# Capitation and fee-for-service in Danish general practice

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**Summary**

Does method of payment influence physician behaviour? In this article a small step is made towards an answer to this question. We compare General Practitioners (GPs) who work under different mixes of capitation and fee-for-service payment, while other important conditions are roughly equal. Numbers per 1000 patients of consultations, diagnostic and curative services and referrals are compared for two groups of GPs: GPs in Copenhagen City before 1987, who worked under an almost complete capitation system, and GPs in the surrounding urban area, who had only half their income from capitation. Numbers are considered to be different if one is at least twice as large as the other. Following that rule, it is found that more diagnostic and curative services are rendered where fees for services are a larger part of GPs' income, while consultations and referrals are equal in number. It is concluded that supply-side effects on diagnostic and curative services are stronger than those on consultations, and that substitution of diagnostic and curative services for referrals does not show in this cross-sectional comparison.

Key words: General practitioners, capitation, fee-for-service, utilization

## 1. Introduction

Recently Sandier[1] compared health services utilization and general practitioners' earnings in a number of OECD countries. In these countries different methods of paying general practitioners (GPs) are in use. One conclusion drawn by Sandier is that the effect of the method of GPs' payment on utilization seems to be outweighed by other factors, i.e. the coverage of expenditure by health insurance agencies and their powers of intervention, morbidity in the population, medical technology, and the country's economic level. Another conclusion she draws is that, if these other conditions are equal, fee-for-service payment seems to allow a GP more room to increase his income than capitation payment. In other words, only if these other conditions are equal will fee-for-service payment display the stimulating effect on the performance of services that is attributed to it in discussions of supplier-induced demand[2].

Most of the comparisons made by Sandier are between countries. Two exceptions are Denmark and the Netherlands, where two health care systems exist alongside each other. For both countries, a comparison between the two systems seems to support the conclusion "that the level of consumption is influenced more by the fact that it is free of charge to the patient than by the method whereby physicians are paid. In these two countries, the number of general practitioner services per insured person using a physician paid a capitation and receiving their treatment free is higher than that for persons covered by the other system, who are generally in better health, consult physicians on a fee-for-service basis, have to pay the physician themselves, and bear part of the cost"[1]. Hence

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this is an instance in which the effects of coverage of expenditure by health insurance agencies and morbidity seem to outweigh the effect of the method of GPs' payment.

Here one more comparison is added to the ones Sandier reports[3]. It takes advantage of the fact that until October 1987 in Denmark, the part of GPs' income made up by capitation for patients receiving free treatment differed between Copenhagen City and the rest of the country. In Copenhagen City it made up the major part of GPs' income, while in the rest of Denmark since 1961 a lower capitation made up half the income of an average GP, by prospective estimate. In both cases the rest of the GPs' income was earned by fees for services. For the group of patients receiving their services in kind (about 95% of the population), these fees were paid directly by health insurance agencies to GPs[4].

The set of services for which fees were paid was smaller in Copenhagen City than in the rest of Denmark. In Copenhagen City fees were paid only for perinatal services (preventive examinations and vaccinations), contraceptive services (instruction in the use of contraceptives, among other things), and for certificates (death certificates, admission to mental institutions). In the rest of Denmark fees were also paid for each consultation, for a set of 43 diagnostic services (such as urine analysis), and for a set of 27 curative services (such as removing warts).

Of the two conditions of reimbursement mentioned above, the one with no out-of-pocket payment by the patient (called group 1) covers by far the largest part of the population. If services per person under this condition of reimbursement in Copenhagen City and the rest of Denmark are compared, the effects of differences in health insurance coverage are ruled out,and so are to some degree, the effects of differences in morbidity. However, morbidity varies not only with insurance status, but also with urbanisation: more urbanised areas often have higher morbidity[5], and Copenhagen City is much more urbanised than the rest of Denmark. This difference in urbanisation is reduced when one compares Copenhagen City with the rest of Copenhagen County: Copenhagen County is the larger (sub)urban area of which Copenhagen City is the central part[6]. If services per 'group 1' insured person in Copenhagen City and the rest of Copenhagen County are compared, the more obvious conditions interfering with the effect of fee-for-service payment are equal. In this comparison, the difference between the two payment systems should have clear effects in numbers of services per person. What effects can be expected then?

1. In the county but not in the city, a fee was paid for each consultation. The effect of that would be that once a patient consults his GP, a county GP would be expected to arrange a return consultation more often. Thus if numbers of initial consultations per person were equal in city and county, *total numbers of consultations per person should be larger in the county*.
2. In the county but not in the city, fees were paid for separate diagnostic and curative services. Here the expected effect is unconditional: *numbers per person of diagnostic and curative services should be larger in the county*.
3. Both in the county and in the city, fees were paid for perinatal services, contraceptive services and certificates. Certificates are rare; they are not considered further here. For perinatal and contraceptive services, from the fact that in both the city and the county fees were paid for them, *numbers per person of perinatal and contraceptive services should be equal in city and county*.
4. 'Group 1' insured Danes have free access to their GP, but can visit a medical specialist in hospital or private practice only after referral by their GP. Neither GP nor patient runs any financial risk from such a referral. Now it could be that return consultations with a GP and diagnostic and curative services by a GP make such a referral redundant. If this is the case, to a city GP referring a patient only implies a gain of time, while to a county GP it implies a loss of income as well. Thus if this is the case, and if numbers of consultations, diagnostic and curative services were larger in the county, *numbers per person of referrals should be smaller in the county*.

Here we shall compare consultations, services

and referrals per 'group 1' insured person in Copenhagen City and the rest of Copenhagen County. We shall check whether numbers per person were as expected, before October 1987. Until then, the differences in GPs' payment described were in existence. Since October 1987, Copenhagen City GPs have been paid the same way as other Danish GPs, with capitation making up half their income by prospective estimate.

## 2. Data and method

*Sources*

The data used in our comparison are from a number of different sources. The data on Copenhagen County are of administrative origin. Those on Copenhagen City were collected to investigate the effects of the change in GPs' payment there. Our data refer to the situation six months before that change.

For Copenhagen County, the data on consultations and services by GPs and on referrals to specialists in private practice are from Copenhagen County health authorities, while data on referrals to hospitals are from hospital administrations. The health authorities data stem from billing by GPs and private specialists respectively.

For Copenhagen City GPs at the time of our comparison no billing was in order yet for consultations and diagnostic and curative services. A sample of Copenhagen City GPs voluntarily recorded all consultations for one week each[7]. The recording sheet covered type of consultation, perinatal and contraceptive services, a sample of diagnostic and curative services, and referrals.

*Time span*

The Copenhagen City GPs recorded their consultations for one week out of weeks 9 through 11 of 1987. For Copenhagen County, administrative data are used that cover time spans as similar as possible.

Hospital administrations produce data on periods of one week; data on referrals to hospitals refer to week 10 of 1987. Health authorities produce data on periods of four weeks; data on consultations and services by GPs refer to weeks 9 through 12 of 1987. Data on referrals to private specialists refer to the preceding period, weeks 5 through 8: health authorities judged the billing data of private specialists on weeks 9 through 12 to be unreliable[8].

All data have been converted into average numbers per week.

*Level of aggregation*

For Copenhagen City data are available at the level of consultations.

For Copenhagen County, data as produced by health authorities and hospital administrations are available only at a higher level of aggregation. Data on consultations and services by GPs produced by health authorities are available at the level of groups of GPs in 'practice areas',as are data on referrals to hospitals produced by hospital administrations. Data on referrals to private specialists produced by health authorities are available at the level of municipalities. Therefore, data on all variables are available only at the level of regions that include both entire practice areas and entire municipalities.

Copenhagen County includes 11 GPs' practice areas and 16 municipalities[9]. From these, 8 regions can be constructed. These regions include a minimum of 10, a maximum of 82, and an average of 41 GPs.

*Coverage*

For Copenhagen County, administrative data are available on all consultations, all services for which fees are paid and all referrals by the 326 GPs practising at the time of investigation. For Copenhagen City our data refer to a sample of GPs, who recorded only the diagnostic and curative services included in the recording sheet.

In Copenhagen City 283 GPs were practising at the time. They were all invited to take part in the investigation mentioned, and 87 eventually participated.

As mentioned above, outside Copenhagen City fees were paid for 43 diagnostic and 27 curative services. A sample of 13 diagnostic and 8 curative services were included in the Copenhagen City GPs' recording sheet. These sample services were billed frequently in the county, and it was judged that the average Copenhagen City GP would have the necessary equipment to perform them.

ten taken by the Copenhagen General Practitioners' Laboratory[12]. Hence for taking blood samples there is evidence that the first one of the three alternatives is indeed often chosen by city GPs.

Taking a cervical smear is the third diagnostic service for which we did not find the expected difference. Some cervical smears are taken in preventive screening of otherwise healthy women, usually according to pre-established time intervals, while others are taken because of present symptoms. Only in the latter case are supply-side effects plausible. If most smears are taken in preventive screening, total numbers of smears are mainly determined by numbers of women of fertile age. There is certainly not a twofold difference in these numbers between county and city.

In this article we have added one comparison to the ones Sandier[1] reports, building on her conclusions. For this purpose we used data that were different in a number of ways. These differences may have produced a number of biases. They also excluded rigorous statistical testing. Instead, we used a rule taken from usage in comparative health services research. Our results turned out to confirm expectations on services performed by GPs, with plausible exceptions. They did not confirm expectations on substitution between services and referrals.

Since these results are from cross-sectional comparison, no firm conclusions can be drawn about the effects of payment systems on the behaviour of GPs. Stronger evidence on effects of payment systems would come from natural experiments when payment systems are introduced. Our data stem from such a natural experiment, in which Copenhagen County served as a control group for Copenhagen City, where fees for services were introduced in October 1987. A comparison of changes from March 1987 to November 1988 did produce evidence on substitution between services and referrals[13]. But then again, our differing results may be an indication that this is a short-term effect only.

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6 Among the other municipalities in Copenhagen County, in Taarnby and Dragør the payment system for GPs was the same as in Copenhagen City until 1987. Here Taarnby and Dragør GPs will be left out of comparisons.

7 A comparison of available characteristics of participating and non-participating GPs showed that they did not differ in gender, but that participating GPs were more recently graduated.

8 In weeks 9 through 12 of 1987 the numbers suddenly doubled, after which a conflict broke out between specialists and health authorities.

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