

Pricing and competition in the private dental market in Finland

E. Widström^{1,2}, A. Väisänen¹ and H. Mikkola¹

¹National Institute for Health and Welfare (THL) Helsinki, Finland; ²Institute of Clinical Dentistry, University of Tromsø, Norway

Objective. To investigate how the prices were set in private dental care, which factors determined prices and whether the recent National Dental Care Reform had increased competition in the dental care market in Finland. **Design.** A questionnaire to all full time private dentists (n=1,121) in the ten largest cities. Characteristics of the practice, prices charged, price setting, perceived competition and expectations for the practices were requested. The response rate was 59.6%. Correlation analysis (Pearson's) was used to study relationships between the prices of different treatment items. Linear regression analysis was used to study determinants of the price of a one surface filling. **Results.** Most dentists' fee schedules were based on the price of a one surface filling and updated annually. Changes in practice costs calculated by the dentists' professional association and information on average prices charged on dental treatments in the country influenced pricing. High price levels were associated with specialisation, working in a group practice, working close to many other practices or in a town with a dental school. Less than half of the respondents had faced competition in dental services and price competition was insignificant. **Conclusions.** Price setting followed traditional patterns and private markets in dental services were not found to be very competitive.

Key words: Competition, pricing, private dental care.

Introduction

Since 1950s, when public dental services were initiated in the form of school dental care, dental services in Finland have been provided by both the public and private sectors. Since the early 1970s, public dental services have been offered in municipal health centres, all over Finland. About half the dentists had worked in the Public Dental Service (PDS) and half in private practices, which are concentrated in towns and cities. Traditionally, the division of patients between the two sectors was clearly defined: only children, young adults, and some special needs groups were entitled to public dental care. Most adults were directed to the private sector. The National Dental Care Reform in 2001–2002 (Niiranen *et al.*, 2008) abolished the earlier restrictions limiting adults' access to the Public Dental Service (PDS) and, subsequently, adults were free to choose between the PDS or private services.

The core services provided by the two sectors are not very different, but the publicly funded health centres provide services at substantially lower prices than the private sector although basic care (excluding prosthetics) in the private sector is partially reimbursed by the National Health Insurance. In the PDS, those under 18 years of age have free care and adults pay heavily subsidized, fixed prices per treatment item. In the private sector pricing is free and the National Insurance Institute (SII) reimburses treatment items using an own fee schedule. There are no private insurances for dental care. The Dental Care Reform increased demand for dental care by adults, putting pressure on the public services and long waiting lists emerged in the bigger health centres (Nihtilä and Widström, 2005; Vesivalo *et al.*, 2006). Little is known of how the changes in the external environment have affected

the private dental care market. One factor indicating a shake-out in the private market was that the number of full time private dentists fell by 8.5% between the years 2000 and 2005, whereas the PDS increased number of employed dentists by 5.8% in this period.

According to a recent study, half of the managers of the biggest private dental practices considered the PDS units as partners and sent them patients e.g. for prosthetic care, the other half viewed them as competitors. The managers also stated that their companies were not influenced by the pricing decisions of other companies or practices and price competition had been noticed only during the deep economic recession in Finland in the beginning of 1990's (Mikkola *et al.*, 2007). In international studies, imperfect competition has been found to be typical for the dental care market and competition has had only a weak impact on the prices of dental services (Kushman and Scheffler, 1978; Grembowski *et al.*, 1988; Grytten and Sørensen, 2000).

For the first time in Finland, the recent Dental Care Reform provided a setting in which private dentists were virtually in direct competition with the PDS. According to economic theory (Sintonen and Linnosmaa, 2000), demand and supply conditions and competition between private care providers and between private providers and the PDS should have an effect on the prices of dental services. Due to higher numbers of remaining teeth and diminished edentulousness in the middle-aged and elderly, demand for dental services by adults has increased. The price of private dental services could be expected to rise due to this higher demand. On the other hand, lower prices and increased capacity in the PDS could be expected to create pressures to lower the prices in the private sector.

The aim of this study was to investigate how prices were set in private sector dental care in Finland and which factors affected the pricing. In particular, we were interested to find out whether the recent National Dental Care Reform had increased perceived competition in the dental care market.

Material and methods

Data were gathered with a pre-tested questionnaire sent to all full-time private dentists practising dentistry (n=1,121) in the ten biggest cities of Finland in September 2005. A list of private dentists working in these cities was obtained from the membership register of the Finnish Dental Association (98% of dentists were members). The dentists were asked about characteristics of their practices, the prices of seven common treatment measures (items of treatments), how the prices were set, how often they were changed and why. Questions about the influence of the Dental Care Reform on their business, perceived competition and future outlooks of their practice were also included. In addition, some background information was collected. Treatment measures were defined using the reimbursement fee schedule of the Social Insurance Institution of Finland (SII). In the questionnaire, closed-ended questions were favoured in order to obtain quantitative data. The inquiry was carried out anonymously in order to ensure a high response rate. After a reminder in November 2005, altogether 668 answers were received, giving a response rate of 59.6%.

Pearson's correlation analysis was used to study relationships between the prices of different treatment measures. Linear regression analysis was used to study determinants of the price level of a one surface filling (having the SII code SFA10). Continuous variables used in the final model were distance to the nearest PDS unit and the number of other private practices within one kilometre. Four dummy variables were used: educational level of the respondent (0=dentist, 1=specialist), gender (0=female, 1=male), practice form (0=solo practice, 1=group practice) and existence of a dental school in the town (0= no, 1= yes).

Of the respondents, 64.8% were women and 20.1% were specialists. The mean age of the respondents was 49.4 years and the average time they had practised dentistry was 23.3 years. In the original sample in the ten biggest cities the gender distribution of full time private practitioners was 64.0% women, 23.7% were specialists and the mean age was 48.0 years showing that the respondents represented the original sample satisfactorily. A third (36.6%) worked in the capital city of Helsinki and the rest in the other nine bigger cities. Most respondents (73.1%) worked as independent practitioners, 23.1% as employees and 3.8% in other positions. Most respondents worked in group practices (73.6%). Most practices (80.1%) situated in city centres and only a fifth in suburbs. According to the respondents, there were on average 19.0 other dental practices within one kilometre of their practice. The distance to the nearest PDS unit was on average 0.93 km. Most respondents (64.6%) reported that their patients were enrolled in a recall system.

Results

Competitive conditions

A great majority of the respondents (81.3%) claimed that in their own market area, there were enough private dentists to respond to the needs of the patients indicating that prerequisites for price competition existed. Half of the respondents (56.5%) believed that patients compared prices before they decided which dentist to visit. Nevertheless, only 47.9% of the respondents announced that they had faced competition from other dentists. An even lower proportion of the respondents had faced price competition (27.1%). A number of the respondents had faced competition in marketing (37.9%), in selection of services they provided (37.3%) and in quality of the services (32.2%). Recently graduated dentists felt that the large economic investments connected with starting their own practice and recruiting patients were problematic and probably lowered competition. The respondents believed that in the future dental practices would become bigger (64.0%), practice chains would become more common (61.0%) and solo-practices less frequent (82.0%). More than half of the respondents (57.6%) believed that competition would increase during the next five years.

Prices charged

Prices charged for seven usual treatment measures are presented in Table 1. The prices varied greatly. The variation was greatest in the price of a prosthetic crown and smallest in intraoral radiographs.

The prices of all treatment measures were found to be statistically significantly correlated with the price of a one surface filling (Table 2). A majority of the respondents (69.1%) reported that they used the pricing service of the Finnish Dental Association where the dentist first defines the price level of an one surface filling and the Dental Association relates the prices of the other treatments on his or her price list to this using a special formula. The correlation in prices was highest between one surface fillings and larger fillings and lowest between one surface fillings and prosthetic crowns.

Price setting and factors reported to influence prices

Most respondents (59.0%) reported that they updated their price lists once a year and the rest did it less often. In Helsinki, the proportion of dentists changing their prices at least once a year (57.5%) was slightly lower than in the other cities (63.7%) but in the end there were no statistical differences in price setting between the cities ($p=0.238$). Almost all respondents (88.0%) changed the prices of all treatment measures at the same time. A great majority of the respondents (68.5%) stated that calculations of changes in practice costs provided by the Dental Association influenced their decision to change their price lists much or very much. A third (36.4%) of the respondents said that the annual reports on mean prices charged for dental treatments collected by Statistics Finland influenced their price setting. Pricing decisions of other dentists were not considered to influence respondents' pricing policy (78.1%). Only 17.1% of respondents said that competition influenced their price setting.

Table 1. Prices charged for seven common treatment measures* in private dental practice in the ten largest cities in Finland in 2005.

| <i>SII code</i> | <i>Treatment measure</i> | <i>Mean EUR</i> | <i>Median EUR</i> | <i>Lowest value</i> | <i>Highest value</i> | <i>n</i> |
|-----------------|--|-------------------|-------------------|---------------------|----------------------|----------|
| SAA02 | Basic examination (max 20 minutes) | 45,55 (0,32)** | 45,00 | 10,00 | 90,00 | 599 |
| SDA01 | Simple periodontal treatment, scaling and polishing (max 10 minutes) | 29,23 (0,30) | 28,00 | 13,96 | 70,00 | 563 |
| SFA10 | One surface filling | 49,39 (0,25) | 50,00 | 26,41 | 80,00 | 594 |
| SFA40 | Large filling or crown of restorative material | 119,52 (0,68) | 120,00 | 50,00 | 195,00 | 576 |
| EBA00 | Extraction of a tooth | 52,03 (0,34) | 50,50 | 26,41 | 88,00 | 579 |
| SPC10 | Prosthetic crown, simple | 287,92 (4,12) | 260,00 | 110,00 | 800,00 | 507 |
| SBB20 | Single intra oral radiograph | 21,82 (0,15) | 22,00 | 10,00 | 42,00 | 583 |

* Defined using codes of the Social Insurance Institution, SII

** Standard errors in parentheses

Table 2. Correlation analysis between prices of seven common treatment measures in private dental practice in the ten largest cities in Finland in 2005†.

| | <i>SII code</i> | <i>SFA10</i> | <i>SAA02</i> | <i>SDA01</i> | <i>SFA40</i> | <i>EBA00</i> | <i>SPC10</i> | <i>SBB20</i> |
|--|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| One surface filling | SFA10 | 1 | 0,597** | 0,374** | 0,736** | 0,684** | 0,128** | 0,558** |
| Basic examination | SAA02 | | 1 | 0,356* | 0,618** | 0,503** | 0,071 | 0,436** |
| Simple periodontal treatment | SDA01 | | | 1 | 0,284** | 0,364** | 0,257** | 0,315** |
| Large filling or crown of restorative material | SFA40 | | | | 1 | 0,608** | 0,163** | 0,595** |
| Extraction of a tooth | EBA00 | | | | | 1 | 0,231** | 0,514** |
| Prosthetic crown, simple | SPC10 | | | | | | 1 | 0,194** |
| Single intra oral radiograph | SBB20 | | | | | | | 1 |

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

† Defined using codes of the Social Insurance Institution, SII

Table 3. Linear regression analysis on factors explaining the price level of a one surface filling (SFA 10) in private dental practice in the ten largest cities in Finland in 2005 (n=461).

| <i>Predictor</i> | <i>Coefficient</i> | <i>Standard error</i> | <i>t-ratio</i> |
|--|--------------------|-----------------------|----------------|
| Constant*** | 39.397 | 1.368 | 28.800 |
| Specialist dentist * | 1.644 | 0.654 | 2.512 |
| Gender (male) | 0.404 | 0.522 | 0.774 |
| Works in Group practice *** | 3.468 | 0.561 | 6.181 |
| Distance to the PDS (km) ns | -0.247 | 0.276 | -0.893 |
| Number of other private dental clinics within one kilometre ** | 0.041 | 0.012 | 3.387 |
| Dental school in town* | 1.119 | 0.505 | 2.218 |
| Adjusted R ² = 0.124 | SSE= 5.244 | | F=11.956 |

* Significant at the 0.05 level (2-tailed)

** Significant at the 0.01 level (2-tailed)

*** Significant at the 0.001 level (2-tailed)

Linear regression analysis revealed that the price of one surface filling was statistically significantly and positively associated with the type of practice (group or solo), formal competence, number of neighbouring private practices and existence of a dental school in town (Table 3). The price of a one surface filling was higher when the respondent was a specialist or worked in group practice, or when the practice was located in same city as a dental school, than when the respondent was general dentist, in solo practice or worked in a city without a dental school. Prices were also higher in cities with high density of dentists than in cities with low density of dentists. Price levels could not be explained by the dentists' sex or distance to the nearest PDS unit. Only 12.4 % of the variation in the price of a one surface filling could be explained by these variables.

Discussion

We surveyed private practitioners in the ten biggest cities where 58.5% of all full-time private dentists worked in 2005. The response rate was moderate (59.6) and although the respondents did not differ from the original sample regarding age, sex and specialisation, the results need to be interpreted with some caution.

It was obvious from our study that analyses on changes in practice costs provided by the Finnish Dental Association twice a year to its members influenced the prices of dental treatments in private practice. From the practising dentists' point of view, this type of service from their professional association is helpful. Dental associations have traditionally had a great impact on the dental care business and its markets (Maurizi, 1974; 1984; Fraundorf, 1984; Zweifel and Eichenberger, 1992). Previously, the Dental Association used to give its members price recommendations but this was forbidden by the Finnish Competition Authority. Information on average prices charged by the private dentists, collected by Statistics Finland and published by the dental association in the dental journal was seen to influence the prices (Suomen Hammaslääkäriliitto, 2005). Although only a fifth of the respondents said that other dentists' prices influenced their own pricing, it was clear from our results that, indirectly, other dentists' pricing decisions influenced the price levels more.

Overall, variation in prices was great and the price levels were associated with dentists' specialisation and type of practice. Higher prices charged by specialists is not a new phenomenon in health care and people are used to paying more for higher competence. Higher prices charged by group practices than solo practices can be explained by broader variety of services, longer opening hours, more varied range of equipment and maybe also by more expensive and better premises. On the other hand, one would have expected that sharing premises, equipment and auxiliaries would offer economies of scale, which would lower the prices. This could, however, not be verified in our study. An interesting detail was that prices were higher in cities with dental schools. In Finland, many dental graduates stay in these cities and thus the density of dentists becomes high which means lower numbers of patients per dentist. Our results also showed that the more dental practices were clustered, the

higher the prices, which strengthened the impression that dental markets were not working in a competitive way.

Less than half of the respondents reported that they had faced competition in dental service provision. The number was clearly lower than in a questionnaire survey among private practitioners in late 1990s (Tuominen and Palmujoki, 2000). In that study, 70% of the respondents claimed to have faced competition. Increased demands by the more dentate adult population and recently increased reimbursements of dental care costs might explain part of the difference. Price competition was found to be modest in our study. In Finland, the private sector has traditionally catered for well-educated and wealthy population groups (Poutanen and Widström, 2001; Ngyen and Häkkinen, 2005) who are motivated to use dental services regularly and are less hindered by costs compared with the less well-off (Suominen-Taipale *et al.*, 2004). When the study was undertaken, the reimbursement from the National Sickness insurance was 33.6 % of the actual costs of basic dental treatments. As the reimbursements were new from 2002 and thus the care cheaper than before for the middle-aged and elderly private patients, they could have purchased more treatments. Increased demand together with greater reimbursements may thus have inhibited competition among private practitioners. Although price competition was not usual, competition with quality and marketing were said to be more usual. Marketing in the form of advertising has always been a sensitive issue among dental professionals but offering a broad spectrum of services, such as specialist or dental hygienist services may be an acceptable way of differentiating one's practice from the others. Fast access was one of the quality aspects mentioned.

Contrary to expectations, private practitioners experienced little competition from the PDS, although the Dental Care Reform had abolished restrictions hindering adults' use of public services and in principle all their patients could have moved to the cheaper public sector. According to a study conducted shortly after the reform, most middle-aged people in the capital area who had used private services throughout their adult lives continued to visit their private dentists even after the reform. Customer loyalty is known to be strong in private dental care. One of four private patients (23.4%) had tried to move to the public sector. A third of them had failed because the PDS units in many bigger cities were overloaded after the reform and waiting lists had become long (Nihtilä and Widström, 2005).

Earlier research has shown that private dentists use regular recall of their existing patients as the most important marketing procedure (Ngyen and Häkkinen, 2005; Mikkola *et al.*, 2007) and do not consider other types of marketing necessary. In our study, more than two-thirds of the respondents claimed to use a recall system. At present, the public sector cannot keep adult patients on recall lists to the same extent because, by law, the public sector has a population responsibility and has to give access to all patients who seek care within certain time frames.

Some of the bigger PDS units have arranged competitive tendering from private firms in order to purchase services for their patients, as they lack the personnel to meet the increased demands and because, by law, they

must arrange the necessary care in one way or another. There were several firms competing for the contracts with the PDS e.g. in Helsinki, and this resulted in favourable contracts (Helminen, 2002). This indicates that public health care organisations and probably also third-party agents can create some competition in the dental care market which, because of information asymmetry and other factors; is not easy for individual patients.

Competition is today believed to be the key to economic efficiency in health care services. Although the prevailing circumstances may have been favourable for increased competition, pricing of dental services continued in the traditional way. Economic analyses showed that the period around the National Dental Care Reform was beneficial for the private dental care industry in terms of growth and profitability (Mikkola et al., 2007). Society's involvement in reimbursing dental care through two channels - supporting both the public and private sectors in a way that creates contradictory incentives might hinder competition. However, reimbursement questions are politically highly sensitive and not easy to shake. In addition, professional recommendations on annual visits and regular use of dental services support the care business.

Acknowledgement

The study was supported by the Finnish Research Academy's Terttu grant for health services research.

References

Fraundorf, K.C. (1984): Organized dentistry and the pursuit of entry control. *Journal of Health Politics, Policy and Law* **8**(4): 759-781.

Grembowski, D., Conrad, D., Weaver, M., Milgrom, P. (1988): The structure and function of dental-care markets. A review and agenda for research. *Medical Care* **26**(2): 132-47.

Grytten, J. and Sørensen, R. (2000): Competition and dental services. *Health Economics* **95**:447-61.

Helminen, S. (2002): Hammashuollon vuoden 2001 ostopalvelukokeilu Helsingissä - tapauselostus. In Liukko, M., Luukkonen, A. Kuntien uusi rooli terveyspalvelujen järjestäjinä ja hankkijoina. Suomen Kuntaliitto, Helsinki.

Kushman, J. E. and Scheffler, R. M. (1978): Pricing health services: verification of a monopoly pricing model for dentistry. *Journal of Human Resources* **13**(3): 402-15.

Maurizi, A. (1974): Occupational Licensing and the Public Interest. *Journal of Political Economy* **82**:399.

Mikkola H, Vesivalo A, Jauhiainen S, Widström E. (2007) An Outlook of Dental Practices - Drivers, Barriers and Scenarios. *Liiketaloudellinen aikakauskirja (The Finnish Journal of Business Economics)* **56**(2):167-192.

Nygen, L. and Häkkinen, U. (2005): Determinants of dental Service utilization among Adults - the Case of Finland. *Health Care Management Science* **8**:335-345.

Nihtilä, A. and Widström, E. (2005): Haasteena oikeudenmukaisuus - keski-ikäisten kokemuksia hammashoitoudistuksesta pääkaupunkiseudulla. (English Summary: Adults' experiences of oral health care reform in Helsinki area - a challenge for equity). *Yhteiskuntapolitiikka* **70**(3): 323-333.

Niiranen, T., Widström, E., Niskanen, T. (2008): Oral Health Care Reform in Finland - aiming to reduce inequity in care provision. *BMC Oral Health* **8**(39): <http://www.biomedcentral.com/1472-6831/8/3>.

Poutanen, R. and Widström, E. (2001): Sosiaalinen tausta ja hammashoitopalvelujen käyttö - katsaus 1950-luvulta nykypäivään. *Yhteiskuntapolitiikka* **65**(3):248-55.

Sintonen, H. and Linnosmaa, I. (2000): Economics of Dental Services. Handbook of Health Economics. Culyer, A J & Newhouse, J P, Elsevier Science B.V. 1.

Suomen Hammaslääkäriliitto (2005): Yksityisen hammashoidon hinnat pysyneet lähes ennallaan. *Suomen Hammaslääkärilehti* **12** (22):1364.

Tuominen, R. and Palmujoki, J. 2000: Perceived competition in private dental practice in Finland. *Acta Odontologica Scandinavica* **58**(5): 213-216.

Vesivalo, A., Widström, E., Mikkola, H., Tampsi-Jarvala, T. (2006): Terveyskeskusten hammashoidon tavoitteet ja kannusteet hammashoitoudistuksen implementoinnissa. (English Summary: Aims and incentives in the implementation of Finnish Dental Care Reform in the Public Dental Service). *Sosiaalilääketieteellinen aikakauslehti* **43**:146-156.

Zweifel, P. and Eichenberger, R. E. (1992): The Political Economy of Corporatism in Medicine: Self-Regulation of Cartel Management? *Journal of Regulatory Economics* **4** 89-108.