The role of payments systems in influencing oral health care provision

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Methods of Remuneration for Health Care Services

- Salaried
  - Public Dental Service
- Fee per Item of service
  - Dental Treatment Services Scheme
  - Fee per Item with co-payment
    - Dental Treatment Benefit Scheme
- Capitation
  - GP Medical Card Scheme
- Bundling
  - DeCare Dental
- Blended
Methods of provider payment are ways of sending messages to providers about how you want them to behave.

Methods of provider payment generate rewards for provider behaviour and, insofar as providers respond to these messages, they determine the allocation of health care resources (what services are produced) and the distribution of health care services (who receives those services), and hence the level of provider income.

<table>
<thead>
<tr>
<th>Method</th>
<th>Basis of payment</th>
<th>Total expenditure</th>
<th>Increase income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>Inputs (time)</td>
<td>$E = \frac{E}{T} \times \frac{T}{P} \times P$</td>
<td>Increase time</td>
</tr>
<tr>
<td>FFS</td>
<td>Throughputs (services)</td>
<td>$E = \frac{E}{Q} \times \frac{Q}{P} \times P$</td>
<td>Increase services</td>
</tr>
<tr>
<td>Capitation</td>
<td>Responsibility (clients/patients)</td>
<td>$E = \frac{E}{N} \times \frac{N}{P} \times P$</td>
<td>Increase clients</td>
</tr>
</tbody>
</table>

$E = \text{Total Expenditure}$, $P = \text{number of providers}$, $T = \text{provider hours}$, $Q = \text{services provided}$, $N = \text{clients served}$, $E/T = \text{wage rate per hour}$, $E/Q = \text{average service fee}$, $E/N = \text{average capitation fee}$

Salaried Remuneration

• Fixed salary payments, for example, are deemed useful when the providers (Agent) have objectives that are closely aligned with those of the patient/payer (Principal).

• In such circumstances the agent (Dentist) can be induced to behave in the principal’s interest by simply ensuring that it is worth working.

• With fixed salary, the dentist’s income is independent of service provision, with incentives for low production.

• Potential to leads to high costs per patient.

• Salaried dentists generally provide more prevention services,

• Can allow for the targeting of services to priority or ‘special needs’ groups.

• Patient benefits from the greater equity of a service and the

• Location of service can be provide by community needs
Evidence: Salaried to Salary + Incentive

Example 1:

Norwegian natural experiment PILOT STUDY in 2009
• Experiment dentist offered 2 contract options:

1. Fixed salary with responsibility for 1,100 patients
2. Fixed salary with responsibility for 1,100 patients + capitation payment of NOK 225 for each additional patient in age 1-18)
• Dentists were free to choose the type of contract – but not the patients

The main finding was dentists reacted to an incentive based remuneration system.
• This led to an increase in the number of individuals under supervision, without either a fall in quality or a patient selection effect.
• There was also a reduction in cost per patient.
• Grytten et al., believe that the results, to a large extent, can be generalized to the public dental services in other counties in Norway.

Evidence: Salaried to Activity

Example 2:

• Chalkey et al., (2008) utilise the natural experiment of the change in dental contract in England Wales, with Scotland (where the contract did not change) as a control, to assess the impact of a move to activity-based financing on both the overall volume of treatments and the measure of dentists’ activity derived from the contractual arrangement.

• Result: the adoption of activity-based remuneration led to an increase in activity, as evidenced by an upward shift relative in activity exhibited in a part of the NHS that were not subject to the change in contractual terms.

• The magnitude of the increase in activity depends on the form of remuneration that was in place prior to the activity-based contract.

• It is largest, over a 40% increase, for dentists who were closest to a salaried arrangement

• It is small and not statistically significant for those dentists who were under a fee-for-service arrangement.

Summary: Fixed Salary Remuneration

**PROS**
Cost, nature and extent of service controlled by HSE
HSE owns the premises and equipment and has direct control over standards
Service provided on the basis of need, greater equity of service
Allows for targeting of "special needs" groups
More clinical time for each patient and as a result prevention services more likely
Location of service can be determined by community needs
No financial incentives to refer difficult cases for secondary care

**CONS**
Dentists income is independent of production
Dentists maximise their utility subject to an income-leisure trade-off
Income is independent of the number of patients, there are no incentives for dentists to work harder
Low production, which leads to high costs per patient
Fee-for Service Remuneration (FFS)

• FFS is the most common payment system in dental service provision for adults.

• 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 provider moral hazard can occur in the form of supplier inducement.
Evidence of FFS

- Atchinson and Schoen (1990) found that in US, patients of dentists paid by FFS had more visits, and more services provided than patients paid by capitation.

- Overtreatment, occurred among dentists paid by FFS practices.

- Under-treatment occurred among dentists paid by capitation..

• The amalgam fee increase of December 1999 influenced the behaviour patterns of providers.
• System changes can be used to change the emphasis from a scheme that was principally exodontia/emergency based to a scheme that is more conservative and based on restoration/prevention.

 Evidence of FFS, DTSS 2001

Summary Statistics on DTSS Utilisation 2001

<table>
<thead>
<tr>
<th>Health Board</th>
<th>Mean Number of Visits Per Patient Per Dentist</th>
<th>*Mean Treatments Per Patient</th>
<th>Mean No. of Oral Examinations Per Patient Per Dentist</th>
<th>Mean Number of Restorations Per Patient Per Dentist</th>
<th>Mean Number of Extractions Per Patient Per Dentist</th>
<th>Mean Number of Prophylaxis Per Patient Per Dentist</th>
<th>Ratio Persons Treated To Dentists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - ERHA</td>
<td>1.29</td>
<td>5.32</td>
<td>0.97</td>
<td>2.05</td>
<td>0.55</td>
<td>0.79</td>
<td>152: 1</td>
</tr>
<tr>
<td>2 - MHB</td>
<td>1.30</td>
<td>5.10</td>
<td>0.95</td>
<td>1.62</td>
<td>0.68</td>
<td>0.69</td>
<td>193: 1</td>
</tr>
<tr>
<td>3 - MWHB</td>
<td>1.31</td>
<td>4.92</td>
<td>0.96</td>
<td>1.66</td>
<td>0.61</td>
<td>0.75</td>
<td>192: 1</td>
</tr>
<tr>
<td>4 - NEHB</td>
<td>1.32</td>
<td>4.91</td>
<td>0.94</td>
<td>1.50</td>
<td>0.49</td>
<td>0.78</td>
<td>164: 1</td>
</tr>
<tr>
<td>5 - NWHB</td>
<td>1.25</td>
<td>5.12</td>
<td>1.00</td>
<td>1.85</td>
<td>0.53</td>
<td>0.80</td>
<td>272: 1</td>
</tr>
<tr>
<td>6 - SEHB</td>
<td>1.33</td>
<td>5.08</td>
<td>0.95</td>
<td>1.69</td>
<td>0.65</td>
<td>0.72</td>
<td>200: 1</td>
</tr>
<tr>
<td>7 - SHB</td>
<td>1.42</td>
<td>5.52</td>
<td>1.03</td>
<td>2.03</td>
<td>0.44</td>
<td>0.83</td>
<td>173: 1</td>
</tr>
<tr>
<td>8 - WHB</td>
<td>1.35</td>
<td>5.27</td>
<td>0.95</td>
<td>1.85</td>
<td>0.53</td>
<td>0.74</td>
<td>261: 1</td>
</tr>
<tr>
<td>Total Average</td>
<td>1.33</td>
<td>5.22</td>
<td>0.97</td>
<td>1.87</td>
<td>0.54</td>
<td>0.78</td>
<td>184: 1</td>
</tr>
</tbody>
</table>

- In 2001, SHB had **the highest no of dentists per inhabitant, highest number of visits per patient, highest intensity of treatment items per episode of care**.
- Given that treatment need as evidenced by NSAOH 2000/01 was not above average in SHB, this implies that dentists maybe reacting to economic incentives by inducing recall visits and over-providing services within the episode of care......Woods (2005) PhD Dissertation
Evidence of FFS, DTSS

• There was a substantially lower than average provision of Extra-Oral Radiographs in regions where regulation was stringently applied.

• The provision of Prolonged Periodontal Treatment was positively correlated with price.

• The dentist-to-population ratio is positively correlated with claims for Surgical Extractions.

• Conclusions: There is evidence from within the funding system that economic incentives, arising from either the contract itself or due to the geographical structure of the dentist workforce in Ireland, leads to variations in certain items of service provision which are potentially inefficient and independent of known treatment need. ....Mullen et al., (2013) Journal of OA Dentistry
SUMMARY: Fee-for-Service

**PROS**

Dentist rewarded according to the amount of work undertaken
Emphasis on productivity, encourages the delivery of care and maximizing patient visits
It solves the problems of patient selection and under-treatment
Equipment and premises are provided and maintained by the dental practitioner, minimising capital input and investment by the state
Incentive to keep costs down so as to maximise profit minimising inflationary pressures on the service
No incentive for supervised neglect and there is a financial incentive to carry out treatment earlier
Greater allegiance to patients with a financial incentive to follow-up non-attenders and to institute an efficient re-call system

**CONS**

Potential incentive to “over-treatment” or “supplier induced demand”
Incentive to err on the side of “drilling and filling”, going against trends in clinical best practice
Emphasis on the speed of treatment rather than quality
Lack of incentive to encourage a preventive approach
No incentive for the funding agency to encourage the use of the services as more use means more associated costs to the state
Encourages the use of services by patients on the advice of the dentist thus inflating care costs with little impact on oral health itself
Capitation Remuneration

• Most acceptable in terms of Exchequer financing

• 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

• Fewer dentists required; education/training costs reduced, thus reducing public expenditure
• Patient access and coverage should more equitable.

• Separates the link between the amount of service provided and financial reward.

• Capitation may encourage more preventive activities as the dentist’s future income is not dependant of service provision.
Capitation

• GMS medical card holders in the Republic of Ireland receive GP services in a capitation scheme.
• Capitation payments are weighted by gender and age only – there is no adjustment for important drivers of need such as deprivation or morbidity burden.
• This disadvantages GPs with older, deprived medical card populations, who must work harder to care for their patients than GPs with younger or more affluent populations.
• It also discourages GPs from locating in areas with older, deprived populations.
• As regards patient selection, most patients select their GP rather than the other way around.
• The only case where GPs would not sign up a GMS patient is if they feel they have no capacity and their list is “closed” – this tends to happen at patient numbers above the limits for attracting additional practice subsidies from the HSE (1,200 patients).
• While some practices have closed their lists in recent years, the majority are open to patients without discrimination.
# Public Capitation Plans—Evidence

<table>
<thead>
<tr>
<th>Spain (Basque)</th>
<th>Macedonia</th>
<th>Sweden</th>
<th>Northern Ireland</th>
<th>Scotland</th>
<th>New Zealand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children 7-15</td>
<td>All population, but adults co-pay</td>
<td>A capitation model corresponding to an insurance policy</td>
<td>Under 18 or in full-time education Capitation payment to GDS for children</td>
<td>Under 18 or in full-time education</td>
<td>Up to age of 12 at 12 month intervals</td>
</tr>
<tr>
<td>Education, Annual check-up</td>
<td>Routine oral exam, Providing oral hygiene advice, Consultations, plaque control, Plaque removal Preventive treatments</td>
<td>Annual examinations Risk classification</td>
<td>The care and treatment necessary to secure and maintain oral health</td>
<td>0-2: toothbrushing instruction and dietary advice. 3-5: +oral exams 6-17 + all clinical prevention</td>
<td>Examination One surface fillings Scale &amp; Polish Radiographs Fissure Seals Topical fluorides Education</td>
</tr>
<tr>
<td>Treatment of decay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Outcome:** Achieved greater equity in access by socioeconomic level compared to salaried dentists

**Outcome:** Not stated

**Outcome**
Capitation patients were more often female and well educated. Had healthier habits, were more motivated to follow self-care advice, Judged their oral health to be very good and considered oral health to be very significant for their wellbeing.

**Outcome:** DMF score of 2.96 or above, is accepted into capitation by a dentist, the dentist shall be paid an additional sum equal to 50% of the appropriate basic fee.

**Outcome:** Not stated

**Outcome:** Not stated
Changing from FFS to Capitation
- for the delivery of dental care to children under the UK NHS

• Coventry et., (1989) involved four paired comparisons of dental care of children based on selected UK communities (rural, urban, suburban and Scotland, which has markedly poorer oral health than the other parts of the UK).

• The mean number of filled teeth per child and the mean percentage of children having one or more teeth extracted were lower among children living in communities served by dentists paid capitation compared to children from communities served by dentists paid FFS.

• However the mean percentage of children receiving active preventive advice was higher in communities served by dentists paid capitation.

• The prevalence of decayed teeth was higher in communities served by dentists paid capitation but this difference was only statistically significant in one of the pairs of communities.

Changing from FFS to Capitation
- for the delivery of dental care to children under the UK NHS

• Brocklehurst et al., (2013) report that “dentists working under capitation arrangements restored carious teeth at a later stage in the disease process than those working under fee-for-service arrangements, but this delay did not appear to compromise dental health."

• The baseline mean DMFT were unbalanced in two of the four pairs, with the differences favouring the FFS communities.

Changing Payment from Capitation to Capitation plus targeted FFS (i.e., blended payments) for specified preventive procedures for the delivery of dental care to children in Scotland under the UK NHS.

• The mean percentage of 12-14 years olds receiving fissure sealants on second permanent molars was 7.1% higher among those served by dentists receiving the additional FFS payment than among those served by dentists who received only capitation.


• After adjusting for the deprivation category for the area of practice, the number of partners in the practice, the throughput of 11 to 13-year-old patients, and the number of restorative fissure sealants placed on first permanent molars at baseline, the percentage difference in children receiving the sealants between those served by dentists with the FFS incentive and those served by capitation-only dentists increased to 9.8%.

• Dentists receiving additional FFS for targeted services provided more care for which they received more pay.

Broklehurst, P., Tickle M., Birch S., et al., 2013)
Summary: Capitation

**CONS**

A *per capita* system can lead to what is termed supervised neglect
The possibility for patient selection and under-treatment
High administration costs where the population is scattered widely
Incentive is to minimize the time spent per patient in order to maximise your panel of patients. That may result in untreated dental disease
Dentists have less time for prevention, for giving advice, or for carrying out preventive procedures such as fissure sealing
The incentive is to **under-prescribe, under-diagnose, and under-treat patients to reduce costs, and therefore maximize net profit.** (Of course, dental care providers cannot ethically refuse to see a patient on the basis of the capitation payment schedule.)

**PROS**

Most acceptable in terms of Exchequer financing
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
Fewer dentists required; education/training costs reduced, thus reducing public expenditure
Patient access and coverage should more equitable.
Separates the link between the amount of service provided and financial reward.
Capitation may encourage more preventive activities as the dentist’s future income is not dependent on service provision.
Bundling

- **Bundled payment**, also known as, **episode-of-care payment**, is defined as the reimbursement of health care providers “on the basis of expected costs (risk) for clinically-defined episodes of care.” – it’s a form of Price Discrimination

- It has been described as "a middle ground" between fee-for-service reimbursement and capitation.

- Bundled payments have been proposed in the health care reform debate as a strategy for reducing health care costs, especially during the Obama administration (2009–present).

- Commercial payers have shown interest in bundled payments in order to reduce costs.

- In 2012, it was estimated that approximately one-third of the United States healthcare reimbursement used bundled methodology.

- DeCare Dental Bundle their treatment [plans](#).
Evidence from NHS – FFS to Bundling

- **NHS Dental Bands**

- In the UK NHS provider payment arrangements changed in 2006 with a FFS system being replaced by three ‘course of treatment’ payment bands.

- As a result many items of treatment that previously carried different fee levels were now paid the same amount.

- An analysis of trends in service items found that within a very short period under the new payment arrangements the mix of service types changed rapidly with services that require less dentist time (e.g., extractions) ‘replacing’ services that require more dentist time (e.g., restorations)....

Bundling - Exemplar

**Prevention**
€xx
- Clinical exam
- Ortho assessment
- Treatment plan
- X-rays
- Advice on prevention
- Fissure sealants
- Pathological exam
- Adjust false teeth
- Scale and polish if clinically needed

**Routine Treatment**
€xxx
- Amalgam Restorations
- Composite restorations
- Extractions
- Exodontics
- Surgical extraction
- 1st stage Endodontics
- Denture repairs

**Below the Line treatment**
€xxx
- Dentures
- Crowns
- Bridges
- Braces
- Inlays
- 2nd Stage Endo
- Extra Oral Radiographs
Bundling

- **NHS Dental Bands**

- ‘Splitting’ – doing the minimum to gain a payment Steele Report

- ‘Gaming’ treatment offered is the most profitable option. Steele Report

- ‘Jibing’ switching between bundles
There will be two 'blends' of remuneration tested in prototypes Dec 2015/Jan 2016:

**Blend A - capitation** will amount to 35% of the contract value and activity 55%.
Capitation: Band 1 treatments
Activity: Band 2 and 3 treatments

**Blend B - capitation 65% and activity 25%, the remaining 10% in each for quality payments.**
Capitation: Band 1 and 2 treatments
Activity: Band 3 treatments

The prototype remuneration model will remunerate for activity with the aim of balancing incentives for treatment and continuing care. Activity will continue to be measured in units of dental activity (UDAs), with band 2 treatments accounting for 2 UDAs (blend A only) and band 3 treatments counting as 11 UDAs. (p 18 Capitation Report).
Researchers from the RAND Corporation estimated that "national health care spending could be reduced by 5.4% between 2010 and 2019" if the PROMETHEUS model for bundled payment was adopted.

This figure was higher than for seven other possible methods of reducing national health expenditures. In addition, RAND found that bundled payments would decrease financial risk to consumers and would decrease waste.

With bundled payments, there is no incentive to carry out unnecessary care. Bundled payment can provide transparency for consumers by fixing pricing.

The scientific evidence in support of it has been described as "scant." For example, RAND concluded that its effect on health outcomes is "uncertain." There is an administrative and operational burden, for example in establishing fair compensation rates. Small sample sizes and incomplete data may cause difficulties in calculating proper rates for bundled payments. If rates are set too high, providers may provide unnecessary services; if rates are set too low, providers may experience financial difficulties or may provide inadequate care.
Blended Approach
(part capitation and part activity)

• Providers are remunerated based on a combination of the number of patients cared for and activity delivered.
• One option for a blended approach would be for a capitation approach to be used to remunerate the first part of the care spectrum (i.e. care that is relatively speaking more predictable) whilst an activity-based approach could be used for the remainder of the care spectrum.

Care Spectrum

A blended approach seeks to harness the best features of capitation and activity approach in such a way that the negative aspects of each are reduced.
• In a blended approach you need to manage the delivery of two remuneration metrics - patient numbers and activity.
• You need to determine what element of the care spectrum covered by capitation and it may be that the element of care covered by capitation increases over time.
• We need to construct a blend that offers us the right balance, neither over- or under- incentivising treatment and giving practitioners the flexibility to exercise clinical judgement and look after their patients in the way that best promotes their oral health.
Exemplar: Blended Remuneration
A blend of payment systems

'Blended' Remuneration

Capitation - Patient care payment

Fee per item of service

ACCESS
Time Limited Registration
Patient appraisal
Scale and Polish
Cancer screening
Prevention tool kit

QUALITY
Patient Experience
Patient safety
Clinical Effectiveness
Peer Review

ACTIVITY
Extractions
Fillings
Dentures
SDA
ART

ACTIVITY
Services requiring prior approval
Crowns
Bridges, etc.
Blended Remuneration

During the past decade, primary health care reform initiatives have included a shift from unitary physician payment methods (mainly fee-for-service but also capitation or salary) to payment arrangements that include blends of fee-for-service, capitation, salary, or payments per session, and targeted payments designed to encourage or reward the provision of priority services (Hutchinson et al., 2011)


The optimal dental contract may be a ‘blended’ payment remuneration 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’ remuneration 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 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.
Conclusion

The method of remuneration influences both consumer and provider behaviour.

- There are PROS & CONS with each method of remuneration

- The method chosen should be influenced by the decision makers outcome requirement for the service.

- If cost containment is a desired outcome then FFS is not desirable.

- With FFS, it is highly desirable to have this method of remuneration supported by quality assurance and probity.

- Capitation would ensure more equity in access to dental services for the whole population and encourage prevention.
Conclusion

• With salaried remuneration, it is highly desirable to have this method tied to promotional opportunities.

• Private Insurance companies tend to favour ‘Bundling’ as it allows them greater control over costs and thus favours profit maximisation.

• Actuarial risk assessment of population is required for accurate pricing of bundles.

• With bundling its important to get price and content balanced.

• Payers of bundles have an incentive to promote prevention in order to reduce long run costs.