PAPER I

PAY SCHEME PREFERENCES AND HEALTH POLICY OBJECTIVES

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ABSTRACT

This paper aims at studying preferences among health care workers for pay schemes involving different levels of risk. Which pay scheme would they prefer for them selves, and which do they think best further health policy objectives? The paper adds methodologically a way of defining pay schemes including different levels of risk. A questionnaire was mailed to a random sample of 1,111 dentists. The respondents gave information about their current and preferred pay schemes, and indicated which pay scheme, in their opinion, would best further overall health policy objectives. A total of 504 dentists (45 percent) returned the questionnaire. There was no indication of systematic non-response bias. All *public* dentists had a current pay scheme based on fixed salary, and the majority preferred a pay scheme with more income risk. Their preferred pay schemes coincided with the ones believed to further stability of health care personnel. The predominant current pay scheme among the *private* dentists was based solely on individual output, and the majority preferred this pay scheme. Their preferred pay schemes coincided with the ones believed to further efficiency objectives. Both public and private dentists believed that pay schemes furthering efficiency objectives had to include more performance-related pay than the ones believed to further stability and quality objectives.

Keywords: income risk levels, performance-related pay, dentists

INTRODUCTION

The choice of payment system for health care providers is an essential health policy issue. Different payment systems give incentives for different behaviour among health care personnel; fixed salary provides incentives for shirking, performance related pay (PRP) for concentrating on those aspects of the job that are measured, and misrepresenting output. The exposure to income risk is very different between salaried workers and those solely dependent on PRP, and a risk-averse worker will – if offered a choice – most likely choose fixed salary if sufficiently profitable, whereas a risk-seeking will choose PRP. As such, payment systems induce self-selection of a workforce that benefit from the inherent incentives (Gibbons, 1998). The third party payer will on the other side prefer a payment system believed to further health policy objectives.

In the private sector health care personnel often work in small scale practices with an income based on PRP. In large scale public organisations health personnel often have a fixed salary. PRP is possible to implement when it is easy to *measure* output and easy to make it *attributable* to a single worker or a work team. Some parts of health care suits this description well independent of organisation size, while others definitely do not. Dentistry serves as an example of a health care sector where output can easily be measured, and where output is possible to attribute to the activity of one worker only. This article, empirically set in Norwegian dentistry, aims at studying dentists' preferences for different pay schemes involving different levels of risk. The general research questions addressed are: i) which pay scheme would health care workers offering health

care with easy measurable and attributable output prefer for themselves, and; ii) which do they think best further health policy objectives.

In this article the general term PRP is used and not the term fee-for-service which is commonly used in health economic settings. Most often a fee set for a service in a health care setting is a fixed amount of money negotiated through government involvement. A very large part of Norwegian dentistry does not operate on such fee-for-service, therefore it is considered more appropriate here to use the term PRP.

Empirical context: The market for dental care in Norway

In Norway, provision of dental care is characterized by a distinct split between public and private provision. The counties are responsible for the Public Dental Service (PDS) which offer free dental services to specific groups of the population: children and adolescences under 18 years old, all mentally handicapped people, and certain senior citizens. It also offers subsidized services for 18-20 year olds.

The PDS operates on fixed public budgets. Dentists who work in the PDS are county employees covered by collective agreements. Wage setting for employees covered by collective agreements takes place at two levels: national and firm. At the national level wage regulations, working hours, working conditions, pensions, medical benefits, etc. are negotiated. Firm-level negotiations determine possible local adjustments and additions to the collective agreements (Hunnes et al., 2007). During the last 10-15 years it has become quite common among counties to negotiate local wage agreements which enable the PDS

to offer pay schemes based on a reduction in fixed salary and an addition of PRP for dental personnel. These schemes are optional, and the PRP could either be linked to team output or individual output. The share of PRP has generally been low in relation to the fixed salary. This is because the PRP is not related to the main activity of offering free dental treatment to specific groups, but to a minor activity where treatment is given to adults who pay for services out of their own pocket. It is this income which is shared between the county and the public dentists. According to the Norwegian Dentist Association a PDS dentist earned on average 60,000 euro a year, ranging between 52,000 and 75,000 euro in 2007.

In general, Norwegian adults have to pay all necessary dental treatment themselves. They are mostly served by private clinics, in which the majority (71 percent) of general practicing dentists are working (Abelsen, 2008). There are no public regulations, neither on where a private clinic can be set up, nor which fees can be charged for dental services. The absence of private providers is the main reason why the PDS in sparsely populated areas offer dental treatment to paying adults.

Compared to dentists in the public sector, private dentist are highly exposed to market forces, and carry a large amount of income risk. Most private dentists are self-employed. A recent study showed that 38 percent of the private dentists work in solo practices (Grytten et al., 2007). The private dental care businesses are dominated by sole proprietorships. A sole proprietor is not separate from the individual; what the business makes, so does the individual. Grytten et al (2007) estimated the sole proprietorship share

to 65 percent of dental care businesses. The rest are organized as limited companies (31 percent) or companies with shared liabilities - where each participant is directly liable for his/her relative ownership of the company. The net profit among self-employed dentists was according to Statistics Norway, on average 113,000 euro in 2006.

Pay schemes set in a principal/agent context

A pay scheme can be seen as a contract between an agent and a principal. In the standard economic treatment of the principal-agent problem (Baker, 2002; Eisenhardt, 1989; Falk and Kosfield, 2006; Gibbons, 1998; McGuire, 2000; McNabb and Withfield, 2007; Spremann, 1987), on how to make an agent act in the interest of the principal, payment systems both allocate risks and rewards productive work (Holmstrom and Milgrom, 1991). The behaviour of both agent and principal is influenced by pay scheme incentives (Grytten, 2005). A pay scheme can be summarized by the linear equation, $y = s + bx$, where the intercept, s, is the base salary, and the slope, b, is the payment per output, x. Increasing b relative to s creates stronger incentives to increase output but also imposes more risk to the agent. The extreme case, $b = 0$, puts no risk on the agent and offers no financial incentive for increased efforts. The other extreme, $s = 0$, is completely dependent on the agents output, and offers the agent no insurance at all (Gibbons, 1998). The agents input or *effort* is private information and not contractible (McGuire, 2000). This gives the purchaser incentive to prefer payment per output. Lazear and Shaw (2007) argues that the lower the cost of measuring output, the more likely it is that good workers will demand that their output be measured, and hence; the greater the likelihood that pay becomes a function of output.

While the agent stays the same, the principal – or the purchaser – differs between public and private sector dentistry. In the private sector where self employment and sole proprietorship is prominent among agents, the customer (patient) seeking dental care also is the purchaser, similar to an ordinary market in which the consumer is the purchaser/payer i.e. no third party payer. In private group practices the dentists could as well be seen as both agents and principals, not in relation to patients but in relation to their partners (Lang and Gordon, 1995). In the public sector the county authority is the purchaser, acting as principal with the aim to maximize social welfare. In negotiating proper pay schemes the authorities will not only care about the agent's productivity, but will also consider how the agents' behavior affect overall health policy objectives like efficiency, quality, and stability among dentists to maintain continuity of patient care. These objectives are likely to coincide with the interests of patients paying for dental treatment out of their own pockets, but patients' negotiating power towards the agents will be far less than that of the county authorities. There is reason to believe that dentists (agents) are motivated more or less by concern for their patients, for the social good, and self-interests (McGuire, 2000; Scott, 2000).

One of the difficulties in designing pay schemes linking financial incentives to measures of performance is that the incentives may generate unanticipated or dysfunctional behaviour (Prendergast, 1999). Introducing PRP in a fixed salary regime is assumed to increase production per dentist and reward the dentist with higher income. This might improve efficiency (the ratio of oral health improvement to the total input) but may also

result in supplier induced demand (SID). SID is the amount of demand created by dentists that exists beyond what would have occurred in a market where the patient is fully informed (Evans, 1984). If the lack of financial incentives is the reason why dentists leave fixed salary jobs, the introduction of PRP might have a positive influence on stability among dentists, but can in some situations be interpreted as an act of hostility with adverse effects than the ones intended (Bénabou and Tirole, 2003; Fehr and Falk, 2002). The quality of dental care matters to the patient, but quality is difficult to measure and can be seen as non contractible input into the production of oral health, and as such unfit as basis for payment (McGuire, 2000). However, the UK National Health Service introduced a PRP scheme called Quality of Outcomes Framework in 2004. All GPs report their achievements on 146 quality indicators. While the changed practice performance increased their income by about 25 %, the effect on patients is less clear (Gravelle et al., 2008).

In line with Gaynor and Gertler (1995), we assume dentist *i* choose effort to maximize utility according to the following equation:

$$u_i = E(y_i) - B_i \cdot \sigma^2_{yi} - v_i (e_i) \qquad (1)$$

where

$u_i \equiv$ *i*'s utility

$E(y_i) \equiv$ the expectation of *i*'s net income

$B_i \equiv$ the marginal disutility of variation in income (risk-aversion)

$\sigma^2_{yi} \equiv$ the variance of *i*'s net income

$e_i \equiv i$'s effort

$v_i \equiv i$'s private nonmonetary cost of effort

The general description of a pay scheme, which includes the possible range from a fixed salary no risk payment to a solely PRP based full risk payment, can be summarized by the linear equation:

$$y_i = q_i \cdot S_i + \alpha \cdot R \qquad (2)$$

where:

$y_i \equiv$ dentist i's income

$S_i \equiv$ fixed salary for individual dentist i, ≥ 0

$q_i \equiv$ fixed salary share for individual dentist i ($0 \leq q_i \leq 1$)

$R \equiv$ the pot set for PRP, e.g. $= \sum R_i$ net revenues in practice, ≥ 0

$R_i \equiv$ net revenue for individual dentist i, ≥ 0

$\alpha \equiv$ proportion of revenue generated that i keeps ($0 \leq \alpha \leq 1$)

Research questions

The dentists perceptions of risks, unverifiable dentist efforts, and the possibility of conflicting goals in the principal/agent relationship makes it interesting to study any discrepancies between which pay schemes dentists prefer for themselves, and which they believe best further overall health policy objectives. First, this paper compares any discrepancy between dentists' current and preferred pay schemes. Would salaried public dentists be willing to take on *more* risk in their preferred pay schemes? Would performance paid private dentists prefer pay schemes offering *less* risk? Second, we

compare their current and preferred pay schemes with those pay schemes dentists believe best further overall health policy objectives like efficiency, quality, and stability among dentist to maintain the continuity of care. Would dentists' preferences regarding what they think is best for themselves match with what they acknowledge might be best in terms of societal objectives? In which ways should the current pay schemes be changed in order to improve efficiency, quality and stability?

METHODS

Questionnaires were mailed to a random sample of 1,111 dentists in April 2005. The sample was randomly selected among members of the Norwegian Dental Association (NDA), of which 96 percent of all practising dentists are members. The sample included 28 percent of all NDA registered members. The sample size was determined by Cochran's sample size formula and budget constrains (Bartlett et al., 2001). One reminder was sent with an option to fill out an electronic version of the questionnaire on the Internet. The reminder increased the respondent sample by 98 dentists, among whom 51 online. No distinction was made between dental specialists and dentists in general practice.

Based on knowledge concerning local wage agreements in the PDS, and knowledge of the business structure and organisation of private dental care in Norway (Grytten et al., 2007), five different pay schemes can be categorised. The categorisation is based on two general assumptions as well. First, fixed salary imposes less risk to the dentist than payment per output. Second, pay schemes based on team work, as compared to only own

work, imposes less risk to the individual dentist. This is based on the assumption that team productivity is less variable, and therefore less risky, than the productivity of individuals working alone.

Based on equation (2) five pay schemes are described as follows according to the level of risks associated with how predictable dentist income will be:

1. **no risk** ($R = 0$, $q_i = 1$); fixed salary: $y_i = S_i$
2. mild risk; fixed salary + team based PRP: $y_i = q_i \cdot S_i + \alpha \cdot R$
3. moderate risk; fixed salary + individual PRP: $y_i = q_i \cdot S_i + R_i$
4. high risk; only team based PRP: $y_i = \alpha \cdot R$
5. **full risk;** only individual PRP: $y_i = R_i$

The respondents were presented with descriptions of the above mentioned pay schemes and asked to give information about their current and preferred alternative. They were also asked to indicated which, in their opinion, among the five pay schemes would best further three different common health policy objectives: efficiency (maximum oral health for the money spent); technical quality in the dental service delivery, and; stability among dentists to maintain continuity of care. Finally, the questionnaire asked for some background information concerning the respondent's sex, age, employment in public or private sector, municipal residency, and clinic structure i.e. number of dentists in their workplace.

The survey instrument was developed in close collaboration with senior dentists representing a wide range of skills (clinical practice, oral health planning, and research). The questionnaire was pre-tested on a small group of dentists.

For analysis purposes the different pay schemes were assigned rank values ranging from 1 to 5 (i.e. no risk = 1, …, full risk = 5). These values, which we call *risk values*, were used to analyse individual rank differences between dentists' current and preferred pay schemes and the ones they consider best further general dental health policy objectives of efficiency, quality and retention. The risk values are ordinal scale and the distances between the categories are not known. However, in the analyses we treat the risk values as interval scale assuming it to be a reasonable approximation (Allison, 1999).

The data was analysed using frequency and contingency tables, one-sample T-test, chi-square test, multivariate linear regression analysis and multinomial logistic regression analysis. Multivariate linear regression analysis (Allison, 1999) was used to study the relationship between the dentists' current pay scheme and their sex, age, residency, and number of dentists in clinic. All explanatory variables were included as dummies in the analysis. Multinomial logistic regression analysis (Agresti, 2002; Chan, 2005) was used to create profiles of the dentists most likely to prefer more risk in their pay schemes, and those most likely to prefer less risk. The dependent variable constructed and analyzed for this purpose was *risk preference*. The *risk preference* values were categorized as: *no difference* if there was no difference between the dentists current and preferred pay scheme; *more risk* if the risk value of the preferred pay scheme was higher than the risk

value of the current, or; *less risk* if the risk value of the current pay scheme was higher than the risk value of the preferred. The independent variables were the same as those included in the linear regression analysis. SPSS version 15.0 was used to perform the statistical analysis.

DATA

A total of 504 (45 percent response rate) dentists returned the questionnaire. Despite the fact that less than half of the sample responded, there was no indication of systematic non-response bias. There were no significant discrepancies, neither concerning sector of employment (private vs. public) nor the place of residence, among the responding dentists compared to information on members of the NDA. Nor were there significant differences in the gender-mix between responders and non-responders.

The analysis included 478 dentists who reported their main employment in the public (32 percent, 155) or private sector (68 percent, 323). We excluded respondents working in the nonclinical sector (26).

Table 1 shows respondent characteristics. Among the public dentist there was a majority of women, while men outnumbered the women among the private dentists. There was no significant difference in age structure between public and private dentists. The mean age was 48 years among public dentist and 49 among private. There was a higher share of public dentists living in municipalities with a small sized population compared to the

private dentists. Working in clinics with only one dentist (solo practice) was significantly more common among the private dentists than among the public.

RESULTS

The study aimed at exploring two different issues concerning public and private dentists; the current vs. their preferred pay schemes, and; which pay schemes they think best further overall health policy objectives.

Current pay schemes

The last column of Table 2 shows that all public dentists had a current pay scheme based on fixed salary ($S_i > 0$ in the above equation). Fixed salary only was as common as fixed salary combined with PRP. Most PRP schemes were based on the public dentist's individual output.

Among the public dentists a linear regression analysis was performed to study the relationship between current pay schemes and the explanatory variables sex, age, population size of residence municipality, and the number of dentists in the clinic where they worked. The analysis showed that public dentists living in municipalities with a small population (≤10 000) had significantly more risk in their current pay schemes ($p < 0.001$) than other public dentists, and also that female dentists had significantly less risk in their current pay schemes ($p < 0.05$) than their male counterparts ($n = 147$, $R^2 = 0.172$).

The last column of Table 3 shows that three quarters of the private dentists had a full risk pay scheme. Among the remaining a no risk pay scheme was nearly as common as a high risk pay scheme. A linear regression analysis similar to the one performed on the public dentist data showed that older private dentists had significantly less risk in their current pay schemes
($p < 0.05$) than younger ones ($n = 305$, $R^2 = 0.051$).

Current vs. preferred pay schemes

Table 2 shows that among the public dentists, 39 percent preferred their current pay scheme (sum along the diagonal), 50 percent preferred a more risky pay scheme (sum above the diagonal), while 11 percent preferred a less risky one (sum below the diagonal). The public dentists had a strong preference for a moderate risk pay scheme. Among the ones whose current pay scheme was moderate risk, 69 percent would prefer to keep this pay scheme. The majority among the ones with other current pay schemes would rather prefer moderate risk.

The overall mean risk value increased from 1.83 in the current pay schemes to 2.79 in the preferred pay schemes among the public dentists. The mean difference in risk value between individual dentist's preferred and current pay scheme was 0.73, a number significantly different from 0 (one-sample t-test, $p < 0.001$). This is interpreted as a general willingness among the public dentists to take on more risk in their preferred pay schemes compared to the current situation.

The majority among the private dentists (62 percent) preferred their current pay scheme (sum along the diagonal), 26 percent preferred a less risky pay scheme (sum below the diagonal), while 12 percent preferred a more risky pay scheme (sum above the diagonal). Even if most private dentists (60 percent) would prefer a full risk pay scheme, as much as 26 percent preferred a moderate risk pay scheme (see Table 3). Compared to the current situation where less than 3 percent had a moderate risk pay scheme, this could be interpreted as a clear preference for less risk among the private dentists. Among the ones who currently had other pay schemes than full risk, there was a preference tendency towards moderate risk.

The overall mean risk value reduced from 4.44 in the current pay schemes to 4.13 in the preferred pay schemes among the private dentists. The mean difference in risk value between individual dentist's preferred and current pay scheme was -0.32, a negative number significantly different from 0 (one-sample t-test, $p < 0.001$), might support the general impression of a preference for less risk among the private dentist but it is probably more appropriate to say that the private dentists fall into two groups. The majority prefer a full risk pay scheme while a minority prefer reduced risk.

The multinomial logistic regression analysis presented in Table 4, shows that among the public dentists the probability of preferring more risk increased significantly if the dentist was a woman, and decreased significantly if the dentist lived in a low populated municipality. Among the private dentists the probability of preferring less risk increased significantly if the dentist worked in solo practice (see Table 4).

Pay schemes and health policy objectives

Table 5 shows that the majority among the public dentists believed a moderate risk pay scheme best further efficiency and stability objectives. Concerning quality objectives, the share in favour of a moderate risk pay scheme was lower, and nearly similar to the share in favour of a no risk pay scheme. Among the private dentists the majority believed a full risk pay scheme best further efficiency and quality objectives. Concerning stability, the share favouring a moderate risk pay scheme was lower but not very different from the share favouring a full risk pay scheme.

Public and private dentists differed significantly in their opinion concerning which pay scheme best further efficiency, quality and stability objectives. However, the mean risk values had the same ordering between the public and private dentists; efficiency had the highest mean risk value and quality the lowest.

The results in Table 6 shows that among the public dentists the *current* pay schemes impose significantly less risk to the agent, than those they believe best further efficiency, quality and stability objectives. The opposite is true among the private dentists, as the current pay schemes impose significantly more risk to the agent than those they believe best further efficiency, quality and stability objectives. Among the public dentists the *preferred* pay schemes coincided in general with the ones believed to best further stability objectives, but impose less risk than believed to best further efficiency objectives, and more risk than believed to best further quality objectives. Among the private dentists the

preferred pay schemes coincided in general with the ones believed to further efficiency objectives, but impose more risk than believed to further quality and stability objectives.

DISCUSSION

Dentists serve as an example of health care workers offering health care with easy measurable and attributable outcome. The results from this study indicate a general preference among dentists for pay schemes including performance-related-pay (PRP). Public dentists would like to be exposed to more PRP, while private ones are happy with their current high exposure to income risk. Hence; some amount of PRP is preferred by the agents not only by the principal. However, the amount of income risk dentists are willing to take on, differed between dentists in public and private sector, i.e. public dentist are in general more risk-averse than private.

Several experimental studies have shown that preferences are dependent on current entitlements (the endowment effect) (List, 2004). Prospect theory posits that individuals tend to think in terms of gains and losses rather than in terms of net assets, and therefore encode choices in terms of deviations from a reference point (usually the status quo) (Kahneman and Tversky, 1979). The endowment effect might contribute to explain the difference in public and private dentists' pay scheme preferences. Accordingly, dentists place a higher value on payments they have than payments that they do not have.

The endowment effect and degree of risk-affinity could be factors to explain why public and private dentists differed significantly in their opinion concerning which pay scheme

best further efficiency, quality and stability objectives. The public dentists are assumed to be risk-averse with preferences formed in a competition protected PDS context, while private dentists are assumed to be risk-seeking with preferences coloured by the market competition they experience in their everyday life. However, the mean risk values of the pay schemes believed to further the three different overall objectives had the same ordering between the public and private dentists; efficiency had the highest mean risk value and quality the lowest. This could mean that both public and private dentists in general believe that a pay scheme furthering efficiency objectives has to include more PRP than one believed to further stability and quality objectives. In other words; one pay scheme is not believed to simultaneously further all the three different objectives. This is vital information to a third party payer (principal). When choosing payment system the principal has to decide which objective they see as most important to achieve.

One in two public dentists had a current pay scheme combining fixed salary with PRP, a type of contracts that were most common among public dentists living in municipalities with a small population. This indicates that PRP is used systematically by the Public Dental Service as a strategic measure in areas where recruiting and retaining dentists is an old and recognised challenge. The majority among the public dentists believed a moderate risk pay scheme best further efficiency and stability objectives. Concerning quality objectives, public dentists were close to evenly divided between moderate risk and no risk pay schemes.

A move from fixed salary to a PRP based pay scheme generally have two different effects: an efficiency effect and a selection effect (Garibaldi, 2006; Lazear, 2000). The selection effect refers to a change in the composition of the workforce. PRP is relatively more attractive to more able workers (Prendergast, 1999). Workers who value intrinsic internal motivation more than extrinsic rewards will gravitate towards salaried jobs (Lazear and Shaw, 2007). The efficiency effect refers to the improvements in performance and productivity of workers that are already in the firm (Garibaldi, 2006). In this case, where dentists already working in the PDS say they prefer moderate risk pay schemes in favour of fixed salary, and the majority among the public dentists share the preference for this particular pay scheme, there is reason to believe that a change to PRP will give an efficiency effect. The strong preference for individual PRP among public dentists indicates slack in today's organisations which might be decreased with proper payment incentives. The study results suggests that the possibility of choosing a more risky pay scheme is welcomed among public dentists, and believed to have a positive impact on both stability and efficiency. A general offer of fixed salary combined with individual PRP to all public dentists might, however, be difficult to implement with today's contracts where the PRP share stems from adult treatment income. Outside low populated areas adults are treated in private clinics and not in the PDS, so there will be no income to share between the PDS and the dentists. Hence, to meet with dentist preferences the PRP pot has to somehow originate from the fixed PDS budgets.

The probability among private dentists of preferring a less risky pay scheme increased significantly if the dentist worked in solo practice. This could be explained by the

absence of third party regulations of fees and clinic establishments in Norwegian private sector dentistry. In theory this means that private dentists are competing for patients in a free market. It is however considered a key question to what extent (Grytten, 2005). The result might indicate that solo practicing dentists experience more competition, and hence more risk attached to their income than wanted. Gaynor and Gertler (1995) state several reasons to organise group practices; to exploit economies of scale, to internalise referrals, to smooth work schedules, exploit reputational economics of scale, and risk-aversion caused by significant and risky investments in own human capital. By merging into group practices and seeking employment rather than self-employment, less risky pay schemes can be accomplished. A capitation system could contribute as well to less risky pay schemes, but will probably require public funding or at least public regulations of adult payments for dental services.

Payment per output links income directly to the volume of service provided and has been studied most widely in the context of supplier induced demand (McGuire, 2000). Competition for patients can influence the dentist to induce demand for dental treatment, which in case increases costs for patients. The presence of supplier induced demand in Norwegian dentistry under the former fixed fee system was studied by Grytten et al (1990), Grytten (1991) and (1992). The conclusion from these studies is that demand for dental care was indeed supplier induced. The fixed fee system was replaced by a free pricing system in 1995. Grytten and Sørensen (2000) claimed to find some evidence against the inducement hypothesis, but their results still indicated that high costs imposed in search for cost-effective treatment, and high transaction costs of changing dentist,

unable the patient to put necessary pressure on the dentists to offer cost-effective treatment. However, the majority among the private dentists in this study believed a full risk pay scheme best further efficiency objectives. Based on knowledge of the presence of supplier induced demand this result might articulate self-serving interests. Norwegian government does in principle not share any risk associated with adult dental treatment, either with the private dentists or the adult population. The results from this study indicate that third party risk-sharing might meet both with the minority of private dentists who preferred less risky pay schemes, and with vital patient benefits of quality and stability of care.

The study has certain limitations and weaknesses. One is of course the relatively low response rate. With a response rate below 50 percent, one should be cautious about generalizing the findings. However, non-response can, but need not, induce non-response bias in survey estimates (Groves, 2006). In this study there is no indication of non-response bias. The uncertainty related to the respondents understanding of the pay scheme descriptions also gives reason for caution. We do not know for certain that the dentists understand what the descriptions intend to describe, e.g. if they get that fixed salary combined with PRP means a lower amount of fixed salary and not same amount of fixed salary and additional PRP. The reliance on hypothetical choices concerning the dentists preferred pay schemes raises obvious questions regarding the validity of the method and generalisation of the results. The use of hypothetical choices relies on two assumptions; that people often know how they would behave in actual situations of choice, and that they have no reason to disguise their true preferences.

It should be acknowledged that in general terms, people might interpret efficiency and quality as dependent variables in the sense that if quality is low, efficiency is compromised. In this study efficiency and quality are perceived to be independent variables, and they also seem to be understood as different concepts by the respondents. A patient may for instance be given dental treatment of low technical quality which removes pain (i.e. improves oral health), and as such is efficient. It is also possible to be given dental treatment of high technical quality with no certain health effect (e.g. change of filling from amalgam to composite).

This paper adds methodologically a way of defining pay schemes including different levels of risk. Empirically the study is set in a rather rare, but interesting context where pay schemes ranging from no risk to full risk actually is in current use. The data reveals information from agents asked to think as principals. A health policy lesson learned is that the choice of payment system for health care also is a choice of health policy objectives.

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Table 1: Respondent characteristics. Percent.

Variable	Value	Public dentists n = 155	Private dentist n = 323	Chi-square p-value
Sex	Male	42	70	< 0.001
	Female	58	30	
Age	< 40 years	29	25	0.312
	40 – 54 years	38	45	
	> 55 years	33	30	
Municipal residence	Small : ≤ 10 000 inhabitants	28	13	< 0.001
	Middle: <10 000 – 50 000] inhab.	29	39	
	High: > 50 000 inhabitants	43	48	
Number of dentists in clinic	1	19	38	< 0.001
	2-3	42	47	
	4 or more	39	15	

Table 2: *Public* dentists' current and preferred pay schemes. Percent. n=143.
(The share above the diagonal prefers *more* risk, while the share below prefers *less* risk.)

	Preferred pay scheme					
Current pay scheme (risk value)	no risk (1)	mild risk (2)	moderate risk (3)	high risk (4)	full risk (5)	Total
no risk (1)	11.9	9.8	26.6	0.7	1.4	50.3
mild risk (2)	3.5	4.2	8.4	0.0	0.7	16.8
moderate risk (3)	4.9	2.1	23.1	0.0	2.8	32.9
high risk (4)	0.0	0.0	0.0	0.0	0.0	0.0
full risk (5)	0.0	0.0	0.0	0.0	0.0	0.0
Total	20.3	16.1	58.0	0.7	4.9	100.0

Table 3: *Private* dentists' current and preferred pay schemes among the. Percent. n=297. (The share above the diagonal prefers *more* risk, while the share below prefers *less* risk.)

Current pay scheme (risk value)	Preferred pay scheme: no risk (1)	mild risk (2)	moderate risk (3)	high risk (4)	full risk (5)	Total
no risk (1)	2.7	0.0	4.0	0.0	2.4	9.1
mild risk (2)	0.0	0.0	0.0	0.0	0.0	0.0
moderate risk (3)	0.3	0.0	2.4	0.0	0.0	2.7
high risk (4)	0.0	0.0	2.4	5.4	6.0	13.8
full risk (5)	2.4	2.4	17.2	1.3	51.2	74.4
Total	5.4	2.4	25.9	6.7	59.6	100.0

Table 4: Multinomial logistic regression analyses of risk preference among public and private dentists on sex, age, municipal residence and clinic structure.

Risk preference (dependent variable)	Independent variable	Public dentists (n=142)			Private dentists (n=296)		
		X^2	df	OR (95% CI)			
More risk (preferred by 50% of the public dentists and 12 % of the private dentists)	Intercept	0.002	1				
	Sex (female = 1)	5.158	1	2.6 (1.1 - 6.1)			
	Age_1 (40-54 years = 1)	0.483	1	1.4 (0.5 – 4.0)	The analysis for private dentists preferring more risk is not presented because of few observations (n=36) in this category.		
	Age_2 (≥ 55 years = 1)	0.093	1	0.9 (0.3 – 2.3)			
	Municipal recidence_1 (Middle = 1)	1.689	1	0.6 (0.2 – 1.4)			
	Municipal recidence_2 (Small = 1)	9.572	1	0.2 (0.1 – 0.5)			
	Dentists in clinic_1 (2-3 dentists = 1)	0.179	1	1.2 (0.5 – 2.9)			
	Dentists in clinic (1 dentist = 1)	2.814	1	2.8 (0.8 – 9.5)			
Pseudo R-square		Nagelkerke = 0.195					
					X^2	df	OR (95% CI)
Less risk (preferred by 11% of the public dentists and 26 % of the private dentists)	Intercept	The analysis for public dentists preferring less risk is not presented because of few observations (n=15) in this category.			7.663	1	
	Sex (female = 1)				1.151	1	1.4 (0.7 – 2.7)
	Age_1 (40-54 years = 1)				3.767	1	0.5 (0.3 – 1.0)
	Age_2 (≥ 55 years = 1)				0.382	1	0.8 (0.4 – 1.7)
	Municipal recidence_1 (Middle = 1)				0.009	1	1.0 (0.6 – 1.9)
	Municipal recidence_2 (Small = 1)				1.181	1	0.6 (0.2 – 1.6)
	Dentists in clinic_1 (2-3 dentists = 1)				2.199	1	2.0 (0.8 – 5.0)
	Dentists in clinic (1 dentist = 1)				6.807	1	3.6 (1.4 – 9.2)
Pseudo R-square					Nagelkerke = 0.080		

The reference category is: **no difference** (same risk in current and preferred pay scheme) was preferred by 39% of public and 62% of private dentists.

Table 5: Pay schemes believed to best comply with efficiency, quality, and retention objectives among public and private dentists. Percent and mean risk value.

	Public dentists			Private dentists		
Pay scheme (risk value)	Efficiency n=147	Quality n=144	Stability n=140	Efficiency n=317	Quality n=308	Stability n=308
no risk (1)	10.2	39.6	15.0	2.2	11.0	2.9
mild risk (2)	20.4	16.0	15.0	4.1	5.5	4.9
moderate risk (3)	57.1	42.4	65.7	26.8	28.6	40.3
high risk (4)	0.7	0.0	0.7	5.0	3.6	3.9
full risk (5)	11.6	2.1	3.6	61.8	51.3	48.1
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Mean risk value	2.8	2.1	2.6	4.2	3.8	3.9

Table 6: Mean difference in risk value (1-5) between current and preferred pay schemes and pay schemes considered best furthering efficiency, quality and stability objectives, among public (n=143) and private dentists (n=305).

		Pay scheme furthering		
		Efficiency	Quality	Stability
Current pay scheme	Public	-1.01***	-0.27*	-0.78***
	Private	0.20*	0.60***	0.50***
Preferred pay scheme	Public	-0.27**	0.47***	-0.06
	Private	-0.11	0.30***	0.22***

One sample T-test, H_o: difference = 0, * p-value < 0.05, ** p-value < 0.01, *** p-value < 0.001