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# The role of payments systems in influencing oral health care provision

N Woods\*

## Abstract

### Introduction

The unique characteristics of dental disease, such as its predictability, non-communicability, ease of diagnosis, and its extensive prevention possibilities, should result in greater cost control and an expectation of a better operation of the market mechanism than in general health care. These differentiating features, however, also increase the likelihood that services are over-consumed and/or over-provided. The most influential feature determining efficient resource use in health care provision is the type of payment system. A per capita system serves as a link between the dentist's future income and service provision, and provides equity in terms of coverage and access. The result is that patients may benefit from fewer unnecessary treatments, and encounter more preventive activities. The system is limited by the potential for under-treatment and problems with patient selection.

With fixed salary, the dentist's income is independent of service provision, with incentives for low production, which leads to high costs per patient. Salaried dentists generally provide more prevention services, and allow the targeting of services to priority or 'special needs' groups. The patient benefits from the greater equity of a service and the location of services can be determined by community needs. Fee-per-item is the

most common payment system in dental service provision for adults, where the dentist is rewarded according to the amount of work undertaken. Fee-per-item removes the incentive for supervised neglect or to cherry pick patients. It also solves the problems of patient selection and under-treatment, associated with capitation financing. Fee-per-item can encourage the use of services by patients on the advice of the dentist with the result that costs can be inflated with little impact on oral health itself. In the absence of a system of probity, dentists can manipulate demand and set fees, and provided moral hazard can occur in the form of supplier inducement. This review discusses the role of payment systems in influencing oral health care provision

### Conclusion

The optimal dental contract may be a 'blended' payment system whereby dentists receive a proportion of their income through capitation, a proportion from allowances and proportion from fee-per-item of service.

### Introduction

Dental care has unique features that distinguish it from health care in general<sup>1</sup>. Diseases are relatively few and tend to be more predictable. Dental care is rarely in response to a life threatening occurrence and untreated disease rarely has dramatic consequences on an individual's health. Dental diseases are relatively easy to diagnose giving the patient more time to plan and take treatment decisions. Disease is non-communicable and there is much greater scope for prevention. As a result of these distinctive features, one would expect

market mechanism to perform better in dental care than in other health services as dental disease across individual's can be treated as independent<sup>2</sup>. A feature of market economies is that, in the presence of externalities such as communicable disease, markets fail to allocate goods and services efficiently. The non-emergency nature of most dental care, the ease of access to relevant information for treatment decisions via X-rays, the different treatment alternatives with varying costs, make it possible to control costs and for a more efficient market mechanism<sup>3</sup>. However, the distinguishing characteristics of dental care also increase the likelihood that services are over-consumed and/or over-provided.

Among the leading strategies to reform health care is the development and implementation of new payment models. The goal is to change the way physicians, dentists, hospitals, and other care providers are paid in order to emphasise higher quality at lower costs—in other words, to improve value.

### Payment systems

When evaluating payment models, the framework used was how well the various payment systems support the attributes of value-driven health system where health is maximised and care is: patient centred, efficient, safe and effective, timely and assessable, accountable, innovative and coordinated across providers and facilities. The choice of payment system is the key issue for efficient resource use in health care provision<sup>4</sup>. The term 'payment system' denotes the body of price regulation existing in the market for dental services<sup>5</sup>. A dentist or

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physician's incentives depend on the combination of payment basis, payment schedule and, to lesser degree, the payment procedure<sup>4</sup>. A 'payment basis' is defined as the level of the payment in a certain period of time, which is remuneration for costs incurred. This is influenced by the hours worked by the dentist, use of equipments, prescription drugs, rent, heating and electricity used in the practice. The 'payment basis' also includes the number and types of service provisions, the number of: treatment episodes, treated patients and potential patients. The 'payment schedule' is a function that connects revenue with the components making up the payment basis<sup>4</sup>. The 'payment procedure' is generally referred to as the institutional mechanism of reimbursement.

Different types of payment systems can be used as a means of influencing both consumer and dentist behaviour. Consumer incentives derive from the interaction of individual preferences. Constraints limiting their preferences, such as income and prices, are also influenced by the health status of the individual, as poor health can lead to a loss of income. Consumer incentives are revealed in terms of the exertion of preventive effort, the decision to initiate an episode of care, and the selection of provider. Dentists are generally remunerated in three different methods: *per capita*, *fee-per-item* and *fixed salary*, and these can be used as a means of influencing dentists' behaviour to provide higher quality at lower costs.

### Per capita remuneration

A *per capita* payment system is mainly used in primary care and is suitable in terms of exchequer financing, because the price and quantity are agreed at the commencement of contract<sup>6</sup>. The system maximises efficiency with the incentive to drive down costs, thus maximising profits. At contract renewal, the government agency can negotiate down the price on foot of these reduced costs. In a *per capita*

system fewer dentists are required; education and training costs are reduced, thus reducing public expenditure<sup>7</sup>. Patient access and coverage should more equitable. Society should benefit from a greater mix of patients being seen and the dentist may have more time to interact with patients and to devise dental plans to suit their needs. A *per capita* system separates the link between the amount of service provided and financial reward. Relative to fee-for-service, capitation may encourage more preventive activities as the dentist's future income is not dependant of service provision<sup>7</sup>.

The main drawback of *per capita* remuneration involves the possibility for patient selection and under-treatment<sup>7,8</sup>. Clearly, the dentist should not have a role in patient selection. To avoid patient selection problems, a well-defined and balanced patient population should be allocated randomly to the dental practice. However, with *per capita* systems patients are generally allocated geographically. This method of patient allocation may induce bias as a patient pool with a concentration of rural patients may have more dental disease as rural dwellers generally have less exposure to fluoridated water supplies. Problems of patient selection and under-treatment can be limited by risk adjustment of the per capita fee<sup>9</sup>. If patient groups with high-levels of treatment needs can be identified<sup>10-12</sup>, then these characteristics can be used in order to differentiate the *per capita* fee. The differentiation must not be based on characteristics that the dentist can manipulate. With a fixed pool of patients for an agreed remuneration dentists have an incentive to under-treat to save costs. A *per capita* system can lead to what is termed supervised neglect<sup>13,14</sup>. However, the evidence *per capita* system for the treatment of children in the General Dental Service in Britain found no evidence of systematic neglect among those treated, but they had fewer fillings, more untreated

diseased teeth and similar disease levels to their counterparts treated under fee-for-service<sup>14</sup>. Administration costs in a *per capita* system are often high and where the population is scattered widely, the population base may be too small to ensure that dentists receive a sufficient per capita income<sup>7</sup>.

A weakness of a *per capita* scheme identified in different studies<sup>7,13-15</sup> is that the quality of the treatment provided can be reduced. Since dentists get a fixed fee per patient under supervision, their financial rewards are positively correlated with the number of patients. The economic incentive is to minimise the time spent per patient in order to maximise the panel of patients. That may result in untreated dental disease. A further weakness is that the dentists have less time for prevention, for giving advice, or for carrying out preventive procedures such as fissure sealing<sup>16</sup>. The most recent evaluation of a *per capita* payment scheme has been undertaken in Norway in 2012<sup>16</sup>. The authors found that a *per capita* scheme did not result in a fall in the quality of dental care. However, the number of observations in this study was small and the project was publicly financed.

### Fee-per-item remuneration

Fee-per-item financing rewards the dentist according to the amount of work undertaken. Dentists are paid a 'piece-rate' for each individual treatment carried out, with specified fees unbundled for each type of treatment (fillings, extractions, crowns, bridges, dentures, etc.). With *fee-per-item* the emphasis is on productivity and it encourages the delivery of care and maximising patient visits. As a payment mechanism, it supports accountability, and it is relatively flexible in that it can be used regardless of the size or organizational structure of a dentist's practice, or the geographical location of care. With *fee-per-item* financing, it is easier to ensure quality, and it also solves the problems

of patient selection and under-treatment, which are associated with *per capita* financing<sup>7</sup>. If dentists are remunerated *fee-per-item* of service, they no longer have an incentive to avoid patients who have high levels of treatment need. With *fee-per-item* services, equipments and premises are provided and maintained by the dental practitioner, thus minimising capital input and investment by the state. This provides a clear incentive for the dentist to keep costs down so as to maximise profit which effectively minimises inflationary pressures on the service. With *fee-per-item* the patient benefits from increased competition between practices in terms of the maintenance of quality standards, particularly in areas of high dentist-to-population ratios. There is no incentive for supervised neglect and there is a financial incentive to carry out treatment earlier, thus resulting in smaller restorations, earlier orthodontic interventions and fewer root canal therapies. There is generally a greater allegiance to patients with a financial incentive to follow-up non-attenders and to institute an efficient recall system.

Fee-per-item is criticised for giving a potential incentive to 'over-treatment' or 'supplier induced demand'<sup>17</sup>, encouraging dentists to err on the side of 'drilling and filling', going against trends in clinical best practice, leading to an emphasis on the speed of treatment rather than quality, and failing to encourage a preventive approach (since dentists were not paid to spend time with patients explaining how they could maintain their dental health). Fee-per-item encourages the use of services by patients on the advice of the dentist and thus inflating dental care costs with little impact on oral health itself. The role of regulation in determining fees is influential in determining costs. Regulated fees are generally negotiated between national dental associations and the health authorities. Costs can only occur when treatment is provided, so

lack of uptake or non-attendance brings the overall cost down. There is no incentive for the funding agency to encourage the use of the services as more use means more associated costs to the state. Fee-per-item financing should be governed by an efficient system of probity that would detect and deter dentists from providing services other than those that are based on need<sup>18</sup>.

#### Fixed salary remuneration

In many European countries, dental services are provided by salaried health board dentist to those under the age of 16. Health authorities generally employ the dentist and control the cost, nature, and extent of the service by determining the terms of reference of employment. The health authority owns the premises and equipments, and has direct control over standards. The advantages of a salaried system are that health care planning is more informed, as dentists' salaries are known in advance and that promotion could be performance related.

The dentist's income is independent of production. They maximise their utility subject to an income-leisure trade-off. Since income is independent of the number of patients, there are no incentives for dentists to work harder. This results in low production, which leads to high costs per patient<sup>7</sup>. Salaried dentists generally provide more prevention services giving a marginal private benefit from the effectiveness of fissure sealants and fluoride applications<sup>13</sup> and greater recall to monitor preventive programmes in place. Producer moral hazard is counteracted as either over-treatment or over-prescribing is not financially rewarded<sup>19</sup>. Advanced innovative treatments can be undertaken with financial loss.

The patient benefits from the greater equity of a service for all on the basis of the need<sup>20</sup>. With a fixed salary, there are no financial incentives to refer difficult cases for secondary

care thus avoiding issues such as over referral, causing increased waiting lists and more unmet need. Fixed salary remuneration allows the targeting of dental services to priority or 'special needs' groups<sup>21</sup>. There is more clinical time for each patient and this is particularly suited to the 'special needs patient' and the 'dental phobic' who can be given the time necessary for proper orientation and multiple appointments can be given if required<sup>13</sup>. With fixed salary remuneration, the location of services can be determined by community needs and not on the individualistic need of a dentist acting in self-interest.

#### Discussion

The author has referenced some of his own studies in this review. These referenced studies have been conducted in accordance with the Declaration of Helsinki (1964), and the protocols of these studies have been approved by the relevant ethics committees related to the institution in which they were performed. All human subjects, in these referenced studies, gave informed consent to participate in these studies.

The incentive-structure in systems of remuneration influences the behaviour of both patient and provider<sup>22</sup>. Consumer incentives are negligible in health care because of asymmetric information as the physician's informational advantage can be used to influence the preferences of the individual<sup>23</sup>. However, a significant influence on consumer incentives results from eligibility for public or private insurance. When an individual becomes eligible for dental services under an insurance plan they may alter their behaviour (moral hazard) and seek more dental care than they would have if they were not insured<sup>19</sup>. Consumer moral hazard arises because insurance eligibility reduces the cost of treatment to zero at the point of consumption and this makes poor oral health less desirable and prevention less vigorously pursued.

This increases the likelihood of poor oral health and increases the probability of requiring dental services. The zero cost at the point of consumption as a result of insurance encourages a higher rate of utilisation than would otherwise be efficient. This creates a gap between the costs of what is provided and the value or willingness to pay for it. The over-consumption of services results in a welfare loss to society as a whole. Consumer moral hazard can be counteracted by a co-payment system, whereby the patient pays some fraction of the dental fee. This provides a financial incentive to prevent oral disease and reduce consumption of dental services. Dentists' behaviour can be influenced by the type of graduate education, organisation of dental services at the clinical level, and accountability with the system of delivery (probity).

### Conclusion

The optimal dental contract may be a 'blended' payment system whereby dentists receive a proportion of their income through capitation, a proportion from *fee-per-item*, and proportion from *fixed salary* or allowances. The *per capita* element would ensure more equity in access to dental services for the whole population and encourage prevention. The proportion from *fee-per-item* would maximise productivity and patient visits. The proportion from *fixed salary* or allowances should be performance related with financial incentive associated with achieving defined and measurable goals related to care processes. This may encourage dentists to form group practices.

A 'blended' payment system with an adjustable incentive formula, negotiated between the dental association and the agency providing remuneration, will act to counteract any variation in either patterns of treatment need or geographical variations. The *fee-per-item* element could have the highest weighting where the population of high-risk to caries

patients was the greatest. The *per capita* element could have the highest weighting in areas with the highest dentist to population ratios, and thus reduce the likelihood of supplier inducement. The blend of incentives can be adjusted periodically based on the requirements of policy makers.

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