

# PROFESSIONAL REIMBURSEMENT AND MANAGEMENT OF TIME IN GENERAL PRACTICE

## AN INTERNATIONAL COMPARISON

MICHAEL CALNAN,<sup>1</sup> PETER P. GROENEWEGEN<sup>2</sup> and JACK HUTTEN<sup>3</sup>

<sup>1</sup>Centre for Health Services Studies, The University of Kent, Canterbury, Kent CT2 7NZ, U.K.,

<sup>2</sup>Netherlands Institute of Primary Health Care, Utrecht and <sup>3</sup>Interuniversity Center for Sociological Theory and Methodology, Utrecht, The Netherlands

**Abstract**—A hypothetical model was proposed for explaining the relationship between general practitioners' system of payment and the amount of time spent in patient and non-patient work. It was hypothesized that GPs reactions to higher workload vary according to the payment system. In this paper we compare two health care systems which have both mixed systems of payment of GPs. In England and Wales up until April 1990 GPs are partly paid by capitation (approx 45% of their income), partly by allowance (38% of their income) and for a much smaller part fee for service (18% of their income). In the Netherlands GPs are paid by capitation for the publicly insured patients (63% of the average practice list) and fee for service for the privately insured patients. We expect (among other things) a stronger, positive relationship between list size and hours worked in the Netherlands and a comparably strong, negative relationship between list size and booking intervals in the Netherlands and in England and Wales.

Drawing on data collected from national surveys of GP workload in the Netherlands and England and Wales these propositions were examined. The results of this comparative analysis showed some support for the propositions in that the relation between list size and number of hours worked in patient related activities is stronger in the Dutch setting than in England and Wales, and about the same strength for the relationship between list size and booking intervals.

*Key words*—general practitioners, payment system, workload, United Kingdom, Netherlands

### 1. INTRODUCTION

Professional reimbursement and workload of general practitioners (GPs) are two related topics that are in the centre of attention of health policy makers in the United Kingdom and in The Netherlands. In both countries the reimbursement system of GPs has been under debate during the past years [1]. In the U.K. the new contract greatly increases the capitation part of total payments and decreases the allowance part. In the Netherlands plans are made to come to a uniform payment system, based on a mix of capitation and fee for service. Behind these changes are ideas about the possibilities to influence the behaviour of GPs through the system of payment.

Workload of GPs, as a topic of policy debate, is mainly discussed in health care systems with (at least partly) capitation payment [2]. In capitation systems the amount of income of GPs is directly related to the number of patients on the list of a GP and not to the number of services, as in fee for service systems. It seems that workload is less often perceived as a problem in fee for service systems, where market forces on demand and supply work more strongly than in capitation systems (or salaried systems). At the background of the debate on workload in capitation systems is the question whether the level of capitation payment justly reflects the amount of work that is generated by different groups of patients [3].

The relation between professional reimbursement system and workload or management of time (workload is often expressed in terms of hours spent on different activities and length of consultations) is not often investigated. The main reason is that these investigations in most cases require international comparisons. In most countries there is only one dominant system of payment, or, if there are more, comparative studies are difficult, because of in-built selection of GPs and/or patients. A notable exception is Mechanic's [4] analysis of the different reactions of paediatricians in pre-paid practice and in fee for service practice to differences in workload. Combined with ideas gained from a review of the literature on workload [2] this formed the basis of a hypothetical model to explain how GPs manage differences in the levels of workload under different remuneration systems. The aim of this paper is to examine the implications of this model for explaining GPs behaviour in England and Wales and The Netherlands.

### 2. BACKGROUND AND RESEARCH QUESTIONS

We consider three basic professional reimbursement systems. The first is capitation payment; GPs receive a fixed amount of money per patient per year, irrespective of the number of service GPs render to their patients. The second is fee for service payment;

GPs receive a fee for every item of service that is separately valued according to some contract. Finally, there is salaried service; GPs are on the pay roll of some organization funded by public or private sources and they receive a fixed amount of money for a fixed number of hours work.

These basic systems contain different incentives that influence the behaviour of GPs [5]. We are here only interested in one aspect of GPs' behaviour, their management of time. The question is how these payment systems influence the management of time in general practice.

To answer this question we make some simple assumptions. GPs can be modelled as rational human beings who allocate scarce resources in such a way as to maximize utility.

Utility is a very broad concept, containing everything that enhances well being and social approval. To use the concept of utility in an informative way, one has to specify these broad utility arguments, or maximants, with reference to the specific problem under investigation. In the context of a model of the allocation of time under different systems of professional reimbursement, we pose the income per unit time invested and the amount of free time as the only relevant utility arguments. That is not to say that GPs have no other aims in life than to gain money and to have leisure time, but that for this specific problem and for the time being it suffices to use only these utility arguments.

The main resource of GPs is their time. General practice does not require very expensive and scarce equipment or buildings, as do some medical specialties (although one could also formulate hypotheses about investments in equipment under different systems of payment).

The allocation of time to work and leisure is restricted by the GPs anticipation of the reactions of patients and by institutional arrangements in contracts. Capitation payment implies fixed patient lists and therefore more administrative barriers for patients to change GPs than in fee for service systems. Also local groups of GPs tend to adhere to informal rules of conduct which restrict overt competition for each other's patients. But still, in capitation systems patients have the freedom to join the list of another GP. In salaried systems patients usually only have the choice to go private and to pay for services themselves. Institutional arrangements for the allocation of time are most clear in salaried systems, where there are fixed working hours for GPs. Capitation contracts sometimes contain arrangements for surgery hours and out of hours duties.

Given these premises, we predict the following responses of GPs to a high patient load as compared to a low patient load:

- in capitation systems the total number of hours worked by GPs is relatively unaffected by higher patient load. A higher patient load is typically

managed by seeing more patients in the same time period. At a given list size the only way to increase utility is by working less hours, thereby increasing the monetary gain per unit of time and at the same time increasing number of leisure hours. An increase in list size means more income, irrespective of the number of services rendered and thus of time invested; GPs will have a tendency not to increase their number of hours worked proportionately to the increase in list size.

- In fee for service systems a higher patient load leads to a higher number of hours worked, while the time invested per patient remains constant. In fee for service systems there is, in contrast to capitation, no fixed patient list. The only way to increase income is to render more services; this increases at the same time the number of hours worked proportionately. The possible tendency to increase services with a better balance between payment and time invested is counteracted by more consumer influence.
- In salaried systems the total number of hours worked and income are fixed. A higher patient load does not affect the number of hours worked, nor the time spent per patient. The effect of a higher patient load is increasing waiting lists.

Described here are hypothetical patterns of behaviour. Observed behaviour in actual health care systems will deviate from this for at least two reasons. First of all, GPs behaviour is more complex than the way we have modelled it here; GPs have other aims in their (professional) lives and are subject to other restrictions in real life situations. But our simple model serves to clarify the principle. Secondly, most health care systems are not pure types, but form a mix of different kind of payment systems. The question now is where general practice in The Netherlands and in England and Wales fit into this hypothetical model. Can we use it to make predictions about patient load and management of time of GPs in these countries?

England and Wales and The Netherlands have in common that the payment system of GPs is partly based on capitation, but with respect to the other part the two countries differ [6]. The payment system of GPs in England and Wales under the pre-1989 contract consists of three parts:

- a capitation fee per patient on the list of a GP, differentiated by age of the patient,
- allowances; basic practice payment and allowances for seniority and for having attended vocational training (fixed payments),
- fee for service, e.g. for vaccinations and preventive services.

The average percentage of income is approx 45 for capitation, 38 for allowances and 17 for fees. The

relatively large part of allowances in the payment system justifies the classification of the system as a mix of capitation and salaried service (although not in the legal sense, but in the sense of the incentives influencing the behaviour of GPs) [7].

The payment system of GPs in the Netherlands consists of two parts:

- capitation payment for the publicly insured patients on the list of a GP,
- fee for service payment for the privately insured patients.

Publicly insured patients are all employees below a certain income ceiling and their dependents, old age pensioners who used to be publicly insured before retirement and certain categories of social welfare dependents. They make up 65% of the population. GPs always have a mix of publicly and privately insured patients, but the actual percentages depend e.g. on the affluence of the community. The payment system of Dutch GPs can be classified in terms of the basic systems of professional reimbursement as a mix of capitation and fee for service.

This classification of the payment of GPs in England and Wales and in The Netherlands, combined with the hypothetical model of the reactions of GPs to differences in patient load, leads us to the following predictions about differences between the two systems:

- the relations between patient load and GPs' management of time will be more or less the same in both systems, because of the common element in both systems;
- the (positive) relation between list size and number of hours worked will be stronger in The Netherlands than in England and Wales;
- the (negative) relation between list size and length of consultations will be approximately equally strong or weak, because both in ideal type salaried systems and fee for service systems length of consultations is unaffected by patient load;
- the (positive) relation between list size and time it takes to get an appointment with one's GP, will be weaker in The Netherlands than in England and Wales.

### 3. DATA AND METHODS

To test these predictions, we have used two datasets. The first is the dataset from the workload studies of the Health Services Research Unit of the University of Kent at Canterbury; the second stems from the Dutch National Survey of Morbidity and Interventions in general practice.

#### *Data collection and sample*

The data on England and Wales have been collected in a national sample survey of unrestricted

principals in autumn 1984. Sample size was 2104; the response rate was 67%. Non-response analysis revealed no serious biases. All data were collected through self-completed questionnaires [8].

The Dutch National Survey consists of several linked data sets: recording of all doctor-patient contacts during three months in 1987/88, a self-completed questionnaire and a diary kept during one full week. Contacts were recorded by 168 GPs, questionnaires were completed by 161 of them and 155 of them kept a diary. The GPs in this study were selected from three independent, stratified random samples from all Dutch GPs. Non-response analysis showed over-representation of younger GPs, female GPs and partnerships [9].

#### *Definition of variables*

Our predictions contain the following variables: personal list size, number of hours worked, length of consultations and time to get an appointment. In the England and Wales data, personal list size was arrived at for single handed GPs by just taking their list size; and for partnerships by dividing them in those with personal lists and those with a free flow system. For those with a free flow system, the answer to the following question was used: "If you were to change to a personal list of patients, what size would it have to be to give you the same workload as you have now?" In the Dutch data practice list size has been established by setting up an age/sex-register of the practices. For single handed practices, personal list size equals practice list size. For partnerships, the practice list size has been distributed over the partners according to their full-time equivalents of involvement in the practice. Trainees and temporary locums or assistants who have a structural share in the practice, have been treated in the same way as partners, i.e. they have been assigned a personal list size according to the full-time equivalents of involvement of the practice.

As far as hours of work are concerned, we restrict ourselves to activities within the practice and we distinguish between the total hours of work and hours spent in patient-related activities. For England and Wales, we have used the answers to the question: "Approximately how many hours did you spend in the last full week (when not on leave) on each of the following activities within the practice?" Total hours of work is the sum of all categories, while the number of hours in patient-related activities is arrived at by summing the hours of surgery consultations with NHS patients and the hours of home visits with NHS patients including travelling. For the Dutch situation, we used the diaries kept by the GPs. Total number of hours worked was arrived at by summing the time spent on activities within the practice on weekdays within office hours (8.00 hr a.m. until 5.00 hr p.m.) and hours spent in patient-related activities by summing the time for consultations in the practice and for home visits.

The length of consultations was not directly measured in the England and Wales data. As a proxy, the normal booking interval was used ("If you do operate an appointments system, what is the normal booking interval?"). In the Dutch data, both the actual length of consultations and the booking intervals are available. We have used the latter for the sake of comparability ("How much time do you set aside per patient in your appointments system?").

The time it takes to get an appointment was measured as the answer to the question (for England and Wales): "If a patient telephoned last Monday morning to request a non-urgent appointment, when would he have been able to see his doctor (in a partnership: any doctor?)" and (for the Netherlands): "Within how many days patients can usually get an appointment?" In both cases, we use the percentage answering 'on the same day'. This was used as a measure, admittedly crude, of accessibility.

#### *Comparability of data*

The two studies took place on different points in time and used different methods of data collection. This poses the question whether or not the data are still comparable enough to test our predictions. The central point here is to note the objective of our study. If we were interested in comparing levels of workload and time management of GPs in both countries, differences in data collection and timing of the studies would have prohibited a meaningful comparison. However, we are not interested in levels, but in relations between variables. It is the comparison of the strength and form of the relations between list size and time management, that we are interested in. In this case, the differences in method and timing of data collection are not problematic.

#### *Method of analysis*

To test our predictions, we break down the average number of hours worked, the average booking intervals and the percentage able to get an appointment on the same day by categories of list size for visual inspection and test of linearity ( $F$ -ratio test for the difference between  $\eta^2$  and  $R^2$ ). Our predictions are about differences between England and Wales and the Netherlands in the strength of the relations between list size and selected dependent variables. Technically, this means a test between two models, one with no interaction between country and list size

and one with an interaction term of country and list size. The first model assumes parallel regression lines for England and Wales and the Netherlands; the second model assumes significantly different slopes of the two regression lines. These models have been tested against each other using GLIM (Generalized Linear Interactive Modelling [10]). The test statistic  $F$  is computed as the difference of the sums of squares of the two models, divided by the scale parameter.

#### 4. RESULTS

One of the *general* predictions of the hypothetical model was that the relation between patient load and GPs management of time will be more or less the same in both the system in the Netherlands and in England and Wales. This prediction received some support (see Table 1) in that for both countries, there was a similar pattern of statistical relationships between list size and the indices of time. In both countries, the relationship between list size and hours worked in contact with patients and practice based activities was positive, and the relationship between list size and consultation length negative. However, in both countries, there was *no* statistical significant relationship between list size and length of time it takes to get an appointment, although this lack of relationship may be an artefact of the rather crude way the concept was measured.

#### *List size and hours worked*

The first of the specific predictions suggested that the relationship between list size and number of hours worked will be stronger in the Netherlands than in England and Wales. Figures 1(a) and (b) show these relationships and show that for both countries, there was a positive linear relationship. Statistical tests ( $F$ -ratio) show for both data sets, there was no significant deviation from linearity—see Table 2.

However, as is suggested in Fig. 1(a), the relationship between list size and hours worked in patient related activities, appears to be slightly stronger in the Netherlands than in England and Wales. Table 3 shows that in this case there is a significant difference between the model that assumes parallel regression lines in both countries and the interaction model. The model parameters show that the slope of the regression line for the Dutch data is steeper than for the

Table 1. Correlations between list size, hours worked, consultation length and length of time to get an appointment (Pearson's correlations)

	England and Wales List size	Netherlands List size
Hours per week in patient contact	0.24 ( $N = 1364$ )*	0.57* ( $N = 155$ )
Hours per week in practice based activities	0.19 ( $N = 1366$ )*	0.61* ( $N = 155$ )
Consultation length (booking interval)	-0.19 ( $N = 1173$ )*	-0.39* ( $N = 159$ )
Length of time to get an appointment	-0.02 ( $N = 1133$ )	-0.05 ( $N = 159$ )

\* $P < 0.01$ .

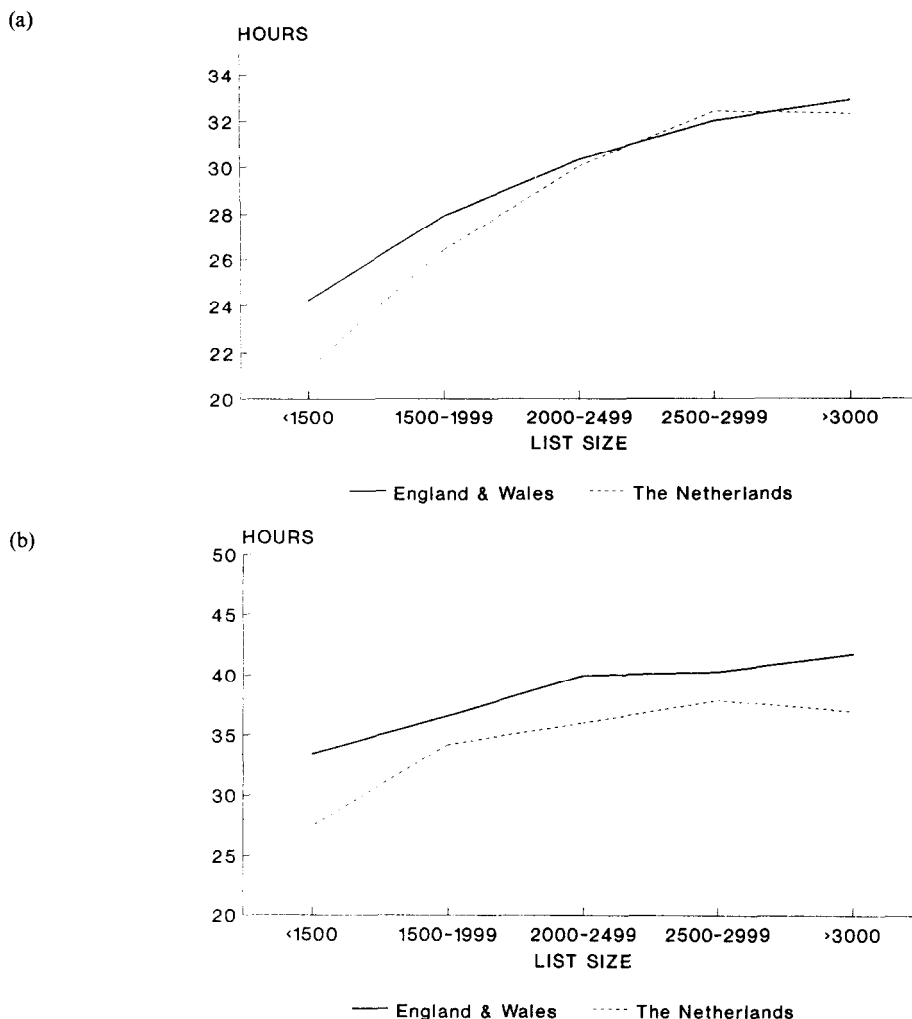


Fig. 1. (a) Hours spent in patient contact. (b) Hours spent in practice-based activities.

English and Welsh data. Hence, there was some support for our prediction although there was little difference between the countries in the relationship between total hours worked in practice based activities and list size. In this case the interaction model is no significant improvement on the parallel regression lines model.

#### *List size and consultation length*

Figure 2 shows the relationship between list size and consultation length (booking interval) for both countries. In both countries, there was a marked, inverse linear relationship between list size and booking interval (statistical tests showed in both data sets, there was no significant deviation from linearity—see Table 2). It was predicted that there would be little difference between the countries in terms of the strength of the relationship between list size and booking interval. The grouped data, shown in Fig. 2, suggest a stronger relation in the Netherlands. However, the test, based on list size as a continuous variable, of the interaction model against the parallel

regression lines model showed no significant difference.

#### *List size and percentage who can see a doctor the same day*

The final prediction suggested that in England and Wales, the relationship between list size and the time it takes to get an appointment with one's GP, will be stronger in England and Wales than in the Netherlands. However, in both countries there was no significance between the two variables and therefore no evidence of a linear relationship (Fig. 3). Thus, there was no support for this prediction (see also Table 3).

## 5. DISCUSSION

The aim of this paper was to examine the relationship between different arrangements for financial reimbursement of general practitioners and the way they managed different levels of workload. Starting

Table 2. Analyses of variance for list size (in five categories) and (I) hours in patient contact; (II) practiced based activities; (III) booking interval; (IV) length of time it takes to see a doctor

	England and Wales					The Netherlands				
	Sum of squares	df	Mean square	F	Significance	Sum of squares	df	Mean square	F	Significance
(I) List size and hours in patient contact										
Between groups	8560.8799	4	2140.2200	22.8067	0.0000	1251.9692	4	312.9923	8.2020	0.0000
Linearity	7893.7646	1	7893.7646	84.1179	0.0000	1192.4508	1	1192.4500	31.2484	0.0000
Dev. from linearity	667.1154	3	222.3718	2.3696	0.0690	59.5183	3	19.8394	0.5199	0.6692
(II) List size and hours in practice based activities										
Between groups	8217.8965	4	2054.4741	12.9722	0.0000	824.0726	4	206.0181	6.470	0.0001
Linearity	7653.5549	1	7653.5549	48.3256	0.0000	709.4762	1	709.4762	22.3122	0.0000
Dev. from linearity	564.3416	3	188.1139	1.1878	0.3131	114.5964	3	38.1988	1.2013	0.3115
(III) List size and booking interval										
Between groups	322.9514	4	80.7378	14.2235	0.0000	130.7329	4	32.6832	10.1304	0.0000
Linearity	312.0103	1	312.0103	54.9664	0.0000	122.1606	1	122.1606	37.8645	0.0000
Dev. from linearity	10.9411	3	3.6470	0.6425	0.5818	8.5724	3	2.8575	0.8857	0.4501
(IV) List size and % able to see doctor on same day										
Between groups	4.0933	4	1.0233	4.7302	0.0009	1.2551	4	0.3138	2.3877	0.0536
Linearity	0.5314	1	0.5314	2.4561	0.1173	0.3785	1	0.3785	2.8803	0.0917
Dev. from linearity	3.4620	3	1.1873	5.4883	0.0010	0.8766	3	0.2922	2.2235	0.0878

off from the three basic systems of remuneration of GPs—capitation, fee for service, salaried service—we have hypothesized typical reactions of GPs in terms of allocation of time to a higher workload. Ideally, these hypotheses should be tested in a comparison of the 'pure' types of remuneration, controlling for all kinds of other relevant differences. For a number of reasons this is usually not possible in the field of research on remuneration systems. 'Pure' types of remuneration are relatively rare; if there would be two 'pure' types within one health care system, there will also be other relevant differences (e.g. in insurance status of patients); and in comparing different health care systems, there will even be more relevant differences, e.g. cultural differences in perceptions of health and health care. In a situation like this, one can either refrain from doing research or acknowledge the methodological difficulties and try to fill in a new piece of the large puzzle about the effects of professional remuneration systems. We think the latter approach is more fruitful. In doing so we have added a new question in the broader field of effects of remuneration systems, the question of differences in allocation of time under different

levels of workload in different payment systems. We do not claim to give definitive answers to this question; the available data sets with all their weaknesses are being used for the exploration of new hypothesis, that should be tested more rigorously in the future.

A comparison was made between a system with a mix of salary and capitation (England and Wales: pre 1990-contract) and a system with a mix of capitation and fee for service (Netherlands). This comparison is of particular importance for the National Health Service as the recent changes in financial arrangements for general practitioners in England and Wales actually involve a shift towards a mix of capitation and fee for service payments. In other words, what is the effect on doctors workload and the management of time of having a fee for service component compared with a salaried component. The answer to this question, at least according to this evidence, is that the fee for service element tends to show, as was predicted, that an increase in workload leads to longer working hours in patient contact, although not an increase in hours worked in other practice based activities. This suggests that general practitioners

Table 3. Test of significance for difference between parallel regression lines (model 1) and interaction between country and list size (model 2), for the relation between list size and (I) hours in patient contact; (II) practice based activities; (III) booking interval; (IV) length of time it takes to see a doctor

	Sum of squares	df	Mean square	Scale parameter	F	df	Significance
(I) List size and hours in patient contact							
model 1	119718	1501					
model 2	119098	1500	619.6	79.4	7.8	1,1500	$P < 0.01$
(II) List size and hours in practice based activities							
model 1	199091	1501					
model 2	198770	1500	320.6	132.6	2.4	1,1500	N.S.
(III) List size and booking interval							
model 1	7225,7	1329					
model 2	7216,3	1328	9.44	5.44	1.7	1,1328	N.S.
(IV) List size and % able to see doctor on same day							
model 1	268,9	1289					
model 2	268,9	1288	0.00	0.21	0.00	1,1288	N.S.

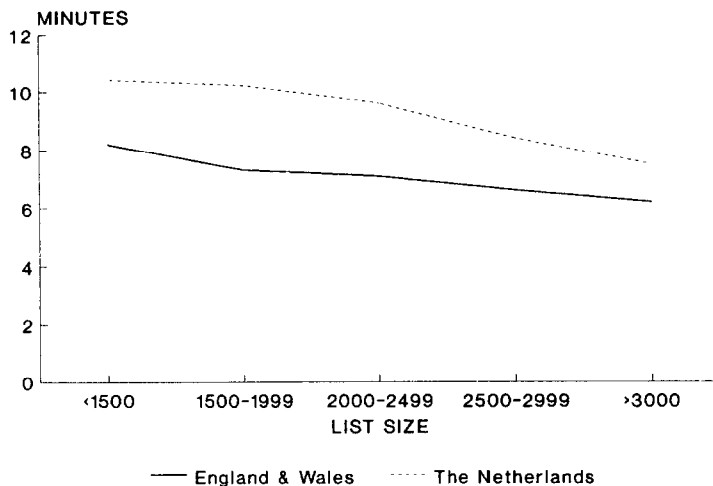


Fig. 2. Average consultation length.

working in systems with a stronger fee for service element may tend to invest more time in patient contact than in other activities. These other activities partly concern administrative duties, but partly also cooperation within primary care and professional activities like post-graduate education. It was also predicted that, because of the common feature of capitation payment in both systems, the relationship between list size and booking interval would be similar. This prediction was shown to be corroborated. The relationship turned out to be similar, indeed. Other research on the relation between list size and management of time in England shows a similar pattern [11], although in this particular study, the strength of the relationships was weaker amongst the lower list size bands. The results suggest that British GPs are more free to allocate their time, which may reflect the extent to which a payment method influences the behaviour of GPs. The final part of the analysis examined the relationship between list size

and accessibility (as measured in this study) which was weak under both systems and the salaried element found in the system in England and Wales did not generate queuing or delay.

Ideally this analysis of the impact of different systems of financial reimbursement should involve a comparison between countries with markedly different systems. The systems found in the Netherlands and England and Wales have some similarities and the introduction of the new contract in England and Wales with the reduction in income from allowance have made them even more similar. Thus, it might be possible to predict from the analysis of the Netherlands data, what the implications of the recent changes will be in England and Wales. Of course in doing so, it has to be taken into account that our analysis was based on data from two studies with different methodologies and sample sizes, stressing the tentative character of our conclusions. One of the conclusions which emerges from this analysis will be



Fig. 3. Appointment the same day.

that the new contract might lead to a change in the relationship between list size and the management of time, with general practitioners who are faced with a heavier workload increasing their hours in patient contact. However, how will general practitioners manage the increase in time spent in patient contact? Judging from the evidence presented here, it might mean less time spent on other activities, as the results showed there was no significant difference between the countries in the strength of the relationship between list size and hours spent on all activities and list size and consultation length. It has been suggested [12] that the new contract will lead to an overall increase in list size and according to our evidence if this occurs there might be a deterioration in the quality of care not only because of a reduction in consultation length [13] but also a reduction in the number of hours general practitioners spend on non-patient contact activities which may mean less time spent on post-graduate education as well as time spent in liaising with other professions. This problem may be exacerbated in the proposals in the new White Paper on the health service in the U.K. in that doctors have been given the option of a more managerial role in terms of controlling use of resources. However, this apparent problem of increasing doctors involvement in management as well as increasing hours in contact with patients may be resolved by delegation of routine tasks, such as health promotion activities to nurses [14].

The analysis also has implications for the proposed changes in the GP-contract in the Netherlands. The proposed new contract for the Netherlands, consisting of a uniform (i.e. the same for publicly and privately insured patients) system of capitation combined with fee for service, is very close to U.K.'s new contract, although the fees will undoubtedly concern other services. Both systems are therefore converging to the same kind of mix, with the capitation part serving to guarantee continuity of care and the fee for service part stimulating active GPs. However, in both systems, then, with larger list size, non-patient related activities will be neglected. Fee for service runs the risk of increasing quantity of care more than quality of care [15]. A counterbalance to this can be found in stimulating postgraduate education and peer review. However, postgraduate education and peer review are typical examples of non-patient related activities. It could be speculated that the allowances in the U.K.'s old contract served to cover these non-patient related activities. Mixed systems of payment are in the centre of attention at this moment [16]—hybridization creates a stronger breed—but it is our feeling that the positive aspects of fixed allowances or salaries are not enough taken into account [17].

## REFERENCES

1. Ham C., Robinson R. and Benzeval M. *Health Check; Health Care Reforms in an International Context*. King's Fund Institute, London, 1990.
2. Groenewegen P. P. and Hutten J. B. F. Workload and job satisfaction among general practitioners; a review of the literature. *Soc. Sci. Med.* **32**, 1111–1119, 1991.
3. Fleming D. M. The case for differential capitation fees based on age in British general practice. *Br. Med. J.* **297**, 966–968, 1988. Ball J. G. Workload in general practice. *Br. Med. J.* 868–870, 1978. Wal G. van der. Voor een differentiering binnen het abonnementshonorarium. *Huisarts en Wetenschap* **27**, Suppl. 68–71, 1984.
4. Mechanic D. The organization of medical practice and practice orientations among physicians in prepaid and non-prepaid primary care settings. *Med. Care* **13**, 189–204, 1975.
5. Glaser W. A. *Paying the Doctor; Systems of Remuneration and their Effects*. The Johns Hopkins Press, Baltimore, 1970; Rosen B. Professional reimbursement and professional behavior: emerging issues and research challenges. *Soc. Sci. Med.* **29**, 455–462, 1989.
6. Groenewegen P. P., van der Zee J. and van Haaften R. *Remunerating General Practitioners in Western Europe*. Avebury, Aldershot, 1991.
7. In an article in *The Receptionist* on the different parts of income of GPs in the U.K. it was formulated thus: "It could be likened to receiving a 'salary' for making himself available for a substantial amount of time and agreeing to look after the patients under his care." (*The Receptionist*, programme 1, issue 1, p. 13, 1984).
8. Calnan M. and Butler J. R. The economy of time in general practice: an assessment of the influence of list size. *Soc. Sci. Med.* **26**, 435–441, 1988.
9. Foets M. and van der Velden J. *Een Nationale Studie van Ziekten en Verrichtingen in de Huisartspraktijk; Basisrapport Meetinstrumenten en Procedures*. NIVEL, Utrecht, 1990.
10. Aitkin M., Anderson D., Francis B. and Hinde J. *Statistical Modelling in GLIM*. Clarendon Press, Oxford, 1989.
11. Wilkin D. and Metcalfe D. H. H. List size and patient contact in general medical practice. *Br. Med. J.* **289**, 1501–1505, 1984.
12. Morrell D. The new general practitioner contract in the NHS—review—is there an alternative. *Br. Med. J.* **298**, 1005–1007, 1989.
13. Roland M. O., Bartholomew J., Courtenay M. J. F. *et al.* The 'five minute' consultation: effect of time constraint on verbal communication. *Br. Med. J.* **292**, 874–876, 1986. Ridsdale L., Carruthers M., Morris R. and Ridsdale J. Study of the effect of time availability on the consultation. *J. R. Coll. Gen. Pract.* **39**, 488–491, 1989. Williams S. J. and Calnan M. Convergence and divergence: assessing criteria of consumer satisfaction across primary, dental and hospital care settings. *Soc. Sci. Med.* **33**, 707–716, 1991.
14. Calnan M. *Preventing Coronary Heart Disease: Prospects, Policies and Politics*. Routledge, London, 1991.
15. Forbes J. F. Public policy and primary medical care in the U.K.; an economic perspective on promoting better health. *Fam. Pract.* **5**, 27–241, 1988.
16. Newhouse F. P. Pricing behavior and imperfections in the medical care market place. *Second World Congress on Health Economics*, Zürich, 1990.
17. Potrykus C. A salaried service for family doctor? *Health Visitor*. *Hlth Visitor* **64**, 216, 1991.