	0	52
S97 chr. ulcer skin/bedsore	469	1	25
F71 allergic conjunctivitis	2113	0	84
A12 allergy/allergic reaction NOS	1695	4	91
<b>(24) Excision skin for pathology</b>			
S77 malign. neopl. of skin	199	10	120
S79 other benign neopl. skin	616	259	81
S80 other unspec. neopl. skin	50	12	17
<b>(25) Diagnostic testing of skin for mycosis/monilliasis/candidiasis</b>			
S741 athlete's foot	288	192	1
S749 dermatophytosis NEC	2112	1559	48
S75 monilliasis/mon.inf./candidias.	448	256	3
<b>(26) Treatment of ulcer and bedsore</b>			
K952 varicose ulcer of skin	420	340	43
S97 chronic ulcer skin (+ varicose)	469	117	25

According to Flierman & Groenewegen, full professional certainty among doctors implies that there is full consensus about standards on when and how to perform a service. Full consensus would be demonstrated when every doctor would always perform a service when encountering specific morbidity conditions, and no doctor would ever perform that service in other conditions. Flierman & Groenewegen (1992, p. 110) thus argue that the degree to which variation in the performance of a service is explained by variation in morbidity conditions - or diagnoses - encountered (expressed in  $R^2$ ) is a good measure for professional (un)certainty. If  $R^2$  is close to 1, the performance of a service is fully determined by morbidity conditions assessed; if  $R^2$  is close to 0, morbidity conditions do not determine whether or not a service should be provided.

Similarly, in a regression analysis over all doctors with referrals as dependent variable and the number of times the GP has encountered relevant diagnoses as independent variables, a high value for  $R^2$  would indicate that there is a large degree of consensus among GPs about when to refer to a medical specialist. For referrals, therefore,  $R^2$  indicates professional (un)certainty on task definitions. In terms of Evans' description (1984, p. 89), for both providing services and for referrals,  $R^2$  indicates how large the zone of uncertainty is within which the physician can pursue his own goals concerning income and leisure without encountering ethical constraints.

#### *Measuring diagnosis-determinedness in this book*

There is one feature of  $R^2$  that needs to be discussed further: it measures professional (un)certainty about providing services or referring patients. It does not measure professional (un)certainty about *not* providing services or *not* referring patients. For example, if no GP ever excises a sebaceous cyst when encountering one, there is full consensus among GPs (namely, that they should not excise sebaceous cysts), but still  $R^2$  would be 0, because there is no variation to be explained. Therefore, it is necessary to introduce three criteria which will have to be met for  $R^2$  to be an appropriate measure of uncertainty:

- First, services have to be performed and referrals have to be made in at least 5% of the total number of episodes with relevant diagnoses. If the percentage of services provided or referrals made is lower, the diagnosis categories are not specific enough to predict or explain the occurrence of services and referrals. For example, paracentesis is performed in only three instances on a total of 2,780 episodes with the diagnosis 'acute otitis media' (ICPC-code H71). Whatever sound reasons GPs may have had for performing paracentesis in those three instances and not in any of the other 2,777 episodes in which the diagnosis 'acute otitis media' was made, their reasons are not represented by the diagnosis 'acute otitis media'.
- Second, relevant diagnoses have to be encountered by at least 80% of all the GPs, as otherwise (un)certainty over all (or the majority of) GPs cannot be measured. Apart from that, services that occur as rarely as that would not generate much substitution if a fee was introduced for performing them in general practice. For example, in the three-month study period only 47 hydroceles were presented to about one-third of the GPs. So GPs could have prevented 47 referrals at the most on a total of over 11,000 referrals made in the study period by all GPs.
- Third, a service has to be provided, or a referral has to be made, at least once during the three months of study by at least 50% of the GPs encountering a relevant diagnosis. If that is not the case, a majority of GPs agree that the service should *not* be provided (or that the referral should *not* be made) given the morbidity conditions assessed. Though, in that case, there is a substantial amount of professional certainty (namely, on *not* providing a service or referral), this

uncertainty cannot be measured with  $R^2$ , as was explained above. An example of this situation is referring women for IUD adjustment. Just over 10% of the GPs have referred women for that reason, and the majority of GPs did so only once throughout the study period. Yet, GPs have encountered 'family planning - IUD' (ICPC-code W12) episodes 491 times in the three months of study. Clearly, GPs generally agree that they should not refer women to a gynaecologist for IUD adjustment.

Table 5.2 Degree to which service types meet the criteria with regard to services provided by GPs and referrals made to specialists with relevant diagnoses: criterion 1 - services provided/referrals made in at least 5% of the total number of episodes with relevant diagnoses; criterion 2 - relevant diagnoses are encountered by at least 80% of GPs; criterion 3 - services provided/referrals made with a relevant diagnosis by at least 50% of GPs  
\* = criterion is met

	Criterion 1:		Criterion 2:	Criterion 3:	
	services	referrals		services	referrals
1. stitching open wound	*	*	*	*	*
2. therapy ingrown toenail	*	*	*	*	*
3. excision nevus/lipoma	*	*	*	*	*
4. excision sebaceous cyst	*	*	*	*	*
5. incision abscess	*	*	*	*	*
6. puncture bursa	*	*	*	*	*
7. corticoid injection	*	*	*	*	*
8. puncture hydrocele		*			
9. treatment fracture		*			
10. treatment dislocation	*	*	*		
11. bandaging ankle	*	*	*	*	*
12. puncture mamma cyst		*	*		*
13. proctoscopy		*	*		*
14. examining vision	*	*	*	*	*
15. treatment injury cornea	*	*	*		
16. audiometry	*	*	*	*	*
17. paracentesis		*	*		*
18. foreign body ear/nose/throat	*	*			
19. diagnosing infertility		*		*	*
20. adjusting IUD	*	*	*	*	
21. adjusting pessary	*	*	*	*	*
22. examining vaginal discharge	*		*	*	
23. allergy testing			*		*
24. excision skin for path.	*	*	*	*	*
25. diagnosing candidiasis	*		*	*	
26. treatment ulcer/bedsore	*	*	*	*	

## Analyses

Table 5.2 presents an overview of the degree to which data with regard to the 26 services under study meet the three criteria presented here. After measuring professional uncertainty in terms of diagnosis-determinedness, three questions remain that will have to be answered in this chapter: (1) Do GPs who provide more services themselves refer less often for provision of these services? (2) Do GPs who work in partnerships provide more services and make less referrals than GPs in single-handed practices? (3) Is the effect of working in partnerships larger for services and referrals that are to a lesser extent determined by the diagnosis made?

Knowing the diagnosis-determinedness of services and referrals, it is possible to select good "candidates" for substitution. Flierman (1991, p. 7) predicts the substitution potential of services after a change in payment system from 100% capitation to a mixed or pure fee-for-service system. If there is full consensus among GPs about when to perform a service and when to refer a patient (high  $R^2$  for both services and referrals), then changing the payment system will have no effect at all. The provision of services and referrals is completely dictated by the morbidity conditions encountered. If there is full consensus about task definition (high  $R^2$  for referrals), but no consensus about when to perform a service (low  $R^2$  for services), then introducing fee-for-service will increase the number of services provided, but will leave the number of referrals unaffected. If, on the other hand, there is no consensus about task definition (low  $R^2$  for referrals), but full consensus about when to perform a service (high  $R^2$  for services), then introducing fees-for-services will result in maximum substitution: GPs will perform more services themselves instead of referring patients to medical specialists for treatment, but full consensus about when treatment is necessary prevents them from providing unnecessary services. Finally, it is possible that there is neither full consensus about task definition nor on performing services. In that case, Flierman (1991, p. 7-8) argues:

" [...] given a patient's state of health, a GP has a choice of whether or not to think that a service is due. And if he thinks that it is, he has a choice between either rendering it or referring the patient to a specialist to perform it. Now under capitation he maximizes utility by either deciding that the service is not due, or deciding that it is and referring the patient. [...]. After the introduction of a fee he maximizes utility by deciding that the service is due, and performing it. "

Introducing a fee for such services will result in an increase in services provided that outweighs the decrease in referrals.

It is not possible to test Flierman's hypothesis on the substitution potential of services by means of the data from the Dutch National Survey on morbidity and interventions, because no change in payment system took place during the period of data collection. It is, however, possible to analyze the substitution potential of services cross-sectionally. Using the cross-sectional data from the National Survey, regression analyses are



carried out with regard to the twelve services for which  $R^2$  could be computed for both providing services and making referrals: stitching an open wound, adjusting pessary, excision of skin for pathology, excision of nevus/lipoma, bandaging a sprained ankle, audiometry, incision abscess, excision sebaceous cyst, corticoid/lidocain injection of shoulder/elbow, puncture of bursa knee/elbow, therapy of ingrown toenail, and examining vision (including tonometry and funduscopy) (see table 5.2). The analyses are restricted to these twelve services, because they meet the criteria for the use of  $R^2$  as far as both services and referrals are concerned. Services that do not meet the criteria are not considered good 'candidates' for substitution to begin with: they either too seldom occur in general practice to contribute substantially to a lower referral rate, or GPs agree that - given the morbidity conditions assessed - the service should *not* be provided or that the referral should *not* be made. In the latter cases, providing services and making referrals is largely determined by medical standards and task definition. So, introducing a fee would not really change GP behaviour.

Regression analyses will be used to test the substitution potential of the twelve services, but also to answer the question: Do GPs who work in partnerships provide more services and make less referrals than GPs in single-handed practices? This implies that two types of regression analyses are carried out: analyses in which the number of services provided is the dependent variable, and analyses in which the number of referrals made is the dependent variable. For some service types the number of services provided and/or of referrals made is not normally distributed over GPs. The distributions are better if data are aggregated to the level of practices ( $n=102$ , instead of the lower level of the 161 individual GPs). For that reason the regression analyses testing the substitution potential of services and the effect of working in partnerships are carried out on the level of general practices ( $n=102$ ).

Firstly, it is analyzed whether GPs in partnerships perform more services than GPs in single-handed practices. The dependent variable in these regression analyses is the number of services provided per general practice in three months. The independent variables are the number of episodes with relevant diagnoses encountered and a dummy for working in partnerships (0= single-handed, 1= partnership). Both the number of episodes encountered and the dummy for working in partnerships are expected to have a positive effect on the number of services provided.

Secondly, it is analyzed whether GPs who work in partnerships and GPs who provide more services refer fewer patients to specialists when encountering relevant diagnoses. In these regression analyses the dependent variable is the number of referrals made per general practice per three months. Independent variables are the number of episodes with relevant diagnoses encountered, the number of services provided and the dummy for working in partnerships. The number of episodes encountered is, again, expected to have a strong positive effect on the number of referrals made. Working in partnerships and the number of services provided should have a negative effect; that is, if providing services actually substitutes for referring patients to specialists. In terms of Flierman's assumptions, working in partnerships can have both a direct and an

indirect effect on referral rates: GPs who work in partnerships could decide more often that treatment (and therefore referral) is not due, or (given that they think it necessary) GPs in partnerships could provide treatment themselves more often (therefore, avoiding a referral).

Table 5.3 Diagnosis-determinedness ( $R^2$ ) of services provided and referrals made (n.a.= not analyzed because criteria were not met)

Service type	Determinedness ( $R^2$ )	
	of services	of referrals
<b>Service types meeting all the criteria</b>		
Stitching an open wound	.89	.20
Adjusting pessary	.69	.14
Excision skin for pathology	.58	.42
Excision nevus/lipoma	.49	.23
Bandaging a sprained ankle	.48	.15
Audiometry	.44	.38
Incision abscess	.39	.12
Excision sebaceous cyst	.33	.13
Corticoid/lidocain injection of shoulder/elbow	.32	.15
Puncture of bursa knee/elbow	.32	.30
Therapy ingrown toenail	.26	.01
Examining vision (including tonometry and funduscopy)	.12	.96
<b>Service types meeting criteria for services/referrals only</b>		
Diagnostic testing of skin for mycosis/moniliasis/candidiasis	.83	n.a.
Adjusting IUD	.62	n.a.
Treatment of ulcer and bed sore	.20	n.a.
Examining vaginal discharge	.16	n.a.
Proctoscopy	n.a.	.10
Puncture of cyst mamma	n.a.	.16
Paracentesis	n.a.	.24
Diagnosing in-/subfertility	n.a.	.29
<b>Service types not meeting the criteria</b>		
Conservative treatment of fracture	n.a.	n.a.
Puncture hydrocele	n.a.	n.a.
Removing foreign body ear/nose/throat	n.a.	n.a.
Treatment injury cornea	n.a.	n.a.
Conservative treatment of dislocation toe/elbow/shoulder	n.a.	n.a.
Allergy testing (skin)	n.a.	n.a.

Finally, it should be tested whether the effect of working in partnerships is larger for services and referrals that are less strongly determined by the diagnosis made. The effect of working in partnerships on both providing services and making referrals is

expressed in the unstandardized regression coefficients B, that result from the multiple regression analyses described above. As far as providing services is concerned, these coefficients should be higher for services with high professional uncertainty (that is, a low  $R^2$ ): the provision of services with a high  $R^2$  is largely determined by the morbidity conditions encountered (in other words, there is little room for practice conditions or payment systems to have an effect). With regard to referring patients, the regression coefficients should be lower for services with a high professional uncertainty (that is, a low  $R^2$ ). In order to test this expectation, rank order correlations are computed for the relationship between unstandardized regression coefficients B and  $R^2$  for services and referrals.

### 5.3. Results

In table 5.3 the diagnosis-determinedness of services and referrals is listed. The detailed results of the regression analyses from which  $R^2$  results, are shown in Appendix A. The determinedness of both services and referrals varies over a wide range. Stitching an open wound has the highest diagnosis-determinedness as far as providing services is concerned, followed by diagnostic testing of the skin for mycosis, and excision of the skin for pathology. This means that there is strong consensus among GPs about when (that is, with which diagnosis) to perform these services. It should be noted that diagnostic testing of the skin was one of the services that could not be defined very strictly in the survey study from which data have been derived. In the previous section it has already been stated that this service was defined as a combination of 'examining the skin' and 'candidiasis'. Examining a patient's skin (which can consist of just looking at someone's skin) is a rather obvious action with the type of complaints that are covered by the diagnoses concerning mycosis and the like. This common practice is reflected in the high diagnosis-determinedness.

With regard to referrals, the high diagnosis-determinedness of referrals for vision complaints is noteworthy. The  $R^2$  of .96 indicates full consensus about task definition with regard to refractive errors and similar morbidity: patients visiting GPs with these complaints are by definition referred to an ophthalmologist. The high  $R^2$  also reflects distinct features of the Dutch referral system. Patients in health care systems with direct accessibility of specialists would go straight to an ophthalmologist with their vision complaints. In the Netherlands, however, publicly insured patients cannot see an ophthalmologist without being referred by their GP. So those who want to see an ophthalmologist first come to their GP first to ask for a referral.

The second question to be answered in this chapter was: do GPs who provide more services themselves refer less for the provision of these services? Going by table 5.3 one would say that stitching an open wound and adjusting a pessary, and, perhaps to a lesser extent, bandaging a sprained ankle and excision of a nevus or lipoma, are

good candidates for substitution, because for all these services there is a relatively high consensus about when (with which diagnoses) to perform it and a relatively low consensus about when to refer for it. Excision of the skin for pathology is expected to have a low substitution potential, because referrals are quite strongly determined by diagnoses encountered ( $R^2$  is .42).

The third research question was: do GPs who work in partnerships provide more services and make less referrals than GPs in single-handed practices? Both the second and third question have been tested by means of multiple regression analysis. In tables 5.4 and 5.5 the results of these analyses are presented. Table 5.4 shows the results of the analyses with the number of services provided as the dependent variable. For every service type the number of episodes encountered has a significant, positive effect on the number of services provided. Working in partnerships significantly affects the number of times minor surgery is performed on an ingrown toenail only: GPs in partnerships provide this service more often.

In the regression analyses presented in table 5.5 the number of referrals per practice per three months for relevant diagnoses was the dependent variable. Independent variables were the number of episodes encountered, the number of services provided and the dummy for working in partnerships. A significant, negative coefficient for the number of services provided indicates a substitution effect: GPs who provide this service more often refer fewer patients to specialists with relevant diagnoses. A significant, negative coefficient for working in partnerships indicates that GPs in partnerships refer fewer patients independently of a possibly higher number of services provided.

A substitution effect is visible for the three out of four services that were regarded good 'candidates' for substitution: stitching an open wound, adjusting a pessary, and excision of a nevus or lipoma, but also for excision of the skin for pathology, excision of a sebaceous cyst, and therapy of an ingrown toenail (which were expected to have low substitution potential).

Patients of general practices where GPs perform these six services more often are significantly less often referred to a specialist, independently of the number of times that GPs are confronted with relevant morbidity conditions, and independently of whether they work in partnerships. The latter has a significant effect only on referring for sprained ankles (GPs in partnerships refer more patients for this condition) and on referring for a sebaceous cyst (GPs in partnerships refer fewer patients).

Finally, in table 5.6. rank order correlations are displayed for the relationship between diagnosis-determinedness ( $R^2$ ) of services (and referrals) and the unstandardized regression coefficient (B) for the effect of working in partnerships on providing services (and making referrals). It was argued that the effect of working in partnerships would be larger for services and referrals that are to a lesser extent determined by the diagnosis made.

Table 5.4 Regression results (unstandardized B and significance \* p <.05, \*\* p <.01) for analyses of numbers of services provided per general practice (n=102), with numbers of episodes with a relevant diagnosis encountered and a dummy for working in partnerships (0= single-handed practice, 1= partnership) as independent variables

Service type	B	significance
<b>Stitching an open wound</b>		
n of episodes with relevant diagnosis	.98	**
working in partnership	-.24	
<b>Adjusting pessary</b>		
n of episodes with relevant diagnosis	.62	**
working in partnership	.24	
<b>Excision skin for pathology</b>		
n of episodes with relevant diagnosis	.41	**
working in partnership	.06	
<b>Excision nevus/lipoma</b>		
n of episodes with relevant diagnosis	.43	**
working in partnership	-.01	
<b>Bandaging a sprained ankle</b>		
n of episodes with relevant diagnosis	.84	**
working in partnership	-.20	
<b>Audiometry</b>		
n of episodes with relevant diagnosis	.87	**
working in partnership	-.16	
<b>Incision abscess</b>		
n of episodes with relevant diagnosis	.22	**
working in partnership	1.16	
<b>Excision sebaceous cyst</b>		
n of episodes with relevant diagnosis	.29	**
working in partnership	-.28	
<b>Corticoid/lidocain injection of shoulder/elbow</b>		
n of episodes with relevant diagnosis	.23	**
working in partnership	-1.62	
<b>Puncture of bursa knee/elbow</b>		
n of episodes with relevant diagnosis	.15	**
working in partnership	.30	
<b>Therapy ingrown toenail</b>		
n of episodes with relevant diagnosis	.66	**
working in partnership	1.52	*
<b>Examining vision (incl. tonometry, funduscopy)</b>		
n of episodes with relevant diagnosis	.42	**
working in partnership	.65	

Table 5.5 Regression results (unstandardized B and significance \* p <.05, \*\* p <.01) for analyses of numbers of referrals made per general practice (n=102), with numbers of episodes with a relevant diagnosis encountered, number of services provided per general practice and a dummy for working in partnerships (0= single-handed practice, 1= partnership) as independent variables

Service type	B	significance
<b>Stitching an open wound</b>		
n of episodes with relevant diagnosis	.08	**
n of services provided	-.03	*
working in partnership	-.20	
<b>Adjusting pessary</b>		
n of episodes with relevant diagnosis	.18	**
n of services provided	-.12	**
working in partnership	.36	
<b>Excision skin for pathology</b>		
n of episodes with relevant diagnosis	.31	**
n of services provided	-.36	**
working in partnership	-.15	
<b>Excision nevus/lipoma</b>		
n of episodes with relevant diagnosis	.31	**
n of services provided	-.41	**
working in partnership	-.63	
<b>Bandaging a sprained ankle</b>		
n of episodes with relevant diagnosis	-.70	*
n of services provided	-.03	
working in partnership	.08	**
<b>Audiometry</b>		
n of episodes with relevant diagnosis	.37	**
n of services provided	-.03	
working in partnership	.03	
<b>Incision abscess</b>		
n of episodes with relevant diagnosis	.09	**
n of services provided	-.02	
working in partnership	-.07	
<b>Excision sebaceous cyst</b>		
n of episodes with relevant diagnosis	.22	**
n of services provided	-.20	**
working in partnership	-.69	*
<b>Corticoid/lidocain injection of shoulder/elbow</b>		
n of episodes with relevant diagnosis	.05	**
n of services provided	-.04	
working in partnership	-.15	

Table 5.5 continued

service type	B	significance
<b>Puncture of bursa knee/elbow</b>		
n of episodes with relevant diagnosis	.17	**
n of services provided	-.09	
working in partnership	-.37	
<b>Therapy ingrown toenail</b>		
n of episodes with relevant diagnosis	.13	**
n of services provided	-.09	**
working in partnership	.10	
<b>Examining vision (incl. tonometry, funduscopy)</b>		
n of episodes with relevant diagnosis	.75	**
n of services provided	-.10	
working in partnership	.30	

Table 5.6 Rank order correlations between diagnosis-determinedness ( $R^2$ ) of respectively services and referrals, and the unstandardized regression coefficient (B) for the effect of working in partnerships on respectively providing services and making referrals for twelve service types (rank order between brackets)

Service type	Providing services:				Making referrals:			
	R <sup>2</sup>	order	B	order	R <sup>2</sup>	order	B	order
Stitching an open wound	.89	(1)	-.24	(10)	.20	(6)	-.20	(8)
Adjusting pessary	.69	(2)	.24	(5)	.14	(8)	.36	(1)
Excision skin for pathology	.58	(3)	.06	(6)	.42	(2)	-.15	(7)
Excision nevus/lipoma	.49	(4)	-.01	(7)	.23	(5)	-.63	(10)
Bandaging a sprained ankle	.48	(5)	-.20	(9)	.15	(7)	.08	(4)
Audiometry	.44	(6)	-.16	(8)	.38	(4)	-.37	(9)
Incision abscess	.39	(7)	1.16	(2)	.12	(10)	-.07	(6)
Excision sebaceous cyst	.33	(8)	-.28	(11)	.13	(9)	-.69	(11)
Corticoid/lidocain injection	.32	(9)	-1.62	(12)	.15	(7)	-.15	(7)
Puncture of bursa knee/elbow	.32	(9)	.30	(4)	.30	(3)	.03	(5)
Therapy ingrown toenail	.26	(10)	1.52	(1)	.01	(11)	.10	(3)
Examining vision	.12	(11)	.65	(3)	.96	(1)	.30	(2)
Rank order correlation			-.30 (p= .17)				-.02 (p=.48)	

The effect of working in partnerships on providing services and making referrals (expressed in the unstandardized regression coefficients B) should be larger for services and referrals with a low diagnosis-determinedness ( $R^2$ ). Therefore, a negative

rank order correlation is expected with regard to providing services (lower  $R^2$ , higher B), and a positive correlation is expected as far as referring is concerned (lower  $R^2$ , lower B). In table 5.6 it can be seen that, with regard to providing services, the rank order correlation is negative as expected (with a value of  $-.30$ ), though not significant. For making referrals the expected relationship is absent altogether: the rank order correlation has a coefficient of  $-.02$ .

## 5.4. Discussion

In this chapter four questions have been addressed that dealt with the potential for substitution of 26 medical-technical services and the relationship between working in partnerships and providing services or making referrals. These questions were:

1. To which extent are provision of services by GPs and referrals for these services by GPs determined by the diagnosis made?
2. Do GPs who provide more services themselves refer less often for the provision of these services?
3. Do GPs who work in partnerships provide more services and make less referrals than GPs in single-handed practices?
4. Is the effect of working in partnerships larger for services and referrals that are determined to a lesser extent by the diagnosis made?

The answers to the questions can be summarized as follows: (1) The provision of services and referrals made by GPs is only to a very limited extent determined by diagnoses encountered. Six service types are so uncommon in Dutch general practice (because either morbidity conditions are uncommon or the provision of services and making referrals with relevant morbidity conditions are uncommon), that the diagnosis-determinedness of services and referrals could not be assessed by applying Flierman's measure:  $R^2$ . This does not mean that there is professional uncertainty among GPs on when to perform these services, or when to refer for these morbidity conditions, but rather that doctors agree that (medically speaking) the relevant diagnosis are hardly ever a good reason for performing a service or making a referral. Judging from the diagnosis-determinedness of services and referrals, insofar as it could be measured with  $R^2$ , there are only two to four good 'candidates' for substitution among the remaining services: stitching an open wound, adjusting a pessary, and, to a lesser extent, bandaging a sprained ankle and excision of a nevus or lipoma. (2) Do GPs who provide these services more often, refer fewer patients to specialists? The substitution potential of services was assessed in cross-sectional analyses on the level of general practices. Six services had substitution effects: stitching an open wound, adjusting a pessary, excision of a nevus or lipoma (all three considered good 'candidates'), excision of the skin for pathology, excision of a sebaceous cyst, and therapy of an ingrown toenail. In general practices where these six services are performed more often, patients are referred less often to a specialist. (3) Do GPs in partnerships provide



Table 5.5 continued

service type	B	significance
<b>Puncture of bursa knee/elbow</b>		
n of episodes with relevant diagnosis	.17	**
n of services provided	-.09	
working in partnership	-.37	
<b>Therapy ingrown toenail</b>		
n of episodes with relevant diagnosis	.13	**
n of services provided	-.09	**
working in partnership	.10	
<b>Examining vision (incl. tonometry, funduscopy)</b>		
n of episodes with relevant diagnosis	.75	**
n of services provided	-.10	
working in partnership	.30	

Table 5.6 Rank order correlations between diagnosis-determinedness ( $R^2$ ) of respectively services and referrals, and the unstandardized regression coefficient (B) for the effect of working in partnerships on respectively providing services and making referrals for twelve service types (rank order between brackets)

Service type	Providing services:				Making referrals:			
	R <sup>2</sup>	order	B	order	R <sup>2</sup>	order	B	order
Stitching an open wound	.89	(1)	-.24	(10)	.20	(6)	-.20	(8)
Adjusting pessary	.69	(2)	.24	(5)	.14	(8)	.36	(1)
Excision skin for pathology	.58	(3)	.06	(6)	.42	(2)	-.15	(7)
Excision nevus/lipoma	.49	(4)	-.01	(7)	.23	(5)	-.63	(10)
Bandaging a sprained ankle	.48	(5)	-.20	(9)	.15	(7)	.08	(4)
Audiometry	.44	(6)	-.16	(8)	.38	(4)	-.37	(9)
Incision abscess	.39	(7)	1.16	(2)	.12	(10)	-.07	(6)
Excision sebaceous cyst	.33	(8)	-.28	(11)	.13	(9)	-.69	(11)
Corticoid/lidocain injection	.32	(9)	-1.62	(12)	.15	(7)	-.15	(7)
Puncture of bursa knee/elbow	.32	(9)	.30	(4)	.30	(3)	.03	(5)
Therapy ingrown toenail	.26	(10)	1.52	(1)	.01	(11)	.10	(3)
Examining vision	.12	(11)	.65	(3)	.96	(1)	.30	(2)
Rank order correlation			-.30	(p= .17)			-.02	(p=.48)

The effect of working in partnerships on providing services and making referrals (expressed in the unstandardized regression coefficients B) should be larger for services and referrals with a low diagnosis-determinedness ( $R^2$ ). Therefore, a negative

rank order correlation is expected with regard to providing services (lower  $R^2$ , higher B), and a positive correlation is expected as far as referring is concerned (lower  $R^2$ , lower B). In table 5.6 it can be seen that, with regard to providing services, the rank order correlation is negative as expected (with a value of  $-.30$ ), though not significant. For making referrals the expected relationship is absent altogether: the rank order correlation has a coefficient of  $-.02$ .

## 5.4. Discussion

In this chapter four questions have been addressed that dealt with the potential for substitution of 26 medical-technical services and the relationship between working in partnerships and providing services or making referrals. These questions were:

1. To which extent are provision of services by GPs and referrals for these services by GPs determined by the diagnosis made?
2. Do GPs who provide more services themselves refer less often for the provision of these services?
3. Do GPs who work in partnerships provide more services and make less referrals than GPs in single-handed practices?
4. Is the effect of working in partnerships larger for services and referrals that are determined to a lesser extent by the diagnosis made?

The answers to the questions can be summarized as follows: (1) The provision of services and referrals made by GPs is only to a very limited extent determined by diagnoses encountered. Six service types are so uncommon in Dutch general practice (because either morbidity conditions are uncommon or the provision of services and making referrals with relevant morbidity conditions are uncommon), that the diagnosis-determinedness of services and referrals could not be assessed by applying Flierman's measure:  $R^2$ . This does not mean that there is professional uncertainty among GPs on when to perform these services, or when to refer for these morbidity conditions, but rather that doctors agree that (medically speaking) the relevant diagnosis are hardly ever a good reason for performing a service or making a referral. Judging from the diagnosis-determinedness of services and referrals, insofar as it could be measured with  $R^2$ , there are only two to four good 'candidates' for substitution among the remaining services: stitching an open wound, adjusting a pessary, and, to a lesser extent, bandaging a sprained ankle and excision of a nevus or lipoma. (2) Do GPs who provide these services more often, refer fewer patients to specialists? The substitution potential of services was assessed in cross-sectional analyses on the level of general practices. Six services had substitution effects: stitching an open wound, adjusting a pessary, excision of a nevus or lipoma (all three considered good 'candidates'), excision of the skin for pathology, excision of a sebaceous cyst, and therapy of an ingrown toenail. In general practices where these six services are performed more often, patients are referred less often to a specialist. (3) Do GPs in partnerships provide

more services and refer fewer patients? The answer to that question, based on the analyses conducted in this chapter is: hardly. GPs in partnerships perform more minor surgery on ingrown toenails, and they refer fewer patients with sebaceous cysts. However, they refer more patients with sprained ankles than GPs in single-handed practices. (4) Furthermore, the expected relationship between working in partnerships and professional uncertainty could not be demonstrated. The effect of working in partnerships is not larger for services and referrals with a higher degree of professional uncertainty (that is, for services and referrals that are to a lesser degree determined by morbidity conditions encountered).

What do these conclusions imply? The 26 services examined here were used in a Dutch experiment (which will be described in more detail in chapter 6) in which a fee for providing these services was introduced for GPs on top of their capitation payment for publicly insured patients. Ideally, the analyses that have been carried out here should have been carried out before an experiment of that type was undertaken. Unfortunately, they were not. Some of the services are so uncommon that less than 80% of Dutch GPs is confronted with a relevant diagnosis in a three month period. It is not likely, therefore, that paying GPs for performing these services will result in substantially lower referral rates. In fact, the majority of the services chosen, even if they are common in general practice, have a fairly low potential for substitution of GP care for specialist care. However, cross-sectional analyses revealed some substitution effects of performing services, even for service types that were not expected to result in substitution. It is interesting, therefore, to examine the effects of introducing fee-for-service for the 26 procedures in over-time analyses of GP referral rates. These analyses will take place in the next chapter, using data on referrals before and after the introduction of fees for the 26 services. The effects of introducing fees will be compared with the effects of providing post-graduate training for GPs, coupled with peer review and feedback. The latter method has been used in yet another Dutch experiment that was aimed at substituting primary medical care for specialist care delivered in hospital. The effects of the experiment with education, peer review and feedback will also shed more light on the role of social control, combined with reducing professional uncertainty with regard to GP referral rates.

## Notes

1. An episode of illness is defined as the phase in which a patient seeks professional help for a problem or illness. Within one episode, one or more encounters can take place (Van der Velden et al, 1992, p. 10).

## 6. REFERRAL RATES IN TWO DUTCH EXPERIMENTS

### 6.1. Introduction

With regard to the microlevel, the first hypothesis formulated in chapter 3 was: increasing certainty among GPs that - given specific morbidity conditions - a referral is not beneficial and increasing social control among GPs will result in lower referral rates. Increased social control will prevent GPs from unnecessarily referring patients in order to gain time (leisure), whereas increased professional certainty leaves them less room for doing so in the first place. In addition, GPs will refuse more often to make a referral that they perceive as non-beneficial, because their peers rather than the individual patient demanding a referral are their source of social approval. This second hypothesis can be tested in secondary analyses, using data from a Dutch experiment that took place in the region of Emmen (in the north-east of the Netherlands), which shall be referred to in this book as the educational experiment.

In chapter 3 three additional hypotheses with regard to the microlevel were presented in the form of a logical argument: (2) under fee-for-service payment doctors provide more services than under capitation payment or salary, (3) a service provided by a GP substitutes for a referral made to a medical specialists, and the more so when there is more certainty about when to perform these services and less certainty about when to refer for these services; therefore, (4) introducing fee-for-service in addition to GP capitation payment will reduce referral rates.

In chapter 4 attention was paid to the assumption that physicians provide more services under fee-for-service payment than under capitation payment or salary. The research that has been done in this field generally corroborates that idea. In chapter 5 the substitution potential of 26 medical-technical procedures was examined. In another Dutch experiment, which shall be referred to in this book as the fee-for-service (F.F.S.) experiment, GPs received a fee for performing these procedures on top of their usual capitation payment. Data from this experiment were made available for secondary analyses by the University of Leiden, where the experiment was designed and evaluated (by Van Heyningen et al, 1991). These data provide the opportunity for testing hypothesis 4: introducing fee-for-service in addition to GP capitation payment will reduce referral rates.

The F.F.S. experiment was set up by the University of Leiden in the region of Leiden and Alphen aan den Rijn in the Netherlands. In this experiment, as was indicated above, fee-for-service was introduced for publicly insured patients of GPs, to be paid in addition to the usual capitation fee for publicly insured patients. The goal of the introduction of fee-for-service was to induce GPs into performing these procedures themselves more often rather than referring patients to medical specialists. In chapter 5

it was argued that the analyses carried out there should ideally have taken place earlier, namely before the start of the experiment. However, when the F.F.S. service experiment was designed (in 1987), the data from the Dutch National Survey were not yet available. The choice of services with a potential for substitution was, therefore, based on a questionnaire distributed among potential participants, in which GPs could indicate how often they performed specific services and how often they referred for relevant morbidity conditions (Van Heyningen et al, 1991).

In chapter 5 it was concluded, on the basis of the survey data, that four services were good 'candidates' for substitution: stitching an open wound, adjusting a pessary, bandaging a sprained ankle, and excision of a nevus or lipoma. For these services, professional certainty about when to perform the service is comparatively high, whereas there is relatively low certainty among GPs about task definition. Of these 'candidates' stitching an open wound, adjusting a pessary and excision of a nevus/lipoma had a significant substitution effect in the cross-sectional analyses. A substitution effect was also found for excision of the skin for pathology, excision of a sebaceous cyst, and minor surgery on an ingrown toenail. In this chapter the substitution potential of the 26 services in the F.F.S. experiment will be tested over time in secondary analyses of data on GP referral rates before and after the introduction of fee-for-service on top of the usual capitation fee.

The educational experiment was designed by the Netherlands institute of primary health care (NIVEL) in cooperation with the regional sickness fund 'Het Groene Land' (Stokx et al, 1992a). The intervention consisted of an extensive programme of post-graduate training, peer review, audit and feedback. The purpose was to equip GPs with the knowledge needed for successfully treating patients themselves and to improve the quality of prescription and referral behaviour in terms of efficiency and effectiveness. While this education was used to reduce professional uncertainty, increasing social control was another key element in the intervention. In monthly meetings the participating GPs were confronted with feedback on their professional behaviour, for example with regard to drug prescription and referrals to specialists. GPs were compensated by the regional sickness fund for attending these meetings (in other words, they could gain social approval without 'losing' physical well-being). In the meetings the GPs collectively set standards and targets for their behaviour. Problems encountered in complying with the new guidelines could also be discussed. All in all, the intervention met Harris' criterion for a good practice model fairly well:

" The best practice model appears to be one in which physicians and administrators make group decisions, develop and continuously improve agreed upon methods of practice, interact and think before acting, and have rewards for such behavior. "  
(Harris, 1990, p. 1218)

Since reducing referral rates was a main goal in both experiments, in this chapter both hypotheses with regard to GP referral to specialists will be tested in a secondary

analysis of data from the experiments. Since the two experiments have already been evaluated separately - the F.F.S. experiment by Van Heyningen et al (1991) and the educational experiment by Stokx et al (1992a) - it is more interesting here to analyze the effects of the two interventions in one analysis. The basic question, therefore, is: did the introduction of fee-for-service in the F.F.S. experiment, and the intervention programme in the educational experiment, result in the desired substitution of care provided by GPs for specialist care, and in what way do possible substitution effects differ between the two experiments and between services? In the next section the design of the experiments and available data will be described. Then hypotheses 1 and 4 will be checked against evidence from the original studies by evaluating the effects separately. Results from the secondary analysis are presented and discussed in two subsequent sections. Finally, since this is the last chapter dwelling on the microlevel of individual physician behaviour, conclusions with regard to the microlevel will be summarized in section 6.6.

## 6.2. Data and method

### *Design*

The F.F.S. experiment took place from July 1988 through December 1989 in the region of Leiden and Alphen aan den Rijn in the Netherlands. Some 106 GPs participated. Since the GPs in that region were not obliged to take part in the experiment more than one-third of them did not participate. GPs could start participating in the experiment at any time between July 1988 and December 1988. The experiment was set up in cooperation with the regional sickness fund, and consequently includes publicly insured patients only. The main intervention consisted of the introduction of a fee-for-service payment on top of the usual capitation payment for the 26 selected procedures that have been analysed in chapter 5<sup>1</sup>. Protocols and post-graduate training regarding the 26 services were offered. Like the experiment itself, however, observing the protocols and participating in the training was done on a voluntary basis. GPs in the neighbouring region of Gouda and Woerden were initially chosen to serve as a control group as far as GP referral rates for publicly insured patients are concerned. However, the non-participating group of GPs practising in the Leiden and Alphen aan den Rijn region proved to be a better control group for the experimental group<sup>2</sup> (cf. Delnoij et al, 1992). For that reason data concerning GPs in Gouda and Woerden will not be used in this chapter.

The educational experiment took place from September 1989 until January 1991 in the Emmen region. There practically every GP in the region participated (a total number of 60), whereas 49 GPs in the Assen region served as a control group. GPs were offered a programme of post-graduate training, peer review and feedback on the following broad subjects: ophthalmology (and referral behaviour with regard to refractive errors

in particular), referring to medical specialists in general, diagnosing chronic respiratory diseases, and prescription of drugs. In monthly meetings, which were already mentioned in the introduction, GPs received training and were taught specific skills, e.g. to detect eye pathology requiring referral to an ophthalmologist. The meetings were also used for discussing protocols and standards of care, and for getting feedback on referral rates and prescription behaviour.

The two experiments were set up independently from one another, by different researchers from different institutes, in two different regions of the country: they were not explicitly meant to be comparable. Apart from their differences in methods used to change physician behaviour, they focused on different aspects of general practice. The only comparable issue, addressed in both experiments, was the performance of eye examinations by GPs, for which in the Netherlands many patients are referred to an ophthalmologist. In the educational experiment GPs agreed to no longer refer patients with refractive errors (but without further pathology) to an ophthalmologist, but to refer them to an optometrist or opticien instead. In the F.F.S. experiment examining vision was one of the 26 services that fees were introduced for.

### *Data*

Not only were both experiments set up independently from one another, as was indicated in the introduction they were also evaluated independently: the F.F.S. experiment by the University of Leiden (Van Heyningen et al, 1991) and the educational experiment by the Netherlands Institute of Primary Health Care (Stokx et al, 1992). In order to test substitution effects, Van Heyningen et al (1991) used data from the administration of the regional sickness fund on (1) referral rates, (2) services provided by medical specialists and (3) services provided by GPs:

- (1) The number of referrals from GPs to specialists between January 1 and 1988 to December 31, 1989 is available for both participants and non-participants in the Leiden and Alphen aan den Rijn region.
- (2) The number of times the six types of services were provided between January 1, 1988 and December 31, 1989 by specialists for patients of GPs in Leiden and Alphen aan den Rijn is available for both participants and non-participants.
- (3) The number of services (for which a fee is introduced) claimed by GPs is available for participants in the experiment only, and for the experimental period (July 1988 - December 1989) only.

Although in this chapter the term 'GP' will be used, in reality the unit of analysis will not always be an individual GP, but the identification number the sickness fund assigned to either individual GPs or to partnerships (or groups) of GPs for administrative purposes. In the analyses presented the number of 'GPs' is, therefore, lower than the real number of (non-)participants. The number of participants in the F.F.S. experiment used in the analyses is 89; the number of non-participants (serving as control group) is 56.

In the educational experiment, changes in GP prescription behaviour were measured using data from the sickness fund files. However, as far as referrals are concerned,



data were collected exclusively for the purpose of evaluation. Using a registration form that at the same time served as a referral card to specialists, information was gathered on the numbers of referrals to specialists per GP, diagnoses with which patients were referred, the reasons for referral (diagnosing a patient, treating a patient, or both) and so on. This registration took place in both the experimental and the control group between May 1989 and January 1991, using data from May 1989 through August 1989 as a pre-test.

The referral data collected in the educational experiment allowed for very detailed analyses of (changes in) GP behaviour. As was indicated before, in the education programme special attention was paid to referral behaviour with regard to refractive errors and to diagnosing chronic respiratory diseases. Using morbidity-specific referral rates, changes in GP behaviour with regard to referring for refractive errors and referring for chronic respiratory diseases could be monitored in detail. A disadvantage of this way of collecting data is that it requires a lot of effort on the part of the registering GPs. Because this type of registration in itself might also change the GPs' referral behaviour (because it makes doctors aware of their actions), referral data from the sickness fund files on a second group of GPs were used. Because sickness fund data do not contain information on patients' morbidity, a comparison of administrative referral rates with the collected data was possible only on the overall level of referrals per specialism and in total ('in total' refers to the total of referrals to all specialisms): in the three years preceding the intervention the experimental group had 5-10% higher referral rates than the two control regions; this difference disappeared in 1989 (the year in which the intervention started).

For the educational experiment, as for the F.F.S. experiment, the unit of analysis is not always an individual GP, but an identification number assigned to either individual GPs or partnerships or groups of GPs. The number of 'GPs' in the experimental group is 48, whereas the control group consists of 39 'GPs'.

For the analyses presented in this chapter, data used from the educational experiment are comparable to data from the F.F.S. experiment, although far more detailed information is available from the evaluation of the educational intervention. It is important to note that in the Netherlands referrals from a GP to a specialist were (at the time of the experiments) valid for one year only. If a publicly insured patient needed specialist treatment for a longer period, the referral had to be renewed after one year. For both the F.F.S. experiment and the educational experiment these renewals of referrals (which are often specialist-initiated) have been excluded from the analyses presented in this chapter, because these rates do not measure GP behaviour but rather specialist behaviour.

For the F.F.S. experiment, data will be used regarding the number of referrals (excluding renewals) per GP per 1,000 patients to individual specialisms (ophthalmologists, ear nose and throat specialists, specialists in internal medicine, gynaecologists, dermatologists, urologists, and the "remaining" specialists) and in total,

in January through June 1988 (pre-test), and January through June 1989 (post-test). The data used for the educational experiment contain the number of referrals (excluding renewals) per GP per 1,000 patients to individual specialisms (ophthalmologists, ear nose and throat specialists, specialists in internal medicine, gynaecologists, dermatologists, urologists, and the "remaining" specialists) and in total, in May through August 1989 (pre-test, multiplied by 1.5 in order to represent a six-month figure), and April through September 1990 (post-test).

The individual specialisms are relevant for the 26 services in the F.F.S. experiment, in that GPs would refer to these specialists for the provision of the services if they would not perform the services themselves. GPs could refer to a surgeon for three of the four 'candidates' for substitution (stitching an open wound, excision of a nevus or lipoma, and bandaging of a sprained ankle) and for adjusting a pessary they could refer to a gynaecologist. For the GPs participating in the F.F.S. experiment a decrease in referral rates for these two specialisms in particular can therefore be expected. For the GPs in the educational experiment the rates of referral to ophthalmology in particular should decrease as the intervention programme was specifically aimed at reducing the number of referrals for refractive errors. Given the high degree of diagnosis-determinedness of referrals for refractive errors and the low degree of diagnosis-determinedness of examining vision (found in chapter 5, table 5.3.), a change in the GPs' professional standards in this respect is more likely to result in the referral rates decreasing than the introduction of a fee for examining vision.

### *Analyses*

Per GP the percentage of change in referral rate will be calculated. Using a t-test, the differences in mean percentages of change will be analysed for the experimental and control groups in the educational and the F.F.S. experiment separately. A valid comparison of referral rates between the two experimental groups is not possible. Discrepancies may reflect differences in morbidity of the population and supply of hospital and specialist care between regions, and differences in data collection (registration data versus sickness fund data), rather than differences in referral behaviour between GPs.

Before turning to a comparison of GP referral rates in the two experiments, in the next section the hypotheses described in the introduction will be checked against results of the separate evaluations of the experiments by Van Heyningen et al (1991) and Stokx et al (1992). Although in both separate evaluations changes in overall referral rates were analyzed, these results will not be described since referral rates are analyzed later on in this chapter.

## 6.3. Evaluation results

### F.F.S. experiment

Doctors provide more services under fee-for-service payment than under capitation payment. A service provided by a GP substitutes for a referral made to a medical specialist. Therefore, introducing fee-for-service in addition to GP capitation payment will reduce referral rates. This set of hypotheses should ideally be tested by analyzing the number of services provided and referrals made for relevant diagnoses before and after the introduction of fees. Unfortunately, these data are not available. The number of services provided is known for the experimental period only, and, with regard to referrals, the diagnoses with which patients are referred are unknown.

However, as was described in the previous section, Van Heyningen et al (1991) did use sickness fund data on the number of services that were provided in ambulatory care by specialists for patients of participating and non-participating GPs. These service types are (1) treatment of an injury to the cornea or foreign body in eye, (2) excision of tumors and foreign bodies, (3) excision of an ingrown toenail, (4) traumatological consultation, (5) wound-excision, and (6) allergy testing of skin. These six services are the only services for which specialists can submit claims to the sickness fund, that are comparable to the 26 services GPs are remunerated for. If the experiment had worked, the number of services provided by specialists for patients of participating GPs should have decreased during the experimental period. The expected decrease occurred for one of the six services only: the number of wound-excisions performed by specialists on patients of participating GPs decreased significantly more sharply than the number of wound-excisions performed on patients of non-participating GPs (Van Heyningen et al, 1991, p. 55-56). Interestingly, wound-excision by specialists corresponds to the 'number 1 candidate' for substitution as distinguished in chapter 5: treatment of an open wound.

### Educational experiment

The second hypothesis to be tested in this section is: reducing professional uncertainty among Dutch GPs about the benefits of referrals and increasing social control will result in lower referral rates to medical specialists. There are two underlying mechanisms by which reducing uncertainty and increasing social control should result in lower referral rates. Firstly, reduced uncertainty leaves GPs less room to act in their own self-interest (which under capitation payment consists of referring patients), and secondly, increased social control will make 'not referring' a more favourable action, because it provides GPs with social approval. In more specific terms, GPs are expected to make fewer referrals that are demanded by patients but viewed as unnecessary by GPs themselves, because increased social control will place more emphasis on the GPs' peers as a source of social approval than on individual patients.

As far as referring for refractive errors in the educational experiment is concerned, both mechanisms seem to have worked as expected. Stokx et al (1992, p. 69-72) find a

significant decrease in the referral rate for refractive errors of participating GPs compared with GPs in the control group. Per 1,000 patients per year, participating GPs generate about ten referrals for refractive errors less than GPs in the control group (Stokx et al, 1992, p. 72). Apart from the diagnosis with which patients were referred, GPs in the educational experiment also indicated whose initiative had led to a specific referral: the GP himself, the specialist, the patient, or the GP and the patient together. The numbers of referrals (for refractive errors) on the patient's initiative as well as the number of referrals on the combined initiative of GP and patient decreased significantly in the experimental group as compared to the control group. This could indicate that, indeed, GPs participating in the experiment were less willing to give in to patients demanding a referral. Not only for ophthalmology did the number of referrals on the patient's or on combined initiative decrease significantly, but so did the number of these referrals made to other specialisms in the educational experiment (Stokx et al, 1992, p. 65). Stokx et al (1992, p. 150) offer as an explanation that GPs became more aware of their different reasons for referring patients, and therefore regarded referrals more often as their own decision rather than a patient's request. Although referrals for refractive errors decreased in the educational experiment, referrals for chronic respiratory diseases increased significantly. It should be noted that with regard to respiratory diseases, the intervention did not explicitly aim at reducing the number of referrals, but at (earlier) detection of these morbidity conditions by GPs. Stokx et al (1992, p. 151) suggest that GPs improved in recognizing respiratory diseases, but since they were not able to treat all these newly detected cases themselves, they had to refer more patients to lung specialists.

#### 6.4. Changes in referral rates

The evaluation results of the F.F.S. experiment as described in the previous section do not shed too much light on possible changes in GP behaviour. The separate evaluation of the educational experiment, though, indicates that due to the intervention, GP behaviour on the microlevel of referrals for specific morbidity conditions has changed considerably. Changing GP behaviour, however, was not a goal in itself in the two experiments, but rather an instrument for effectuating substitution of care. Whether this goal has been achieved can be analyzed by looking at the GPs' overall referral rates. In order to gain a better insight into the referral rates of the GPs prior to the experiment (and possibly existing differences between experimental and control groups) the mean rates of referral to the different specialisms are listed, in table 6.1, for experimental and control groups in both the F.F.S. and the educational experiment. The referral rates of GPs in the experimental groups and their accompanying control groups do not differ very much. The differences are significant only for the referral rate to internal medicine in the F.F.S. experiment, which is somewhat lower in the experimental group than in the control group ( $t = -2.32$ ,  $p = .02$ ).

Table 6.1 Mean referral rates of GPs prior to the start of the F.F.S. and educational experiments per specialism per 1,000 patients per 6 months

Specialism	FFS experiment		Educational experiment	
	exp. group	ctrl.group	exp. group	ctrl. group
ophthalmolgy	21.1	20.0	14.0	15.9
ear, nose & throat	11.6	11.1	12.5	11.5
surgery	19.3	19.3	20.1	17.8
internal medicine	17.4	21.4	9.1	8.7
dermatology	7.5	8.4	8.5	10.6
gynaecology	11.1	10.4	11.0	9.8
urology	4.8	5.1	3.4	4.1
other specialisms	36.0	36.8	37.0	38.1
all specialisms	128.1	129.6	115.1	116.2

The total number of referrals per 1,000 patients per 6 months, however, does not differ significantly. Although participation in the F.F.S. experiment was voluntary, the referral rates of participants (with the exception perhaps of referrals to internal medicine) do not indicate that prior to the intervention the participating GPs were more active in preventing referrals. An accurate comparison of referral rates between the two experimental groups is not possible, for reasons mentioned in section 6.2.

In table 6.2 the changes in GP referral rates in the two experiments are presented. During the experiment the total referral rates for the two groups in the F.F.S. experiment decreased, while those for the two groups in the educational experiment increased. With the exception of the rate of referral to surgeons and ear, nose and throat specialists in the educational experiment (which increases significantly more sharply for GPs in the experimental group than for GPs in the control group), none of the differences between groups are significant. Although referrals for refractive errors decreased significantly in the educational experiment, as has been described in the former section, the total number of referrals to ophthalmologists made by GPs participating in the experiment did not differ significantly from the referral rate of GPs in the control group. In both experiments there is no significant difference between the changes in total referral rates of the experimental and control groups either.

The total absence of any significant effects in the F.F.S. experiment is striking. This is obviously not only due to a lack of power: referral rates do not consistently decrease more sharply in the experimental group (in the control group, rates of referrals to ear, nose and throat specialists, internal medicine, dermatology and urology decrease more sharply).

Table 6.2 Mean percentage of change in referral rates per GP in the experimental period as compared with pre-experimental referral rates per specialism in the FFS experiment and the educational experiment and t-value plus significance (one-tailed p) of difference between experiment group and respective control group

Specialism	% change in FFS experiment				% change in educational experiment			
	exp. group	ctrl. group	t	p	exp. group	ctrl. group	t	p
ophthalmology	-22	-14	-1.29	.10	33	38	.30	.38
ear, nose & throat surgery	11	4	.74	.23	32	4	-1.67	.05
internal medicine	-12	-8	-.57	.28	26	4	-2.16	.02
dermatology	-17	-22	.78	.22	25	15	-.85	.20
gynaecology	21	3	1.26	.11	10	19	.51	.31
urology	15	16	-.08	.47	3	55	1.63	.06
remaining specialisms	4	-7	.84	.20	6	51	-1.61	.06
all specialisms	-3	-4	.35	.36	12	4	-1.21	.12
	-12	-13	.30	.39	10	4	-1.53	.07

It was expected that the rates of referral for surgery and gynaecology would decrease significantly, because these two specialisms correspond to the four service types for which substitution was expected to occur: treating an open wound, adjusting a pessary, excision of a nevus/lipoma and bandaging a sprained ankle. However, the expected effect did not occur.

## 6.5. Discussion

From the results presented in section 6.3 it must be concluded that GP referral rates did not decrease as a result of the introduction of fee-for-service, nor as a result of the educational intervention. It may be argued that referral rates aggregated on the level of specialisms are too crude a measure to detect effects of introducing fee-for-service or an education programme. As far as measuring changes in GP behaviour is concerned this may be a correct argument, given e.g. that Stokx et al (1992) found significant decreases in referrals for refractive errors which could not be detected on the aggregated level of all referrals to ophthalmologists. However, if the goal is to bring about substitution of care by reducing the number of GP referrals to specialists, aggregated referral rates are, in a sense, the only adequate measure for evaluating the experiments.

It may also be argued that the analyses presented here were based on quite crude methods for testing effects. However, both Van Heyningen et al (1991) for the F.F.S. experiment, and Delnoij et al (1992) for both the F.F.S. and the educational experiment, have carried out more sophisticated analyses of the development of GP referral rates; controlling, for example, for practice characteristics such as urbanization or practice setting (single-handed or group practice), and for differences in the GPs' task definition and referral rate prior to the experiment. However, none of these more detailed analyses showed any of the expected effects.

Van Heyningen et al (1991) and Delnoij et al (1992, p. 203) offer a number of possible explanations for the lack of effect in the F.F.S. experiment. Van Heyningen et al (1991) suggest that, perhaps, many of the services that were included in the experiment were already being provided by GPs most of the time when encountering a relevant diagnosis, leaving little room for improvement. However, perhaps more important than the "room for improvement" is the observation made in chapter 5 that only a relative minority of the 26 services are good candidates for substitution effects.

Delnoij et al (1992) offer an additional possible explanation: the fees for-services were paid on top of the capitation payment. In interviews with participants described in Delnoij et al (1992, p. 257-265), some participants claimed that performing the services could add 5% at the most to their gross revenue. This is, of course, not as good an incentive as the Danish mixed system of capitation and fee-for-service in which GPs derive 50% of their total income from performing services (including fees per consultation). Another important difference with the Danish system is that in the F.F.S. experiment GPs knew that fees were being introduced for a limited period of time (a year and a half) only. This may not have encouraged them to really change their practice style and behaviour.

## **6.6. Summary of the findings with regard to the microlevel**

In chapters 4 through 6 attention was paid to the effect of different institutional arrangements on the professional behaviour of individual physicians. The institutional arrangements studied in these chapters were payment systems, and social control and utilization review. In chapter 3 four hypotheses were formulated with regard to the relationship between institutional arrangements that Dutch GPs are subject to and the GPs' decisions on the microlevel.

The first hypothesis referred to changing GP behaviour by increasing professional certainty and social control:

1. Increasing certainty among GPs that - given specific morbidity conditions - a referral is not beneficial and increasing social control among GPs will result in lower referral rates.

The second through fourth hypotheses referred to changing the GPs' behaviour by changing their payment system:

2. Under fee-for-service payment doctors provide more services than under capitation payment or salary.
3. A service provided by a GP substitutes for a referral made to a medical specialists, and the more so when there is more certainty about when to perform these services and less certainty about when to refer for these services.

Given that hypothesis 2 and 3 are true:

4. Introducing fee-for-service in addition to capitation payment will reduce referral rates.

With regard to the first hypothesis, the analyses carried out in chapter 5 indicate that social control in itself, operationalized as working in partnerships and group practices, has little impact on GP referring behaviour. For the twelve service types that were examined in section 5.3., GPs in partnerships generally did not provide more services themselves, and all in all they did not refer fewer patients either. A few significant differences were found between GPs in single-handed practices and GPs in partnerships: GPs in partnerships more often perform minor surgery on ingrown toenails, refer fewer patients with sebaceous cysts, and refer more patients with sprained ankles.

Increasing certainty among GPs that, given a certain diagnosis, a referral is not beneficial, combined with increased social control, does change GP behaviour on the microlevel, as the results of the educational experiment indicate. However, in the educational experiment this changed behaviour was not reflected in aggregated referral rates of GPs to specialists. The two significant differences in referral rates that could be detected were 'in favour' of the control group: GP referral rates to surgeons and to ear, nose and throat specialists increased more sharply in the experimental group than in the control group. The first hypothesis, therefore, must be rejected.

In this book the second hypothesis was not tested as such, because it is common knowledge that physicians under fee-for-service payment perform more services than physicians under capitation payment or salary. However, in chapter 4 it was investigated to what extent this commonly held idea is corroborated by empirical research. In that chapter it was concluded that the number of research reports comparing fee-for-service payment with salary or capitation payment is quite limited. However, the research that has been conducted generally corroborates hypothesis 2 that physicians under fee-for-service payment provide more services than salaried physicians or physicians under capitation payment.

With respect to the third hypothesis, the substitution potential of services was assessed in cross-sectional analyses in chapter 5. For six service types substitution effects were found: stitching an open wound, adjusting a pessary, excision of a nevus or lipoma



excision of the skin for pathology, excision of a sebaceous cyst, and minor surgery on an ingrown toenail. In general practices where these six services are performed more often, patients are referred less often to a specialist. It was also hypothesized that services substitute for referrals to a larger extent when there is more certainty about when to perform these services and less certainty about when to refer for these services. For stitching an open wound, adjusting a pessary, and excision of a nevus or lipoma there is a relatively high certainty about when (that is, with which diagnoses) to perform these services, and a relatively low certainty about when to refer patients. However, with regard to excision of the skin for pathology there is a quite high agreement among GPs on when to refer patients, and with respect to excision of a sebaceous cyst and minor surgery on an ingrown toenail, certainty is low about both when to perform the service and when to refer patients. Therefore, hypothesis 3 cannot fully be accepted. The findings in chapter 5 and those of research conducted by Groenewegen (1990, 1991b) suggest, nevertheless, that (some) services substitute for referrals. In this respect it is interesting that five of the six services with substitution effects in chapter 5 are therapeutic and minor surgical services, which Groenewegen too (1990) found to have more substitution effects than diagnostic services.

The fourth and last hypothesis concerning the microlevel has been tested in this chapter. Given that hypothesis 2 is true (physicians under fee-for-service payment provide more services than physicians under capitation payment) and that hypothesis 3 is partly true (some, mainly therapeutic and minor, surgical services performed by GPs substitute for referrals to specialists), it may be expected that (hypothesis 4) introducing fee-for-service in addition to capitation payment will reduce referral rates. Though research conducted by Krasnik et al (1990) and Flierman (1991) seems to support this hypothesis, and evidence that the opposite would be true (changing from fee-for-service to capitation increases referral rates) was also found by Stearns et al (1992), the F.F.S. experiment described in this chapter did not have a single effect on the GPs' referral rates. Hypothesis 4, the conclusion of the logical argument in which hypothesis 2 and 3 were premises, must therefore be rejected as far as Dutch GPs are concerned. Because in the F.F.S. experiment data are available on overall GP referral rates only, it cannot be established which of the two premises was not true: hypothesis 2, GPs did not perform more services during the F.F.S. experiment, or hypothesis 3, GPs did perform more services but these did not substitute for referrals to specialists, or both. The keywords in the rejected hypothesis, however, are probably 'in addition to'. A major difference between the F.F.S. experiment and the Danish mixed system of capitation and fee-for-service (evaluated by Krasnik et al, 1990, and Flierman, 1991), is that in Denmark GPs derive on average 50% of their income from fees for services (including consultations). In contrast, in Leiden and Alphen aan den Rijn, these fees constituted a far lower proportion (estimated at 5% by one of the participants) of the GPs' gross revenues and were paid *in addition to* the usual capitation fee.

## Notes

1. In fact, there was one more "service" for which a fee was introduced, namely for diagnosing and treating gonorrhoe. However, in the Dutch National Survey described in chapter 5 this could not adequately be defined as a single service .
2. Although originally referral rates of the GPs in the Gouda and Woerden region were collected to serve as a control group in the F.F.S. experiment, referral rates of GPs in the control group both before and during the experiment were much higher than the rates of GPs in Leiden and Alphen aan den Rijn (both participants as well as non-participants), and showed a quite different trend, especially as far as referrals to internal medicine and dermatology were concerned (Delnoij et al, 1992). The cause of these differences is not altogether clear. Van Heyningen et al (1991, p. 81) put the blame partly on the conflict that had erupted between specialists and sickness funds in 1987 and early 1988, which lasted until 1989. As a consequence of this conflict, in many regions referral claims were no longer directly submitted by specialists to the sickness fund. Instead, patients had to submit claims and were then reimbursed. This may have resulted in under-registration (cf. Stokx et al, 1992b, p. 7), a problem which, according to Van Heyningen et al (1991), has occurred less in the Gouda and Woerden control region. The non-participants in the experimental region are a better control group for the experimental group, because they practise in the same region, refer their patients to the same specialists in the same hospitals, and referral claims are submitted to the same sickness fund. Administrative or other specifically regional factors can, therefore, not interfere with (the development of) GPs' referral rates.

## 7. THE PRICE OF CARE: FEE NEGOTIATIONS AND HEALTH CARE EXPENDITURES

### 7.1. Introduction

The first chapter introduced "the great equation in medical economics", involving the control of expenditures (E) which equal price (P) times quantity (Q) (Eastaugh, 1991, p. 56). Chapters 4 through 6 dealt with the relationship between payment systems and individual physician's decisions with regard to the quantity of care delivered (in terms of services provided and referrals made). In this and the following chapter attention will be paid to factors influencing the price of care (in casu physician fees). Physician fees have two aspects: first, from society's point of view the sum of all fees paid to physicians amounts to a proportion of total health care expenditures; second, from a physician's point of view the sum of all fees paid to him results in his total gross revenue. In other words, like two sides of the same coin:

" One person's spending is another person's income [...]"  
(Pauly, 1993, p. 153)

Negotiations on physician fees, therefore, are the key to understanding the transformation problem: how should social conditions in health care be shaped in order to ensure that physicians' professional behaviour on the microlevel results in cost control on the macrolevel? In chapter 3 it was argued that in negotiations between physicians and third-party payers the microlevel and the macrolevel almost literally meet, because negotiations are entered by third-party payers primarily with a view to overall cost control, whereas physicians enter negotiations primarily with their future incomes in mind.

Chapter 8 will pay attention to methods of negotiating fees and physician incomes. This chapter will deal with the relationship between different methods of negotiating fees and health care expenditures. In both chapters OECD countries are the unit of analysis, in contrast to chapters 4 through 6 where individual physicians were the unit of analysis. In the next section four methods of determining fees will be addressed and examples from ten OECD countries<sup>1</sup> will be used to illustrate the different methods: fees can be determined by market forces (supply and demand), by negotiations directly on the level of fees, through expenditure targets or caps (fees determined so as to reach budgetary goals), or by using target incomes for physicians (fees determined so as to reach a certain level of income). In section 7.3. it will be argued that the opportunities for cost control on the macrolevel are best in countries where expenditure targets or caps, or target incomes are imposed. If fees are left to be determined by market

forces, there is no control over price or quantity of care, and if negotiations are directly about fees, price constraints can be compensated by increasing the quantity of services provided.

In summary: the hypothesis to be tested in this chapter is: in countries where (a) fee-for-service payment is combined with negotiations directly on the level of fees (without constraining the quantity of care), third-party payers have less control over health care expenditures than do third-party payers in countries where (b) expenditure targets or caps, or target incomes for physicians are imposed, and where they have the political power and determination to use these mechanisms for cost control.

## **7.2. Methods of calculating fees**

The four basic methods for determining the level of fees have already been mentioned in the introduction to this chapter: 1) market forces, 2) fee negotiations, 3) the use of expenditure caps and 4) target incomes. In the Western world market forces are no longer the sole determinants of physician fees. Negotiations taking place directly on the level of fees (method 2) are becoming less and less popular as well, for reasons that will be explained later. In all Western health care systems there is a tendency to start imposing expenditure caps (also known as global budgets) on the system, and to calculate fees so as to reach the budgetary target. Finally, calculating fees on the basis of income targets has developed in European countries such as the United Kingdom, the Netherlands and Denmark, and in the Canadian province of Quebec. Each of the four methods will be looked at in the next subsections.

### **Market forces**

Under market forces price (P) is theoretically the result of the confrontation of supply and demand on the market<sup>2</sup>. Here, price determination by market forces will be defined as a situation in which physicians can set their own fees without being tied to maximum charges defined in a fee schedule published by others than the medical profession itself. Defined as such, in OECD-countries market forces still play a role in the United States' health care system (Reinhardt, 1985). However, payment mechanisms differ with insurance plans. In the United States private insurance schemes (operated by both commercial and non-profit organizations) and public schemes such as Medicare and Medicaid coexist. Of all expenditures for ambulatory physician services in the United States in 1987, for example, 38% were covered by private insurance, 14% by Medicare and 18% by other public programmes (in particular Medicaid)<sup>3</sup> (Hahn & Lefkowitz, 1992, p. 12).

Commercial health insurance policies in the United States traditionally pay the patient a specified amount according to a so-called benefit schedule, but the patient is responsible for paying the doctor the amount billed. Blue Shield Plan (nonprofit health insurers) originated as a service-benefit plan (with provision of services in kind) with

participating doctors agreeing to accept the Plan's payment as payment in full. However, non-participating physicians may also bill the patient directly, who is then reimbursed by the Plan. So, even within private health insurance programmes the degree to which doctors are bound by payment controls varies (Showstack et al, 1979, p. 233).

Since 1980 free pricing is also possible for ambulatory care physicians in France. Since 1971 fees had been negotiated on the national level between the National Sickness Insurance Fund (CNAMTS) and the two French medical associations. The negotiated fees (prix conventionnés) were binding for doctors who had accepted the convention (Stephen, 1979, p. 79, Wilsford, 1991, p. 109), but not for certain doctors - considered to have high qualifications - who had the right to charge higher fees. By the late 1970s approximately 17% of all doctors had this "droit de dépassement" (Stephen, 1979, p. 79). In 1980 the "droit de dépassement" was replaced by the Sector II fee system<sup>4</sup>. This Sector II system allows doctors to choose for free pricing and to exceed the negotiated fee schedule "with tact and reasonableness" (Wilsford, 1991, p. 127). Sector II physicians must, in return, pay their own social insurance contributions. By 1990 one out of every four physicians had opted for the Sector II status (Carrere, 1991).

There is one specific method for establishing the amount of payment in the United States that shares characteristics with both a fixed fee schedule and free pricing: the UCR method (the usual, customary and reasonable reimbursement system). Like a fixed fee schedule, the UCR-method sets a maximum fee per service. However, the maximum payment is, in turn, based on physician billing behaviour during a particular period of time. As a result, market forces can influence the amount of payment as well. The system is applied by private insurers, and until January 1 1992 it was used under the name of CPR (Customary, Prevailing, Reasonable) for physician payment under Medicare<sup>5</sup>.

Under the UCR-method physicians are paid the lesser of three levels of payment: the usual charge of the individual doctor for a specific service, the customary charge of all doctors in a given geographic area, or the reasonable charge. Definitions of "reasonable charges" differ, but when a charge is above the usual or customary charge, reasonableness is judged e.g. by a medical review committee that evaluates whether a particular case has special circumstances that justify a higher charge (Showstack et al, 1979, p. 234). Market forces thus influence payment with some delay: in order to be paid more in the future, physicians can raise their usual charges by consistently billing higher than they did in the past. Of course, if enough providers in an area follow the same strategy, the customary charge will also be raised. Showstack (1979, p. 235) concludes that under UCR, the fee-for-service system's general lack of incentives to be cost-effective, or to minimize fee inflation, is exacerbated (cf. Yett et al, 1985). In the United States various methods have been applied to control inflation of unit prices under UCR, however with little succes<sup>6</sup>. Its inflationary impact, coupled with the complex administrative procedures required to maintain fee profiles in UCR, has led

to a decline in the popularity of the method. Showstack (1979, p. 237) noticed that towards the end of the 1970s there was increasing interest in the alternative: the maximum benefit (or fee) schedule<sup>7</sup>.

### **Fee negotiations**

Negotiations between physicians and third-party payers can be directly about fees or, in terms of the equation, on price (P): the amount of money that is to be paid for one specific service (in the case of fee-for-service payment) or for treating a patient during a given period of time (under capitation payment) or for an hour's work (in a salary system). In negotiations the arguments for fee raises are linked, for example, to overall levels of economic growth or inflation, increased practice expenses etcetera.

Under fee-for-service payment, fee negotiations are usually based on a benefit or fee schedule. Fee schedules consist of (1) relative values of medical services and (2) a conversion factor for transforming relative values into prices. Relative values can be determined historically, but in most cases they are at least formally related to e.g. the time or the skills required to perform a specific procedure. In the United States much effort has been put into designing a sophisticated relative value scale of medical services that accounts for resource-input costs needed to provide a certain service. This has resulted in the Resource-Based Relative Value Scale (RBRVS) developed by Hsiao et al (1988a, 1988b). In the RBRVS three factors determine the relative value of a given medical service: the total work input by the physician, practice expenses (including malpractice premiums) and opportunity costs of postgraduate training to become a qualified medical specialist (Hsiao et al, 1998a, p. 835).

In order to transform relative values into fees, a conversion factor is attached to fee schedules. In France, in Belgium until 1991 and in Germany until 1976 this conversion factor itself is (was) subject of negotiations; that is, it is (was) not attached to budgetary targets or a target income for physicians (Wilsford, 1991, Kesenne, 1991, Kirkman-Liff, 1990). For example, until 1976 the sickness funds in Germany made quarterly payments to the regional associations of physicians (kassenärztliche Vereinigung) calculated on the basis of the average worth - expressed in points - of the claims in the previous quarter. Thus the fee schedule officially used points to represent the relative value of services. However:

" [...] the conversion factor (from points to deutsche marks) was constant and universally known and was used both to allocate the pool to the physicians and to generate the next quarter's payment. [...] The system was essentially fee-for-service reimbursement, with the sickness fund physician association acting as a central claims processing and payment distribution office [...]. "

(Kirkman-Liff, 1990, p. 77)

Applying a fee schedule without linking the conversion factor to an expenditure target or a global budget is not very effective as regards cost control. Eastaugh (1991, p. 56)

compared the health care system to a very adaptable balloon: a squeeze here (for example price) can result in a bulge there (for example, increased volume of services). Negotiations on fees, therefore, have become less and less popular. Germany (Schneider et al, 1987) and Quebec (Neuschler, 1990) were among the first to introduce expenditure caps and targets in the 1970s in order to determine physicians' fees, and by the early 1990s the method had become more widespread.

### **Expenditure caps**

When expenditure caps and targets are imposed, calculating physicians fees is simple in principle: determine E - total expenditures - and Q - quantity: divide E by Q and the result is P - price. Glaser (1991, p. 423) distinguishes between caps (also referred to as global budgets) and targets. When expenditure caps are imposed the budget is fixed and tightly monitored, so that, for example on an annual basis, it cannot be exceeded. Adjustments are made during the course of a budgetary year, for example quarterly. Expenditure targets are less tightly monitored. In that case fees are set in advance so as to reach a given target, for example in the next year. The imposition of targets or caps for physician fees is quite common nowadays. Apart from Quebec and Germany, they are applied, for example, to the fees of medical specialists in the Netherlands (since 1989), in Belgium (since 1991) and Medicare in the United States (since 1992) in compliance with the propositions of the Physician Payment Review Commission (Iglehart, 1989, Ginsburg & Lee, 1991).

In Germany expenditure targets were imposed between 1978 and 1986. The approach was not as effective as desired, in that expenditures consistently exceeded the target. Therefore, in 1986 the target was converted into an expenditure cap. This implies that the conversion factor is determined retrospectively, on the basis of the total number of points claimed by physicians. The total budget per region is negotiated between regional physician associations and sickness funds. The system was modified further in 1987, when in most regions of West Germany three separate pools were created for physician consultation services, laboratory testing, and other services. At the same time, in order to emphasize the role of family physicians, relative values of basic physician services (consultations, physical examinations and preventive care) were upgraded, whereas relative values of laboratory services were downgraded (Brenner & Rublee, 1991, p. 149).

Public health insurance in Canada is operated by the ten Canadian provinces. Within the Canadian federal system they are considerably more powerful in the field of health care than, for example, the states within in the United States' federal system (Neuschler, 1990, p. 9). In the French-speaking province of Quebec the incomes of physicians have been curbed since the mid-1970s, by the government limiting the amount payable to each individual doctor per quarter to a maximum. If the quarterly cap is exceeded, payments are made at a rate of only 25% of the negotiated fee schedule. On top of that, there are annual global caps for GPs and specialists separately. If the expenditure

cap is exceeded by the profession as a whole, fees are reduced in subsequent years in order to compensate for the excess payment (Neuschler, 1990, p. 33). According to Neuschler (1990, p. 33):

" One might expect that this particularly stringent approach to expenditure control would lead to severe emigration of physicians. This has not occurred, probably because Quebec is the only province in which a French-speaking culture dominates. "

In any case, none of the English-speaking provinces have imposed expenditure caps yet, although four<sup>8</sup> have begun to experiment with systems which allow for excessive increases in utilization being compensated by fee reductions in subsequent years. In the United States a new payment system for physicians under Medicare Part B has been in effect since 1 January, 1992<sup>9</sup>, replacing the CPR-system that has been described in section 7.2.1. The new Medicare Fee Schedule (MSF) uses a complex formula to determine physician payment which consists of three parts: (1) a Relative Value Scale (RVS - a modification of Hsiao's RBRVS<sup>10</sup>), (2) a Geographic Adjustment Factor (GAF - adjusting for differences in the costs of producing medical services), and (3) a Conversion Factor (CF - converting relative values into dollars) (Levy & Borowitz, 1992, p. 263). The updating of the conversion factor is regulated by the Medicare Volume Performance Standards (MVPS), which set a target for the rate of growth of Part B expenditures. The MVPS are not a cap on expenditures, because payments for services already rendered will not be decreased or withheld if the target is exceeded (in other words, the budget is not monitored retrospectively). The mechanism to update the conversion factor is the Medicare Economic Index (MEI), minus the difference between the MVPS and actual Part B expenditures<sup>11</sup>. Levy & Borowitz (1992, p. 270) give an example of use of the mechanism: for 1991 the MEI was set at 2.8%; the MVPS for 1990 was 9.1% and actual spending in 1990 was 10%. So, the difference between the MVPS and actual expenditures was 0.9%. The conversion factor is then updated with 2.8% (MEI) minus 0.9% (MVPS minus actual spending): 1.9%. All in all, Levy & Borowitz (1992, p. 270-271) conclude that the MFS is a radical departure from CPR; also because under the MFS payment non-participating physicians<sup>12</sup> can only bill the beneficiary a set amount (15% for 1993) above the fee schedule. Under CPR, non-participating physicians experienced few restrictions on balance-billing.

### **Target incomes**

In health care systems with salaried physicians, such as Sweden and Finland, salary negotiations are usually based on an income policy. Income policy, however, can also be applied to non-salaried physicians, paid by capitation or fee-for-service. This is the case with GP's in the United Kingdom, the Netherlands and Denmark. Combined with capitation or fee-for-service, the general technique is to determine an appropriate level of income for the average provider determine the expected quantity of care, and then



calculate fees so that the average physician providing the average level of care can earn the average income.

Since 1948 the United Kingdom has had its tax-based National Health Service (NHS) covering the whole population. Medical specialists, working in hospitals exclusively, are in salaried service. Since 1911 however, when an insurance system preceding the NHS was introduced, GPs have been independent contractors with the British national health service. British GPs are paid on the basis of a mixed system of allowances, capitation, fees for services (e.g. night visits, contraceptive services, maternity medical services) and incentive payments for immunisation and cervical cytology (payment is made for achieving specified levels of coverage in the practice population). In 1991-1992 total payments to GPs were made up of 53% capitation fees, 24% fees for services, 16% allowances and 7% incentive payments<sup>13</sup>.

The principle of a target income for GPs has been adhered to since the establishment of the NHS. As early as 1945 a committee was set up to consider an appropriate level of income for GPs. The technique of calculating the level of fees to reach a target income has been applied since 1952 (Hogarth, 1963, p. 31-40). Throughout the 1950s a pool payment system was applied, in which the total amount of money in the pool could be adjusted for changes in the number of doctors. However, changing patterns of utilization or the age structure of the population were not taken into account. By 1965, due to a declining number of GPs relative to the population, British GPs found themselves caring for larger numbers of patients for the same, fixed net income (Mechanic & Faich, 1970, p. 445). Consequently, a crisis erupted in 1965 over the recommendations made by the Review Body on Doctors' and Dentists' Remuneration<sup>14</sup>. The crisis ultimately resulted in the abolition of the pool payment system (Marmor & Thomas, 1972), although the principle of a target income is still being applied<sup>15</sup>. The Review Body on Doctors' and Dentists' Remuneration advises the British government on the appropriate level of GP payment. The Review Body takes into account views on an increase in the level of payment that have been submitted by both the General Medical Services Committee (the GPs' representation within the British Medical Association) and representatives of the Department of Health and Social Services. Allowances and fees are then calculated so as to reach the recommended income level (Groenewegen et al, 1991).

In the Netherlands target incomes for GPs have been used since 1966. The income policy with respect to Dutch GPs has been described in detail in chapter 2.

In Denmark income policy is implicitly applied to GPs (who work as independent contractors with the national health insurance) as well. Danish GPs (except for GPs in Copenhagen) have since 1961 been paid by a mixed system of capitation (for patients over 16) and fees for services. Every doctor-patient contact (house call, consultation in office, telephone consultation or renewal of prescription) is called a basic service, which is paid for separately (Flierman, 1991). Apart from basic services, fees are paid for a number of diagnostic, curative, perinatal and family planning services as well as for certification (Groenewegen et al, 1991). Until 1987 GPs in Copenhagen were paid fixed

capitation fees per patient plus some fees for perinatal and family planning services and certification. In October 1987 the Copenhagen GPs changed to the same mixed system that was in effect in the rest of the country. National health insurance covering the whole population was introduced in 1973. With the introduction of the National Health Security Law a Central Negotiating Committee was established (Baggesen, 1992) consisting of seven representatives of the County Councils, the regional authorities responsible for the availability and financing of health services. The committee enters into negotiations with the organisation of GPs (Praktiserende Lægers Organisation - PLO) on behalf of the national health insurance. Negotiations are entered taking the existing agreement or contract as a starting point. Apart from the adjustment of fees, other health policy topics, such as the number of GPs, vocational training or practising new forms of treatment are addressed in negotiations (Baggesen, 1992). In negotiating the level of fees, one of the main principles PLO and the Negotiating Committee go by is that GP income resulting from fees for services should be equal to income derived from capitation payment (Flierman, 1991), which implies that average gross revenues and net revenues are monitored for fee negotiations. In fact, since 1970 the PLO has regularly conducted cost investigations into revenues and costs of GP practices.

### **7.3. Methods of negotiation and overall health care expenditures**

What does all this have to do with cost control on the macrolevel? Firstly, it should briefly be defined how health care expenditures control shall be measured in this chapter. Frequently, in comparing health care expenditures across countries and over time, expenditures and their development are expressed as a percentage of Gross Domestic Product (GDP), or a country's national income. Pauly (1993) has objected to using expenditures as a percentage of GDP in cross-country comparisons, because the share of GDP is largely determined by health professionals' wages. However, in this chapter cost control is measured in terms of the *development* of health care expenditures as a percentage of GDP, not in terms of the level of GDP share.

Of the four ways to determine the level of physician fees, as described above, strictly applying expenditure caps is thought to be the most efficient one to control total health care expenditures, provided that third-party payers have the political power and determination to apply this method for cost containment (Hurst, 1991). It is difficult to obtain information on third-party payers' power and determination in the ten OECD-countries under study in this chapter. According to Pfaff (1990, p. 21-22), the degree of control over spending in health care systems varies, among other factors, with the share of public financing of health care expenditures. In the two countries examined in this chapter where expenditure targets and caps are used (Germany and Canada), the level of public funding in 1991 was more or less the same: 71.8% of total health care expenditures in Germany, 72.2% in Canada. Therefore, for the analyses conducted

here, it will be assumed that the third-party payers' political power does not vary between these two countries. In chapter 8, more attention will be paid to the role of political bargaining power in negotiations between third-party payers and physicians.

To continue with the four ways of determining the level of fees: under market forces there is no control at all over price or volume of care. If physicians and third-party payers negotiate on the level of fees, it is possible to constrain prices. However, in the past it has become sufficiently evident that fee constraints under fee-for-service payment hardly result in lower expenditures, because physicians can make up for a real or perceived loss of income by increasing the volume or intensity of services<sup>16</sup>, the so-called "volume effect" or "volume offset" (Christensen, 1992).

Whether an income policy can help to contain health care costs, depends partly on the exact arrangements with which the system is combined. If - like in the United Kingdom before the 1965 crisis - the pool from which doctors are paid is adjusted only for the number of doctors, independently of the size of their lists, an increase in physician density will result in increasing health care costs<sup>17</sup>. Similarly, in countries with salaried physicians, like Sweden and Finland, an increase in the number of physicians who work for guaranteed incomes would inevitably result in higher overall expenditures for physician services. It should be noted further that in Finland the GPs have a contract obliging them to work 37 hours a week for their salary. However, for work done in extra hours they receive fee-for-service payments which are not subject to income policy. Similarly, hospital doctors are salaried for 36 hours a week and are free to run a private practice outside these hours (Boerma et al, 1993, p. 38-39).

In the Netherlands the GP target income is linked to a normative list size: fees are calculated so that a GP with the normative list size (of 2350 patients, since 1986) can earn the target income. In fact, in such a system the pool from which physicians are paid is adjusted for the number of patients the GPs have. If the number of GPs increases, but the number of patients does not, health care expenditures remain stable, whereas GP incomes will decline<sup>18</sup>.

All in all, one would expect that opportunities for controlling health care expenditures would be best in systems imposing expenditure caps and/or targets: Germany and Canada in this sample. Income policy offers different opportunities for control, but expenditure control is expected to have been most effective in Sweden, the United Kingdom and Denmark, because there income policies are in effect for both GPs and medical specialists. Control is expected to have been less effective in the Netherlands, where income policy applies to GPs only, and in Finland, where the incomes of physicians are subject to income policy for their salaried service only. Fee negotiations (Belgium, France) and market forces (United States) offer little or no opportunity for control.

Table 7.1 Total ambulatory care expenditures and total general health care expenditures as a percentage of GDP in selected Western countries in 1981, 1986 and 1991.

Country	1981	1986	1991	change 1981-1986	change 1986-1991
<b>Ambulatory care expenditures</b>					
Germany*	2.3	2.3	2.3	0.0	0.0
Canada	1.6	2.0	2.2	+ 0.4	+ 0.2
Sweden	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom	n.a.	n.a.	n.a.	n.a.	n.a.
Denmark	2.1	1.8	2.2	- 0.3	+ 0.4
Finland	1.9	2.4	3.1	+ 0.5	+ 0.7
The Netherlands	2.2	2.2	2.2	0.0	0.0
Belgium	2.8	3.0	3.1	+ 0.2	+ 0.1
France	1.9	2.3	2.6	+ 0.4	+ 0.3
United States	2.6	3.1	3.0	+ 0.5	+ 0.9
<b>Total expenditures</b>					
Germany	8.7	8.6	8.5	- 0.1	- 0.1
Canada	7.5	8.8	10.0	+ 1.3	+ 1.2
Sweden	9.5	8.5	8.6	- 1.0	+ 0.1
United Kingdom	6.1	6.1	6.6	0.0	+ 0.5
Denmark	6.8	6.0	6.5	- 0.8	+ 0.5
Finland	6.6	7.4	8.9	+ 0.8	+ 1.5
The Netherlands	8.2	8.1	8.3	- 0.1	+ 0.2
Belgium	7.2	7.6	7.9	+ 0.4	+ 0.3
France	7.9	8.5	9.1	+ 0.6	+ 0.6
United States	9.6	10.8	13.4	+ 1.4	+ 2.6

\* Figure for 1991 refers to 1990  
Source: Program OECD HEALTH DATA  
Data: OECD

Looking at the development of expenditures for the health care systems that have been described in the previous section, it appears that the expectations can only partly be confirmed by empirical data. Table 7.1 shows expenditure data for Germany, Canada, Sweden, the United Kingdom, Denmark, Finland, the Netherlands, Belgium, France and the United States. Listed are total expenditures for ambulatory health care and total general health care expenditures, both as a percentage of Gross Domestic Product (GDP). Effects should be visible on the level of ambulatory care expenditures especially, since total health care expenditures are also highly affected by hospital payment systems, the use of medicines, and the like. Unfortunately, no data are

available on total health care expenditures for ambulatory care in the United Kingdom and Sweden.

The development of expenditures for both ambulatory care and total health care matches the expectations as far as Germany (targets and caps throughout the 1980s), Belgium, France and the United States (all relying on fee negotiations throughout the 1980s) are concerned. As expected, Sweden (for which data on total expenditures only are available) has also been able to control and even decrease total expenditures during the 1980s. According to Garpenby (1989, p. 89), this is the result of the central government in the 1980s finally having succeeded in convincing local authorities (responsible for health care planning and financing) that the health care sector had to hold back on spending.

In the United Kingdom costs were stable between 1981 and 1986, but have since increased. Expenditures in Denmark show a similar, though somewhat more instable development: a decrease between 1981 and 1986, followed by a rise in the second half of the decade.

Finland has experienced quite rapidly increasing costs of health care as a percentage of GDP. The opportunities for control were regarded as fairly limited for reasons mentioned earlier, but in Finland health care expenditures have risen even faster than in Belgium and France (countries with - at least theoretically - far less potential for cost control than Finland).

Finally, two countries show trends that are completely opposite to the expectations. First, the Netherlands has managed to contain the costs of ambulatory care remarkably well, considering that until 1989 fees for medical specialists (paid on a fee-for-service basis) were not linked to expenditure targets, and that in 1990-1991 specialists exceeded these targets (cf. chapter 2). Second, the development of expenditures in Canada shows a dramatic increase in comparison with the expectations. Ambulatory care expenditures increased from 1.6% of GDP in 1981 to 2.2% in 1991, total health care expenditures increased from 7.5% of GDP in 1981 to 10% in 1991.

It is difficult to determine whether perhaps the Canadian provinces do not have enough bargaining power or political will to monitor the targets. There is some evidence that in Quebec the growth of expenditures has been more modest than in the rest of Canada. This is interesting, because in Quebec global and individual expenditure caps are being imposed instead of the - less strictly monitored - targets in four of the other provinces. And apart from that, physicians may be less powerful in that they cannot easily migrate from French-speaking Quebec to one of the English-speaking provinces (Neuschler, 1990, p. 33). Barer et al (1988, p. 51-52) report an increase of medical care costs per capita of 7.6% in Quebec between 1977 and 1985, whereas in Canada as a whole the increase percentage over the same period was 11.9% (calculated from Barer et al, table A3, p. 51). Hughes (1991, p. 2348-2349) too concludes that Quebec has largely been responsible for Canada's lower overall rate of increase (compared with the United States) in expenditures for physician services between 1975 and 1987 because of its large population and its slower increase in physician costs (24.4% per capita compared

with 49.4% for Canada as a whole). However, for Canada as a whole, Rublee and Moser (1991, p. 120) conclude that:

" If the criterion of evaluation of Canada's achievements [...] is a *low aggregate amount* of national income spent on physicians' services, then Canada's system is a major success [...]. If, in contrast, the criterion is restraint on the *rate of growth* in national income spent on physicians' services, Canada's performance is less impressive. "

## 7.4. Discussion

In this chapter the link between negotiating physician fees and health care expenditures was examined. In theory, some methods for calculating physicians fees offer better opportunities for cost containment than others. The example of Canada, however, shows that imposition of targets and caps is no guarantee for controlled growth of costs, whereas the development in the Netherlands seems to indicate that, even without targets being used, fee-for-service payment (for medical specialists) can very well go together with cost control in ambulatory care.

It should be noted, of course, that the growth of health care expenditures is not only determined by the factors that have been addressed in this chapter. An ageing population, improved access to care, the development of new medical technology, and such factors as spiralling malpractice premiums in the United States, all contribute to the increase of health care costs. Apart from that, third-party payers being technically able to control health care expenditures does not necessarily provide them with the political bargaining power to effectively impose limits to the growth of expenditures as well. In the introduction to this chapter it was stated that from the point of view of society, the sum of all fees paid to physicians amounts to a percentage of total health care expenditures. From the physicians' point of view, however, the sum of all fees paid to them results in total gross revenues and, therefore, in physician income. If physicians have enough bargaining power, they may be able to accomplish substantial annual increases in total budgets available. The relationship between negotiating fees and physician income will be analyzed in the next chapter. In chapter 8 too attention will be paid to different views on the physicians' bargaining power in their confrontations with third-party payers.

## Notes

1. Information on fee negotiations has been collected for the United Kingdom, France, Germany (that is, former West-Germany), the Netherlands, Belgium, Denmark, Sweden and Finland as part of a study, conducted for the OECD, on the development of GPs' income in Western Europe between 1960 and 1990 (see also chapter 8). For this chapter, additional information has been collected for the United States and Canada through a study of the literature.
2. Due to deficiencies in the market for medical care (e.g. the information asymmetry between consumer and provider), payment for medical care deviates from the theoretical competitive marketplace. Uncertainty with regard to the need for medical services has led to the establishment of health insurance, but even before insurance was wide-spread, physicians usually charged for their services based on the patient's ability to pay (Showstack et al, 1979, p. 231).
3. The rest was covered by out-of-pocket payments (26%) and by private charity and similar sources (5%), such as free services from providers (including bad debt) (Hahn & Lefkowitz, 1992, p. 12).
4. The Sector II fee system was expected to slow down the growth of medical consumption, because of the introduction of market elements, and because giving all doctors the choice for Sector II would enable the sickness funds to authorize smaller increases in the negotiated fees (Carrere, 1991, p. 1221).
5. The system was adopted by Congress "[...] to recognize established geographic and specialty variations in charges for physician services, thus mirroring the charge pattern in the private market." (Levy et al, 1990, p. 717)
6. Controlling the price of medical care usually resulted in an increase in the volume of services (cf. Hadley et al, 1979, Rice, 1983, Gabel & Rice, 1985).
7. Defining the maximum reimbursement for either patients (benefit schedule) or physicians (fee schedule). Whether a *benefit* schedule or a *fee* schedule is used, depends of course on the payment system: indirect (the patient pays the doctor and is then reimbursed) or direct (the doctor is paid directly by the third-party payer and the patient receives benefits in kind). Glaser (1970) describes the two systems as, respectively, cash benefits and service benefits.
8. Manitoba, British Columbia, Saskatchewan and Ontario (cf. Neuschler, 1990, p. 33-35).
9. Medicare is the United States' health insurance programme for people over 65 and certain disabled persons. It is financed through payroll taxes, general tax revenue, enrollee premiums, deductibles and coinsurance payments, and it consists of two types of coverage: Part A (covering inpatient hospital care, care delivered in skilled nursing facilities and by home health agency services or hospice services) and Part B (covering physician services in the office, outpatient department or hospital). Payment for inpatient care under Part A has since 1983 been based on the so-called Prospective Payment System (PPS). Under PPS, payment to hospitals is made prospectively for episodes of illness using Diagnosis-Related Groups (DRGs) (Levy & Borowitz, 1992).
10. The formula used in the MFS differs from Hsiao's formula in three ways: the method for calculating practice costs, specialty differentials, and the geographic adjustment factor. In Hsiao's formula, practice costs are proportional to total work, whereas in the MFS practice costs are determined independently from physician work. Hsiao's formula accounts for opportunity costs of training, whereas in the MFS all specialties receive the same payment for performing the same procedure. Hsiao did not use a Geographic Adjustment Factor (GAF); the formula used in the MFS, however, accounts for geographic variation in costs (Levy et al, 1990, p. 718).

11. This is the default mechanism. Congress can, however, choose to deviate from the mechanism and update the conversion factor as it pleases or follow the recommendations of the Secretary of Health and Human Services (Levy & Borowitz, 1992, p. 270).
12. Participating physicians agree to accept Medicare's payment as payment in full. Non-participating physicians are allowed to charge beneficiaries above the approved charge (the so-called "balance-billing" (Levy & Borowitz, 1992, p. 265).
13. Information was provided by the NHS Management Executive, Department of Health, Health Authority Personnel (Statistics), Quarry House, Quarry Hill, Leeds LS2 7UE.
14. In 1963 the British Medical Association had asked the Review Body to upgrade GP incomes by 18 million pounds a year. In February 1965 the Review Body recommended an increase of only 5.5 million pounds. As a result, by March 1965 16,500 of Britain's 22,000 GPs had sent in signed but undated letters of resignation from the NHS to the British Medical Association with the intention that these would be submitted by April 1 (Mechanic & Faich, 1970, p. 444-445).
15. The 1965 crisis also resulted in changes in the payment system. The capitation fee became differentiated according to patients' age. Fees for night visits and other specific services were introduced and GPs received reimbursement for a percentage of practice costs (Mechanic & Faich, 1970).
16. Physicians can provide more services (increasing the volume) or substitute relatively cheap procedures for relative highly paid services (increasing the intensity) (cf. for example Hadley et al, 1979, Rice, 1983, Van Doorslaer & Geurts, 1989, Rublee & Moser, 1991, p. 126).
17. As has been explained before, in the United Kingdom a decrease in physician density occurred, which confronted the GPs with a higher workload against the same, fixed income (Mechanic & Faich, 1970).
18. Therefore, for physicians, this type of system is acceptable only if it is coupled with stringent rules as regards physician density (as was the case in the Netherlands until 1991, where GPs needed a permit from the municipal authority to establish in general practice, cf. chapter 2) or in the face of physician shortage (which is expected in the Netherlands for the next decade, cf. Hingstman & Pool, 1992).



## 8. THE PRICE OF CARE: FEE NEGOTIATIONS AND PHYSICIAN INCOME

### 8.1. Introduction

Chapter 7 dealt with one aspect of physician fees, namely that from society's point of view the sum of all fees paid to physicians amounts to a proportion of total health care expenditures. However, it was stated that from a physician's point of view the sum of all fees paid to him results in his total gross revenue. In this chapter attention will be paid to the relationship between calculating and negotiating fees on the one hand, and physician income on the other hand. Income is defined in this chapter as the physician's yearly revenue (from medical practice) after deduction of practice expenses, but before taxes are deducted. Two factors that in theory can influence physician income are taken into account: economic factors (supply, demand, competition), and political factors (the bargaining power of organized medicine). In section 8.2. attention will be paid to the relative influence of economic and political factors, and their interaction with institutional characteristics. The theories and assumptions behind hypotheses 7 through 9, formulated in chapter 3 with regard to the level and development of GP income, will be described in more detail in section 8.2. The hypotheses will be tested in section 8.4., using data on the development of GP incomes in eight European countries between 1975 and 1990. Section 8.3. will consist of "country descriptions" (a quick overview of factors that are possibly relevant to the development of GP incomes in the selected countries) and the methods that will be used in section 8.4. for analyzing cross-national differences in income, and the over-time development of GP incomes. In section 8.5. results will be discussed. Parallel with section 6.6., where the findings for the microlevel were summarized, the findings with respect to the transformation problem and macrolevel are summarized in section 8.6.

### 8.2. Factors influencing physician income

#### Economic factors

Physician gross revenue is a function of the price of physician services ( $P$ ) times the quantity of services provided ( $Q$ ). The exact nature of quantity ( $Q$ ) depends on the unit of payment: under fee-for-service payment quantity refers to the total number of services provided by a physician, under capitation payment it refers to the total number of patients on a physician's list, and under salary it refers to the total number of hours worked (usually per month).

The price of physician services is thought to be influenced by supply and demand<sup>1</sup>. A high demand for physician services increases prices, whereas a high supply of physicians relative to the population is thought to reduce prices. A higher price, in turn, results in a higher income, whereas a lower price results in a lower income, unless physicians can compensate for lower prices by increasing the quantity of services provided: the so-called "volume effect" or "volume offset" (Christensen, 1992).

In a study of trends in physician income, Pope & Schneider (1992, p. 188-190) argue that the factors contributing to the growth of the average net income of American office-based physicians during the 1980s - and particularly after 1985 - are: (1) greater volume and profit per service, (2) slower increase in physician supply, and (3) more comprehensive insurance coverage of physician services. A greater volume of services could point to an increased demand for physician services, which could be due to either a higher morbidity in an - ageing - population, or to supplier manipulation of demand (cf. chapter 4). In the case of physicians in the United States, however, Pope & Schneider (1992, p. 190) suggest that the greater volume of services performed by office-based physicians in ambulatory care (especially the explosion in outpatient surgery and diagnostics testing) results from a shift from inpatient to outpatient care after the implementation (in 1983) of Medicare's Prospective Payment System (PPS) for hospital care<sup>2</sup>.

The third contributing factor Pope & Schneider mention, a more comprehensive coverage of physician services, is of course directly related to increased demand for physician services. Several studies have shown that demand for physician services is negatively related to the price of these services (e.g. Beck & Horne, 1980, Scitovsky, 1980, Newhouse et al, 1981, Wedig, 1988, Cherkin et al, 1989): increased insurance coverage reduces the price of care for the population that is newly brought under insurance, and consequently increases their demand for medical care. Finally, physician supply is found to be negatively related to physician income, not only by Pope & Schneider (1992), but also, for example, by Van der Zee et al (1991, p. 812), who - in a cross-national study among Western European countries - find a significant correlation ( $r = .75$ ,  $p < .05$ ) between average GP income (as in this chapter, defined as revenue minus practice expenses, before deduction of taxes) in a country and the number of inhabitants per GP: the lower the GP density, the higher the average net income.

High physician density leads to increased competition between physicians over scarce resources. For GPs this competition could be particularly fierce when they do not have a monopoly on the provision of primary medical care. In European countries such as Germany, Belgium, France and Sweden, medical specialists are accessible without referral by a GP. In these countries, therefore, primary medical care is provided not only by GPs, but also by medical specialists. In countries with a referral system, such as the United Kingdom, Finland, Denmark and the Netherlands, the GPs theoretically hold a much stronger competitive position. However, Groenewegen et al (1991, p. 25), could not find a significant relationship between average GP average income in a given country and access to specialist care.

## Political factors

Although economic factors influence physician income, they are not the only determinants of a doctor's earnings. Poullier (1986, p. 36) argues that:

" The relative size of doctors' earnings compared with those of the average employee has declined in all OECD countries during the past decade. This cannot be attributed to a single determinant such as the impact of increases in the supply of physicians; public authorities have acted both as a countervailing power to erase part of the monopolistic return attached to medical education and as a monopsonic buyer to moderate the shift of resources going to medical care providers. "

From chapter 7 it has become clear that, in general, regulations governing the price setting of medical care are moving in the direction of expenditure targets and caps. Sandier (1989, p. 42) points out that, therefore, the physician's average income is the amount that the community either directly or indirectly agrees to pay him, with any deviations from this amount being compensated in the next round of negotiations. Consequently, Sandier argues, physicians as a group have nothing to gain by increasing their output. As individuals, however, they may try to improve their position on the scale of earnings for the profession (Sandier, 1989, p. 42).

Although Sandier is right about the fact that, under expenditure targets or caps, increasing the volume of services will be of little use to physicians as a group, of course as a group they may try to boost the amount of money that the community will spend on medical services. Depending on how successful organized medicine is in doing so, one might also describe the physician's average income as the amount that the community is forced to pay him.

The role of physicians in policymaking has been studied widely in order to shed more light on interest group politics, and, according to Stone (1980, p. 3), the general lesson emerging from these studies is that:

" [...] physicians as a group form a highly successful interest association, able to forge cohesive collective action, gain important concessions in the formation of public health programs, and block major features of health programs which are distasteful to them. "

The major question in studies of the politics of medical care is described by Stone (1980, p. 5-6) as the extent to which physicians' professional power is derived from the nature of medical care itself or, alternatively, the extent to which professional power is shaped and limited by the political context in which it operates<sup>3</sup>. Marmor and Thomas (1971) believed that physicians' professional power results from the fact that they produce a crucial service in industrial countries for which governments can hardly provide substitutions, in other words, that their power derives from the nature of medical care. Stone (1980, p. 8-9) gave an outline of two basic arguments that support this notion. Firstly, in order to provide medical care, highly specialized, technical

expertise is required. Possession of specialized knowledge, however, is a characteristic that the medical profession shares with other professions, such as engineers, lawyers or computer programmers, and therefore, technical expertise alone cannot account for the power of organized medicine. The second argument explaining physicians' political power could, according to Stone, be summarized as the increased importance of the concept of illness in many areas of social life.

The ideas expressed by Marmor & Thomas (1971, 1972) deviated from earlier work done by Eckstein (1960). Eckstein analysed the question why, in general, pressure groups are effective and why, in particular, the British Medical Association (BMA) appeared to have been extremely successful in influencing the nature and scope of governmental health policy (Marmor & Thomas, 1972, p. 422). Eckstein described the BMA-Ministry relation as intimate, close and friendly. The intimacy of this relation was - according to Eckstein - vitally important to BMA's success: the more private (in the sense of not being carried out in full view of, for example, other departments or the mass media) negotiations were, the more likely it was for the BMA to be successful. Eckstein used the case of the payment disputes in the early 1950s (over GP remuneration) as an illustration.

In short, this dispute was on the following: in 1946, a committee under the chairmanship of Sir Will Spens (consequently called the Spens Committee) recommended a range of incomes for GPs that was based on pre-war net incomes increased with approximately 20%. GPs were paid from a central pool, which was adjusted only for changes in the number of patients (and not for changes in the number of doctors). In this way, the Spens conception of a guaranteed average net income could not be realised, and by 1951 GPs had become increasingly dissatisfied with their payment system. Government and the BMA failed to reach a settlement in bilateral negotiations and, therefore, in 1951 Mr Justice Dankwert was appointed as Adjudicator, to arbitrate in the conflict. The resulting, so-called Dankwerts Award fixed the betterment factor to be applied to pre-war standard income at 100% for 1950-51 and 85% for the two preceding years and decided that the amount of money in the pool should vary according to the number of GPs and not according to the number of potential patients, thus making fundamental changes in remuneration mechanisms  
(Hogarth, 1963, p. 30-42)

In Eckstein's opinion, even though the BMA got what it wanted with the Danckwert Award, the dispute ended in a BMA failure, because - with the appointment of Danckwert as an arbitrator - it had not been able to keep the negotiations closed and intimate. Marmor & Thomas (1972, p. 427), however, disagreed with Eckstein on the negotiations being a failure and on the intimacy of relations being an important explanatory factor.

In their own study, Marmor & Thomas wanted to suggest

" [...] a more promising account of the unquestionable success doctors in Western Europe and America have in controlling the form and amount of their remuneration by the state. "  
(1972, p. 427)

On the basis of evidence from three countries (the United Kingdom, Sweden, and the United States), which differed markedly in the setting as well as the atmosphere of negotiations on physician payment, they showed that, in general, in all three cases the remuneration methods that were preferred by the respective medical organizations became government policy<sup>4</sup>. Or, as they had put it in an earlier article (Marmor & Thomas, 1971, p. 72):

" Whatever the political and medical structure of a western industrial country, physician preferences determine the governmental methods of payments. "

As was said before, according to Marmor & Thomas (1971) collective medicine derives its power from the fact that physicians produce a crucial service in industrial countries for which governments can hardly provide substitutions. Marmor & Thomas (1971, p. 73) argued that Western industrial states would never risk a medical strike because of the high political costs associated with an interruption of personal health services, irrespective of governmental views on the merits of physicians' demands with respect to payment methods. However, the political costs of an interruption of medical care services are lower in countries with an abundant supply of physicians, leaving governments in a relatively stronger bargaining position (Marmor & Thomas, 1971, p. 76), which may be a second cause for the negative relationship between physician incomes and physician density.

Almost two decades later, Garpenby (1989, p. 207) argues that although the health care sector develops certain universal features across nations, country-specific characteristics (such as the national policy style, tradition in the field of health care, or the structure of organized medicine) still affect the process of interaction between the state and the medical profession. He thus confirms what Stone already preferred to believe in 1980 (p. 181), that, different from Marmor & Thomas' views:

" [...] the political power of the medical profession is an artifact of political arrangements as well as technical expertise. "

Wilsford (1991) moves even further in the direction of attributing decisive influence to state structures. He argues that there are significant cross-national differences in the influence of organized medicine on the shaping of health policy and the organization of the health care system. Wilsford seeks to understand these differences and suspects that there are universal forces leading to an erosion of organized medicine's influence.

" Marmor & Thomas (1970) [...] argued that whenever there was a dispute about methods of provider payment, physicians always won. There was strong evidence in support of this view and others like it. But in twenty years scholars of comparative health policy must reverse themselves.

In the struggle to finance increasingly expensive health care systems [...] [g]overnments and insurers everywhere pursue reforms that restructure and redesign the supply side of the health care system. These reforms eventually curb clinical autonomy and contain physicians' income in every advanced, industrial democracy. Well-organized groups of providers (physicians) may delay reforms in some countries, depending on the character of the political system. They will do so in part by advancing claims of expertise. But in no country will physicians avoid these reforms forever because the huge costs underlying the fiscal imperative in health care will eventually override even the most aggressive professional arguments. "

(Wilsford, 1991, p. 4)

In order to illustrate his argument, Wilsford compares the relation between doctors and the state in both France and the United States. He describes the medical profession in France as comparatively weak, because of its being fragmented (in contrast to the American Medical Association's cohesion, which results in a politically strong medical profession). The French state is pictured as strong - holding a "preeminent position in the political system's balance of power" (Wilsford, 1991, p. 54-55) - as opposed to the "stateless" American state, which lacks autonomy and is dominated by society (Wilsford, 1991, p. 57). According to Wilsford (1991, p. 57), in the United States interest groups play a dominant role in many stages of the policy process, even to the extent that not the state, but interest groups assert the public interest. Even in the United States however, Wilsford argues, the physicians' clinical autonomy has been limited, for example through utilization review, which is typically applied on HMOs. These types of programmes, which are aimed at restraining the physicians' power to allocate public resources, were also mentioned by Stone (1980, p. 165) in her comparison of doctor-state relations in the United States and Germany.

The recent introduction of the Medicare Fee Schedule, which has been described in the former chapter, corroborates Wilsford's hypothesis that the "golden age" of liberal medical practice is over, because:

" [...] the "fiscal imperative" pushes both public policymakers, even in cases of weak state autonomy, and private insurers and employers, even in cases of high interest mobilization of providers to work to diminish the influence of providers in making health care policy. "

(Wilsford, 1992, p. 597-598)

### **Payment methods, fee negotiations and incomes**

In abstracto, a fee-for-service payment system by itself offers somewhat better opportunity for individual physicians to increase their income than payment by

capitation or salary, because under fee-for-service payment the income is directly related to physician output. Under capitation an increase in earnings can be obtained by adding more patients to the doctor's list (which can be difficult to realize), whereas an increase in salary requires working overtime (if this is reimbursed), ageing of the physician (provided that the number of years on the job are rewarded extra), or a promotion. Needless to say that especially getting older, and to a lesser extent working overtime or obtaining a promotion, are also factors that are difficult to manipulate by individual physicians themselves.

However, the openings for physicians to raise their incomes under fee-for-service payment by providing more services are severely limited when barriers are built into the system in the form of expenditure caps like those imposed in Germany or Quebec (Sandier, 1989, p. 40). It is necessary, therefore, to include the methods of setting the price of care, which have been described in the former chapter, in an analysis of the development of physician incomes.

If the four different methods of calculating physician fees are regarded as a continuum, with market forces and expenditure caps/target incomes on opposite ends and fee negotiations and expenditure targets in between, than one could use a country's position on this continuum as a measure of the relative influence of the state and organized medicine respectively. In the post-war period OECD countries have generally moved from reliance on market forces, via fee negotiations and expenditure targets, towards expenditure caps or target incomes for physicians. The presence of strict regulations, such as targets and caps, can be viewed as a symptom of the political 'defeat' of organized medicine in a particular country. In these countries the 'fiscal imperative' has prevailed over the interests of collective medicine. Weakened as the profession's political power is under these conditions, political power is paradoxically the only tool available to physicians as a group to increase their incomes. As Sandier (1989, p. 42) explained, physicians as a group have nothing to gain by increasing their output, because any non-compliance with the target or cap will be made up for in the next round of negotiations. The only way in which the physicians' average earnings can increase, is by persuading the state or health insurers to raise the total amount of money in the pool.

In contrast, under market forces and under fee negotiations, physicians in a fee-for-service system have, both as a group and individually, far better options for improving their income situation. Even in the face of fee freezes, physicians have been able to maintain a sufficiently high level of production (cf. Eastaugh, 1991, p. 56). Furthermore, it was demonstrated in chapter 4 that physicians may try to offset the effects of economic factors such as an increase in the supply of physicians, by increasing the volume of services, and, if they succeed in doing so, an increase in physician density is more likely to result in higher overall health care expenditures than in lower incomes. An increase in physician supply under expenditure targets and caps will inevitably cause physician income to decrease, except of course, when professional organizations succeed in getting third-party payers to raise the total budget. However,

the latter will be all the more difficult when there is oversupply, because that puts governments in a relatively stronger bargaining position (Marmor & Thomas, 1971, p. 76, WHO, 1993, p. 62).

### **Hypotheses**

Based upon the three previous sections it is now possible to list the three hypotheses that will be tested with regard to GP incomes in OECD-countries. The first two (hypotheses 7 and 8) define relationships that are expected to exist cross-nationally with regard to both the level of GP income and the development of their income:

- The relationship between the number of inhabitants per GP and GP income is positive, such that: (a) GP income is higher in countries where the number of inhabitants per GP is higher, and (b) over time GP income increases more (or decreases less) in countries where the number of inhabitants per GP increases more (or decreases less).
- The relationship between the GPs' collective bargaining power and GP income is positive, such that: (a) GP income is higher in countries where GPs collectively hold a stronger position, and (b) over time GP income increases more (or decreases less) in countries where GPs collectively hold a stronger position.

Further, the development of GP income between 1975 and 1990 is expected to be conditioned by the openings the payment and negotiation system allows GPs as a group to increase their income through increasing the volume of care. Under expenditure caps, for example, the GP income development depends entirely on the GPs' bargaining power, which is in turn influenced by GP supply (in case of an oversupply GPs hold weaker positions). If no caps or targets are in effect, however, and GPs are (partly) paid on a fee-for-service basis, they may offset the effects of an increase in the supply of physicians or the effects of fee freezes by increasing the volume of services. The final hypothesis (hypothesis 9), referring to the development of GP income only, was therefore formulated as follows:

- If GPs can increase their income by increasing the quantity of services provided, the development of their income depends less on the development as regards the number of inhabitants per GP.

### **8.3. Methods**

This section will start with eight country descriptions. The eight countries are: Sweden, Finland, Denmark, the United Kingdom, the Netherlands, Belgium, France and Germany. The payment and negotiating systems as well as the developments in GP incomes in these countries have been studied for the OECD. Selection of exactly these countries was primarily for practical reasons (particularly the availability of data on GP incomes). However, as will become clear in the next section, the eight countries are also a fairly good representation of different payment and negotiating systems. The



study period (1975 through 1990) has also been chosen because data from an earlier period were not available for all countries.

The country descriptions are used in order to determine the GPs' political power and the ways open to them to increase income by raising volume. In table 8.1, section 8.3.2., the scores of the eight OECD-countries on those two variables will be listed. Readers who are not interested in the exact arrangements in the different countries can skip the descriptions and go straight to the information presented in section 8.3.2.

### **Country descriptions**

In this section, for each of the eight OECD-countries some information will be presented with respect to the health care system and the GPs' position in that system, the GP payment and negotiating system and the relations between GPs as a professional group and the state (or its representatives in the health care sector).

#### **Sweden**

Since 1963 planning and providing both hospital and primary care services has been the responsibility of the Swedish county councils, of which there are now 26 (23 counties and three large municipalities). The Swedish health care system has long been hospital-dominated (Stephen, 1979, p. 159). In the last two decades the county councils have striven to stimulate primary health care by creating multidisciplinary health centres (Boerma et al, 1993). Specialists are accessible without a GP referral. As a result primary medical care is provided by a variety of doctors (GPs working in health centres, district medical officers who also act as public health officers, and specialists).

Since 1970 GPs working in health centres or employed by the county councils have been paid by salary (Stephen, 1979, p. 157) and have been denied the right to collect fees from patients (Garpenby, 1989, p. 163). The small, but increasing group of privately practising GPs are paid on a fee-for-service basis through the health insurance scheme. Traditionally, this payment system has been based on reimbursement of doctors' fees. Until 1989, salary negotiations for public GPs took place annually on the national level between the Swedish Medical Association (SMA) and the Association of County Councils (Boerma et al, 1993). This system became more flexible in 1989, enabling employers and employees to enter negotiations on an individual basis or on the local level between individual county councils and local trade unions<sup>5</sup>.

According to Garpenby (1989), the Swedish government is quite autonomous in the field of health care. Traditionally, interest groups have not been able to dictate public policy, although interest groups are often represented in (ad hoc) government committees. Consensus is the norm in the relation between government and interest groups, but there is a willingness among civil service to accept mild conflict or debate (Garpenby, 1989, p. 100-101). As a reflection of the health care system, the Swedish Medical Association (SMA) is dominated by salaried hospital staff. There appears to be a division into senior doctors and junior staff, but in general the association speaks on behalf of all members (Garpenby, 1989, p. 125). Consequently: in a hospital-dominated system, and without separate representation, the GPs' position in Sweden is quite weak.

## **Finland**

Universal health insurance covering 100 percent of the population was adopted in Finland in 1964. The insurance system is a reimbursement model with copayments for pharmaceutical and dental care, as well as for the services of private doctors providing outpatient care (Boerma et al, 1993). Since the early eighties additional voluntary health insurance schemes covering the full costs of private health care have become more popular (Groenewegen et al, 1991). Health care in Finland is the responsibility of 461 municipalities, which run health centres (described by Groenewegen et al (1991, p. 69) as "functional units providing all primary health care services in a certain administrative area"). After the adoption of the Community Health Care Act in 1972, primary care has gained importance in Finland. In the early seventies 90% of total health care expenditures were devoted to specialist and hospital care, whereas by now the proportion of primary health care to total expenditures has increased to 40% (Boerma et al, 1993). Finnish GPs are employed by and keep practice in the local health centres. GPs provide a broad range of services and serve as gatekeepers to hospital care, for which patients need a referral (Groenewegen et al, 1991).

Although the GPs are salaried employees of municipal health centres, the basic salary accounts for only part of GP income, about 66% in 1990, according to Heiskanen (1990). In return for their basic salary the GPs have to work 37 hours a week, but during these hours the GPs are still being paid extra money for performing medical-technical procedures and for certification (up to an agreed maximum of FM 500 per month). For work outside the 37 hours a week the GPs receive a basic payment for being on call, and extra fees if treatment is provided. In their spare time the GPs are free to work in private practice, where payment takes place on a fee-for-service basis. Since 1972 income negotiations have been taking place between the Finnish Medical Association and the Municipal Institute of Labour Relations (the representative of the municipalities). Apart from the basic salary, general working conditions are discussed. The result of the negotiations is valid for a two-year period (Groenewegen et al, 1991).

With the introduction of the Community Health Care Act in 1972, the state has gained considerable influence in the field of health care. Since then health care is for the major part the responsibility of the municipalities running the health centres. Since 1972 the GPs have been working as salaried employees within these centres. Their salaried service in a state-dominated health care system suggests that GPs occupy a fairly weak position. However, because the doctors strongly opposed the introduction of the salary system in 1972, they managed to keep the right to work in private practice. A minority of GPs even continued to be fully private. Finnish GPs again demonstrated their willingness to strike in 1984, forcing the Municipal Institute of Labour Relations to approve more substantial increases in GP income. Apart from that, due to a shortage of GPs some extras were paid in the periode between 1987 and 1990 to attract young physicians to general practice.

## **Denmark**

Since 1973 Denmark has had national health security: a tax-financed system covering 100% of the population. There are two types of coverage: the so-called group 1 and group 2 coverage. Until 1976 group coverage was determined by income. However, since 1976 all citizens aged 16 or over are free to choose for either group 1 or group 2 coverage. Currently 97% of the population is covered by group 1 (Baggesen, 1992). Access to secondary care depends on group membership. Group 1 patients receive medical care in kind from the GP on whose list

they are, and are entitled to a medical specialist's care after referral by their GP only<sup>6</sup>. Group 2 patients have no obligation to be on a specific GP's list and have free access to medical specialists; however, for group 2 patients a reimbursement system exists, with coinsurance up to 50% for ambulatory medical care (Groenewegen et al, 1991).

As has been explained in chapter 7, since 1961 GPs have been paid according to a mixed system of capitation (for patients over 16) and fees for services. Every doctor-patient contact (house call, consultation in office, telephone consultation or renewal of prescription) is called a basic service, which is paid for separately (Flierman, 1991). Apart from basic services, fees are paid for a number of diagnostic, curative, perinatal and family planning services as well as for certification (Groenewegen et al, 1991).

Fees are negotiated in a Central Negotiating Committee (Baggesen, 1992). The existing agreement is taken as a starting point. The contract does not have a specific period of validity, but in recent years it has been renegotiated every year. In negotiations the main principle is that income to be expected from fees for services should be equal to income derived from capitation payment (Flierman, 1991).

Planning and management of health care facilities and staff in Denmark are the responsibility of counties and municipalities. The central government, however, may issue guidelines with regard to regional plans. The county councils are also responsible for governing the national health insurance and, as such, are represented in the Central Negotiating Committee mentioned before. The state thus has considerable opportunity to influence the health care system. GPs are represented by a separate organisation (Praktiserende Lægers Organisation - PLO). In fee negotiations GPs and County Councils have been in conflict twice since 1975. These conflicts resulted in a so-called "contract-free" period (during which patients do not receive care in kind, as usual, but are required to pay the doctor themselves after which they are (partially) reimbursed by the relevant local authorities). The two contract-free periods occurred in 1975/1976 (four months) and in 1984 (three months). Being independent contractors with the public scheme, who serve as gatekeepers to hospital care and are represented by their own GP association, the GPs' position in Denmark should be assessed as relatively strong.

### **United Kingdom**

In 1948 a tax-based National Health Service (NHS) covering the whole population was introduced in the United Kingdom. Since then the NHS has provided a wide range of services freely at the point of delivery, with some minor copayments, e.g. for drug prescription. The GPs are independent contractors with the NHS, who serve as gatekeepers to more highly specialized care provided by (salaried) medical specialists in hospitals.

The payment system for GPs under the NHS has maintained the principle of capitation payment that had been used since long before 1948. Since 1966 the British capitation fee has been differentiated according to patients' age (under 65, 65-74 and over 75) (cf. Fleming, 1988). For patients living in deprived inner city areas a deprivation allowance is attached to the capitation fee (Boerma et al, 1993). Also since 1966, practice expenses have been partly included in fees and partly reimbursed to individual GPs on the basis of a proportion (70%) of actual costs incurred. Apart from capitation fees and allowances, GPs receive fees for separate services (e.g. night visits, and contraceptive and maternity medical services) (Marmor & Thomas, 1972, Groenewegen et al, 1991). In 1990 incentive payments for immunisation and cervical cytology uptake were introduced (Boerma et al, 1993). For the period between 1960

and 1990 it is estimated that capitation fees accounted for only 42 to 46%, allowances for roughly 20 to 25% and fees-for-services for about 30 to 35% of total revenues<sup>7</sup>. In order to calculate GP fees the principle of a target income is used in the United Kingdom. The Review Body on Doctors' and Dentists' Remuneration advises government on the appropriate level of payment for GPs, taking into account the demands made by the General Medical Services Committee (the GPs' representation within the BMA) and the Department of Health and Social Services. Allowances and fees are calculated in such a way that the recommended income level can be reached (Groenewegen et al, 1991).

In the United Kingdom a pattern of consultation between government departments and interest groups has developed, even to the extent that the support of societal interest is used in the competition over public resources between the departments (Garpenby, 1989, p. 95). In political culture with regard to health care, the emphasis is on consensus and compromise, whereas consultation of external interest groups by government generally takes on an informal character as opposed to formal negotiation. The British medical profession has adopted a structure where autonomous bodies (GPs and hospital consultants) approach the government. According to Garpenby (1989, p. 125-126): "The strategy of the organized medical profession in Britain is a dual one: division or unification, according as circumstances require." The position of British GPs, as independent contractors with autonomous representation within the BMA in a echelonized health care system, can be regarded as comparatively strong.

### **The Netherlands**

In the Netherlands every citizen earning an income below a critical limit is publicly insured. The publicly insured do not have direct access to medical specialists and hospitals (patients have to be referred by their general practitioners) and receive benefits in kind. About 61% of the Dutch population is publicly insured, the remaining 39% of the population being privately insured. Financing care for the privately insured takes place according to the reimbursement system (the patient pays the physician and is then reimbursed). The publicly insured are obliged to be on a GP's list, for the privately insured this obligation does not exist, though in practice most privately insured are on the list of the GP of their choice.

For publicly insured patients a GP is paid a flat capitation fee for every patient on his list. GPs receive the full payment for the first 1,600 patients on their list only. For every patient beyond that number a reduced tariff is paid. For privately insured patients GPs are paid on a fee-for-service basis mainly involving fees per session. In the Netherlands fees are negotiated upon between the Dutch association of GPs and public and private insurers. The outcome of negotiations has to be officially approved by the Minister of Health, who is advised by the central body on tariffs in health care (COTG), which consists of representatives of government, trade unions, employers organizations, health care providers and health insurers. GP fees have been based on an 'intended' or 'target' income (related to the income of high civil servants) since 1966. Capitation fees and fees for items of service are calculated in such a way that a GP with the normative list size is able to earn the target income. The Dutch association of GPs (LHV) and third-party payers agreed upon this normative list size that would be used in order to calculate fees. During the 1980s this desired list size has decreased from 2600 patients to 2500 in 1983, from 2500 to 2400 in 1985, and to 2350 in 1986 (Baaijens 1988, De Hoog, 1988). The Dutch state is regarded as traditionally weak in the field of health care, in which it did not even wish to interfere until the mid-1970s, when the escalating costs of care called for

government action (De Roo, 1988, p. 218). Since then, health care reform - if at all - has been brought about only very slowly and incrementally, not in the least because organized interest groups successfully form a countervailing power (cf. chapter 2). As in the United Kingdom, GPs and specialists act autonomously in separate associations, particularly as far as their trade union activities are concerned. This, in combination with their gate-keeping function, provides the GPs with a relatively strong position. After a long and harsh conflict in 1966 between GPs and sickness funds about the level of capitation fees (IJsbrandy, 1979, p. 129-152) the Dutch association of GPs has generally been cooperative as regards government policy, probably because this policy has been aimed at strengthening primary care since 1974 (Baaijens, 1988, p. 92).

## **Belgium**

Belgium has two compulsory health insurance schemes: a general scheme, offering a broad range of benefits for all employees and their dependents, and another scheme covering "great risks" for self-employed (Boerma et al, 1993). The health insurance system is based on the principle of reimbursement (except for - inpatient - hospital care) and copayments. However, widows, orphans, disabled persons and pensioners, are (partly) exempted from copayments. Patients have free access to higher specialized care, and primary health care is provided by specialists (particularly gynaecologists and paediatricians) as well (Groenewegen et al, 1991). GPs are paid directly by their patients on a fee-for-service basis. Fees are collected for home visits and office consultations (together accounting for approximately 90 per cent of total revenue) and for medical-technical procedures such as minor surgery (Groenewegen et al, 1991). GPs with vocational training collect higher fees than GPs without such training. Representatives of the medical profession are more or less continuously in discussion with representatives of the mutualities (health insurance associations) in national committees that were established by law in 1963. Within these committees negotiations on the physician fee schedule take place. An agreement on fees has to be sanctioned by at least 75% of the national committee's members and it has then to be approved by the Minister of Social Affairs. The agreement is not valid in a defined region until 60% of the GPs have ratified it. GPs who have accepted the agreement are obliged to charge the agreed fees, others may charge higher fees.

The Belgian state in general has to cope with its internal division into French-speaking Wallonia and Dutch-speaking Flanders. On top of that, direct government involvement in health care is fairly limited. In fact, the health care system in Belgium is regarded by some as a non-system, resembling the United States' system with respect to its high degree of 'laissez-faire' and its large number of non-governmental organizations struggling for independence and maintenance of their position (Roemer & Roemer, 1981, Boerma et al, 1993, p. 16). The medical profession enters negotiations in the committees as a group; GPs are not represented separately. The fee negotiations in national committees started off in 1964 with a general physician strike. Nonetheless, the argument was settled and since then the climate has been fairly peaceful (Dejardin, 1991). The position of GPs in Belgium should, however, be described as weak: the GP has little status and experiences competition from both specialists and paramedical professions (Hermesse & Van den Oever, 1991, p. 239).

## France

A variety of different health insurance schemes together cover about 99% of the French population (Boerma et al, 1993). The largest scheme, covering approximately 80% of the population, is administered through the National Sickness Insurance Fund (caisse nationale de l'assurance maladie des travailleurs salariés - CNAMTS). French health insurance is designed to resemble the conditions of private practice as closely as possible (Hogarth, 1963, p. 142), which in practice means that patients have direct access to any doctor of their choice (GP or specialist) and that GPs do not have a fixed list of patients. Primary health care in France is provided by both specialists and GPs.

The fundamental principle on which French medicine is founded, is liberal medicine (la médecine libérale), specified in the Code of Medical Ethics as: the patient's liberty to see the doctor of his choice, the doctor's liberty to prescribe whatever treatment he regards best for the patient, the direct agreement of fees between doctor and patient as well as the direct payment of fees by the patient to the doctor (Hogarth, 1963, p. 128). These principles determine the payment system for French GPs: a reimbursement model in which the physician is paid on a fee-for-service basis by the patient, who is then reimbursed by his "caisse locale". The main categories for which GPs can collect fees are for office consultations and home visits. Since 1971 tariffs have been negotiated on the national level between the National Sickness Insurance Fund (CNAMTS) and the two medical associations. Until 1980 highly qualified doctors were free to charge higher fees. This so-called "droit de dépassement" was replaced in 1980 by the Sector II fee system allowing doctors to choose free pricing. In return, Sector II physicians must pay their own social insurance contributions.

Wilsford pictures the French state as strong - holding a "preeminent position in the political system's balance of power" (1991, p. 54-55), whereas the medical profession in France is described as comparatively weak, because of its being fragmented. In France, there have been two *competing* national associations since the late 1960s: the Confédération des Syndicats Médicaux Français (CSMF) and the Fédération des Médecins de France (FMF) (Wilsford, 1991, p. 109). French GPs are not represented by a separate organization. Combined with the fact that primary medical care is not exclusively delivered by GPs, their position can be characterized as rather weak.

## Germany

In Germany approximately 93% of the population is covered by the Bismarckian public health insurance scheme (Groenewegen et al, 1991). Patients receive medical services in kind, with no copayments for physicians' fees. In Germany there is a distinct division into institutional care (provided by salaried hospital doctors) and non-institutional, ambulatory care. Within ambulatory care, provided by so-called 'niedergelassene Ärzte', there is no division into GPs and medical specialists. Both types of doctors are, if working in ambulatory care, freely accessible.

Ambulatory care physicians are paid on a fee-for-service basis. However, in Germany this system of reimbursement is a two-stage process: first the sickness funds pay the Kassenärztliche Vereinigungen (KV - associations of insurance doctors) an aggregate pool in exchange for all the services provided to sickness fund members. Then this aggregate pool is distributed by the KVs to their individual members. This distribution is based on a fee schedule and the individual service claims submitted by physicians (Stone, 1980). The conversion factor

in the fee schedule (the so-called 'Einheitliche Bewertungsmaßstab' - EBM) has since 1978 been linked to the so-called 'Grundlohnsumme' (the income of all members of the social sickness funds) as an expenditure target. In 1986 the expenditure target was turned into a cap, and in 1987 separate pools for laboratory testing, physician consultations and other services were introduced (Brenner & Rublee, 1991, Schneider, 1991).

In Germany, considerable power in the field of health care has been delegated to the federal states. The German health care system is regarded as a good example of a pluralistic system (Groenewegen et al, 1991, p. 59) within which there is no single centre of power. According to Stone (1980, p. 18) the German political system, instead of fragmenting the medical profession in order to control its power, has deliberately consolidated it, but confronted it with powerful countervailing organizations. However, Stone (1980, p. 180) concludes that the German sickness funds - that were to act as a countervailing organization - have been considerably weakened by internal competition. In Germany the medical profession has derived its collective power primarily from its early willingness to engage in collective action, against both the state and private employers. German physicians have organized themselves as a trade union. In addition, the physicians' collective power has been added to by specific governmental decisions, such as the creation (in the early 1930s) of Kassenärztliche Vereinigungen as monopolistic associations that were granted the exclusive right to negotiate and contract with sickness funds (Stone, 1980, 163-165). Wilsford, on the other hand, describes German organized medicine as "[...] characterized by an ethos of cooperation, coordination, consensus, and compromise, unlike its French counterpart" (1991, p. 286), which puts them - according to Wilsford (1991, p. 288) in a relatively weak position. As a reflection of the health care system, in which there is no division into specialists and GPs in ambulatory care, GPs are not represented separately.

### **Independent variables**

On the basis of the information presented in the country descriptions it is possible to attribute to the eight countries characteristics related to the profession's political power and to the GPs' opportunity to increase their income level as a group by raising the volume of care provided. However, classifying countries with regard to these types of features is, to a certain extent, an arbitrary process. For example, should German GPs be regarded as strong - as is Stone's opinion (1980, p. 163-165) - or as weak - as they are characterized by Wilsford (1991, p. 286)? In order to avoid misclassification of countries, only very crude dummy-variables will be used as representing the factors political power and opportunity for a volume offset.

With regard to the GPs' power it can be concluded that the profession holds a strong position in the United Kingdom, Denmark and the Netherlands, because in these countries GPs (1) are independent, self-employed contractors with a national health service or health insurance organizations, (2) serve as gatekeepers to specialist and hospital care, (3) have a monopoly on the provision of primary medical care, and (4) are represented by their own GP association (or in the case of the U.K. by an independent committee within the BMA) in income negotiations. Consequently, GPs in the other five countries have been classified as 'weak' in table 8.1.

With regard to the GPs' collective opportunity to improve their income position by increasing volume, it is obvious that between 1975 and 1990 GPs in both Belgium and in France had plenty of opportunity to do so, regarding the combination of their fee-for-service payment system with the absence of expenditure caps or even targets. In contrast, in Sweden, where GPs are paid fully through salary, GPs have had no opportunity at all to improve their income position by increased volume. In the United Kingdom and the Netherlands, where GP income is tied to a target income, GPs have very limited opportunity for improvement. In both countries on average one third of total income could be derived from fees for services during the study period (1975-1990). However, the services under fee-for-service payment are not very susceptible to physician-induced demand: night visits, contraceptive and maternity services (United Kingdom) require specific patient conditions in order to be provided, whereas the number of consultations (the main category for which Dutch GPs are reimbursed for privately insured patients) cannot easily be increased either (for one thing, for example, return visits require patients' cooperation). Furthermore, if GPs would have increased the volume of these services, the fees could have been adjusted downward in the next round of negotiations. The same type of mechanism applies to German GPs, who were tied to expenditure targets (1975-1986) and caps (1986-1990).

Compared with the United Kingdom and the Netherlands, GPs in Denmark may have had some more opportunity for improvement, especially because there separate fees are paid for a number of medical-technical and diagnostics procedures as well. Finnish GPs may also have had a little more room for improvement, because reimbursement for services provided outside their regular office hours is not tied to a maximum. However, in order to avoid arbitrary decisions with regard to characterizing countries, in table 8.1 the following scores are attributed to countries: 'moderate' opportunity for improvement (Belgium, France), and 'no' opportunity for improvement in the remaining six countries. Two of the independent variables affecting GP income have now been operationalized. The remaining third independent variable is the number of inhabitants per GP. This information is also derived from the study on GP incomes in eight OECD-countries mentioned earlier.

In table 8.1 the number of inhabitants per GP in 1975, 1980, 1985 and 1990 is listed. In order to correctly reflect trends and developments throughout the study period, perhaps smaller time lags would have given more accurate information. However, with this type of study the countries for which the fewest data are available dictate the form in which the information can be analyzed. As will become clear from the many footnotes under tables 8.1 and 8.2, in several instances a particular figure had to be extrapolated and intrapolated from data from surrounding years for some countries even as it is. So the use of three periods of five years each is a compromise.



Table 8.1 Independent variables: GP position, opportunity for income increase through volume increase, number of inhabitants per GP in 1975, 1980, 1985 and 1990

Country	GPs' (political) position	higher income through increased volume	number of inhabitants per GP in:			
			1975	1980	1985	1990
U.K.	strong	no	2298	2154	1967	1875
Netherlands	strong	no	2828	2588	2329	2290
Denmark	strong	no	2096	1866	1755	1610
Germany <sup>1</sup>	weak	no	2487	2465	2227	2077
Finland <sup>2</sup>	weak	no	4211	2971	1730	1524
Sweden <sup>3</sup>	weak	no	4353	3804	3126	2378
Belgium <sup>4</sup>	weak	moderate	1011	898	707	687
France <sup>5</sup>	weak	moderate	1662	1306	1149	977

<sup>1</sup> 1975: The number of inhabitants per GP was extrapolated using 1970 and 1976 data, formula:  $\text{density}_{1976} - ((\text{density}_{1976} - \text{density}_{1970}) / 6)$

<sup>2</sup> The number of inhabitants per GP was extrapolated for 1975, 1980 and 1990 using 1976, 1985 and 1993 data. The formulae used, were:

1975:  $\text{density}_{1985} - \{ ((\text{density}_{1985} - \text{density}_{1976}) / 9) * 10 \}$

1980:  $\text{density}_{1985} - \{ ((\text{density}_{1985} - \text{density}_{1976}) / 9) * 5 \}$

1990:  $\text{density}_{1993} - \{ ((\text{density}_{1993} - \text{density}_{1985}) / 8) * 3 \}$

<sup>3</sup> The number of inhabitants per GP in 1990 was extrapolated using 1985 and 1989 data, formula:  $\text{density}_{1985} + \{ ((\text{density}_{1989} - \text{density}_{1985}) / 4) * 5 \}$

<sup>4</sup> 1975: The number of inhabitants per GP was extrapolated using 1976 and 1980 data, formula:  $\text{density}_{1976} - ((\text{density}_{1980} - \text{density}_{1976}) / 4)$

1990: The number of inhabitants per GP was extrapolated using 1988 and 1991 data, formula:  $\text{density}_{1991} - ((\text{density}_{1991} - \text{density}_{1988}) / 3)$

<sup>5</sup> The number of inhabitants per GP in 1990 was extrapolated using 1985 and 1991 data, formula:  $\text{density}_{1991} - ((\text{density}_{1991} - \text{density}_{1985}) / 6)$

With regard to Sweden, one additional remark should be made here. Apart from GPs in public service, some Swedish GPs work in private practice. The number of private GPs has grown from 104 in 1985 to 163 in 1992. For previous years no data were available with regard to the number of private GPs. Garpenby (1989, p. 60) however, does provide data on all private physicians (GPs as well as specialists) between 1975 and 1985. The number of private physicians for 1989 could be extracted from a statistical yearbook (Statistiks Årsbok för Landsting 1991/1992, p. 69). The proportion of GPs in the total number of private physicians was 17% in 1985 and 29% in 1989. For the analyses presented in this chapter GP density in Sweden has been calculated on the

basis of the combined numbers of GPs in public service and all private physicians (GPs and specialists). These figures, therefore, exaggerate GP density in Sweden.

### **Dependent variables**

The dependent variable in the analyses of this chapter is GP income in the eight countries between 1975 and 1990. The GPs' income was defined earlier in this chapter as their average net revenue: that is, average gross revenue from general practice minus practice expenses, but before taxes are deducted. Taxation data were not collected in the study from which the income data are derived. It is easy to imagine the difficulties inherent to collecting cross-national information on social security contributions and taxation for the period between 1975 and 1990. Apart from that, the dependent variable is average GP income, and how should one define an 'average' GP as far as taxation is concerned. Different deductibles and the like are in used under different taxation models in OECD-countries. Defining an average GP as, for example, married with (two) children, wife running the household, and having an average mortgage, is too crude an estimate to use in the comparisons that will be made in this chapter (cf. Groenewegen et al, 1991, p. 9, p. 23)

The sources of information on GP income differ for the eight countries: for Finland and Denmark the information is based on surveys that are held regularly among the GPs, for Sweden the average salary the County Councils pay GPs is used; data for Belgium are based on income tax data collected by the Ministry of Economic Affairs; French and German income figures are largely based on health insurance data; finally, for the United Kingdom and partly for the Netherlands as well, the target GP income as agreed upon in negotiations is used in the analyses. The original data all present GP income in nominal, national currencies. Of course, in order to test the hypotheses, the income data that have been gathered in European countries will have to be modified before cross-national and over-time analyses are carried out.

For cross-national comparisons of the level of income, it is important to find one common denominator that facilitates comparison of data. Monetary exchange rates, by which for example all income data are expressed in US dollars, are not the most appropriate when it comes to comparing GP incomes. Currency exchange rates are affected by supply and demand on the money market, which can be influenced by deliberate monetary interventions, but also by such things as the US president's health status or the Gulf war. Furthermore, the dollar's exchange rate (or any currency exchange rate, for that matter) does not correct for differences in purchasing power (cf. Parkin et al, 1989). Therefore, for cross-national comparisons, income data are corrected using the OECD's US\$ Purchasing Power Parities (US\$ PPP) (OECD Health Data, 1993). The results of that correction are listed in table 8.3.

Table 8.2 GPs' average net revenue in nominal currencies in 1975, 1980, 1985 and 1990 in eight OECD-countries

Country	1975	1980	1985	1990
U.K. (UK£)	8,638	17,970	23,212	33,630
Netherlands (HFL)	141,221	151,949	143,719	144,778
Denmark <sup>1</sup> (DK)	280,249	333,822	440,202	488,174
Germany <sup>2</sup> (DM)	135,123	138,842	142,560	154,093
Finland <sup>3</sup> (FIM)	104,484	136,740	179,652	267,456
Sweden <sup>4</sup> (SK)	146,400	178,200	225,000	363,600
Belgium (BF)	1,035,955	1,275,582	1,261,641	1,435,662
France (FF)	136,969	186,322	273,420	336,628

- <sup>1</sup> 1980: mean net revenue of 1979 and 1981  
 1990: extrapolated using net revenue in 1985 and 1989, formula:  
 $income_{1985} + \{ ((income_{1989} - income_{1985}) / 4) * 5 \}$
- <sup>2</sup> 1980: mean net revenue of 1975 and 1985
- <sup>3</sup> 1975: mean net revenue of 1974 and 1976
- <sup>4</sup> 1975: extrapolated using net revenue in 1977 and 1979, formula:  
 $income_{1979} - \{ ((income_{1979} - income_{1977}) / 2) * 4 \}$   
 1980: mean net revenue of 1979 and 1981

The time-series analyses require that income data are comparable, not so much between countries, but rather over a certain period of time. For example, a 1990 US dollar does not buy the same basketful of goods as a 1975 US dollar. Therefore, income data will somehow have to be adjusted for inflation and economic development. In order to do so GP incomes can be corrected for the OECD's Nominal Price Index, resulting in time series that contain figures based on the price level in 1985.

Apart from that, incomes can be compared with per capita GDP. Expressing GP incomes as a ratio of per capita GDP has the advantage that it does not only show the GPs relative income position within one country and over time, but also facilitates cross-national comparisons of the GPs' relative position on the income distribution. In table 8.4 GP incomes are presented both in constant prices and as a ratio of per capita GDP. In table 8.5 the percentages of change are listed both for GP incomes based on constant 1985 prices, and as a ratio of per capita GDP. This table confirms what had been found earlier, for example by Poullier (186, p. 36) or Sandier (1989, p. 42): that, in general, GP incomes corrected for changes in the price level or related to average earnings (or in this case, per capita GDP) have declined since 1975. Both in constant prices and as a ratio of per capita GDP, the development of GP incomes between 1975 and 1990 shows a similar pattern (Pearson's r between the two variables is .76, p < .05): in general, incomes decreased between 1975 and 1985, and stabilized between 1985 and 1990. Because of this similarity, analyses are conducted on the development of GP income as a ratio of GDP only.

Table 8.3 GPs' average net revenue in US\$ Purchasing Power Parities in 1975, 1980, 1985 and 1990 in eight OECD-countries

Country	1975	1980	1985	1990
U.K.	22,732	34,558	40,723	52,547
Netherlands	47,549	55,054	56,360	62,674
Denmark	34,011	38,414	44,919	47,860
Germany	41,964	51,045	57,484	64,474
Finland	22,665	26,917	30,092	39,506
Sweden	23,728	25,567	27,607	37,292
Belgium	21,673	29,459	28,288	32,335
France	25,843	31,054	37,609	45,614

Table 8.4 GPs' average net revenue in constant 1985 prices and GPs' average net revenue divided by per capita GNP in 1975, 1980, 1985 and 1990 in eight OECD-countries

Country	GPs' average net revenue in constant 1985 prices in:				GPs' average net revenue divided by per capita GNP in:			
	1975	1980	1985	1990	1975	1980	1985	1990
U.K.	24,061	25,063	23,212	25,516	4.6	4.4	3.7	3.5
Netherlands	224,517	179,609	143,719	137,884	8.8	6.4	5.0	4.3
Denmark	617,289	481,706	440,202	404,788	6.6	4.6	3.7	3.1
Germany	193,586	162,960	142,560	135,765	8.1	5.8	4.8	4.0
Finland	251,163	206,244	179,652	201,701	4.7	3.4	2.6	2.5
Sweden	357,946	266,766	225,000	258,790	4.0	2.8	2.2	2.3
Belgium	1,792,310	1,685,049	1,261,641	1,235,509	4.5	3.6	2.6	2.2
France	347,637	289,320	273,420	282,169	4.9	3.6	3.2	2.9

Table 8.5 Percentage of change in GPs' average net revenue in constant 1985 prices, and change in GPs' average net revenue as a ratio of per capita GNP between 1975-1980, 1980-1985, 1985-1990, and 1975-1990 in eight OECD-countries

Country	Percentage of change in net revenue in constant 1985 prices between:				Change in net revenue as a ratio of per capita GDP between:			
	75-80	80-85	85-90	75-90	75-80	80-85	85-90	75-90
U.K.	+4	-7	+10	<b>+6</b>	-0.2	-0.7	-0.2	<b>-1.1</b>
Sweden	-25	-16	+15	<b>-28</b>	-1.2	-0.6	+0.1	<b>-1.7</b>
France	-17	-5	+3	<b>-19</b>	-1.3	-0.4	-0.3	<b>-2.0</b>
Finland	-18	-13	+12	<b>-20</b>	-1.3	-0.8	-0.1	<b>-2.2</b>
Belgium	-6	-25	-2	<b>-31</b>	-0.9	-1.0	-0.4	<b>-2.3</b>
Denmark	-22	-9	-8	<b>-34</b>	-2.0	-0.9	-0.6	<b>-3.5</b>
Germany	-16	-13	-5	<b>-30</b>	-2.3	-1.0	-0.8	<b>-4.1</b>
Netherlands	-20	-20	-4	<b>-39</b>	-2.4	-1.4	-0.7	<b>-4.5</b>

### Testing the hypotheses

Hypotheses were formulated earlier for cross-national comparisons of both the level and the development of GP incomes. Cross-national comparisons of the level of incomes will be carried out for 1975, 1980, 1985 and 1990. For all four points in time, if the hypotheses are correct, there should be a significant positive relationship between the number of inhabitants per GP and GP income in US\$ PPP, and a significant positive relationship between the profession's position and GP income in US\$ PPP. The over-time development of GP incomes should, if hypothesis 3 is correct, also be conditioned by the opportunities GPs have had to offset increases in GP density or price regulations by increasing the volume of services provided.

Testing the hypotheses should ideally take place in multivariate analyses, because the three factors influencing GP incomes are theoretically interdependent: the GPs' position can be affected by density, and changes in density can be offset by volume responses. However, a database containing only eight cases does not allow for refined multivariate models. With regard to analyses of the level of GP incomes it is possible to look at multiple regression coefficients for both the dummy for the GPs' political position and GP density. However, as far as the development of GP incomes is concerned, multivariate analyses are difficult to carry out. The independent variable at hand (GP income) is in fact measured in eight subjects at four points in time. A design of that nature calls for e.g. a repeated measures analysis of variance. Unfortunately, as will become clear later on, the model best explaining the development of GP income consists of four main effects and two interactions. In a situation with eight cases (one of

which will be identified as a clear outlier) this leaves too few degrees of freedom to test the hypotheses in a repeated measures model.

The alternative is to carry out multiple regression analysis on the development data, with change in GP income as the dependent variable and the within-subjects factor 'time' as one of the independent variables. Change in income can be measured at three points in time: 1980 compared with 1975, 1985 compared with 1975, and 1990 compared with 1975. Three measurements of change in income times eight countries results in 24 cases for the regression analyses. However, although the change in income compared with 1975 will be used as the dependent variable (absorbing some of the country-related variance), rather than, for example, the absolute ratio of per capita GDP, regression results have to be interpreted very cautiously. Because the data consist of repeated measures on eight subjects, autocorrelation may affect the results (in that regression coefficients are estimated correctly, but may be registered as significant when in fact they are not). In order to gain more insight into the possible presence of autocorrelation, Durbin-Watson's tests for autocorrelation are presented alongside the multiple regression results. This test results in a coefficient with a value of 2, if there is no autocorrelation, and extreme values of 0 and 4 indicating that autocorrelation exists. Between the extremes and the value of 2, there is a zone in which the test is inconclusive (which is quite broad with small sample sizes).

## 8.4. Results

### Cross-national analyses

In this section the relationship between GP incomes in US\$ PPP on the one hand, and the number of inhabitants per GP and the profession's position on the other hand, will be analyzed for the years 1975, 1980, 1985, and 1990. In figures 8.1 through 8.4, for each of these years the average net revenue of GPs in US\$ PPP is plotted against the number of inhabitants per GP. Especially in figure 8.1, showing results for 1975, it is obvious that Finland and Sweden with their hospital-dominated health care are outliers, with a very high number of inhabitants and a comparatively low income per GP. The same situation, but less obvious, is demonstrated in figure 8.2 referring to 1980: here Finland is already moving in the direction of the other six countries. In 1985 Finland is no longer an outlier (see figure 8.3), whereas in 1990 even Sweden has come somewhat closer to the other seven countries (see figure 8.4). This is in line with what has been mentioned in the country descriptions (section 8.3.1.), namely that in both Finland and Sweden government has tried to stimulate the development of primary care.

Measured over all eight countries no significant correlation is found between the number of inhabitants per GP and average GP income in US\$ PPP in any of the years, as can be seen in table 8.6. If, however, Finland and Sweden are left out, Pearson's  $r$  is significant with values of respectively .79, .88, .92 and .94.

Figure 8.1 Relationship between GP incomes in US\$ PPP and the number of inhabitants per GP in 1975

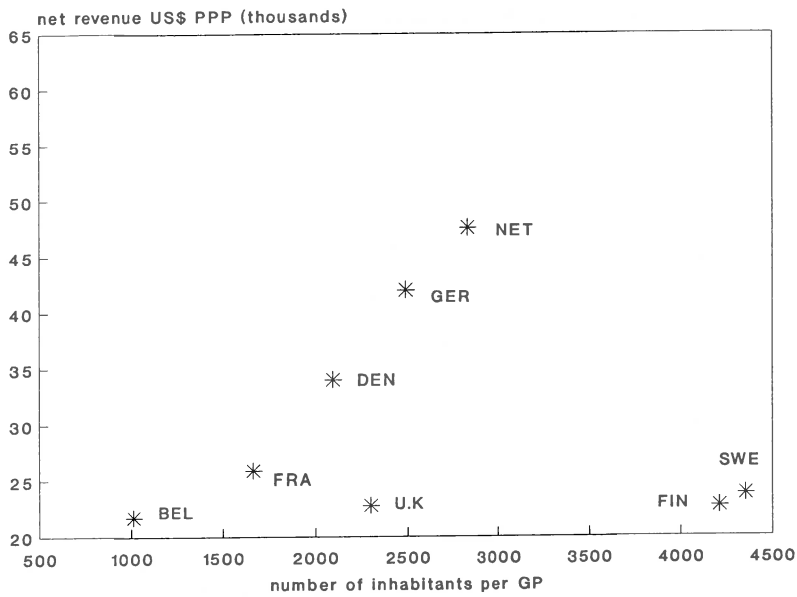


Figure 8.2 Relationship between GP incomes in US\$ PPP and the number of inhabitants per GP in 1980

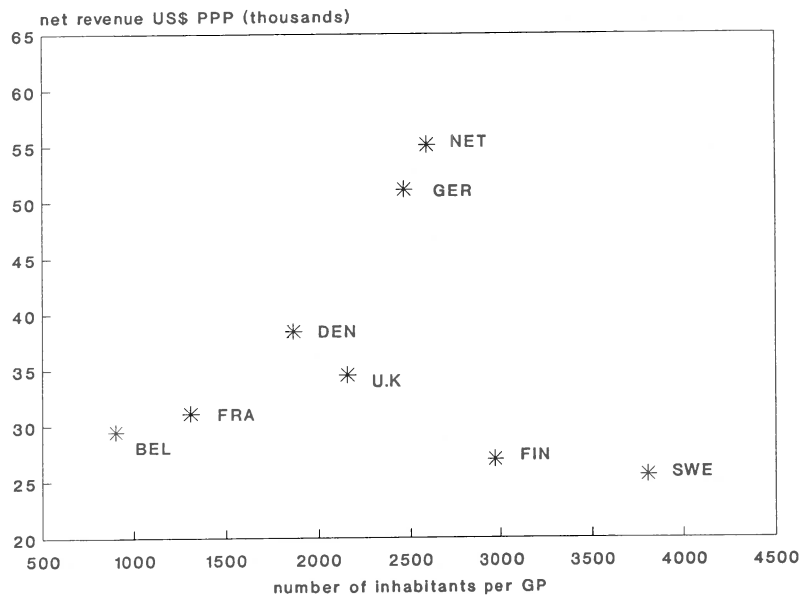


Figure 8.3 Relationship between GP incomes in US\$ PPP and the number of inhabitants per GP in 1985

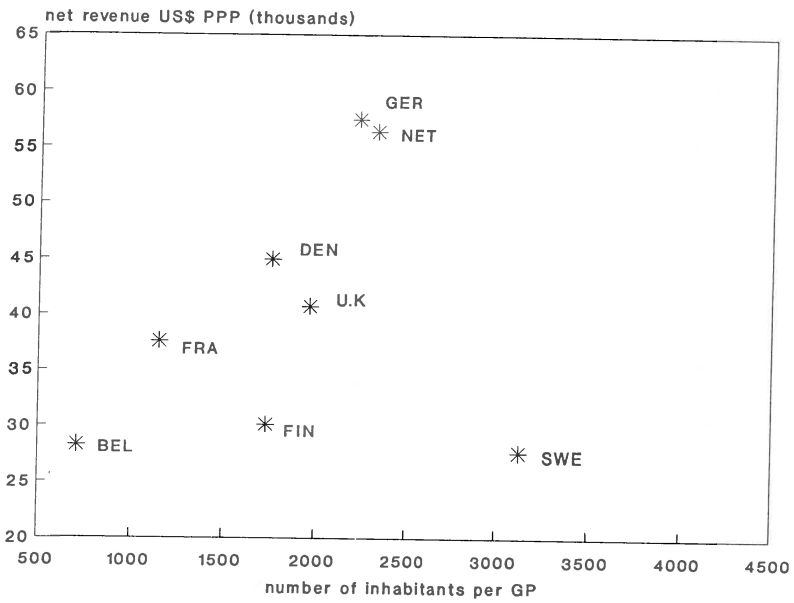


Figure 8.4 Relationship between GP incomes in US\$ PPP and the number of inhabitants per GP in 1990

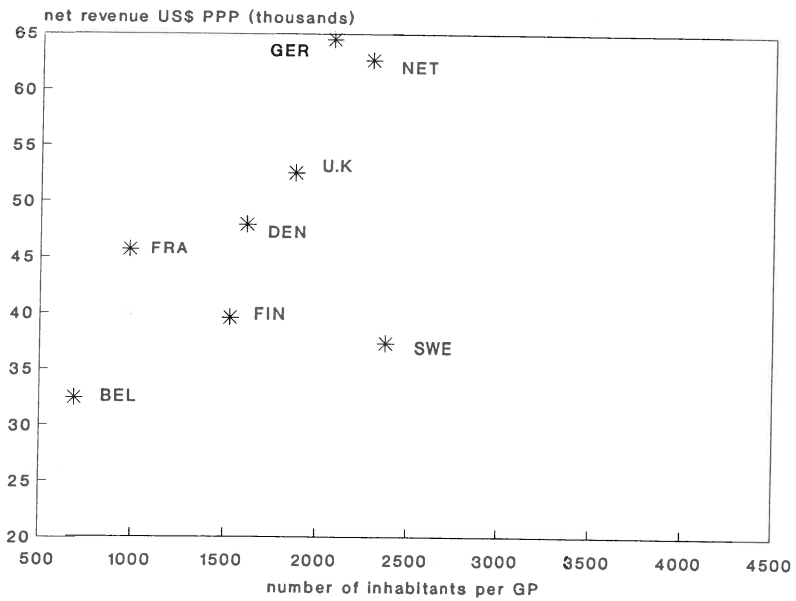




Table 8.6 Bivariate correlations (Pearson's r) and one-tailed significance (\* =p <.05, \*\* =p < .01) between GP position (strong/weak), number of inhabitants per GP and GP income in US\$ PPP in 1975, 1980, 1985 and 1990, over all countries, and excluding Finland and Sweden (-- = not analyzed)

Income in US\$ PPP	GPs' position	inhabit./ GP 1975	inhabit./ GP 1980	inhabit./ GP 1985	inhabit./ GP 1990
<b>all countries</b>					
1975	.39	-.04	--	--	--
1980	.46	--	-.01	--	--
1985	.48	--	--	.23	--
1990	.47	--	--	--	.56
<b>Finland+Sweden excluded</b>					
1975	--	.79*	--	--	--
1980	--	--	.88*	--	--
1985	--	--	--	.92**	--
1990	--	--	--	--	.94**

Table 8.7 Unstandardized multiple regression coefficients (B) plus one-tailed significance (\* = p <.05, \*\* = p <.01) of GP position and the number of inhabitants per GP on GP income in US\$ PPP in 1975, 1980, 1985, and 1990 for all countries and excluding Finland and Sweden

Independent variables	Unstandardized regression coefficients (B) for:			
	1975	1980	1985	1990
<b>all countries</b>				
GP position	7660.09	9884.35	10526.38	7084.26
Inhabitants per GP	.21	.20	2.58	8.66
constant	26599.63	32345.70*	31601.25	30610.18*
<b>Finland+Sweden excluded</b>				
GP position	-6143.00	-5031.22	-6566.40	-7737.71
Inhabitants per GP	16.12	16.28*	19.47*	21.57**
constant	2098.96	11853.10	14626.10	20577.92*

The relationship between GP incomes in US\$ PPP and GP position is not significant, neither in bivariate analyses (table 8.6) nor in multivariate analyses (table 8.7). In general, GP incomes are higher in the three countries where the GPs' collective power has been classified as "strong". However, GPs in the United Kingdom ("strong") earned less than French and Swedish GPs ("weak") in 1975, whereas throughout the whole period German GPs, whose position has also been characterized as "weak", earned an income that was the highest for all eight countries in 1985 and 1990. Bivariate correlation coefficients, as a result, are not significant. Bivariate correlations for the six countries excluding Finland and Sweden indicate (though not significantly) that in the countries with a strong profession the number of inhabitants per GP is higher (correlation coefficients vary from .53 in 1980 to .59 in 1990). If the effect of GP position and GP density is, therefore, evaluated multivariately, the dummy for the GPs' position consequently shows a negative sign (in analyses excluding Finland and Sweden). However, the coefficients are not significant (significance levels varied from .49 for 1975 to a low .08 for 1990).

### **Time-series analysis**

With regard to the development of GP incomes as a ratio of per capita GDP between 1975 and 1990 it was expected that incomes had decreased less where GPs' hold strong positions, and that incomes had decreased more where the number of inhabitants per GP had decreased more, unless GPs could increase their income by increasing the volume of services provided.

These expectations have been tested in a multiple regression analysis, the results of which are presented in table 8.8. The dependent variable was change in GP income as a ratio of per capita GDP between 1975 and 1980, between 1975 and 1985, and between 1975 and 1990 (thus resulting in three cases per country). The independent variables entered into the regression equation were, subsequently:

- the (corresponding) absolute change in the number of inhabitants per GP between 1975 and 1980, between 1975 and 1985, and between 1975 and 1990 (GP-SUPPLY),
- one dummy (POSITION) representing the strong political position of GPs in the U.K., the Netherlands and Denmark,
- one dummy (VOLUME) representing the opportunities for income increase through volume increase for French and Belgian GPs,
- the interaction between the dummy VOLUME and GP-SUPPLY, and
- two dummies representing time (one for 1985 and one for 1990) (DUM1985 and DUM1990).

From table 8.8 it becomes clear that none of the expected effects has occurred. The only significant independent variable is time, as represented by the two dummies for 1985 and 1990. Apart from that, the Durbin-Watson statistic (which equals 2 if there is no autocorrelation) indicated positive autocorrelation in the data. Furthermore, the coefficient for change in number of inhabitants per GP has a negative sign (though the

observed significance level was only .08), which suggests that incomes decreased less where the number of inhabitants per GP increased the most. This finding does not provide evidence for the theory of supplier-induced demand, because on closer investigation the phenomenon appears to have been caused by the development of GP income and GP density in Finland and Sweden (which could have been expected from the results shown in the former section). In Finland and Sweden the number of inhabitants per GP increased dramatically between 1975 and 1990 (compare table 8.1), but this was the result of a deliberate, and apparently effective, strengthening of primary care and should not be interpreted as a cause of the GPs' income and position deteriorating. Therefore, another multiple regression analysis was carried out in which two more independent variables were included:

- one dummy (FIN-SWE) representing the opposite relationship between GP supply and income in Finland and Sweden (which, as explained, is the result of a deliberate strengthening of primary health care by government),
- the interaction between the dummy FIN-SWE and GP-SUPPLY.

The results of that analysis are presented in table 8.9, first column. After correction for the development of primary health care in Finland and Sweden, five significant effects can be detected that together explain 68% of the total variation. First, the constant (the intercept) is -1.99, indicating that GP income as a ratio of GDP per capita has decreased significantly between 1975 and 1980 with an absolute value of -1.99. Second, as expected: the change in income is positively related to the change in GP-SUPPLY. The decrease in income has been less where the decrease in numbers of inhabitants per GP has been less. However, third, this is not the case in Finland and Sweden, which is indicated by the significantly negative interaction term of FIN-SWE with GP-SUPPLY and, fourth, it may not be the case where GPs can increase their income by increasing volume, which is indicated by the negative interaction term of VOLUME with GP-SUPPLY (which was strictly speaking not significant, with  $p$  being exactly .05). And fifth, the dummy POSITION, representing the GPs' strong political position in the U.K., the Netherlands and Denmark, is also significant, even offsetting the negative constant with a regression coefficient of 2.16.

However, the Durbin-Watson test for autocorrelation was inconclusive with a value of 1.27. Inspection of the residuals showed that in particular the United Kingdom's residuals were high and positive, indicating that the rather modest decrease in income the British GPs have experienced cannot be explained by the independent variables in the regression equation. If the regression analysis is conducted without including this outlier, which the United Kingdom appears to be as far as the *development* of GP income is concerned, all the regression coefficients are significant and total explained variance of the model is .94 (table 8.9, second column). Also Durbin-Watson's  $d$  is much closer to 2 (with a value of 1.91), though the test is still inconclusive.

Table 8.8 Unstandardized multiple regression coefficients (B) plus one-tailed significance (\* =  $p < .05$ , \*\* =  $p < .01$ ),  $R^2$  and Durbin-Watson's  $d$  for analysis of change in GP income as a ratio of per capita GDP in 1980 compared with 1975, 1985 compared with 1975, and 1990 compared with 1975

Independent variables	Unstandardized regression coefficients (B)
DUM1985 - dummy 1985	-1.24*
DUM1990 - dummy 1990	-1.67**
POSITION - dummy for GPs' position	.55
VOLUME - dummy for possibilities for volume offset	1.09
GP-SUPPLY - change in inhab./GP	-7.24
VOLUME * GP-SUPPLY - interaction	-3.48
constant	-2.21**
$R^2$ = .41	
$d$ = .76	

Table 8.9 Unstandardized multiple regression coefficients (B) plus one-tailed significance (\* =  $p < .05$ , \*\* =  $p < .01$ ),  $R^2$  and Durbin-Watson's  $d$  for analysis of change in GP income as a ratio of per capita GDP with correction for developments in Finland + Sweden, and after exclusion of developments in the United Kingdom

Independent variables	Unstandardized regression coefficients (B)	
	all countries	U.K. excluded
DUM1985 - dummy 1985	-.106	-.657*
DUM1990 - dummy 1990	.136	-.724*
POSITION - dummy for GPs' position	2.163**	.939**
VOLUME - dummy for possibilities for volume offset	.885	1.166*
FIN-SWE - dummy for Finland and Sweden	1.085	1.211*
GP-SUPPLU - change in inhab./GP	.007*	.004**
VOLUME * GP-SUPPLY - interaction	-.006*	-.003*
FIN-SWE * GP-SUPPLY - interaction	-.007	-.003**
constant	-1.991**	-2.278**
$R^2$ =	.68	.94
$d$ =	1.27	1.91

## 8.5. Conclusion

In this chapter the relationship between calculating and negotiating fees on the one hand, and physician income on the other hand has been examined, taking into account two factors that can theoretically affect physician income: economic factors (supply, demand, competition), and political factors (the bargaining power of organized medicine). It was hypothesized that the higher the number of inhabitants per GP in a country is, the higher the GPs' income is, and that the more powerful GPs are as a group, the higher their income is. These relationships were expected to exist with regard to cross-national differences in the *level* of the GPs' income as well as the *development* of their income. It was also expected that the development of GP income between 1975 and 1990 had been conditioned by the room the payment and negotiation system left GPs as a group to increase their income through increasing the volume of care: if GPs had the room to increase their income through increasing volume, the *development* of their income between 1975 and 1990 did not depend on the development as regards the number of inhabitants per GP.

The results presented in this chapter do not provide evidence strong enough for these hypotheses to be rejected, though they do not strongly corroborate them either. The hypothesis concerning the relationship between GP density and income does not hold for countries with a strongly hospital-dominated health care, like Sweden, and like Finland until 1980. Elsewhere, GP income is higher where GP density is lower. As far as the level of income is concerned, however, the hypothesis with regard to GP position and income must be rejected.

Nevertheless, the GPs' position is a significant factor in explaining the development of GP income, that is, if in the multiple regression analysis of the development of GP income a dummy is introduced to account for the deliberate stimulation of primary health care in the originally hospital-dominated systems of Finland and Sweden. Analyses of the development of GP income suggest that, in general, GPs incomes compared with per capita GDP have decreased since 1975. This decrease has been smaller for GPs who collectively hold a strong political position. Part of the decrease is, however, due to economic factors, namely the increase in GP supply. However, if GPs can increase their income by providing more services, which is the case in Belgium and France, they seem to be able to partly offset the negative consequences of increased physician supply.

Evaluation of the development of GP income further shows that British GPs did remarkably well between 1975 and 1990. Dutch and German GPs, on the contrary, experienced a serious decrease in their relative incomes, that is, compared with the per capita GDP, although they still rank number two and number one on the list of highest incomes in US\$ PPP. The development of the British GPs' incomes cannot quite be explained by the economic (GP density), political (GP position) or institutional (payment and negotiating system) factors that have been studied in this chapter. According to Sandier (1989, p. 45) the generally deteriorating economic position of GPs is:

" [...] part of a general pattern of narrowing of income differentials that has been occurring in many countries since the end of the 1960s. "

Sandier (1989, p. 45) also noticed a leveling off of the decrease in GP income in the late 1980s, for which she offers three possible explanations:

" a certain loss of enthusiasm for the philosophy of egalitarianism, the perhaps temporary benefits of disinflation, and the comparatively low level to which GP incomes had already descended. "

Now, if the income development of physicians is subject to a general trend of narrowing income differentials, the income development of the British GPs might be explained from the fact that in the United Kingdom these differentials have not narrowed as much as they did in the other seven countries. Taking the percentage of the poor<sup>8</sup> in the population as an indicator of income differentials, for example, the United Kingdom shows the largest increase in the percentage of the poor (from 14.6% to 18.2%) between 1980 and 1985. However, by this measure income differentials in the Netherlands too increased in the same period: the percentage of poor people rose from 9.6 to 11.4<sup>9</sup>. Dutch GPs, however, whose target income is linked to the income of high civil servants, had the disadvantage that throughout the 1980s the incomes of Dutch civil servants did not rise nearly as fast as the incomes of salaried employees in the private sector<sup>10</sup>.

The overall conclusion that should be drawn from this chapter is, that it is important to collect data on GP incomes for more countries than the eight that have been evaluated here. Expanding the number of cases available for international comparisons would, for example, allow for statistical analyses that are more apt to examine over time developments within subjects and differences in developments between subjects. A larger dataset would thus facilitate a more conclusive testing of the hypotheses formulated here. This would then shed more light on the question as to whether the development of physician income can be explained by a general theory including economic, political and institutional factors, or whether for every country a specific explanation has to be given for why physician income has evolved as it did.

## **8.6. Summary of the findings with regard to the macrolevel**

This and the previous chapter have paid attention to the relationship between negotiating physician fees, health care cost control and physician income. It was explained in chapter 3 that negotiations between third-party payers and physicians form the key to understanding the transformation from individual physician behaviour to health care expenditures. Negotiations, namely, are entered by third-party payers with a view to overall cost control and by physicians with a view to their future incomes. In

other words, from the third-party payers' point of view the sum of all fees paid to physicians amounts to a certain proportion of total health care expenditures; from the physicians' point of view the sum of all fees paid to them amounts to total gross revenue. This implies that, in pursuing their own personal income (which is an 'action' that takes place on the microlevel) physicians directly and indirectly influence total health care expenditures (which is an 'outcome' on the macrolevel). Similarly, in trying to control health care costs (an 'action' on the macrolevel), third-party payers directly or indirectly influence the physicians' revenues (an 'outcome' on the microlevel).

Not coincidentally, the hypotheses formulated for the macrolevel start with an expectation regarding physicians behaviour on the microlevel:

5. If physicians are paid on a fee-for-service basis, they will react to a decrease in their revenues by increasing the quantity of services provided.

Therefore, the outcome of this behaviour on the macrolevel was expected to be as follows:

6. In countries where (a) fee-for-service payment is combined with negotiations directly on the level of fees (without constraining the quantity of care), third-party payers have less control over health care expenditures than do third-party payers in countries where (b) expenditure targets or caps, or target incomes for physicians are imposed, and where third-party payers have the political power and determination to use these mechanisms for cost control.

In chapter 3 it was argued that this also implies that physicians who can compensate for reductions in the price of their services by increasing the quantity of services provided, will be better off in terms of the development of their income, than physicians who are subject to strictly monitored expenditure targets or income targets; and that physicians who collectively have more (political) power are better off in terms of the development of their income. Bearing in mind that average physician earnings can also depend on physician density, three hypotheses were formulated with regard to GP incomes:

7. The relationship between the number of inhabitants per GP and GP income is positive, such that: (a) GP income is higher in countries where the number of inhabitants per GP is higher, and (b) over time GP income increases more (or decreases less) in countries where the number of inhabitants per GP increases more (or decreases less).
8. The relation between the GP's collective bargaining power and GP income is positive, such that: (a) GP income is higher in countries where the GPs' collectively hold a stronger position, and (b) over time GP income increases more (or decreases less) in countries where the GPs collectively hold a stronger position.

9. If GPs can increase their income by increasing the quantity of services provided, the development of their income depends less on the development in the number of inhabitants per GP.

Hypothesis 5 (if physicians are paid on a fee-for-service basis, they will react to a decrease in their revenues by increasing the quantity of services provided), though an essential assumption with regard to the transformation problem, was tested in chapter 4, because it referred to physician's individual reactions to different institutional arrangements. In chapter 4 it was concluded that it is difficult to find evidence for this hypothesis, because reactions observed of physicians under fee-for-service payment to e.g. increased physician density can also be explained by traditional economic models. In other words, if physicians increase the quantity of services, this does not necessarily indicate that they are trying to maintain a certain income level. However, findings reported by Rice (1983), Birch (1988), Van Doorslaer & Geurts (1987), and Grytten (1991) indicate that physicians, as well as dentists and physiotherapists, react as hypothesized to changes in the price of care or in physician density. On the other hand, a number of studies have produced counter-evidence (Shwartz et al, 1981, Barer et al, 1987, Schwartz & Mendelsohn, 1990, Escarce, 1992). One of the questions that are important in discussions on the phenomenon of supplier-induced demand, is to what extent physicians would be willing to provide unnecessary services in order to maintain a desired income level. Evans (1984) linked supplier-induced demand to professional uncertainty about the benefits of treatment for a specific patient. Flierman (1991), testing Evans' hypothesis, found that physicians under fee-for-service payment will act in their own financial interest only within the boundaries of medical ethics and standards on when and how to perform specific services. The conclusion with regard to hypothesis 5 can, therefore best be summarized with Wilensky & Rossiter's remark that

" Physicians initiate medical care for their patients primarily because of their patients' health status modified by their patients' financial interests rather than in a way which is consistent *only* with their own self-interest. "  
(1983, p. 272)

Hypothesis 6, on the relationship between negotiation methods and cost control, was tested in chapter 7. In that chapter it was concluded that in theory some methods for calculating physicians fees offer better opportunities for cost containment than others. However, mixed evidence is found when cost control, operationalized as the growth of health expenditures' share in GDP, is examined in ten OECD-countries. The development of expenditures match the expectations expressed in hypothesis 6 as far as Germany, Sweden, Belgium, France and the United States are concerned. On the other hand, two countries have experienced trends that are completely opposite to the expectations. Expenditure trends in Canada show that targets and caps are no



guarantee for controlled growth of costs; the development of costs in the Netherlands indicates that fee-for-service payment (for medical specialists) without the use of targets can go together with cost control in ambulatory care. In chapter 7 it could not be decided whether the 'disappointing' results in Canada had anything to do with the provinces' lack of bargaining power or determination to apply cost control mechanisms. It was argued that to a certain extent the effectiveness of expenditure targets and caps depends on the political bargaining power of third-party payers and physicians as a group. If physicians enter negotiations primarily with a view to their future incomes, and collectively have enough bargaining power, they may be able to accomplish substantial annual increases in total budgets available.

The relationship between negotiations and physician income was examined in this chapter. The three hypotheses (7 through 9) were tested using data on GP incomes between 1975 and 1990 in eight European countries. The general conclusions from this chapter were that the results did not provide evidence strong enough for hypotheses 7, 8 and 9 to be rejected, but did not strongly corroborate these hypotheses either. Hypothesis 7 (with regard to the relationship between GP density and income) must be rejected for countries with a strongly hospital-dominated health care, such as Sweden and Finland (till about 1980). In other countries, however, GP income is higher where GP density is lower.

Hypothesis 8, concerning the relationship between GP position and income, must be rejected as far as the *level* of income is concerned. The GPs' position is, however, a significant factor in explaining the *development* of income. In general GP income compared with per capita GDP has decreased since 1975, but this decrease has been smaller for GPs who collectively hold a strong political position. Apart from political factors, the decrease of GP incomes can be explained by economic factors, namely the increase in GP supply (which is in line with hypothesis 7). Finally, if GPs can increase their incomes by providing more services, which is the case in Belgium and France, they can partly offset the negative consequences of increased physician supply. The latter finding suggests that hypothesis 8 cannot be rejected. It should, however, be noted, that the number of observations examined in this chapter is low. Income data could be analyzed for eight countries only. A larger dataset is needed for a more conclusive testing of hypotheses 7 through 9.

## Notes

1. cf. Pope, G.C., J.E. Schneider, Trends in Physician Income, Health Affairs, 11 (1992), no. 1 (Spring), p. 181-193
2. Under the PPS, payment to hospitals for inpatient care (Medicare Part A services) is made prospectively for episodes of illness on the basis of Diagnosis-Related Groups (DRGs) (Levy & Borowitz, 1992). Under this payment system, hospitals are paid a fixed amount of money for the treatment of a patient with a particular diagnosis, regardless whether this patient is treated in an inpatient or outpatient department. The PPS thus offers incentives for hospitals to substitute relatively cheap outpatient care for more expensive inpatient care. There is evidence that, in case hospitalization is inevitable, patients leave the hospital "quicker and sicker": for some five diseases studied by Kahn et al (1990) average length of stay fell with 24% after the introduction of the PPS, and Kosecoff et al (1990) found that a larger percentage of patients were discharged from hospital in an unstable condition.
3. It is important to distinguish between the collective and individual dimensions of the physicians' power. The power of individual physicians (e.g. with respect to their patients) has been studied in chapters 4 through 6, in which attention was paid to physicians' behaviour as incomplete professional agents. This chapter, on the other hand, will deal with the power of physicians as a group, e.g. with respect to the state (cf. Stone, 1980, p. 2).
4. Marmor & Thomas (1972, p. 432) believe that the main reason for BMA's success in the 1965-66 crisis on GP remuneration, which has been described in section 7.2.4., was the threat of strike the GPs had imposed on government when sending in their letters of resignation from the NHS. More in general, Marmor & Thomas contribute the medical organizations' success to the fact that physicians produce a crucial service in industrial countries for which governments can hardly provide substitutions (1971, pp. 72). Similarly, Stone (1980, pp. 163-165) attributes the collective power of the medical profession in Germany primarily to its early willingness to engage in collective action against both the state and private employers. In contrast to American doctors, German physicians have organized as a trade union. In addition, the physicians' collective power has been added to by specific governmental decisions, such as the creation (in the early 1930s) of Kassenärztliche Vereinigungen as monopolistic associations that were granted the exclusive right to negotiate and contract with sickness funds.
5. The information on the new negotiating system was provided by the Federation of County Councils.
6. A small number of self-employed ophthalmologists and ear-, nose- and throat-specialists working outside hospitals are freely accessible.
7. Information was provided by the NHS Management Executive, Department of Health, Health Authority Personnel (Statistics), Quarry House, Quarry Hill, Leeds LS2 7UE.
8. Defined by Eurostat (1991, p. 78) as having less than 50% of the equivalent mean national expenditure of adults.

9. Percentage of the poor in the population between 1980 and 1985, where the poverty threshold is set at 50% of the equivalent mean national expenditure of adults:

EC-country	% poor 1980	% poor 1985	chg 1980-1985
United Kingdom	14.6	18.2	+3.6
Netherlands	9.6	11.4	+1.8
Denmark	7.9	8.0	+0.1
Germany	10.5	9.9	-0.6
Belgium	7.1	5.9	-1.2
France	19.1	15.7	-3.4

Source: Eurostat (1991, p. 78)

10. For example, the average hourly wage of civil servants increased with only 2.1% between 1980 and 1987, compared with an increase of 24.7% for employees in the private sector (CBS, 1988, p. 340).

## 9. CONCLUSIONS

### 9.1. Introduction

How should the provision of medical care be structured (institutionally) in order to obtain efficiency on the microlevel and cost control on the macrolevel? This question was introduced as the basic theme of this study in section 1.1. In that section the microlevel and the macrolevel were thus introduced in one basic question, and both levels were - in that question - regarded as being shaped by institutional structures. Institutional arrangements on the macrolevel (of, for example, a country's health care system) and social conditions influence the actions or behaviour of individuals on the microlevel (for example, individual physicians in encounters with individual patients). All these individual actions on the microlevel (for example, GP referrals to specialists), in turn, result in effects or outcomes on the macrolevel (for example, a country's total health care costs). Sometimes the outcomes on the macrolevel may be regarded as undesired by (groups in) society and/or government. In other words, actions on the microlevel may have adverse effects on the macrolevel (for example, a rapid growth of health care expenditures). This, in turn, may call for a change in institutional arrangements (for example, a reduction of physician fees), which again influences the individual's behaviour on the microlevel (physicians may, for example, increase the quantity of services provided in order to maintain revenues), which, in turn, results in different macro outcomes.

This macro-micro and micro-macro approach is reflected in the chapters of this book. Chapter 1 started with a general description of the strategies applied in western countries (macrolevel) to control and contain health care costs. In chapter 2 health care and health care policy in the Netherlands (macrolevel) were described. In chapter 3 hypotheses were formulated about how institutional arrangements and social conditions influence physician behaviour on the microlevel, and about how the effect of this behaviour is 'transformed' into health care expenditures on the macrolevel. The chapters 4 through 6, then, dealt with the macro-micro link: how do different payment systems and different organizational settings influence the physicians' behaviour with regard to services they perform and referrals they make? Chapters 7 and 8, in contrast, paid attention to the micro-macro link: which consequences do physicians' decisions on the microlevel have for governments' and third-party payers' control over health care expenditures?

In this final chapter conclusions will be drawn, first in section 9.2., on physician behaviour on the microlevel, and then in section 9.3., on the outcome of this behaviour on the macrolevel. In these sections the two more detailed research questions, into which the 'basic theme' was rephrased are addressed: how should social conditions in health care be shaped, in order to ensure that (1) the physicians' social production

functions lead to efficiency on the microlevel, and (2) the physicians' professional behaviour on the microlevel results in cost control on the macrolevel?

Furthermore, it was stated in chapter 1 that these questions would be answered for Dutch health care in particular, using the background knowledge on rules, procedures, and other relevant institutions (provided in chapter 2) that is so crucial in solving the "transformation" problem (Wippler & Lindenberg, 1987, p. 147). This implies that the conclusions drawn from the research conducted with regard to the microlevel and macrolevel are of a rather general nature, whereas the policy implications (presented in section 9.4.) focus on the organization of health care in the Netherlands.

## 9.2. The microlevel

With regard to microeconomic efficiency the following can be concluded. Physicians' professional behaviour is determined by a variety of factors that are related to physician characteristics, patient characteristics and specific features of a health care system. Physician characteristics that may affect professional behaviour are, for example, age, training, position and experience, a related willingness to accept uncertainty, the practice setting in which doctors (choose to) operate and so on. Patient characteristics that might influence individual doctors' decisions are, most importantly, morbidity conditions, but also patients' social conditions such as a patient's social network or ability to pay. Features of the health care system that influence doctors' decisions are, for example, availability of and access to resources (such as hospital beds, operating theatres, or drugs), legal guidelines with regard to certain procedures (such as abortion or euthanasia), and the specific payment system that is in effect. This whole set of factors has, of course, not been studied in this book. Rather, some assumptions have been tested, that may add to the existing patchwork of information on a subject that has not ceased to fascinate (some) researchers even after at least thirty years of study<sup>1</sup>: the relationship between payment systems and physician behaviour. In chapters 4 through 6 this relationship was studied, and particular attention was paid to the role of professional uncertainty in determining the limits between which physicians can act in their financial self-interest. For that purpose both the relationship between payment systems and doctors' decisions, and the relationship between professional uncertainty and doctors' decisions were analyzed.

From the chapters concerning the microlevel, in general, it may be concluded that after three decades of study the idea has become widely accepted that - in general - physicians under fee-for-service payment perform more services than physicians under capitation payment or salary. However, the number of empirical studies conducted to find (counter-)evidence for this idea, is not overwhelmingly high. Apart from that, the limited number of studies that have been carried out compare physicians under fee-for-service payment with salaried physicians (or physicians under capitation payment)

cross-sectionally. Only two studies comparing physicians' behaviour before and after a change in payment system could be detected, one of which unfortunately lacked a control group (Hemenway, 1990). The other longitudinal study, conducted by Krasnik et al (1990) and Flierman (1991), used data from a natural experiment in which Copenhagen GPs moved from 100% capitation payment to a mixed payment system of capitation and fee-for-service. Flierman's study was taken as the starting point from which hypotheses, concerning the microlevel, were formulated in chapter 3 of this book. In that chapter, building on Evans (1984) and Flierman (1991), physicians were modelled as incomplete professional agents: the doctor acts in the interest of his patient, but he cannot know for certain what health care is in his patient's best interest given his health status. Therefore, the physician experiences a "zone of uncertainty" in which he may pursue his financial self-interest without encountering ethical constraints (Evans, 1984, p. 89). Flierman (1991, p. 5) describes this idea in physician utility functions, which he assumes to contain three elements, one of which (namely compliance with medical ethics and standards of care) constrains the trade-off between the other two (namely, income and leisure). Flierman (1991) operationalizes professional uncertainty from a GPs' point of view as uncertainty about standards of care (when and how to perform procedures) and as uncertainty about task definitions (who is to perform a procedure: the GP or a specialist).

Thus, uncertainty is in a way defined as a medical criteria that may determine a physician's behaviour more or less strictly, somewhat comparable to traditional definitions of appropriateness of care, that take into account medical aspects of appropriateness only and do not include costs as a relevant factor. In chapter 3 of this book, however, it was argued that costs of care occasionally dictate physician behaviour as well. When and why that is, has been hypothesized using rational choice theory.

It was argued, in concordance with Wippler & Lindenberg (1987, p. 145), that all individuals, so physicians too, have at least two ultimate goals: physical well-being and social approval. Physicians can achieve physical well-being by pursuing income and leisure (in some optimal mix of the two). For social approval, physicians have at least two sources: their individual patients and society as a whole, impersonated for example in their peers or an employer. In order to obtain social approval from society as whole, the physician should not provide treatment to one particular patient of his if this would interfere with the achievement of benefit to others (that is, he should provide treatment up to the point where marginal benefit equals marginal costs). On the other hand, in order to obtain social approval from one individual patient who is consulting the doctor, the physician should continue providing treatment up to a point beyond which there is no marginal benefit for the patient. Which of the strategies a physician will follow depends on the attending social conditions. If he denies treatment, the benefits of which he perceives not to outweigh the costs, to an individual patient, the physician is able to 'compensate' for this loss of social approval only if there is a colleague around,

or an employer, or a third-party payer, who can see him take the best decision from society's point of view.

From this description of the physicians' so-called social production functions, four hypotheses resulted, which were tested in chapters 5 and 6. The results of this testing were summarized in more detail in section 6.6. The first hypothesis referred to changing GP behaviour via professional uncertainty and social control:

1. Increasing certainty among GPs that - given specific morbidity conditions - a referral is not beneficial and increasing social control among GPs will result in lower referral rates.

The second through fourth hypotheses referred to changing GP behaviour by changing their payment system:

2. Under fee-for-service payment doctors provide more services than under capitation payment or salary.
3. A service provided by a GP substitutes for a referral made to a medical specialist, and the more so when there is more certainty about when to perform these services and less certainty about when to refer for these services.

Given that hypothesis 2 and 3 are true:

4. Introducing fee-for-service in addition to GP capitation payment will reduce referral rates.

In chapter 5 it was concluded that social control among GPs, operationalized as working in partnerships and group practices, has little impact on GP referring behaviour. In general, GPs in partnerships did not provide more services themselves and all in all they did not refer fewer patients either. However, findings presented in chapter 6 indicated that increasing certainty among GPs that given a certain diagnosis a referral is not beneficial, coupled with increased social control, does change GP behaviour on the microlevel of referrals for specific diagnoses. This conclusion is based on the results of an experiment, referred to as the educational experiment. In this experiment, designed and analyzed by Stokx et al (1992), GPs were offered a programme of post-graduate training (which may be expected to reduce uncertainty among GPs about the benefits of treatment), peer review, audit and feedback (all three of them substantially increasing social control among GPs). The programme focussed on four broad themes: ophthalmology (and conduct with regard to refractive errors in particular), chronic respiratory diseases (which GPs were taught to detect earlier in their practice population), referral to medical specialists in general, and drug prescription. Especially the effects of the intervention with regard to GP behaviour towards refractive errors are interesting for the purpose of this book. In the experiment, GPs were explicitly taught to monitor a patient's vision complaints for possible pathology, in which case the patient would be referred to an ophthalmologist (as agreed upon by participating GPs). However, should a patient's vision complaints turn out to be resulting from refractive errors only, then the GPs would refer him directly to an

optometrist or optician (thus avoiding the use of health care facilities). Though Stokx et al (1992) were able to demonstrate that the participating GPs made a significantly lower number of referrals for refractive errors (compared with GPs in the control group), on the overall level of GP referrals to ophthalmologists as analyzed in chapter 6 no difference was found between participating GPs and GPs in the control group. In other words, the GPs' changed behaviour was not reflected in aggregated referral rates of GPs to specialists.

The second hypothesis was not tested as such, but rather served as a premise for hypothesis 4. In chapter 4, however, a review of the literature on this subject was presented, from which it was concluded that empirical evidence (though scarce) generally corroborates hypothesis 2.

With respect to the third hypothesis, the substitution potential of services was assessed in cross-sectional analyses in chapter 5. For six service types substitution effects were found: stitching an open wound, adjusting a pessary, excision of a nevus or lipoma excision of the skin for pathology, excision of a sebaceous cyst, and minor surgery on an ingrown toenail. This means that, in general practices where these six services are performed more often, patients are less often referred to a specialist.

A major purpose of chapter 5, apart from testing the effect of social control and performing services on referral rates, was to predict which effect introducing fees for 26 selected services on top of the GP capitation fee would have on GP referral rates. Thus, chapter 5 served in a way as an introduction to chapter 6, in which secondary analyses were conducted on GP referral rates in two Dutch experiments, one of which introduced fees for the 26 services analyzed in chapter 5 on top of GP capitation payment for publicly insured patients. Unfortunately, the quasi-chronological order in this book (first test the substitution potential of services, then use good 'candidates' in an experiment), is not the order in which things happened in reality. Would that have been the case, then a number of services would probably not have been picked for item-of-service remuneration in the experiment, because there was too little certainty about when to perform these services among GPs and/or too much certainty about when to refer patients for the diagnoses involved.

The somewhat unhappy choice of items may have been one of the reasons why the experiment, referred to in this book as the fee-for-service (F.F.S.) experiment, had no effect whatsoever on GP referral rates. Van Heyningen et al (1991), who designed and first analyzed the F.F.S. experiment for the University of Leiden, suggest that, perhaps, many of the services that were included in the experiment were already being performed by GPs most of the time when they encountered a relevant diagnosis, leaving little room for improvement. Interviews with participants in the experiment, described in Delnoij et al (1992), rather indicate that performing the services added too small an amount to the GPs' total gross revenue, and that in fact the majority of participants did not want to substitute (precious) time for (too little) money. What has



been the real cause of the introduction of fees for services not having any effect on GP referral rates is difficult to detect in the data available. In section 6.6. it was pointed out that it cannot be established which of the two premises was not true: hypothesis 2, GPs have not performed more services during the F.F.S. experiment; or hypothesis 3, GPs have performed more services but these have not substituted for referrals to specialists; or both.

All in all, the conclusion that is to be drawn from chapters 5 and 6 is that reducing professional uncertainty and introducing more social control as well as changing the physicians' payment system influences decisions taken by individual doctors on the microlevel with regard to individual patients. In two Dutch experiments these changed decisions on the microlevel could not be traced in data on the more aggregated level of GP overall referral rates. In contrast to the F.F.S. experiment, however, Flierman (1991, p. 45) did find a decrease in referral rates after Copenhagen GPs changed from pure capitation payment to a mixed system of capitation and fee-for-service. In this respect it should be noted that an important difference between the Danish payment system and the system used in the F.F.S. experiment is that Danish GPs derive 50% of their total income from fees for services (including fees for the so-called basic services: consultations in office, home visits and telephone consultations). This provides a stronger incentive to perform services than does a relatively minor payment on top of one's usual income.

### 9.3. The macrolevel

'Income' is one of the two keywords in describing the transformation of individual behaviour on the microlevel to outcomes on the macrolevel. The second keyword is 'health care expenditures'. In chapter 3 it was argued that negotiations between third-party payers and physicians are entered by third-party payers with a view to overall cost control and by physicians with a view to their future incomes. Namely, from the third-party payers' point of view the sum of all fees paid to physicians amounts to a certain proportion of total health care expenditures, whereas from the physicians' point of view the sum of all fees paid to them amounts to total gross revenue.

This implies that, in pursuing their own personal income (an 'action' on the microlevel) physicians directly and indirectly influence total health care expenditures (an 'outcome' on the macrolevel). In trying to control health care costs (an 'action' on the macrolevel), third-party payers in turn influence physician revenues (an 'outcome' on the microlevel). The hypotheses formulated in chapter 3 for the macrolevel started with an assumption regarding physician behaviour on the microlevel:

5. If physicians are paid on a fee-for-service basis, they will react to a decrease in their revenues by increasing the quantity of services provided.

Evidence for this assumption was found in chapter 4. It should be noted though, that physicians' behaviour in pursuing an income is modified by their compliance with medical ethics and standards of care (cf. Flierman, 1991).

The outcome of physician behaviour in pursuit of an income, in turn, was expected to be as follows:

6. In countries where (a) fee-for-service payment is combined with negotiations directly on the level of fees (without constraining the quantity of care), third-party payers have less control over health care expenditures than do third-party payers in countries where (b) expenditure targets or caps, or target incomes for physicians are imposed, and where third-party payers have the political power and determination to use these mechanisms for cost control.

This hypothesis was tested in chapter 7, however with somewhat inconclusive results. In particular the development of health care expenditures in Canada and the Netherlands provided counter-evidence for hypothesis 6. The Canadian example suggests that the use of expenditure caps is no guarantee for controlled growth of costs. In Germany, in contrast, the use of caps seems to have contributed significantly to that countries' controlled growth of health care expenditures as a percentage of GDP between 1981 and 1991. At the same time, however, this has put German physicians in a rather awkward position. Individually, they are still interested in providing services because they are paid on a fee-for-service basis, but due to retrospective price setting under the expenditure caps, they collectively end up with the worst possible result (cf. Olson, 1974). The risk for physicians is that they will have to provide more and more services each round, against lower and lower prices. This dilemma was, for example, described in an interview with a Bavarian doctor (Schmidt, 1992) who pictured German physicians as being in a treadmill: the one who drops out while the others keep moving is punished in a twofold way: he has few services to bill himself and, apart from that, he is struck by the reduction in fees that follows from the others' excess activity<sup>2</sup>. In such a situation, patients are being exposed to the risks of inappropriate procedures and unnecessary dependence on professional help.

Strictly monitored expenditure caps evidently affect the physicians incomes. The relationship between negotiating physician fees and incomes was examined in chapter 8. Physician income has been under constant pressure since the mid-1970s, as was discussed in chapter 8. In all OECD-countries, physicians' earnings as compared with those of average employees have decreased since 1975, and European GPs are no exception to that rule. The decrease in physicians' earnings compared with those of the average employee is, according to Poullier (1986, p. 36), due to increases in the supply of physicians and to the struggle of public authorities to restrain the growth of expenditures. Support for this argument was found in the analyses in chapter 8, which were carried out using data on the level and development of GP incomes in eight OECD-countries between 1975 and 1990. In that period GP income compared with per capita GDP decreased, partly because of an increase in GP supply. However, the

decrease in income has been smaller in countries where GPs collectively hold a strong position. Also, there seemed to be interaction, in that the increase in the supply of GPs did not affect incomes in countries where GPs were able to make up for the negative impact of supply on their income by providing more services. They could do so in Belgium and France, where throughout the study period GPs were paid on a fee-for-service basis, and no expenditure caps or targets were in effect.

All in all, on the basis of these findings, the hypotheses formulated in chapter 3 with regard to GP income cannot be rejected (with the exception of hypothesis 8a). These hypotheses were:

7. The relationship between the number of inhabitants per GP and GP income is positive, such that: (a) GP income is higher in countries where the number of inhabitants per GP is higher, and (b) over time GP income increases more (or decreases less) in countries where the number of inhabitants per GP increases more (or decreases less).
8. The relationship between the GPs' collective bargaining power and GP income is positive, such that: (a) GP income is higher in countries where the GPs' collectively hold a stronger position, and (b) over time GP income increases more (or decreases less) in countries where the GPs collectively hold a stronger position.
9. If GPs can increase their income by increasing the quantity of services provided, the development of their income depends less on the development in the number of inhabitants per GP.

It was stressed in chapter 8 however, that the number of observations (eight countries) examined was low and that a larger dataset is needed for a more conclusive testing of hypotheses 7 through 9.

#### **9.4. Policy implications for Dutch health care**

The decisions taken by individual doctors with regard to individual patients has received a substantial amount of attention in this book, with chapters 3 through 6 dealing with this microlevel. Yet the basic research questions that were formulated in chapter 1 did not primarily deal with physicians' responses to various stimuli. Rather, knowledge about these responses was gathered in order facilitate structuring the provision of medical care so as to obtain microeconomic and macroeconomic efficiency.

To use Lindblom's (1977) and Bressers & Klok's (1987) typologies: in order to make physician behaviour more compatible with the search for efficiency on the microlevel and the need for control over expenditures on the macrolevel, is it more effective to command them (that is, to control their behaviour by legal tools), to induce them (by using economic tools), or to persuade and educate them (by using moral tools)?

As far as efficiency on the microlevel is concerned, neither of the two different tools that have been evaluated in this book (economic and moral tools) has been found to be obviously superior. Theoretically speaking, the most promising strategy seems to be a combination of the two. It was argued in chapter 3 that the chances of society's interest prevailing over other considerations are highest when there is social control, that is when the physician is able to attain social approval from his peers, his employer or his financier. However, even in group practices with well-designed programmes of utilization review, many decisions taken by individual doctors will continue to be taken in a zone of uncertainty. Under the Dutch capitation payment for the publicly insured, within this zone of uncertainty GPs will either decide that treatment is not due or, if they think it is, refer the patient to a specialist for treatment. On the other hand, if the Dutch GP payment system would be changed into a pure fee-for-service system without working on reducing uncertainty with regard to standards of care, the increase in services performed would be larger than the decrease in referrals made. In this respect, Flierman (1991, p. 87) already concluded that in order to maximize referral reduction:

" [...] fees should be introduced for services with a strong scientific foundation of standards on when and how to perform them. Moreover, such standards should be published, and adherence to them should be guarded and enhanced by postgraduate education and peer review. "

This is in line with Harris' idea (1990, p. 1218), quoted in chapter 6, that the best practice model is one in which physicians and administrators make group decisions, develop and improve agreed upon methods of practice, interact and think before acting, and are rewarded for doing so.

Based on these assumptions, the best way to guarantee microeconomically efficient behaviour on the part of Dutch GPs would be to design a mixed system of capitation payment and fees for those medical-technical procedures that have a strong enough scientific foundation of standards on when and how to perform them and are not yet being predominantly provided by GPs (in other words, task definition should be somewhat uncertain). Unfortunately, the total number of such potential services is low. The 26 services examined in chapter 5 constitute the majority of medical-technical procedures that Dutch GPs could be paid for separately. The substitution potential of these services, however, proved to be low in general. Apart from that, international comparisons show that Dutch GPs already provide a comparatively large number of services themselves (Flierman, 1991, p. 71) and refer comparatively few patients to specialists (e.g. Fleming, 1993, figure 5.5, p. 58). Changing the Dutch GP payment system would, therefore, not contribute substantially to substitution of GP care for specialist care.

Of course, this does not imply that Dutch health care is maximally efficient as it is. Especially the fee-for-service payment system for medical specialists, whose revenues are not included in hospital budgets, is generally thought to pose efficiency problems

(Commissie Modernisering Curatieve Zorg, 1994, p. 46). Specialists have until recently been the target of government policy aiming at cost control on the macrolevel in particular. Though, as was shown in chapter 7, the growth of expenditures as a percentage of GDP has certainly not been excessive in the Netherlands since the early 1980s, specialists have been subject to expenditure targets for the costs of their services since 1989. These targets, however, have consistently been exceeded, due to the mechanism that German ambulatory care physicians have been subject to as well. Individually, specialists have an interest in providing services (exposing patients to the risks of inappropriate procedures and unnecessary dependence on professional help). In doing so they collectively end up with the worst possible result. In other words, though strictly monitored targets or caps can be effective in terms of cost control, combined with fee-for-service payment they have a negative effect on efficiency on the microlevel. It is not advisable, therefore, to impose a cap on expenditures for Dutch medical specialist services while leaving the current fee-for-service system intact.

For cost control on the macrolevel, two theoretical options are left, which may be used in combination with one another. The first option is to change the specialist payment system into one that contains less incentives for providing services: salary. This may, however, interfere with efficiency on the microlevel, in that it encourages waiting lists (Hurst, 1991, Fleming 1993, p. 64). The second, is, therefore, more favourable: make specialists responsible for micro-budgets (for example, on the hospital level), in order to bridge the gap between their individual (or small group) interests and their collective interests.

In chapter 2 it was already indicated that in a recent advice to the Department of Health, the Biesheuvel Committee has proposed to more or less combine these two options: to pay specialists for 80% by means of a basic allowance which is integrated in the hospital budget, and to allow for a bonus of 20% (Commissie modernisering curatieve zorg, 1994, p. 46-48), the payment of which could, for example, be linked to budgetary targets on the level of departments within hospitals.

## Notes

1. The oldest book in the literature consulted for this study is 'The Payment of the General Practitioner, Some European Comparisons', by Hogarth, which was published in 1963.
2. "Der Kassenarzt befindet sich in einem Laufrad. Nur wer in diesem Laufrad mitläuft, hat eine Chance, daß er an der Honorarentwicklung teilnimmt." (Schmidt, 1992, p. 10)

## SAMENVATTING

In *hoofdstuk 1* wordt een onderscheid gemaakt in twee factoren die de totale kosten van gezondheidszorg bepalen: de hoeveelheid verleende zorg en de prijs van die zorg. Volgens Eastaugh (1991, p. 56) proberen alle financiers, hetzij verzekeraars, hetzij de overheid, de kosten van gezondheidszorg zoveel mogelijk te beheersen door de hoeveelheid verleende zorg in te perken en de prijzen van zorg laag te houden. Volgens Reinhardt (1992, p. 31) zijn er twee strategieën mogelijk om tot kostenbeheersing in de gezondheidszorg te komen: de Canadees-Europese methode en de Amerikaanse methode. In de Canadees-Europese methode worden kosten van zorg min of meer rechtstreeks in de hand gehouden via het gebruik van macrobudgetten, in tegenstelling tot de Amerikaanse methode, die vooral mikt op het veranderen van de afwegingen die individuele aanbieders en consumenten van zorg maken op het microniveau, hetgeen op zijn beurt zou moeten resulteren in een meer beheerste groei van de kosten op macroniveau. Deze relatie tussen het micro- en het macroniveau vormt het belangrijkste thema van dit proefschrift. De algemene vraagstelling luidt: hoe dient de medische zorgverlening (institutioneel) te worden gestructureerd om te komen tot efficiëntie op het microniveau en kostenbeheersing op het macroniveau?

Beantwoording van deze vraag vindt plaats door gebruik te maken van inzichten uit de rationele keuze theorie. Deze theorie gaat ervan uit dat mensen doelgericht handelen, waarbij ieder mens geacht wordt te streven naar tenminste twee uiteindelijke doelen: fysiek welzijn en sociale erkenning. Hoewel deze beide doelen universeel zijn, dat wil zeggen, door iedereen worden nagestreefd, staan mensen onder verschillende sociale omstandigheden ook verschillende middelen ter beschikking om fysiek welzijn en sociale erkenning te 'produceren' (Wippler & Lindenberg, 1987, p. 145). Deze middelen die mensen in verschillende omstandigheden en onder verschillende institutionele structuren kunnen gebruiken, kunnen worden beschreven in een zogeheten sociale productiefunctie. De boven geformuleerde, algemene vraagstelling kan nu worden uiteengelegd in twee deelvragen, namelijk: Hoe dient aan sociale omstandigheden in de gezondheidszorg vorm te worden gegeven, zodat (1) de sociale productiefunctie van artsen leidt tot efficiëntie op het microniveau en zodat (2) het professionele handelen van artsen op het microniveau resulteert in kostenbeheersing op het macroniveau? Deze vragen worden in het proefschrift in het bijzonder beantwoord voor de Nederlandse gezondheidszorg, zij het dat ook vergelijkingen met andere Westerse landen zullen worden getrokken. De sociale omstandigheden die in het bijzonder worden bestudeerd zijn verschillende betalingssystemen voor artsen en een programma van deskundigheidsbevordering en feedback.

Omdat de vragen, zoals gezegd, vooral worden beantwoord voor de Nederlandse gezondheidszorg wordt in *hoofdstuk 2* een overzicht gegeven van (de belangrijkste

ontwikkelingen in) de Nederlandse gezondheidszorg. *Hoofdstuk 2* is met name bedoeld om buitenlandse lezers te voorzien van de achtergrondinformatie die onontbeerlijk is voor het begrijpen van de overige hoofdstukken. De beschrijving van de Nederlandse gezondheidszorg begint in 1941 met de invoering van de verplichte ziekenfondsverzekering door de Duitse bezetters en de invoering van de Algemene Wet Bijzondere Ziektekosten (AWBZ) in 1968. Vervolgens wordt ingegaan op de betalingssystemen voor huisartsen en specialisten.

Voor ziekenfondsverzekerden (61% van de Nederlandse bevolking) ontvangen huisartsen een abonnement, dat wil zeggen, een vast bedrag per patiënt per jaar. Particulier verzekerden betalen hun huisarts over het algemeen eerst zelf per consult of visite, waarna zij de kosten vergoed krijgen voor zover zij tenminste verzekerd zijn voor de kosten van huisartsgeneeskundige zorg en geen eigen risico hebben of een eigen bijdrage dienen te betalen. Medisch specialisten worden zowel voor ziekenfonds- als voor particuliere patiënten per verrichting betaald.

Sinds 1966 zijn de tarieven van huisartsen gebaseerd op een norminkomen (het inkomen dat een huisarts met een normpraktijk bestaande uit 2350 patiënten kan verdienen). Dat betekent dat dus eerst wordt bepaald wat een huisarts met een normpraktijk zou moeten verdienen en dat vervolgens de tarieven zo worden gekozen dat de bedoelde omzet ook inderdaad kan worden gerealiseerd. Voor het abonnementsdeel van het honorarium is dit relatief eenvoudig: bepaal het inkomensdeel dat uit ziekenfondsbetalingen moet komen en deel dit vervolgens door het aantal ziekenfonds-patiënten. Voor particuliere tarieven is een en ander veel ingewikkelder, omdat bekend moet zijn hoe vaak particuliere patiënten contact met hun huisarts hebben om tot een tarief voor consulten en visites te kunnen komen.

De tarieven van medisch specialisten zijn sinds 1989 gebaseerd op een zogeheten macrobudget: de jaarlijkse totale kosten voor medisch-specialistische hulp mogen het niveau van 1989 niet overschrijden. Gebeurt dit toch, dan worden de verliezen gecompenseerd door een verlaging van de tarieven in het daaropvolgende jaar. Dit systeem heeft geleid tot herhaalde tariefsverlagingen voor specialisten in verband met budgetoverschrijdingen en tot harde conflicten tussen specialisten en het ministerie van WVC. Ten behoeve van buitenlandse lezers wordt in paragraaf 2.3. de geschiedenis van het Nederlandse beleid ten aanzien van gezondheidszorg geschetst, te beginnen in 1974 met de Structuurnota Gezondheidszorg die een tijdperk van overheidsplanning en regulering van de gezondheidszorg inluidde. Vervolgens wordt de kentering in het midden van de jaren tachtig beschreven, die vooral duidelijk tot uitdrukking komt in het advies van de Commissie Dekker uit 1987. Tevens wordt aangegeven dat de uit Dekker voortvloeiende, voorgenomen opheffing van het verschil in particuliere en ziekenfondsverzekering de vraag opwierp op welke wijze Nederlandse huisartsen betaald zouden moeten worden. In 1990 sloot de Landelijke Huisartsen Vereniging (LHV) een overeenkomst met de toenmalige Vereniging van Nederlandse Ziekenfondsen (VNZ), waarin werd overeengekomen om huisartsen bovenop het voor ziekenfondsverzekerden geldende abonnement apart te betalen voor het uitvoeren van 17 medisch-technische



verrichtingen. Het idee bestond dat huisartsen deze verrichtingen daardoor vaker zelf zouden gaan uitvoeren, waardoor minder patiënten verwezen hoefden te worden naar de relatief dure specialist in de tweede lijn. Dit idee is nooit in de praktijk gebracht, hoewel er wel een experiment heeft plaatsgehad met een soortgelijk honoreringssysteem in de regio Leiden en Alphen aan den Rijn. Dit experiment zal worden beschreven in *hoofdstuk 6*. Meer recente voorstellen voor de uniformering van ziekenfonds- en particuliere honorering van huisartsen zijn gedaan door de LHV, die voorstander is van een gemengd systeem van abonnementshonorering en honorering per consult/visite (in een verhouding van 60-40% van het inkomen van huisartsen) en door de Commissie Modernisering Curatieve Zorg (1994) die een uniform, gedifferentieerd abonnement voorstelt. De differentiatie van het abonnement zou volgens de Commissie plaats moeten vinden op basis van de leeftijd van patiënten (jonger dan 65, 65-74 en 75 en ouder) om zodoende te corrigeren voor verschillen in werkbelasting die de verschillende patiëntencategorieën met zich meebrengen.

In *hoofdstuk 3* wordt de sociale productiefunctie van artsen nader uitgewerkt en worden hypothesen geformuleerd met betrekking tot het microniveau en de transformatie van het handelen van artsen op microniveau naar kosten van zorg op macroniveau. Eerder werd gesteld dat alle mensen streven naar tenminste twee universele doelen: fysiek welzijn en sociale erkenning. De manier waarop deze doelen kunnen worden bereikt, verschilt van mens tot mens afhankelijk van sociale omstandigheden waarin mensen verkeren en afhankelijk van institutionele structuren. In *hoofdstuk 3* wordt beargumenteerd dat artsen fysiek welzijn 'produceren' indien zij streven naar een hoog inkomen en voldoende vrije tijd. Voor sociale erkenning hebben artsen tenminste twee bronnen: hun patiënten en hun beroepsgroep, gepersonifieerd in collegae.

Verschillende sociale omstandigheden beïnvloeden de keuze van artsen tussen hetzij een hoog inkomen of vrije tijd (beide leiden tot fysiek welzijn), alsmede de keuze tussen hetzij handelen in het belang van een individuele patiënt dan wel conform de richtlijnen van - wat in het proefschrift wordt genoemd - sociale professionele ethiek (voor zover die richtlijnen handelingen voorschrijven die tegen het individuele belang van patiënten kunnen zijn). Beide afwegingen behoeven nadere uitleg.

Gillon (1988) beargumenteert dat, artsen niet altijd en onder alle omstandigheden handelen in het belang van hun individuele patiënt, maar dat zij ook in zekere mate rekening houden met kosten van dat handelen voor de maatschappij. Dit soort economische overwegingen gaan soms vóór het belang van een individuele patiënt, namelijk wanneer de kosten van behandeling niet opwegen tegen de verwachte baten (gezondheidswinst). Handelt een arts in het belang van de maatschappij als geheel door economische overwegingen in zijn beslissingen te betrekken (bijvoorbeeld door een onnodige verwijzing of onnodig geneesmiddel te weigeren), dan is hij voor sociale erkenning vooral afhankelijk van zijn collegae of een verzekeraar. De individuele patiënt aan wie iets geweigerd wordt, zal dit over het algemeen niet op prijs stellen. In *hoofdstuk 3* wordt gesteld dat economische overwegingen daarom eerder een rol

zullen spelen in het handelen van artsen, wanneer artsen meer sociale controle ervaren (bijvoorbeeld doordat zij in duo- of groepspraktijken werken) en voor hun sociale erkenning minder afhankelijk zijn van patiënten. Desalniettemin is de kans dat artsen uit zichzelf economische overwegingen hanteren klein. Om die reden proberen verzeke- raars en overheden honoreringssystemen te ontwikkelen die artsen prikkelen tot efficiënt gedrag.

Honoreringssystemen beïnvloeden de afweging tussen tijd en geld (inkomen) van artsen. Wanneer een arts per verrichting wordt betaald, levert het doen van meer verrichtingen extra geld op, maar een verlies aan vrije tijd. Onder abonnementshonorering kost het doen van verrichtingen alleen maar tijd, terwijl het geen extra geld oplevert. Onder salaris, tenslotte, levert het doen van verrichtingen evenmin extra geld op, maar omdat tevens een bepaald aantal uren gewerkt moet worden, kost het ook niet direct vrije tijd. Artsen die een salaris ontvangen, hebben echter wel belang bij het minimaliseren van de werkbelasting tijdens de werkuren, waardoor dit systeem in zijn effecten lijkt op een abonnementshonorering.

Flierman (1991) beargumenteert dat de afweging tussen tijd en geld, die verschilt per honoreringssysteem, door artsen wordt gemaakt binnen de grenzen die de medische ethiek stelt. Artsen streven er in de eerste plaats naar hun patiënt beter te maken. Vaak is het echter niet volstrekt duidelijk welke behandeling of diagnostiek een patiënt nodig heeft; Evans (1984) noemt dit een 'zone van onzekerheid'. Binnen deze zone kunnen artsen tijd inwisselen voor geld en andersom. Een arts die per verrichting wordt betaald, heeft er belang bij om binnen deze zone van onzekerheid verrichtingen uit te voeren. Een arts die een abonnement of salaris ontvangt, heeft er belang bij om hetzij geen verrichtingen te doen, dan wel als de klachten van de patiënt vragen om behandeling of diagnostiek, de patiënt te verwijzen.

Op basis van de voorgaande overwegingen worden vier *hypothesen* geformuleerd met betrekking tot het microniveau:

1. Het vergroten van de zekerheid onder huisartsen dat - gegeven bepaalde morbiditeit - een verwijzing geen gezondheidswinst oplevert, alsmede het vergroten van de sociale controle onder huisartsen zal resulteren in lagere verwijscijfers. De hypothesen 2 tot en met 4 kunnen worden gelezen als een logische bewering, waarbij 2 en 3 de premissen zijn en 4 de conclusie. Om die reden wordt hypothese 2 als een hypothese opgevoerd, hoewel het hierbij eigenlijk gaat om een algemeen bekend en aanvaard mechanisme.
2. Onder honorering per verrichting voeren artsen meer verrichtingen uit dan onder salaris of abonnementshonorering.
3. Een verrichting uitgevoerd door een huisarts vervangt een verwijzing naar een specialist en dit is in sterkere mate het geval als er meer zekerheid bestaat over de vraag wanneer een verrichting moet worden uitgevoerd en minder zekerheid over de vraag wanneer ervoor moet worden verwezen.

Gegeven dat 2 en 3 waar zijn:

4. Het invoeren van een honorering voor verrichtingen in aanvulling op het abonnementshonorarium van huisartsen zal leiden tot lagere verwijscijfers.

In het vervolg van *hoofdstuk 3* wordt ingegaan op de transformatie van gedrag op microniveau naar uitkomsten op macroniveau. In dit verband is het belangrijk om vast te stellen dat wat door de overheid wordt gezien als uitgaven voor gezondheidszorg, voor artsen hun inkomen vormt. In hun streven (op microniveau) naar een inkomen beïnvloeden artsen daarom direct en indirect de kosten van gezondheidszorg (op macroniveau) en, omgekeerd, in hun streven om de kosten van gezondheidszorg (op macroniveau) te beteugelen, beïnvloeden overheid en verzekeraars de inkomsten van artsen (op microniveau).

Het micro- en macroniveau ontmoeten elkaar bijna letterlijk in onderhandelingen over tarieven tussen artsen en overheid of verzekeraars. Het is daarom van belang om een goed inzicht te krijgen in de wijze waarop in verschillende landen wordt vorm gegeven aan deze onderhandelingen. Daarbij kan onderscheid worden gemaakt in vier typen situaties: (1) het ontbreken van onderhandelingen (tarieven komen tot stand onder invloed van marktwerking), (2) onderhandelingen rechtstreeks over de tarieven, (3) onderhandelingen over een macrobudget op basis waarvan vervolgens de tarieven worden vastgesteld, of (4) onderhandelingen over een norminkomen op basis waarvan vervolgens de tarieven worden vastgesteld. Honorering per verrichting gecombineerd met onderhandelingen over de tarieven biedt weinig mogelijkheden voor overheid of verzekeraars om de kosten te beheersen. Een verlaging van de tarieven kan immers worden gecompenseerd door een groter volume van verrichtingen. Bij verrichtingshonorering liggen daarom meer kansen voor kostenbeheersing in een systeem van macrobudgetten of norminkomens, vooropgesteld dat overheid en verzekeraars voldoende politieke macht bezitten om deze mechanismen ook daadwerkelijk toe te passen. Machtige artsenorganisaties kunnen immers met succes streven naar een hoger macrobudget of norminkomen om hun inkomen op peil te houden. Naast de politieke macht van artsenorganisaties kan het inkomen van artsen worden beïnvloed door economische factoren, met name de artsendichtheid, en door de mogelijkheden die het honoreringssysteem biedt om het inkomen te verhogen door het doen van verrichtingen.

Gebaseerd op deze vooronderstellingen worden vijf *hypothesen* geformuleerd met betrekking tot de transformatie van micro- naar macroniveau, die uitspraken doen over de kosten van gezondheidszorg en over het inkomen van huisartsen:

5. Als artsen per verrichting worden betaald, zullen ze op een verlaging van de tarieven reageren door meer verrichtingen te doen.

Dus:

6. In landen waar (a) honorering per verrichting wordt gecombineerd met onderhandelingen rechtstreeks over tarieven (zonder de hoeveelheid verleende zorg te beperken) hebben financiers minder controle over de uitgaven voor gezondheids-

zorg dan in landen waar (b) macrobudgetten of norminkomens voor artsen worden gehanteerd en waar financiers over de politieke macht en vastbeslotenheid beschikken om deze mechanismen aan te wenden voor kostenbeheersing.

Met betrekking tot het inkomen van huisartsen gelden de volgende hypothesen:

7. De relatie tussen het aantal inwoners per huisarts en het inkomen van huisartsen is positief, in die zin dat (a) het inkomen van huisartsen hoger is in landen waar het aantal inwoners per huisarts hoger is en (b) het inkomen van huisartsen in de tijd gezien meer stijgt (of minder daalt) in landen waar het aantal inwoners per huisarts sterker stijgt (of minder daalt).
8. De relatie tussen de collectieve macht van huisartsen in onderhandelingen en het inkomen van huisartsen is positief, in die zin dat (a) het inkomen van huisartsen hoger is in landen waar huisartsen een sterkere positie innemen en (b) het inkomen van huisartsen in de tijd gezien meer stijgt (of minder daalt) in landen waar huisartsen een sterkere positie innemen.
9. Als huisartsen hun inkomen kunnen verhogen door meer verrichtingen te doen, hangt hun inkomensontwikkeling minder sterk af van de ontwikkeling in het aantal inwoners per huisarts.

In *hoofdstuk 4* wordt hypothese 2 geconfronteerd met de internationale literatuur op het gebied van honorering voor artsen. Hoewel het een algemeen bekend gegeven wordt geacht dat artsen onder honorering per verrichting meer verrichtingen doen dan onder abonnementshonorering of salaris, is het interessant om na te gaan in welke mate hiervoor ook empirische aanwijzingen zijn te vinden. Geconcludeerd wordt dat het aantal onderzoeken waarin het gedrag van artsen onder verschillende honoreringssystemen wordt vergeleken klein is, maar dat de verwachte effecten over het algemeen wel optreden.

Daarnaast wordt in dit hoofdstuk literatuuronderzoek gedaan naar hypothese 5: als artsen per verrichting worden betaald, zullen ze op een verlaging van de tarieven reageren door meer verrichtingen te doen. Gesteld wordt dat het niet eenvoudig is om deze hypothese te testen omdat bepaalde reacties van artsen ook kunnen worden verklaard met behulp van meer traditionele economische modellen. In de literatuur worden gemengde resultaten gevonden.

In *hoofdstuk 5* staan hypothese 1 en 3 centraal. Hypothese 1 wordt in dit hoofdstuk getoetst voor zover het gaat om de invloed van sociale controle op het verwijsgedrag van huisartsen. Aan de hand van gegevens uit de Nationale Studie naar ziekten en verrichtingen in de huisartspraktijk wordt nagegaan of huisartsen in duo- en groepspraktijken (waarvan wordt aangenomen dat die meer sociale controle ervaren) zelf meer verrichtingen doen en minder patiënten verwijzen naar de specialist. Dit blijkt slechts in zeer beperkte mate het geval te zijn: huisartsen in duo- en groepspraktijken opereren vaker zelf aan ingegroeide teennagels en verwijzen minder patiënten voor

atheroomcysten. Daar staat tegenover dat zij vaker patiënten met een verstuite enkel verwijzen.

De relatie tussen zelf verrichtingen uitvoeren en verwijzen, onderwerp van hypothese 3, wordt in *hoofdstuk 5* eveneens onderzocht op basis van Nationale Studie gegevens. Eerst wordt daartoe de substitutie-gevoeligheid onderzocht van 26 medisch-technische verrichtingen. Deze 26 verrichtingen zijn gekozen omdat huisartsen hiervoor apart werden betaald in het eerder genoemde honoreringsexperiment in Leiden en Alphen aan den Rijn. Hypothese 3 stelt dat verrichtingen meer substitutie teweeg brengen, dat wil zeggen beter een verwijzing vervangen:

- naarmate er meer overeenstemming bestaat onder huisartsen over de vraag wanneer en bij welke patiënt een verrichting dient te worden uitgevoerd (zodat de verrichting niet 'te pas en te onpas' kan worden gedaan) en
- naarmate er minder overeenstemming bestaat over de vraag wanneer voor een bepaalde verrichting moet worden verwezen (waardoor duidelijk gesproken kan worden van een verrichting op het grensvlak van huisartsgeneeskundige en specialistische zorg, in tegenstelling tot verrichtingen die duidelijk tot de taak van huisartsen dan wel specialisten worden gerekend).

De overeenstemming onder huisartsen over het uitvoeren van verrichtingen en over verwijzen wordt gemeten met behulp van Flierman's diagnose-bepaaldheid: de mate waarin variatie tussen huisartsen in het uitvoeren van een verrichting, dan wel het verwijzen voor die verrichting, wordt bepaald door variatie in het voorkomen van de voor die verrichting relevante diagnose(n), uitgedrukt in het percentage verklaarde variantie ( $R^2$ ). Een  $R^2$  van 1 voor verrichtingen wil zeggen, dat huisartsen het onderling geheel eens zijn over de vraag wanneer en bij welke patiënten zij zelf een verrichting moeten uitvoeren. Een  $R^2$  van 1 voor verwijzingen betekent dat huisartsen onderling overeenstemmen over hun taakopvatting ten opzichte van de specialist, dat wil zeggen over de vraag bij welke diagnoses patiënten verwezen dienen te worden naar een specialist en bij welke diagnoses niet. Een  $R^2$  van 0 wijst op het ontbreken van overeenstemming.

In *hoofdstuk 5* blijkt dat zes verrichtingen substitutie-effect hebben, in die zin dat in huisartspraktijken waar de zes verrichtingen vaker worden uitgevoerd, patiënten minder vaak - voor met de verrichting samenhangende diagnoses - worden verwezen. Deze zes verrichtingen zijn: wondhechten en -verzorging, aanbrengen van steunpessarium, excisie van lipoom of naevus, huidbiopt voor PA, excisie van atheroomcyste en kleine chirurgie ingegroeide teennagel. Er bestaat geen significante relatie tussen enerzijds het substitutie-effect van verrichtingen en anderzijds de diagnose-bepaaldheid van verrichtingen en verwijzingen. Met andere woorden, voor het tweede deel van hypothese 3 (verrichtingen vervangen verwijzingen in sterkere mate als er meer zekerheid bestaat over de vraag wanneer een verrichting moet worden uitgevoerd en minder zekerheid over de vraag wanneer ervoor moet worden verwezen) wordt geen bewijs gevonden.

*Hoofdstuk 6* is gewijd aan een vergelijking van de verwijscijfers van huisartsen in twee regionale experimenten die in 1989 en 1990 in Nederland hebben plaatsgevonden. Eén van deze experimenten is al eerder genoemd: het Verrichtingenproject Leiden-Alphen aan den Rijn. Dit experiment werd opgezet, uitgevoerd en geëvalueerd door het Instituut voor Huisartsgeneeskunde van de Rijksuniversiteit Leiden (Van Heyningen et al, 1991) in het werkgebied van het vroegere ziekenfonds RZLA (tegenwoordig Zorg & Zekerheid). In dit experiment werden huisartsen voor ziekenfondspatiënten betaald voor het uitvoeren van 26 medisch-technische verrichtingen bovenop het gebruikelijke abonnementshonorarium. De verwachting was dat huisartsen deze verrichtingen vaker zelf zouden gaan uitvoeren, waardoor minder patiënten verwezen zouden worden. Er trad echter geen enkele verandering op in de verwijscijfers van huisartsen ten gevolge van het experiment. Achteraf kan niet worden vastgesteld of dit komt doordat huisartsen zelf niet meer verrichtingen zijn gaan uitvoeren (gegevens hierover werden namelijk alleen gedurende de experimentele periode geregistreerd aan de hand van declaraties van huisartsen), of doordat het vaker uitvoeren van de verrichtingen niet heeft geleid tot minder verwijzen. Als meest waarschijnlijke verklaring voor het ontbreken van effecten wordt aangedragen dat de honorering per verrichting plaatsvond *in aanvulling op* het abonnement (hetgeen een minder sterke prikkel vormt voor het uitvoeren van verrichtingen dan een betaling *in plaats van* een gedeelte van het abonnement) en dat slechts een relatief laag percentage van de totale omzet kon worden bijverdiend met het uitvoeren van de verrichtingen (door één van de deelnemers geschat op maximaal 5%). De verwijscijfers van huisartsen in het Verrichtingenproject Leiden-Alphen worden in *hoofdstuk 6* vergeleken met de verwijscijfers van huisartsen in een ander Nederlands experiment: het project Kostenbesparing door kwaliteitsbevordering, dat werd opgezet en uitgevoerd in het werkgebied van het vroegere ziekenfonds DNO (tegenwoordig Het Groene Land) door het NIVEL in samenwerking met Het Groene Land en Stichting O&O. In dit experiment konden huisartsen in de regio Emmen (gratis) deelnemen aan een programma van deskundigheidsbevordering, onderlinge toetsing en feedback op een viertal thema's: oogheelkunde (doel: terugdringen van verwijzingen naar de oogarts voor refractie-afwijkingen), CARA (doel: betere herkenning en opsporing van CARA door de huisarts), prescriptie (doel: rationeler en kwalitatief beter voorschrijven) en verwijzen (doel: onder andere verbeteren communicatie huisarts-specialist). Op het gebied van verwijzen door huisartsen werden in het experiment wel effecten zichtbaar voor specifieke verwijstdiagnosen: het aantal refractie-verwijzingen nam significant af, het aantal verwijzingen voor CARA nam significant toe in vergelijking met huisartsen in de controlegroep (huisartsen in Assen). Op het niveau van verwijscijfers per specialisme en zeker op het niveau van het totale verwijscijfer konden effecten van het experiment echter niet meer worden teruggevonden. Huisartsen in de experimentele groep verwezen zelfs significant vaker naar de KNO-arts en chirurg dan huisartsen in de controlegroep.

In *hoofdstuk 7* wordt het microniveau verlaten en wordt de aandacht gericht op de transformatie van het handelen van individuele artsen op het microniveau naar uitkomsten op macroniveau, zoals de kosten van gezondheidszorg in een land. Zowel in *hoofdstuk 7* als in *hoofdstuk 8* zijn de analyse-eenheden dan ook OESO-landen (OESO - Organisatie voor Economische Samenwerking en Ontwikkeling) in plaats van individuele artsen of praktijken. In *hoofdstuk 7* wordt gekeken naar de relatie tussen onderhandelingen over tarieven enerzijds en kosten van zorg anderzijds. Vier typen situaties worden onderscheiden (ze werden eerder genoemd): (1) het ontbreken van onderhandelingen (tarieven komen tot stand onder invloed van marktwerking), (2) onderhandelingen rechtstreeks over de tarieven, (3) onderhandelingen over een macrobudget op basis waarvan vervolgens de tarieven worden vastgesteld, of (4) onderhandelingen over een norminkomen op basis waarvan vervolgens de tarieven worden vastgesteld. Verwacht wordt dat (hypothese 6) in landen waar (a) honorering per verrichting wordt gecombineerd met onderhandelingen rechtstreeks over tarieven (zonder de hoeveelheid verleende zorg te beperken) financiers minder controle hebben over de uitgaven voor gezondheidszorg dan in landen waar (b) macrobudgetten of norminkomens voor artsen worden gehanteerd en waar financiers over de politieke macht en vastbeslotenheid beschikken om deze mechanismen aan te wenden voor kostenbeheersing. Deze hypothese wordt getoetst door de ontwikkeling van de kosten van gezondheidszorg te vergelijken met onderhandelingsystemen in tien OESO-landen: Canada, de Verenigde Staten, Finland, Zweden, Denemarken, Groot-Brittannië, Nederland, de Bondsrepubliek Duitsland (het vroegere West-Duitsland), België en Frankrijk. De verwachte relatie wordt evenwel niet zichtbaar. Met name Canada en Nederland vormen uitzonderingen: in Canada zijn de kosten van gezondheidszorg vrij sterk gestegen ondanks het gebruik van macrobudgetten, in Nederland daarentegen zijn de kosten van zorg gedurende de jaren tachtig min of meer stabiel geweest, ondanks het feit dat macrobudgetten voor specialistische zorg pas sinds 1989 worden gebruikt.

In *hoofdstuk 8* wordt aandacht besteed aan de inkomensontwikkeling van huisartsen sinds 1975 in acht Europese landen: Finland, Zweden, Denemarken, Groot-Brittannië, Nederland, het vroegere West-Duitsland, België en Frankrijk. Hypothese 7 tot en met 9 worden in dit hoofdstuk getoetst door te kijken naar verschillen tussen landen in de hoogte van inkomens van huisartsen en in de ontwikkeling van inkomens van huisartsen. De hoogte van de inkomens van huisartsen blijkt vooral samen te hangen met het aantal inwoners per huisarts (de huisartsendichtheid): naarmate het aantal inwoners per huisarts hoger is, verdienen huisartsen meer (bijvoorbeeld in Nederland en Duitsland). Uitzonderingen hierop vormen landen die een sterk ziekenhuis-georiënteerde gezondheidszorg hebben, dat wil zeggen Zweden en Finland tot ongeveer 1980. De resultaten met betrekking tot de ontwikkeling van het inkomen van huisartsen kunnen als volgt worden samengevat: sinds het midden van de jaren '70 is het inkomen van huisartsen gedaald in vergelijking met de gemiddelde inkomens van werknemers. Deze daling

wordt deels veroorzaakt door een toename van het aantal huisartsen per hoofd van de bevolking (de spoeling wordt dunner). Echter, in landen waar huisartsen een grotere politieke macht hebben (bijvoorbeeld in Engeland, Denemarken en Nederland) is hun inkomen minder sterk gedaald dan op grond van de toename van het aantal huisartsen verwacht had kunnen worden. Hetzelfde geldt voor landen waar huisartsen per verrichting worden betaald zonder dat hun tarieven ondergeschikt worden gemaakt aan een macrobudget (bijvoorbeeld in Frankrijk en in België tot 1991). In die omstandigheden kunnen artsen hun inkomen voor een deel op peil houden door het doen van verrichtingen.

In *hoofdstuk 9* tenslotte, worden de belangrijkste conclusies en beleidsimplicaties gepresenteerd. Na een bespreking van de resultaten die in het voorgaande zijn samengevat, wordt voor de Nederlandse gezondheidszorg geconcludeerd dat het (a) weinig zinvol is om te proberen substitutie van zorg te bewerkstelligen door de honorering van huisartsen te veranderen en (b) dat het gebruik van een macrobudget voor specialistische zorg een negatieve invloed heeft op efficiëntie op microniveau door de combinatie met de geldende verrichtingenhonorering voor specialisten. Dit systeem verleidt specialisten tot het uitvoeren van steeds meer verrichtingen tegen steeds lagere tarieven. Besloten wordt daarom met de aanbeveling om specialisten op microniveau (bijvoorbeeld op het niveau van ziekenhuizen) verantwoordelijk te maken voor een budget, om op die manier de kloof te overbruggen tussen hun individuele en collectieve belangen.



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## APPENDIX

Table A1 Regression coefficients (unstandardized B, standardized  $\beta$ ), significance (\*  $p < .05$ ), \*\*  $p < .01$ ) and  $R^2$  for services provided with relevant diagnoses (ICPC NIVEL version)

Relevant diagnoses (ICPC-code + title)	B	$\beta$	significance
<b>Stitching an open wound (<math>R^2=.89</math>)</b>			
A80 accident/injury nos	.27	.06	**
S19 other injury skin/tissue	.79	.56	**
S18 laceration/cut	.99	.93	**
<b>Therapy ingrown toenail (<math>R^2=.26</math>)</b>			
S94 ingrown toenail	.55	.51	**
<b>Excision nevus/lipoma (<math>R^2=.49</math>)</b>			
S78 lipoma of skin	.18	.16	**
S79 other benign neoplasma skin	.43	.73	**
S80 other/unspec. neoplasma skin	.36	.11	**
S82 nevus/mole	.39	.47	**
<b>Excision sebaceous cyst (<math>R^2=.33</math>)</b>			
S93 sebaceous cyst	.32	.58	**
<b>Incision abscess (<math>R^2=.39</math>)</b>			
A872 complications (wounds)	.01	.01	
A879 complications (NEC)	-.04	-.02	
S09 infected finger/toe	.26	.52	**
S10 boil/carbuncle/cellulit.	.19	.48	**
S85 pilonidal cyst/fistula	.01	.00	
X991 absc. gland. Bartholini	.07	.02	
<b>Puncture of bursa knee/elbow (<math>R^2=.32</math>)</b>			
L931 bursitis (excl. shoulder)	.29	.61	**
L10 elbow symptoms/complaints	.22	.09	
L15 knee symptoms/complaints	.06	.11	*
<b>Corticoid/lidocain injection of shoulder/elbow (<math>R^2=.32</math>)</b>			
L92 shoulder syndrome	.26	.59	**
L932 lateral epicondylitis	.28	.33	**
L10 elbow symptoms/complaints	.16	.03	
L08 shoulder symptoms/compl.	.07	.04	

(Table A1 continued)

Relevant diagnoses (ICPC-code + title)	B	$\beta$	significance
<b>Bandaging a sprained ankle (<math>R^2=.48</math>)</b>			
L77 sprains/strains ankle(s)	.80	.69	**
<b>Examining vision (including tonometry and funduscopy) (<math>R^2=.12</math>)</b>			
F05 other vision problems	.10	.24	**
F91 refractive errors	.06	.27	**
F992 retinopathy	-.18	-.09	
<b>Audiometry (<math>R^2=.44</math>)</b>			
H02 hearing complaints	.39	.41	**
H83 otosclerosis	.45	.13	**
H841 presbycusis	.48	.55	**
H842 acoustic trauma	.60	.22	**
H849 deafness NEC	.39	.37	**
H99 other dis. ear/mastoid	.63	.63	**
<b>Adjusting IUD (<math>R^2=.62</math>)</b>			
W12 family planning (IUD)	.51	.79	**
<b>Adjusting pessary (<math>R^2=.69</math>)</b>			
X871 uterovaginal prolapse	.71	.87	**
X872 stress-incontinence female	.48	.12	**
<b>Examination of vaginal discharge (<math>R^2=.16</math>)</b>			
W04 vag. discharge during pregnancy	.20	.04	
X11 menopausal sympt./complt.	.14	.19	**
X72 urogenital candidiasis, proven	.14	.44	**
X73 urogenital trichomoniasis, proven	.32	.19	**
<b>Excision skin for pathology (<math>R^2=.58</math>)</b>			
S77 malign. neopl. of skin	-.01	-.01	
S79 other benign neopl. skin	.39	.77	**
S80 other unspec. neopl. skin	.24	.08	*
<b>Diagnostic testing of skin for mycosis/moniliasis/candidiasis (<math>R^2=.83</math>)</b>			
S741 athlete's foot	.68	.21	**
S749 dermatophytosis NEC	.74	1.01	**
S75 moniliasis/monilia inf./candidiasis	.64	.27	**
<b>Treatment of ulcer and bedsore (<math>R^2=.24</math>)</b>			
K952 various ulcer of skin	.97	.54	**
S97 chronic ulcer skin incl. varicose	.28	.17	**

Table A2 Regression coefficients (unstandardized B, standardized  $\beta$ ), significance (\*  $p < .05$ ), \*\*  $p < .01$ ) and  $R^2$  for referrals made with relevant diagnoses (ICPC NIVEL version)

Relevant diagnoses (ICPC-code + title)	B	$\beta$	significance
<b>Stitching an open wound (<math>R^2=.20</math>)</b>			
A80 accident/injury nos	.11	.29	**
S19 other injury skin/tissue	.02	.18	**
S18 laceration/cut	.04	.43	**
<b>Therapy ingrown toenail (<math>R^2=.01</math>)</b>			
S94 ingrown toenail	.04	.11	
<b>Excision nevus/lipoma (<math>R^2=.23</math>)</b>			
S78 lipoma of skin	.22	.32	**
S79 other benign neoplasma skin	.14	.39	**
S80 other/unspec. neoplasma skin	.26	.13	**
S82 nevus/mole	.23	.47	**
<b>Excision sebaceous cyst (<math>R^2=.13</math>)</b>			
S93 sebaceous cyst	.10	.36	**
<b>Incision abscess (<math>R^2=.12</math>)</b>			
A872 complications (wounds)	.04	.06	
A879 complications (NEC)	.08	.08	*
S09 infected finger/toe	.07	.31	**
S10 boil/carbuncle/cellulit.	.04	.21	**
S85 pilonidal cyst/fistula	.28	.22	**
X991 absc. gland. Bartholini	.29	.17	**
<b>Puncture of bursa knee/elbow (<math>R^2=.30</math>)</b>			
L931 bursitis (excl. shoulder)	.10	.33	**
L10 elbow symptoms/complaints	.21	.14	**
L15 knee symptoms/complaints	.20	.62	**
<b>Corticoid/lidocain injection of shoulder/elbow (<math>R^2=.15</math>)</b>			
L92 shoulder syndrome	.05	.41	**
L932 lateral epicondylitis	.06	.26	**
L10 elbow symptoms/complaints	.16	.11	*
L08 shoulder symptoms/compt.	.04	.09	
<b>Bandaging a sprained ankle (<math>R^2=.15</math>)</b>			
L77 sprains/strains ankle(s)	.07	.38	**

(Table A2 continued)

Relevant diagnoses (ICPC-code + title)	B	$\beta$	significance
<b>Puncture of cyst mamma (<math>R^2=.16</math>)</b>			
X88 chronic cystic dis. breast	.14	.23	**
X15 lump/mass breast	.38	.39	**
X16 breast pain	.01	.02	
X17 other sympt.complt. breast	.07	.28	**
<b>Proctoscopy (<math>R^2=.10</math>)</b>			
D92 divertical dis. intestines	.05	.12	*
D94 chr.enteritis/ulcerat. colitis	.12	.32	**
K96 hemorrhoids	.05	.31	**
D753 malign. neopl. colon/rectum	.09	.09	
<b>Examining vision (including tonometry and funduscopy) (<math>R^2=.96</math>)</b>			
F05 other vision problems	.92	.51	**
F91 refractive errors	.96	.98	**
F992 retinopathy	.62	.07	**
<b>Audiometry (<math>R^2=.38</math>)</b>			
H02 hearing complaints	.34	.40	**
H83 otosclerosis	.10	.03	
H841 presbyacusic	.44	.57	**
H842 acoustic trauma	.15	.07	
H849 deafness NEC	.47	.50	**
H99 other dis. ear/mastoid	.15	.17	**
<b>Paracentesis (<math>R^2=.24</math>)</b>			
H71 acute otitis media/myringitis	.08	.53	**
H72 serous otitis media/glue ear	.20	.12	
<b>Diagnosing in-/subfertility (<math>R^2=.29</math>)</b>			
Y10 in-/subfertility	.32	.24	**
W15 complaints of infertility	.37	.62	**
<b>Adjusting pessary (<math>R^2=.14</math>)</b>			
X871 uterovaginal prolapse	.10	.40	**
X872 stress-incontinence female	.11	.08	
<b>Excision skin for pathology (<math>R^2=.42</math>)</b>			
S77 malign. neopl. of skin	.66	.73	**
S79 other benign neopl. skin	.16	.50	**
S80 other unspec. neopl. skin	.34	.19	**



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Probably the most common fear shared by people writing acknowledgements is forgetting to mention someone. I shall try to reduce that risk by naming persons who have contributed to this book in a sort of chronological order. Another sequence I could have chosen was to start with the most important ones. In that case too I would have started where I do now: first of all, I would like to thank my parents and Louk for having stimulated and supported me in many ways.

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Since I seem to have lost the chronological order by now, I may as well end by thanking my old and dear friends, who in their very own way provided me with a strong incentive to complete this study: by regularly inquiring when the party would be held.

## ABOUT THE AUTHOR

Diana Delnoij was born in Kerkrade, the Netherlands, on September 15, 1965. She attended the Katholiek Gymnasium Rolduc, a grammar school in Kerkrade. After graduating, in 1983, she read political science at the Catholic University of Nijmegen. In April 1987 she started a three-month apprenticeship at the Netherlands Institute of Primary Health Care (NIVEL). She obtained her master's degree in December 1987 and has since been working for NIVEL as a researcher on several projects, including an evaluation of the organizational structure of post-graduate education for Dutch GPs and analyses of the GPs' preferences for post-graduate training. Since 1990 she has predominantly been involved in projects that have resulted in this book: first a study of the literature on payment systems and a comparison of two regional experiments, funded by the Ziekenfondsraad (Dutch sickness fund council), and later a project aimed at collecting data on GP incomes in Western Europe, funded by the OECD.