How should we pay doctors: a systematic review of salary payments and their effect on doctor behaviour

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Authors' objectives
To determine the influence of salaried payment on doctor behaviour.

Searching
The following sources were searched: MEDLINE from 1966 to 1997; EMBASE (via BIDS) from 1980 to 1997; EconLit from 1969 to 1997; and ISI (via BIDS) from 1981 to 1997. The keywords used were 'physicians', 'practitioners' and 'doctors'. Both published and unpublished studies reported in any language were eligible for inclusion. The bibliographies of retrieved papers were also examined for additional references.

Study selection
Study designs of evaluations included in the review
Randomised and non-randomised controlled studies were included. Interrupted time series and case-control studies were also reported in the review.

Specific interventions included in the review
Salaried payment of doctors compared with other payment methods, either separately or as a combination. The other payment methods included:

- fee for service (FFS), which pays the doctor a predetermined fee for each item of service they provide;
- capitation payment, which provides the doctor with a payment for each patient that is registered with them;
- target payments, which remunerate the doctor on achieving a target level of service provision;
- allowances, which provide the doctor with a lump sum payment (usually to cover practice expenses) that is independent of the level of service provision;
- sessional payment, in which payments are made for each clinical session; and
- withhold payments, which involve withholding a physician's income against any budget deficits.

Physician payment method was defined as that which directly affects the real income of the doctor. Studies of general practitioner fundholding and US studies comparing health maintenance organisations with traditional FFS medical schemes, rather than physician payment methods, were excluded. Studies that failed to clarify what payment methods were being used, were also excluded.

Participants included in the review
Doctors. The studies reported in the review included internists, paediatricians, primary care doctors and hospital surgeons.

Outcomes assessed in the review
Objective outcomes and measures of doctors behaviour. The outcomes reported in the review included, amongst others: the numbers of procedures per patient, throughput of patients per doctor, the length of consultations, the number of preventive care procedures, the number of days spent in hospital, and patterns of consultation.

How were decisions on the relevance of primary studies made?
Two reviewers independently assessed the relevance of primary studies.
Assessment of study quality
Validity was not formally assessed but certain issues surrounding study validity were discussed for certain studies, e.g. whether studies were controlled for physician, patient and practice setting characteristics.

Data extraction
It would appear that two reviewers independently extracted the data. Tables reported in the review included details of the following: authors and year of publication; study design; comparators; doctor and patient sample; country of origin; outcome findings; and other notes of interest.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative presentation.

How were differences between studies investigated?
Some details of the differences between the studies were discussed in the narrative presentation.

Results of the review
Nineteen studies were included: 1 randomised controlled trial, 1 controlled before-and-after study, 2 interrupted time series and 15 case-control studies. The overall number of participants included in the studies was not reported.

Only one study attempted to identify health status as an outcome measure by using wound infection rates; no studies examined whether salaried doctors treated different patient groups differentially. However, the included studies showed that salaried doctors, compared with doctors paid by FFS, tended to differ in terms of the quantity of care they provided. Nine studies showed that salaried doctors had lower volumes of consultation than FFS doctors. Five of the 9 studies looking at the volume of tests and X-rays requested found that salaried doctors ordered fewer tests than FFS doctors. In 4 studies from the US, Canada and South Africa, salaried doctors were associated with lower levels of hospital use than FFS doctors. Two studies found the salaried surgeons undertook less surgery; however, one found that salaried surgeons had a higher wound infection rate than their colleagues on FFS and salary plus profit payment schemes. The 2 studies that compared salary payment with capitation found that salaried doctors had lower volumes of consultation, ordered fewer tests and X-rays, and were associated with lower levels of hospital use. These studies showed that FFS was associated with the highest levels of service provision, compared with salary and capitation.

Compared with FFS, salaried employment was also found to be associated with different patterns of consultation, and longer consultations. Two out of 3 Norwegian and German studies indicated that salaried doctors tended to have surgery-based consultation, rather than home visits, particularly for the elderly. Findings from US and Norwegian studies indicated that salaried doctors tended to have longer consultations. Four of the 5 studies investigating the provision of preventive care found that salaried doctors provided more than FFS doctors.

Authors' conclusions
The authors stated that they were unable to draw conclusions on the likely impact of salaried payment on efficiency and equity. However, the limited evidence suggested that payment by salary is associated with the lowest use of tests and referrals, compared with FFS and capitation. In addition, compared with FFS, salary payment was also associated with lower numbers of procedures per patient, lower throughput of patients per doctor, longer consultations, more preventive care and different patterns of consultation.

CRD commentary
This appeared to be a reasonable review of the topic area, although the report lacked detail of a number of methodological issues that may affect the validity of the findings. A reasonable search of the literature was performed, using electronic databases and a supplemental search of the bibliographies of retrieved studies. No language restrictions
were applied. However, no specific attempts were made to locate unpublished data and so the possibility of publication bias exists. Two reviewers independently assessed the studies for inclusion and extracted the data. However, the studies do not appear to have been systematically assessed in terms of their validity. The study details were tabulated, but the number of participants involved in the studies was not always apparent.

Certain issues surrounding the heterogeneity of the studies were discussed briefly; the use of a narrative presentation was appropriate given the apparent differences between the studies.

The authors findings would appear to follow from the data presented, and a number of limitations and issues surrounding the review were discussed. In view of these comments, the authors' conclusions would appear to be reasonable, but should be considered with some degree of caution.

**Implications of the review for practice and research**

Practice: The authors stated 'the results of our review suggest that if cost containment is a key policy aim of government then salaried payment systems are more likely to achieve this compared with FFS and possibly more effective than capitation systems. However, cost containment by itself may be inefficient if it results in the provision of suboptimal care. Indeed, salaried systems may not be ideal for pursuing public health policy such as population immunisation which depends upon high quantities of care being provided'.

Research: The authors identified a number of features that were lacking amongst the studies and which prevented any firm conclusions from being drawn about the efficiency and equity of salary payment. These included:

- most of the included studies only compared salary payment with FFS and other comparisons were lacking;
- none of the studies examined differences in resource use by patients with either similar or different health status;
- there was a paucity of studies reporting health status as an outcome measure; and
- studies often failed to control for physician, patient and practice setting characteristics.

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