Oral Healthcare Systems in the Extended European Union

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Summary: This article reports a survey of the systems for the provision of oral healthcare in the 28 member and accession states of the EU/EEA in 2003. Descriptions of the systems were collected from the principal dental advisers to governments in the individual states. In many states these were the Chief Dental Officers (CDOs). In states without a CDO, descriptions were gathered from CDO equivalents or senior academics. A template (model description) was used to guide all respondents. Additional statistical information on oral healthcare costs and workforce was collected from the Council of European Chief Dental Officers, WHO and World Bank websites.

The study showed that in broad terms there were six patterns (Beveridgian, Bismarkian, The Eastern European (in transition), Nordic, Southern European and Hybrid) for the administration and financing of oral healthcare in the expanding EU. The extent and nature of government involvement in planning and coordinating oral healthcare services and the numbers and pay of the oral healthcare workforce varied between the different models.

The biggest recent changes in European oral healthcare were found to have occurred in Eastern Europe, where there has been wide scale privatization of the previously public dental services. However, most of the EU accession (Eastern European) states seemed to be slowly developing insurance systems to cover oral health treatment costs. In the existing EU/EEA, the public dental services such as those in the Nordic countries still have strong political support and some expansion has occurred. In Southern Europe public dental services seemed to have gained some acceptance for the treatment of children and special needs groups. In UK, which has a unique public dental service system, there are plans to make big changes in the delivery, commissioning and remuneration of dental services in the near future. Some EU member states which operate the Bismarkian system with health insurances offering wide population coverage, comprehensive treatment and benefits connected with frequent dental visits, were reported to be experiencing financial problems.

The study also indicated that at present, with the exception of Portugal and Spain, where there is dynamic growth in the numbers of dentists, the overall size of the EU/EEA oral health workforce is expanding fairly slowly. Only a minority of member states appeared to collect data on uptake of services and care costs and there were great difficulties in assessing outcomes of care. The data on costs appeared to show wide variations from member state to member state in per capita spending on oral healthcare. In the majority of states, however, costs, especially those in the private sector, could only be estimated. Nevertheless, at a 'macro' level, the study indicated that, in 2000, the 28 member and accession states of the EU/EEA had a total population of 456 million and an oral health workforce of 900,000 (some 300,000 of whom were dentists) and that the cost of oral healthcare was about EUR 54,000,000,000.

Conclusion: The study showed wide variations in oral healthcare provision systems between EU/EEA member and accession states and no evidence of harmonization in the past.

Key words: European Union, oral healthcare, systems, workforce, costs

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INTRODUCTION

Within the European Union (EU) the provision and financing of healthcare has been and is the responsibility of individual member states and is not coordinated centrally by the European Commission (EC). Nevertheless it is a basic principle of the EU that there should be a free market within the Union for labor, goods and services which allows free movement between member states. Furthermore, many political decisions are made centrally which bind all member states. Increasing ease of travel has lead to increased mobility for all citizens of the EU. Both healthcare workers and patients can and do move from country to country to work or to obtain healthcare including oral healthcare. This has almost certainly led to an increased awareness among the decision makers, professionals and patients of differences in levels and standards of provision of healthcare between the different member states of the EU. It is also possible that in the expanded EU there will be more migration of both healthcare professionals and patients. There is therefore a need for accurate and up to date information on the systems for the provision of healthcare in all member states of the expanded EU.

There is little recent literature comparing systems for oral healthcare provision in the member states of the European Union (EU) and European Economic Area (the EU plus Iceland, Norway and Liechtenstein), whose healthcare professionals and citizens are allowed free movement within the EU. The existing literature (Anderson et al, 1997; O'Mullane, 1997; Widström and Eaton, 1999) is based on data which are now at least five years old. In May 2004 a further ten states, known as 'the accession states' joined the EU. There is therefore a need to survey the existing states of the EU/EEA and the ten accession states and produce an updated publication.

PURPOSE

The aim of this publication is to provide an up to date review of the systems for the provision of oral healthcare and related data in the member and accession states of the EU/EEA and to briefly discuss the main characteristics of the systems and perceived trends.

MATERIAL AND METHODS

In January 2003, members of the CECDO (Chief Dental Officers (CDOs) or their equivalents) were asked to provide short descriptions of the oral healthcare provision system in their countries using an earlier report (Widström and Eaton, 1999) as a model. In countries where no CDO could be identified members of university departments of dental public health/community dentistry/oral epidemiology, working as advisers to their national governments, were asked to provide a description. The individual reports from each member state were edited by the co-coordinating authors and returned to the original authors for checking. No updated information could be obtained from Liechtenstein. The description for Liechtenstein which appears in this publication is reproduced from the previous CECDO report (Widström and Eaton, 1999). To give readers a more comprehensive picture of the oral healthcare in the member states of the expanded EU, data on workforce numbers, costs and mean national DMFT figures of 12-year-olds from the CECDO database (www.cecdo.org, 2003) have been included. These data are collected by the CECDO on a two-yearly cycle. The last year for which there is a virtually complete data set is 2000. The data presented in the tables are therefore from 2000. (As such they are not necessarily the same data that appear in the descriptions from each member state which are frequently for 2001 and 2002.) The data for percentage of national GNP spent on all aspects of healthcare in 2000 are taken from the WHO website (www.who.int/country as at 14 Oct. 2003) and represent health spending in both public and private sectors.

RESULTS

DESCRIPTION OF THE ORAL HEALTHCARE SYSTEMS IN EU AND EEA COUNTRIES IN 2003

AUSTRIA

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Austria has a population of just over 8 million and just under 4,000 dentists. Before joining the EU

dentists were first trained as medical doctors and then undertook three years further training in dentistry (stomatologists). In 1997, the law was changed to make provision for a six-year dental course, in accordance with the EU directives. There are three dental schools. At present, no dental hygienists are trained.

Approximately 99% of the population is covered by sickness insurance which includes cover for specified dental treatments. Premiums are paid by employers and employees (each 50%). Sickness insurance is governed by a law (Allgemeines Sozialversicherungsgesetz – ASVG) and is organized and managed by a corporate body (Federation of Austrian Social Insurance Institutions). The corporate body's officials are appointed by the 'social partners' (associations of employers and employees) and are controlled by state authorities. The Federation contracts payments to dentists (and the rights and duties of the contract partners) with the 'Zahnärztekammer' (federal and local dental chambers). Any dentist, who wants to become a contract partner of an Institution of the Federation is able to apply to do so (approximately 80% of dentists have such contracts). These contracts do not cover all types of dental treatment. For example orthodontics is not fully included and a major part of its costs have to be paid for privately.

The type of treatment covered by the social sickness fund is the same throughout Austria. There are regional differences in the percentage the patient has to pay. Restorative and some surgical treatments are fully covered by the sickness insurance. However, for some treatments and within some sickness insurances patients contribute 10% to 20% ('Selbstbehalt'). For removable prostheses patients have to pay between 25% and 50% of the costs. Crown and bridge work has to be paid for in full by the patient.

Patients can visit any dentist they like. However, if the dentist has no contract with their sickness insurance, then the patient is expected to pay the dentist's bill and obtain a reimbursement from the sickness insurance up to 80% of the amount specified in the sickness fund tariffs. In addition, patients can be insured by a private insurance company, which pays the costs and which is outside the social sickness insurance system.

As well as contracts with dentists, the sickness insurances run approximately 90 outpatient clinics ('Ambulatorien'), where any patient can obtain treatment.

There is no organization entirely dedicated to children's dental care. However, some larger cities have dental clinics for children ('Jugendzahnkliniken'). Children are covered by the social sickness insurance of their parents.

There are institutions in every county ('Bundesland') which offer caries prevention programs. These are mostly educational programs (how to brush teeth, what healthy food to eat, etc.). In most of the counties the teeth of the children are examined regularly. A federal program of oral health surveys began in 1996. Each year the oral health status in a subgroup of the population will be examined. In 1996 and 2001 children aged 6 years were examined and in 1997 and 2002 children aged 12 years were examined. At present, the oral health status of 12 and 18-year-olds meets the WHO oral health goals but that of 6-year-olds does not, with variations between different counties.

Epidemiology

The national survey of 2002 indicated that the national mean DMFT for 12-year-olds was 1.04 (ÖBIG, 2003) and that 58% had no visible caries.

Costs

In 2001, the total expenditure on dentistry from social sickness funds was approximately EUR 684 million. How much the Austrian population paid for treatments not covered (in full) by the state insurance is not known. Estimates vary between a third and a half of the public expenditures.

Thus total expenditure on oral healthcare in 2001 can be estimated as between EUR 900 and 1,000 million.

BELGIUM

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In 2001, Belgium had a population of 10.3 million. In the main, those who live in the north of the country (Flanders) speak Flemish and those in the south (Wallonia) speak French. There is a small German speaking community in the east of the country. In Belgium the dentist is the only professional trained and educated in the chairside provision of oral

healthcare. The use of auxiliary personnel is almost non-existent. There are no organized programs for training dental nurses, hygienists, or therapists. As in France, most private practitioners work alone without any chairside assistance. A minority employ dental nurses, who they train 'on the job'. In 2001, the number of active dentists in Belgium was 8512. However, due to feminization of the profession and part-time working the effective full-time equivalent has been estimated at 7,000. The dentist/population ratio was 1:1,250. The national government has tried to control the situation by limiting the number of dentists admitted to the dental profession per year during the period 2002–2010. The number is fixed at 140 per year (84 from the Flemish part of the country and 56 from the French speaking part). There is an additional mechanism in Flanders to reduce the numbers of new entrants to dental schools. It takes the form of a compulsory entrance examination which currently reduces the yearly inflow of dental students to about 100 for the whole country.

Dental services, both preventive and restorative, are almost exclusively delivered in private dental practices by private practitioners, and only to a small extent (< 5%) in public clinics which are usually hospital based. The system is based on a compulsory social insurance system. Adults in work, both salaried and self-employed, make compulsory payments through deductions from their wages or incomes which contribute to the health and social services, provided by the National Health Insurance scheme. Employers also contribute additional sums for their employees. Self-employed people are only obliged to pay an insurance premium related to high risk healthcare (major surgery, hospitalization, etc.). Dental care is classified as low risk healthcare. Approximately 85% of the population is covered for all risk (low and high) healthcare.

There is a reimbursement system for oral healthcare, which is on a fee for item of service basis. Patients pay the dentist and are then reimbursed at 75% of the nationally agreed fees for restorative care, removable dentures, minor oral surgery and limited preventive care. Restorations for children aged 0–12 years, including fissure sealants, are reimbursed at 95%. In order to be reimbursed for preventive care patients have to prove that they have visited a dentist within the last 12 months. Calculus removal before the age of 18 years is not covered by the insurance system, except for handicapped children. Periodontal treatment, fixed prostheses and oral implants are not covered. There is only a low level of reimbursement for orthodontic treatment and it is only given for children who start orthodontic treatment before the age of 14 years.

The range of treatments available and fees are set through a convention between representatives from the National Health Insurance Scheme and the Dental Associations. It is negotiated every second year. After the negotiations, if fewer than 60% of the dentists agree, the total agreement collapses. In 2003, 73% of the practicing dentists signed up to the latest convention. The percentage of dentists who signed up was markedly lower in the capital region of Brussels (58%).

There is no oral healthcare delivery organized at community level. However, for children, there is a School Healthcare Service, which includes an oral examination by a general medical practitioner whilst they are at kindergarten and during the 1st and 3rd year of primary school and 1st and 3rd year of secondary school, following which a referral letter is sent to parents.

Two dental specialties: orthodontics and periodontology are currently recognized in Belgium. In a European context, the budget for oral health in Belgium is rather low. There are no national data on uptake of services. In 2001, in the Flemish speaking part of Belgium, the insurance scheme reported that a mean of 2 visits per person were made to the dentist by people up to the age of 75 years and one per year for those over 75 years.

Epidemiology

There have been no national epidemiological surveys of oral health in Belgium. The most recent survey in Flanders indicated a mean DMFT for 12-year-olds in this part of the country of 1.1 (Declerck et al, 2002; Vanobbergen et al, 2003).

Costs

In 1998, the cost for oral healthcare from the National Health Insurance scheme amounted to 0.18% of the GNP. As 10% of the population and an estimated 30–40% of oral healthcare is not covered by this scheme, it is possible that the total costs of oral healthcare in Belgium were at least 0.30% of GNP, bearing in mind that the items of

care not covered are usually expensive items such as implants and bridges.

Finally, it can be said that whilst the level of dental caries appears to be fairly low in Belgium, some groups experience a high level of disease. People in these high risk groups often have limited access to oral healthcare and are disinclined to use it. The oral health workforce is limited mainly to dentists and as a consequence there is a reduced emphasis on prevention which auxiliaries might bring if team care was practiced. A public health approach is limited at present. Nevertheless, efforts are being made to improve the system and eliminate some of its shortcomings.

DENMARK

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Denmark had a population of 5.4 million in 2002 and just under 5,000 dentists. Dental hygienists, clinical dental technicians and dental nurses provide clinical support for the dentists. Approximately 1,000 dentists work within the municipal dental care sector (PDS) treating children, adolescents, and elderly persons. Dental care (including orthodontics) is free up to the age of 18 years and is usually delivered in municipal school dental clinics, manned by salaried public dentists. It is estimated that 99% of the children and adolescents utilize this service. Elderly persons living either in nursing homes or their own homes with social and nursing support are also provided with free municipal dental care. In addition, the municipalities subsidize dental treatment for adults following orofacial trauma and, as a result of social services legislation, can provide financial support for necessary dental care for people with low income. This financial support also covers dentures made by clinical dental technicians (denturists). The practical arrangements for the provision of these services vary in different municipalities. A small number of salaried dentists work in hospitals, in the armed forces, and in prisons.

Most adults obtain oral healthcare from the private sector. A proportion of the cost of this care is refunded by the public health insurance scheme financed by the government out of general taxation. The refund rates vary from 30–65% depending on the patient's age and the category of treatment. According to an agreement between the Danish Dental Association and the National Health Service dental examinations, scaling, prophylactic and periodontal treatment, fillings, root canal treatments, extractions and surgical procedures are subsidized. There is no reimbursement for fixed (implants, gold crowns and bridge work) and removable (dentures) prostheses.

Approximately 1.5 million Danes have a private dental insurance, partly to complement treatment costs covered by the public health insurance scheme and partly to cover costs not subsidized by the public health insurance scheme.

From 2001 the scope of public dental service has been widened as the counties (sub-regional administrative areas) started to offer care to patients with special needs, e.g. patients with psychiatric illnesses or mentally handicapped individuals who were not able to use the aforementioned dental services. Moreover, the counties offer highly specialized care and treatment for patients with rare diseases or handicaps for whom the underlying condition leads to special problems with teeth, mouths or jaws and for children and adolescents with dental conditions that would lead to a permanent functional disability. Special reimbursement is offered to patients with documented dental problems due to radiation therapy of cancer in head or neck, chemotherapy of cancer and Sjögrens Syndrome.

In response to changing patterns of treatment need, there are plans to increase the numbers of dental hygienists in the future as numbers of dentists decrease.

Epidemiology

In 2001, the mean DMFT in 12-year-old children was 0.89 (SCOR, 2002). In the age group 45–55 years, nine out of ten visited the dentist within the past year. For persons older than 55 years the percentage using the dental services declined, and for elderly people (> 85 years) two thirds had not used the dental services for five years. Approximately 18% of persons between 65 and 74 years were edentulous.

Costs

Dental services for adults in Denmark are financed in a number of ways: through social and private in-

surance schemes, by the municipalities, and by the government out of general taxation (public health insurance), but mainly through direct payment by patients.

In 2001, the cost of municipal dental care (PDS) was EUR 116 million, reimbursements from the Public Health Insurance amounted to EUR 81 million whilst patients themselves paid about EUR 325 million. The total spend on oral healthcare was therefore EUR 522 million.

FINLAND

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Finland is a sparsely populated country with a land area of 338,000 km^2 and a population of 5.1 million in 2002 (15 inhabitants per sq km). Healthcare in Finland is organized by local municipalities and services are mainly funded out of tax revenues. Private sector healthcare supplements the large public sector. Oral health services are provided both by the public and the private sectors. Public dental services (PDS) are available all over the country (including remote parts) in health centers run by municipalities alone or cooperatively by several municipalities. Student oral healthcare and army dental clinics form a minor and separate part of public services. Private sector services are provided by both private dentists and clinical dental technicians (denturists). In the PDS the dentists earn a basic salary supplemented by a productivity-related commission equivalent to about 20–30% of the basic salary. Private dentists work on a fee-for-service basis. The dental profession consists of about 4,800 dentists, of whom slightly less than a half works in the PDS and more than half in private practice. In addition there are about 1,200 dental hygienists.

When the Primary Healthcare Act was introduced in 1972, all children under 17 years were entitled to free care in the PDS while most adults had to use private care. Since the mid-1980 s adults have gradually been given access to public services starting with young age groups. Alternatively they have been given partial reimbursement of costs (approximately 40%) for basic care except for orthodontics and prosthetics from the National Health Insurance (NHI) when they visited a private dentist. The fee scale for private dentists is unregulated and the NHI reimburses according to its own fee scale. Treatment provided in the public sector is less expensive for patients than subsidized private care.

Prior to 2000, people born in 1956 or later had access to subsidized care and the rest of the population, except World War Two veterans, were not covered by the system. From December 2002, the entire population has had access to publicly funded dental care. Children under the age of 18 years continue to have free care, including orthodontics.

Practically all children and about half of the adults, who seek care, are treated by the PDS. The other adults are treated in private practice. About 64% of adults of working age claim to have been to a dentist within the past year and nearly 80% of children under 19 years have visited the PDS. However, over a 3 year period more than 95% of them visit a dentist. The elderly use dental services less often.

Epidemiology

In 2000, the mean DMFT for 12-year-olds was 1.2 (Stakes, 2003). Six per cent of 15 to 64-year-olds and about 40% of 65+ year-olds were edentulous.

Costs

For a small proportion of workers, employers pay all or a proportion of oral health expenses directly to the providing dentists. As an alternative, some workers paid the dentist and then received reimbursement from their employer's sickness benefit fund. There are no private dental insurance companies. Oral healthcare expenditure was EUR 589 million in 2000, of which public expenditure contributed about 43%.

FRANCE

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France is one of the four largest countries in the EU with a population of nearly 60 million in 2002 and over 42,000 dentists. There are also some 1,500 stomatologists (dentists who also have a medical degree). However, there are no dental hygienists or

Clinical dental technicians and many dentists work without full-time chairside support from a dental assistant (nurse). Oral healthcare is predominantly private in France. A mandatory insurance system called 'Sécurité Sociale' (National Health Insurance) covers the entire population. The 'Sécurité Sociale' was set up in 1945/1946 with two main objectives:

- to compensate patients for loss of income due to illness
- to allow entitled persons to cover the medical or paramedical expenses resulting from their own illness or from the illness of any members of their dependent family.

The 'Sécurité Sociale' is financed by compulsory contributions from individual incomes and taxes on employers. It pays for the cost of medical treatments, costs of drugs and costs of dental treatments and restorations. Apart from those in work, additional beneficiaries are spouses, children (up to the age of 20 years, if they are students), handicapped children, grandparents, parents and members of the family if they live with the insured person and undertake no further activities other than housekeeping or education of children (under the age of 14 years).

Patients pay full fees to the dentist. The 'Sécurité Sociale' reimburses about 70% of these fees on a fee-per-item basis for all standard treatments such as extractions, conservative dentistry, prostheses and orthodontics (if the treatment begins before the age of 16 years). Scaling, sealing and fluoride tablet administration are also reimbursed in the same way as preventive treatments. About 5% of the population belonging either to low-income groups or to groups without any income, benefit from free care.

Most prosthodontic treatment is paid for entirely by patients, who may take out a complementary additional private insurance to cover part or all of such costs, 76% of the population does so. Adolescents between the ages of 15 and 18 years can benefit from an annual consultation, including necessary radiographs, and some prevention and treatment paid directly to the dentist on a contract price basis by the 'Sécurité Sociale'. As long as any treatment starts within two months after the initial consultation, it is fully reimbursed by the 'Sécurité Sociale'. Orthodontic and prosthetic treatment is not covered.

About 4% of dentists work in practices owned by public bodies or companies. These dentists receive salaries and provide treatment for all kinds of patients. There is no nationally organized public dental service.

Epidemiology

The Union Francaise Pour La Sante Bucco-Dentaire conducted a national survey of 12-year olds in 1998, which indicated a national mean DMFT of 1.9 and 40% with no visible caries (Hescot et al, 1998). This study has not been published in the international literature.

Costs

In 2001, the cost of oral healthcare was EUR 7,114 million, 5.4% of all healthcare costs (EUR 130, 605 million) in France. Refunds from the *Sécurité Sociale* for oral healthcare represented 3% of total medical repayments. In 2001, health spending represented 8.9% of GDP.

GERMANY

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Germany is the largest country in the EU, in terms of population and number of dentists, with just over 82 million inhabitants and 64,000 active dentists in 2002. Although dental hygienists are not trained in Germany, just over 200 work in one 'Land' (region) and there are over 3,000 dental assistants who have undergone extended training and perform supra-gingival scaling.

General dental practitioners in private practice provide almost all oral healthcare in Germany. The vast majority of adults and children use dental services on an annual basis. There is a statutory health insurance system in which the receipt of healthcare depends on membership of a 'sick fund'. Sick funds are state-approved health insurance organizations. All salaried workers, with the exception described below, must be members of a state approved sick fund. The oral healthcare system is funded from the statutory sick funds through *Krankenkassen*. About 90% of the population is insured through these funds. Both employers and

employees each contribute 50% and together pay a sum equal to about 14% of an individual's total pay to health insurance. Children, spouses and the unemployed are covered without making any contributory payments. About 10% of the working population, who are members of a sick fund and earn more than a defined income (EUR 3,375 per month in 2002), may change to a private insurance scheme. However, although the premium for private insurance is lower, it covers only one person, not spouses or children.

The sick funds pay 100% of costs for examinations, radiographic investigations, fillings, oral surgery, preventive treatments for defined groups, periodontal care, endodontic treatment and 80% of the cost of orthodontics for children. At present, prosthetic care such as dentures, crown and bridge work attract a subsidy of 50% to 60%. These benefits were reduced in 1997. Implants are not covered at all.

The public health insurance system, which in 2001 was operated by more than 395 separate funds, is organized regionally, or by company or guild, or on the basis of membership of a special group. With minor exceptions, all funds provide similar benefits. Services are supplied on a contractual basis. Dentists' fees are determined by negotiations between the insurance funds and regional dental associations (*Kassenzahnärzliche Bundesvereinigung*). Healthcare expenditure in Germany has been considered to be high and this has led to several reforms in recent years. The Federal Government can influence the costs by legislative actions only, cost containment is up to the sick-funds.

Public Health Services exist in the form of university dental clinics and in the armed forces. A limited number of dentists are employed in the Public Dental Service (PDS) which provides examinations and group prevention for children between the age of 3 and 12 years. The PDS is subject to two relatively new laws. In most cities the PDS conducts surveys (oral health screening) – Reihenuntersuchungen – of all children between the ages 3 and 18 years. Parents are informed of any treatment needed, and it is then their responsibility to arrange treatment. In 'Länder' (autonomous regions) with little or no publicly funded oral health screening, parents are responsible for arranging all aspects of their children's oral healthcare. Private practitioners provide the vast majority of oral healthcare and treatment. However, there are public dental services in some parts of the country, which employ a total of about 500 public dentists. As can be seen from Table 2, a feature of German dentistry is, and has been, a high number of dental technicians, relative to the numbers of dentists.

Preventive programs for groups of children started in 1980 s and had become nationwide by the late 1990 s. At the same time, private dentists started their own *Obleute-programme* (grassroots) in which they developed a preventive program for local kindergartens. Dental chambers (regional dental associations) and sick funds, together with dentists interested in public health have founded regional and national councils to promote oral health for children and adolescents. These councils *(Landesgemeinschaft für Jugendzahnpflege*) now exist in all 'Länder' and are responsible for the implementation of group prevention, which was outlined in federal laws for the health system (*Reformgesetz 1988 and GKV-Gesundheitsreform 2000*).

Epidemiology

Surveys during the last 20 years have indicated that caries prevalence in children and young adults has decreased considerably since 1983. In 2000, the mean national DMFT was 1.2 in 12-year olds (Pieper, 2001). DMFT was 16.1 for 35 to 44-year-old adults, and 23.6 for 65 to 74-year-olds.

Costs

The Statistische Bundesamt reported that 10.9% of GNP was spent on healthcare in Germany in 2001. As expenditure on dental care was about 8.2% of the total healthcare expenditure in 2002, it represented about 0.94% of GNP.

GREECE

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In 2002, the population of Greece was just over 10.5 million. In general, oral healthcare is provided by private practitioners. There is also some provision by the National Health System (ESY) and the dental departments of the polyclinics operated in urban areas by a small number of Social Insurance Funds (SIF). In 2000, there were 12,858 dentists in Greece and a dentist/population ratio of 1:820.

Private practice accounted for 95.3%, and 4.7% worked in the ESY. Around 10% of the private dentists were also part-time salaried dentists either at a SIF, or in academia, or the armed forces. There are no dental hygienists working in Greece.

About 70% of the Greek population is insured for dental care by 33 SIFs. However, the cover provided varies from SIF to SIF. SIFs are funded from general taxation allocated by the government, as well as from employees' and employers' contributions.

Irrespective of age, sex, ethnicity, area of residence, and level of income, the insured population can obtain dental treatment from a number of sources. The first are the dental departments of those SIFs that operate polyclinics where treatment is provided free of charge at the point of delivery. The second are private dental practitioners who are contractors with a SIF (or SIFs) and provide some treatments free of charge and some others with co-payments. The third option is, from an independent dental practitioner without any contract with the SIF; in which case patients claim back a proportion (20–30% of the charges) from the SIF. The Greek government sets the fee-per-item of dental treatment within the SIF system. However, Greek dentists have considered the fees to have been quite low during the last two decades. As a result, the vast majority of dental practitioners opted out of contracts with SIFs, so the third option (reimbursement) is the common practice. There are a few funds, called 'the noble' ones, which set higher fees and dentists prefer to contract with them.

The National Health System (ESY), which was established in 1983, provides Primary Dental Care (PDC) through a network of 157 Dental Departments in rural and semi-urban Health Centers, staffed by 349 dentists. The ESY also provides Secondary Dental Care (SDC) through the 101 Hospital Dental Departments in urban areas of the country staffed by 220 dentists. PDC provides oral health promotion and education for the entire population of the catchment areas of the Health Centers, full dental treatment (orthodontics excluded) for children aged 0–18 years, and emergency dental care for adults. SDC comprises dental treatment (except prosthetics) for people with special needs, the medically compromised and the inpatients, and emergency dental care for the entire population. The ESY is funded by the general taxation and has revenue from the Social Health Insurance Funds which purchase services. Dental care within the ESY is free of charge at the point of delivery.

Epidemiology

There have been no national epidemiological surveys of oral health. However, a recent survey, which included representative samples from all socio-economic groups, in Attica, a region where over 50% of the population lives, indicated that the mean DMFT for 12-year-olds in this region was 2.2 (Moraitaki-Tsami et al, 2003).

Costs

In 2000, a national household survey indicated that 1.1% of GNP was spent on oral healthcare, 95.7% of this expenditure was private.

ICELAND

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Iceland has a small population of 286,000 (2002). Two-thirds reside in or very near Reykjavik (the Capital). Even though the rest of the population is spread around the vast coastline of the island, access to dental care is no longer perceived as a problem. Satellite clinics serve the more sparsely populated areas and means of transportation have improved in the last decade. In 2003, the number of registered dentists in Iceland was 325, of whom about 90% were active. The ratio of one dentist per 870 inhabitants is the lowest in Europe except for Greece. Most dental practices are small and all are privately owned. State school dental clinics operated in Iceland from 1922 but they were all closed in 2002.

There is one dental school in Iceland and six students graduate annually after a six-year course. There is also a steady inflow of Icelandic dentists who have graduated from dental schools in Scandinavia and other European countries. Only a few dental hygienists practice in Iceland (21 in 2002), and most of them are employed in private dental offices, as they are not allowed to work independently.

The national health insurance system scheme offers partial reimbursement of the cost of dental treatment for those under 18 years or over 67 years of age as well as long-term patients and the disabled. For those under 18 years, 75% of the cost of most dental treatments, with the exception of gold crowns, bridges and orthodontics, are reim-

bursed. Those who need orthodontic treatment receive a fixed subsidy of EUR 1750 under special rules. Complete and partial dentures are covered, but not crowns and bridges. Implants for use with attachments under overdentures are partially covered. Reimbursement of the cost of dental treatment is not available to the rest of the population. No private dental insurance is available. The fee-schedule that the national health insurance system uses for reimbursements is decided by the Minister of Health and is usually lower than the fees of the private dental offices as dentists in Iceland have their own free-market fee-schedules.

The Ministry of Health and Social Security plays a leading role in implementing dental health programs in kindergartens, schools and local health agencies as well as an advertising campaign in association with an annual Oral Health Week. Bi-weekly fluoride rinse programs have been implemented in the majority of elementary schools by the local health agencies, but with a more restricted healthcare budget for oral health some of these programs are being cut.

In 2001/2002, 64% of children 0–18 years of age had a dental examination over an 18-month period. For those aged 4–18 years the corresponding figure was 79%.

Epidemiology

In 1996, the national mean DMFT score for 12-year-olds was 1.5 (Eliasson, 1998).

Costs

In 2000, total expenditure on health was 8.9% of GDP and public expenditure on dental care was 0.15% of GDP, (EUR 11.3 million). Private expenditure for dental care was EUR 37.8 million. Total expenditure on oral health from both private and public sources was therefore EUR 49.1 million or approximately EUR 173 per capita.

IRELAND

Gerard Gavin, Department of Health and Children, Dublin

Ireland has a growing population which was just over 3.8 million in 2002. In the same year, there were 2,134 registered dentists and 241 registered hygienists. Some 33% of dentists were female. It has been estimated that 1,800 of those dentists on the register were in active practice. There are two dental schools located in Dublin and Cork, producing approximately 70 dentists and 20 hygienists annually. Other types of personnel complimentary to dentistry are under consideration by the Dental Council and the Health Ministry.

The Department of Health and Children is responsible for planning oral healthcare. The system is administered through 11 regional health boards. Since 2000, all children under the age of 16 years who attend state schools have access to free dental care through the Health Board Dental Service (HBDS).

Children aged 7, 9, 11 and 13 years are targeted for screening and preventive measures. Eighty per cent of children of these ages who have been screened subsequently utilize the HBDS. However, the overall utilization of the HBDS for children of all ages is less than 50%. HBDS services are delivered by salaried dentists (372) and dental hygienists (37) and by some 43 dentists (including consultants) in the hospital service. Children are also screened for orthodontic treatment need which, if required, is provided free of charge to children in severe categories of need.

The HBDS has responsibility for promoting oral health and for community preventive programs including water fluoridation. The Dental Health Foundation plays a leading role in developing oral health promotion programs. Monitoring of oral health status in the population and other oral health services research is carried out by health boards in collaboration with the two dental schools.

Children and adults with special needs receive care from an HBDS team consisting of dentist, dental nurse and dental hygienist. Those in need of more complex care are treated in specialized units in Dublin and Cork. For adults there are two schemes. The first is for those over 16 years of age who have a 'low income'. It is referred to as the Dental Treatment Services Scheme (DTSS). Approximately one million (out of a total population of 3.9 million) are covered by this scheme, which is delivered by approximately 1,140 dentists in the private sector on a fee per item basis. It is essentially a basic oral healthcare scheme which covers examinations, scaling, fillings, extractions, root treatments and periodontal and removable prosthetic treatment. It is provided free of charge and is available

to all medical card holders including those over 70 years of age who were recently added to the scheme. Uptake for the DTSS was close to 40% in 2001.

The second scheme is called the Social Insurance Funded Dental Scheme (SIFDS) in which over 1,200 private dentists provide a range of dental treatments to persons who contribute to Pay Related Social Insurance (PRSI); some treatments are provided free of charge while part of the cost of other treatments must be met by the patient. Spouses (wives and/or husbands) of those entitled to this care are also covered. This scheme covered 1,200,000 people and its utilization was 50% in 2001. It is estimated that 300,000 persons have 'dual eligibility' under both schemes.

A limited number of dental procedures are covered by private health insurance, these relate mostly to inpatient oral surgery. There has been a very strong tradition of private practice dentistry in Ireland and a great reluctance to become involved in third party funded dentistry especially in the more expensive specialized aspects of care. However, this has changed gradually and, as can be seen from the figures quoted above, the majority of Irish dentists are now providing care within both state schemes. It is expected that there will be increasing demand for specialized dental treatment.

While many improvements have been made to the dental services in the last ten years there still remain a number of weaknesses. In the children's dental service gaps in coverage persist in remote areas of the country. Recruitment of salaried dental staff to these areas is difficult. There is also a scarcity of private dentists in the same regions. Children under 5 years of age are being identified as a special needs group who, because they are not attending national schools, do not have easy access to oral healthcare. Dental services for other special needs groups such as those with intellectual disabilities are in the early stages of development and will need considerable investment over the next ten years. A range of oral health promotion initiatives aimed at specific target groups needs to be developed by the Dental Health Foundation. There are shortages of trained specialists leading to delays and waiting lists, especially in orthodontics. A framework is being put in place to establish publicly funded training programs in a range of dental specializations.

Epidemiology

A North-South survey of children's oral health indicated that, in 2002, in the areas of the Republic of Ireland with fluoridated water supply the mean DMFT for 12-year-olds was 1.1 and in other non-fluoridated areas it was 1.3 (Whelton et al, 2003). It also found that 69% of the 12-year-olds sampled in the Republic had at least one fissure sealed permanent tooth present in their mouths.

It has been estimated that some 69% of the population regularly receive dental care and that 44% visited a dentist in the last 12 months.

Costs

In 2002, 9.9% of GNP was spent on healthcare. In the same year, total expenditure on the DTSS was estimated at EUR 56 million, expenditure on the DTSB was EUR 35 million, with a further EUR 9 million in patient contributions and the cost of the HBDS some EUR 70 million. Thus it appears that in 2002, some EUR 170 million (0.17% of GNP) was spent on oral healthcare in the public and social insurance sector. It is unclear exactly how much was spent on oral healthcare in the private sector. However, it has been estimated to be around EUR 150 million. Thus the total expenditure on oral healthcare in 2002 can be estimated at about EUR 320 million or 0.33% of GNP.

ITALY

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Italy had a population of just under 58 million in 2000. It is estimated that this population will fall significantly over the next 50 years if the birth rate does not rise and there is little immigration. In Italy 95% of dentistry is provided by private practitioners. The number of dentists is around 50,000 giving a ratio of about 1:1,200 inhabitants. Since the 1980 s there have been 31 Dental Schools, which currently graduate 900 dentists every year. Medical doctors (physicians) who graduated before 1980 can also practice dentistry. As there is significant unemployment for physicians, many do so. Other physicians who do not have an automatic right to practice dentistry could, in the past, attend postgraduate cour-

ses to enable them to be licensed as dentists. There is no formal training of dental nurses who are trained by their employers. However, formal education for dental hygienists and technicians exists. Dentists can specialize in orthodontics and oral surgery.

There is no uniformly organized system for dental care for children at national level, despite the fact that there is a national law dating from 1993 which stipulates that the National Health Service (NHS) is responsible for the dental health of children up the age of 14 years and adults over the age 65 years, subject to payment of a small fee. Public Dental Services are organized and delivered by local health authorities and vary greatly throughout the country. In some regions, children are offered dental check-ups at defined intervals. However, the responsibility for arranging a dental examination for a child predominantly rests with the parents. In practice, publicly provided dental treatment comprised mainly extractions and occasionally restorations. Emergency treatment of orofacial trauma is also provided. In most regions, orthodontic or prosthetic treatment is not normally covered by the public system. About 2,000 dentists work within the public health service (ASL) or in hospitals.

At present, the government is revising the public dental services, saving the existing free ones for the socio-economically disadvantaged, including the elderly with systemic diseases and high-risk children (in respect of caries). Private practice is in the most part outside any existing insurance schemes and patients pay dentists directly for their care and treatment. However, it is planned that, apart from the free services provided by the public dental services, other aspects of oral healthcare will be covered by regionally organized insurance systems. These may differ from region to region.

Epidemiology

It appears that no national epidemiological studies of oral healthcare have been carried out. DMFT figures quoted for Italy have been produced by taking means of some regional studies (Marthaler, 1996).

Costs

The WHO has suggested that in 2000 some 8.1% of GNP was spent on all aspects of healthcare. As virtually all expenditure is made directly to dentists from patients and not via public or private insurance systems, it is difficult to estimate how much is spent on oral health. However, national household surveys suggested that in 2000 some 0.76% of GNP and in 2002, some 0.82% of GNP was spent on oral healthcare.

LIECHTENSTEIN

It is believed that the system for oral healthcare provision in Liechtenstein is similar to that in Switzerland. Many of the around 30 dentists in the country, who provide care for its 30,000 inhabitants trained at Swiss dental schools. The Swiss 'system' is mainly private with the costs of dental care paid directly by private individuals.

LUXEMBOURG

Nico Diederich, Association des Medicins et Medicinedentistes, Luxembourg

Luxembourg is a small, densely populated country. In 2003, it had a population of nearly 450,000 and 288 dentists, some 28% of whom were women. There were an estimated 250 dental nurses (chairside assistants) and 60 dental technicians. There are no dental hygienists or clinical dental technicians in the country. There is no dental school in Luxembourg. The majority of dentists practicing in Luxembourg have trained in Belgium. A change in the law is planned which will require all dentists to undertake continuing professional education throughout their working lives.

Oral healthcare is provided almost entirely within private practice and no dental specialties are recognized. Medical (and dental) insurance is obligatory and covers 99.9% of the population. The system is financed from a general health fund which receives contributions from the Government, employers and employees. Patients pay dentists and then obtain reimbursement of a proportion of the fees from the sickness insurance scheme. All dentists must work within the sickness insurance scheme. All dental care is provided in general practice. There is no issue regarding patient access to dental care. The *Union des Caisses de Maladie* is responsible for reimbursements to the dentist and for the scales of fees. The *Union des Caisses de Maladie* is also responsible for negotiating fees

with the professional association. It is possible to buy complementary private health insurances including dental care. The *Union des Caisses de Maladie* lists the fees to be charged for part of the treatments provided. Items not listed in the scale of fees may be charged at any reasonable rate.

There is no structured Public Dental Service in Luxembourg. At a local level, some town Mayors have a small budget for dental health education in schools. Dentists in general practice are contracted to do this work. Children needing dental treatment then have to visit their own dentist. The State provides a medical/dental care service for the Army and an examination service for school children.

Epidemiology

A national mean DMFT score for 12-year-olds of 3.0 was reported to the CECDO in 1996 (WHO, 2003).

Costs

Luxembourg has by far the highest per capita GNP in the EU/EEA. In 2000, it was reported by the World Bank as EUR 45,470. In the same year, the World Health Organization reported that 5.8% of GNP was spent on all healthcare. As can be seen from Table 4, this was the lowest percentage in all EU/EEA member states. However, in real terms it can be translated into an actual spend of $US 2,740 (at the time equivalent to EUR 2,740) per capita, which was the second highest in the EU/EEA. In 2000, the percentage of GNP spent on oral healthcare in the public sector was 0.18% and total spending on all healthcare was estimated at about 0.20% of GNP.

THE NETHERLANDS

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In 2000, the Netherlands had a population of just under 16 million and there were 7,284 registered dentists under the age of 64 years of whom 5,772 were in practice. Of these 17% were women. There were also an estimated 1,750 dental hygienists, 3,314 dental technicians, 285 clinical dental technicians and about 11,800 dental nurses.

There are three dental schools in the Netherlands which had 260 entrants in year 2000. This number has subsequently risen to an annual intake of about 300. Only two specialties, orthodontics and oral surgery are recognized. However, it is possible for Dutch dentists to undertake three-year-training programs in specialties such as periodontics and then limit their practice to the specialty concerned.

Approximately 60% of the Dutch population is compulsorily insured in the national public healthcare scheme. This scheme (financed 50% by the employers and 50% by the employees) provides oral healthcare for employees and their families who earn less than EUR 28,000 per year. All dentists practice privately, although 90% have a contract with a public insurance scheme. The national public healthcare scheme provides those under 18 years of age with preventive oral healthcare and treatment (excluding crowns and bridges and orthodontic treatment) completely free of charge and adults over the age of 18 years with regular examinations, simple maintenance care and full dentures free of charge. In addition, those with special needs and some medically compromised persons can receive all necessary care and treatment free of charge. The rest of the population is encouraged to take out private health insurances to cover their oral health needs. In most cases these insurances refund up to a fixed (limited) maximum of the total costs. Adults are therefore advised to participate voluntarily in additional dental insurance schemes, to cover the balance of costs and 70% appear to follow this advice.

Before 1995, young people under the age of 18 years were entitled to free oral healthcare and treatment, except for orthodontic care for which they had to contribute a small amount of money to meet the costs. Adults could obtain all necessary basic treatment. Adults paid part of the costs of prosthetic treatment and total costs of crowns and bridges. However, the changes do not appear to have significantly disadvantaged patients or dentists. No organized dental care or preventive programs exist in schools.

Epidemiology

There have been have been no national epidemiological oral health surveys for several years. Several small studies have been performed and national figures for DMFT in 12-year-olds are quoted. The latest is 0.6 (Truin et al, 2003).

Costs

WHO reported that 8.1% of GNP was spent on all healthcare in the Netherlands in 2000. In the same year is has been estimated that a total of EUR 1,500 million was spent on oral healthcare of which 30% came from public funds and the remaining 70% from private funds.

NORWAY

Liljan Smith Aandahl, Norwegian Directorate for Health and Social Affairs, Oslo

In 2000, Norway had a population of just under 4.5 million. There are 1,170 Dentists working in the Public Dental Health Services (PDHS) and 2,620 (including specialists) in the private sector. In addition, there are 590 non-active dentists and several hundred dental hygienists. The Norwegian public oral health care system was established in 1950 and was implemented governed by the Acts of 1949 and 1983 relating to oral health services. Local government is responsible for planning and funding the PDHS. Under the Acts, all children aged between 0 and 18 years receive free treatment except for orthodontic care for which parents have to pay a part of the fee according to the degree of malocclusion. Take-up of services is about 93%, which represents the percentage of those aged between 3 and 18 years that were seen by the PDHS in 2001. Mentally retarded people aged over 18 years receive free dental care and 87% were seen by the PDHS in 2001. Elderly people in nursing homes and person receiving systematic free care at home from the public nursing services also receive care from the PDHS.

Young people aged between 19 and 20 years, are offered oral healthcare services by the PDHS and pay 25% of the normal fees. On the basis of local decisions, oral healthcare may be provided free of charge to recipients of social welfare assistance, the unemployed and refugees. In 2000, 6% of adults in Norway, mostly in rural areas, received their oral healthcare through the PDHS. They paid a fee set by the local authority. Before 2001 this fee was a national fee and set by the Ministry of Health and Social Affairs. The range of the fee in 2002 was EUR 100–130.

The oral health of the adult population is generally considered to be good. Use of the services is at a high level and 75% of adults are thought to visit the dentist regularly (once a year). There are no subsidies to refund the fees of adults who use the services of the private sector, nor are there plans to establish or introduce such subsidies paid for from public funds. Since 1996, there have been no set fees in the private sector. A private dental insurance scheme was introduced in 1996. In addition, there are a few companies that offer subsidized dental treatment to their employees.

Epidemiology

In 2000, the national mean DMFT score in 12-year-olds was 1.5 and 48% had no visible caries (Statens Helsetilsyn, 2001).

Costs

In 2001, the total cost of dental treatment in PDHS and the private sector was estimated to be EUR 588 million, which included EUR 175 million spent in the PDHS and a further EUR 38 million refunded from State Insurance System to adults for dental treatment and orthodontic treatment for children. Out-of-pocket spending on dental care for adults was estimated to be EUR 375 million.

PORTUGAL

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Portugal is a fairly small country which consists of five regions on the mainland of Europe and two 'island' regions. The majority of the population (just under 10 million) lives on or near to the coast. Oral healthcare is provided almost entirely by the private sector. Public Dental Services are available in only a few hospitals and the type of treatment offered is limited to major conditions that require hospital admittance, e.g. major surgery, oncology, etc. A handful of Public Health Centers provide simple restorative treatments and extractions. Nearly all practitioners that work in the public sector are stomatologists, medical doctors who have done further training in dentistry. Until 1975, when the first dental school opened, stomatologists were the only university-trained practitioners that provid-

ed oral healthcare. Since then, the situation has changed dramatically. In 2002, there were only 756 Stomatologists. Although training in the specialty is still available, the number of trainees has been decreasing over the years and fewer than 10 training places are offered per year. Furthermore, not all trainees in stomatology complete training. The future for the specialty, as it is now organized, is uncertain.

The situation for dentists is very different. They complete a six-year university education and their number has been steadily increasing. In the past 5–6 years there has been an exponential growth and the total figure has doubled to 4,203 dentists. This growth may well continue because in 2002/2003 some 580 students entered the seven dental schools (four public and three private). Many dentists work in the urban areas of Lisbon and Porto, (48% of the dentists but only 38% of the population). There is still a group of about 800 odontologists who have never completed any kind of university training and 'learned practical dentistry' as 'apprentices' in dental practices. This type of training ceased when the first dental schools opened. Existing odontologists were registered. However, at present, their entitlement to provide comprehensive oral healthcare is being legally challenged. They are an aging group and as no new odontologists can be trained, they will eventually cease to exist as part of the oral health workforce in Portugal. Sadly, illegal dentistry continues to exist, practiced by people that do not have any kind of practical or theoretical training whatsoever. The Portuguese Dental Association estimates that there are 300 of these 'practitioners'.

Courses for dental hygienists have been run at one school since 1984 and courses for dental nurses since 1986. By 2003, there were 352 certified dental nurses and 200 dental hygienists. Two schools provide training in dental technology, one private and one public. The number of certified dental technicians is not known. Most 'practicing' dental nurses and technicians have no specific training and have learned from the dentists they work for or from others. It is estimated that there are more than 4,000 dental nurses and 4,000–5,000 dental technicians.

A Public Oral Healthcare system, focused on prevention is being developed. Dentists who choose to participate notify their local Health Centers. Children, aged 6–10 years, from the nearby schools are then referred to them to be seen in their private practices (offices). Each child is entitled to two visits per year. Payment is made by the Ministry of Health and is based on a fee per child per appointment. Treatment to first permanent molars is limited to fissure sealants, simple restorations, basic endodontic treatment and extractions. All other treatments, including that of primary teeth, are excluded. If the child needs additional treatment, the parent has to agree and pay a private fee, negotiated with the dentist concerned. Treatment quality is monitored by dentists appointed by the Portuguese Dental Association who randomly examine 9% of children treated. Continuing participation in the program by a specific dentist is dependent on this evaluation. By 2002, 1,180 Dentists had enrolled in this program and 27,349 children received care, approximately 10% of children in this age group. EUR 4.5 million were spent, 0.0035% of the Ministry of Health's budget.

In some parts of the country the local health sub-region has programs providing assistance to other population groups. In the autonomous regions of Madeira and Azores, oral healthcare is provided within the National Health Service and is financed by the regional government.

Certain professional groups pay an extra social security tax to a Sick Fund, which can also insure direct relatives, and covers oral health expenses. Civil servants, bank workers, police and military as well as large companies are covered by these types of schemes. There are large numbers of these funds and each one has its own list of eligible treatments and scale of fees. Usually orthodontics, advanced prosthodontics and complex surgical treatment are excluded and, if not, are dependent on prior approval. In general, the scope of treatment offered within the schemes is limited to basics and fees are very low. Patients who are covered can go to a dentist who has a contract with their scheme and pay a token fee to the dentists or are not charged at all. The dentist then reclaims the fee directly from the fund. Alternatively, patients can go to any other dentist of their choosing, pay the full private fee and then claim a refund of the entitled amount directly from the scheme.

Epidemiology

A national survey indicated that in 2000, some 43% of 12-year-olds had visible caries and that the mean national DMFT score was 2.9 (General Direc-

torate of Health, 2000). However, a subsequent survey, which was limited to the Portuguese mainland and which used the WHO *Pathfinder* methodology produced a national mean DMFT score of 1.5 (Almeida, 2003). There are no data for the uptake of oral healthcare in Portugal. However, it has been estimated that fewer than 30% of adults visited a dentist in 2002.

Costs

In 2002, the total expenditure on health was EUR 7.6 billion, some 5.6% of GNP. It is difficult to estimate how much was spent on oral healthcare. The public health service provision for 6 to 10-year-olds cost EUR 4.5 million. However, the cost of other publicly funded oral healthcare such as in the Azores and Madeira and in hospital departments is not reported centrally and there are no reliable data for costs in the private sector or from household surveys of expenditure.

SPAIN

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Spanish dentistry has experienced a big change in the past decade during which the number of dentists in Spain has doubled to 19,938 by the end of 2002. The population of Spain is just under 40 million and currently the dentist/patient ratio is 1:2,001. The majority of dentists work in urban areas where the dentist/patient ratio in Madrid is 1:1,000. Forty per cent of dentists have obtained their qualifications from foreign countries (mainly in South America) and the mean age of dentists has decreased (60% are less than 35 years of age). By 2003, there were 11 public dental schools in Spain and a further 4 private ones. In addition, there is a school of stomatology at Oviedo which trains medical doctors who then take a dental degree. In 2003, it is expected that 2,000 new dentists will be registered in Spain. In spite of the widely available formal postgraduate training in all dental specialties, none of these specialties are yet recognized for registration. Dental hygienists undergo a 2-year program prior to qualification and the right to work as such. Dental nurses (chairside assistants) are not required to have formal training and are usually trained by their employers. There are an estimated 20,000 dental nurses and 1,000 dental hygienists.

Spanish dentistry is mainly private and patients pay the total cost of care. There are no statutory predetermined fees. However, each local dental council (one for each of the 17 autonomous regions) publishes recommended fees annually. A new, although not extensive development, is for increasing number of dentists to work for private insurance companies providing comprehensive dental treatment. The patients, who are covered by these insurances, are provided with care and treatment dependent upon their annual premium. The company pays the dentist a set fee for treatment provided. An alternative insurance scheme has also evolved in which the patient pays the dentist a fee or fees on a scale set by the insurance company and the dentist then pays a small percentage of the patient's fee to the company.

There is a Public Dental System (PDS) which provides information, education, preventive measures and advice to school children between 6 and 14 years free of charge. The Public Dental Team is comprised of nurses, dental hygienists and dentists who may provide oral health screening and dental health education programs at schools, or may apply preventive measures (fluoride applications and fissure sealants to permanent molars) in 'prophylaxis odontological units'. In addition, the PDS provides free treatment of acute problems, limited to extractions and oral surgery, for patients of all ages, as well as preventive oral healthcare for pregnant women.

Since 1990, two autonomous regions, Pais Vasco and Navarra, have offered free restorative treatment in permanent teeth, sponsored by local government, for children from the age of 6 years. These regions have arranged treatment by private dentists through a capitation system, which provides fillings, endodontics and orthodontics for children up to the age of 14 years. Recently, Andalusia has implemented a similar system in which children from 6 to 15 years of age will be treated free of charge by private dentists. This system is based on collaboration between the local government and some private dentists. The government pays the dentist a fixed amount per child for an annual examination including oral hygiene instructions and preventive procedures. If further restorative treatment is needed, the government will pay the dentist a predetermined fee for each procedure. Orthodontic treatment is not included.

In 2002, a national survey indicated that just under 27% of Spaniards visited a dentist. Uptake of oral healthcare services is therefore rather low in comparison with many other EU countries.

Epidemiology

The recent Spanish national survey of 12-year-olds indicated that in 2000 the mean national DMFT was 1.1 (Llodra et al, 2002).

Costs

As the vast majority of oral healthcare is provided privately and there have been no national household surveys which included a question on this topic, it is therefore difficult to obtain any reliable data for the total cost of the provision of oral healthcare in Spain.

SWEDEN

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Sweden is geographically a fairly large country by EU standards. However, it has a relatively small population (just under 9 million in 2002). All 21 county (sub-regional) councils are obliged to provide public oral healthcare. Of the 7,600 practicing dentists, about 4,300 work in the public sector and 3,300 in the private sector. Some 2,500 dental hygienists support the work of the dentists. The Public Dental Service (PDS) began in 1938. Initially, its purpose was to establish a systematic oral healthcare system for children and teenagers. Adults of all ages have also had the right to use the PDS within the available resources. At present, the PDS offers systematic and free dental care to all children up to the age of 19 years. The county councils can also provide public dental care for adults to an extent considered 'appropriate and necessary'. The PDS also provides specialist treatments for all Swedes. Children's dental care is financed solely by local taxation.

Since 1974 the general dental insurance has covered all inhabitants from the age of 20 years and over with the aim of making dental care financially accessible to all citizens.

The reformed system of dental care subsidies, which entered into force in 1999, aimed to provide all adults with improved financial support for primary dental care and to give better financial support to certain groups of elderly, unwell and disabled people and, cost ceiling permitting, patients with high dental costs (high-cost protection). Within general dental insurance all types of treatments are subsidized, including prosthetics and orthodontics, if they are necessary to achieve acceptable oral health from a functional and aesthetic point of view. However, dental insurance does not provide for treatment carried out solely on aesthetic grounds. An expert's assessment on the appropriateness of a treatment plan is a prerequisite for the refund of fees for expensive treatments. Patient fees, both in the public and private sectors are no longer regulated by the government.

For specific groups there are special arrangements for both the provision and funding of oral healthcare. These groups comprise people with a persistent and essentially increased need of dental care due to chronic illness and disability, the elderly and chronically sick. Such patients are often identified via free outreach activities. In 2002, about 190,000 patients were estimated to be entitled to free outreach care. In 2002, the dental insurance subsidies for the provision of all fixed and removable prostheses for those aged over 65 years were raised. One hundred per cent of charges over EUR 900 are now paid from public funds as long as the treatment plan is accepted by the social insurance office.

A survey carried out in 1999 indicated that 88% of 20 to 44-year-olds, 93% of 45 to 64-year-olds, 83% of 65 to 74-year-olds and 69% of those aged 75 years or older had visited a dentist in the previous two years.

Epidemiology

The mean national DMFT for 12-year-olds was 1.0 in 2002 (Socialstyrelsen, 2003).

Costs

At present, public dental health insurance for adults is estimated to cost the state EUR 210 million per year. The county councils' contribution to children's oral healthcare is estimated to be EUR

395 million per year. Thus, the total contribution from public funds is EUR 605 million. Patients' fees amount to EUR 980 million, which means that the total spend on dentistry is about EUR 1,585 million.

UNITED KINGDOM

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In 2000, the UK had a population of just over 59 million. Since 1948, it has had a specific government financed public oral healthcare system within the framework of the National Health Service (NHS). There are three 'branches' for oral healthcare within the NHS. The largest is the General Dental Service (GDS). Approximately 85% of UK dentists work within the GDS. One of the particular characteristics of the system is its funding. The government annually allocates a certain amount of funds for oral healthcare purposes and fees are then specified within this 'budget'. Dentists, who provide care within the GDS are very rarely salaried. They pay for their buildings, equipment, staff salaries and laboratory bills for technical services and work as full or part-time contractors to the NHS. Most also provide care privately outside the NHS. It is believed that in 2001 only about 650 dentists worked solely privately. The vast majority treat patients both within the NHS and privately. Part of a patient's care may be provided within the NHS and part privately. Often basic treatment is carried out within the NHS and more advanced treatment, involving the use of more expensive materials, privately. In 2002, one estimate suggested that on average about 50% of a general dentist's income came from private fees and 50% from the NHS.

The mechanisms for paying fees within the NHS have changed over last 12 years and are still evolving. Plans to devolve decisions on funding oral healthcare in the NHS from a national level to 300 local Primary Care Trusts (in England) and their equivalent in Scotland, Wales and Northern Ireland, have recently been approved by the UK parliament and the greatest change since the foundation of the NHS in 1948 has started. In 2001, general dentists received payments from the NHS through a combination of capitation and fees for item of treatment for patients aged from 0–17 years. The size of the capitation payment varies with the age of the child or adolescent. It covers prevention, simple restorations and extractions. Crowns, dentures and orthodontic treatment are paid for on a fee for item basis. Dentists receive a small annual fee for every adult registered with him/her for regular care.

All oral healthcare within the NHS is free for persons under the age of 18 years, students under 19 years old, expectant mothers, unemployed, those on low income and all persons undergoing medical treatment as inpatients in hospitals. Other NHS patients pay 80% of their fees up to EUR 500, above this figure they pay nothing. Various insurance companies sell private oral healthcare insurance.

The other two branches that provide oral healthcare within the NHS are the Community Dental Service (CDS) and the Hospital Dental Service (HDS). Dentists who work for the CDS and HDS are paid salaries. The CDS provides care for patients (mainly children) who are unable to find care within the GDS or who have special needs. The CDS also carries out a national screening program such that all children who attend state funded schools (93%) receive oral health screening three times during their school years and provides the majority of examiners for national and local oral health surveys. The HDS has been responsible for much of the specialist oral healthcare provided in the UK. However, since the introduction of specialist lists, 13 dental specialties are recognized (see www.gdc-uk.org for details), an increasing proportion of specialist care is being provided in local practices (offices) by specialists.

In 2002, 61% of children and adolescents under the age of 18 years were registered with an NHS dentist in England and Wales. A similar percentage was registered in Scotland and Northern Ireland. The utilization of services for this age group may therefore be estimated at 66%, allowing for care provided by the CDS and the private sector. Forty-five per cent of those aged 18 years or more were registered with an NHS dentist in England and Wales in 2002. However, the UK Adult Dental Health Survey of 1998 suggested that 59% of dentate adults were 'regular dental attenders'. The utilization of services by those over 18 years of age may therefore have been about 60% in 2002.

The concept of a dental team has developed. Apart from some 31,500 registered dentists, there are also some 4,000 enrolled (registered) dental hygienists and some 420 enrolled dental therapists providing clinical care in the UK. A series of changes in the law are taking place to enable the

development of the dental team. Since July 2002, dental therapists have been legally permitted to work in the GDS as well as in the CDS and HDS. Within the next two years two further groups, clinical dental technicians and orthodontic auxiliaries, will be permitted to treat patients under the leadership of dentists. All these groups, together with dental technicians and nurses will be required to register with the national competent authority (the General Dental Council) and will be required to undertake continuing professional education throughout their working lives. Dentists have had such a requirement since January 2002.

Epidemiology

National epidemiological surveys of the oral health of adults and children are performed at ten yearly intervals. The last survey for children was carried out in 1993 when the national mean DMFT figure for 12-year-olds was 1.4 (O'Brien, 1994). A rolling national school screening program of 5, 12 and 14-year-olds is also performed. The latest mean national DMFT figure for 12-year-olds from this program was 0.9 (Pitts et al, 2002). Surveys of adult dental health indicate that the percentage of those over 16 years who are edentulous has fallen from 37% in 1968 to 13% in 1998 (Kelly et al, 2000).

Costs

In 2001/2002 the total expenditure on oral healthcare in the GDS (public sector) in England and Wales was EUR 2,300 million of which patients paid EUR 710 million. Including expenditure in Scotland and Northern Ireland and in the CDS and HDS, the total expenditure on oral healthcare within the NHS in 2001/2002 was some EUR 3,000 million. Estimates of private expenditure on oral healthcare varied for 33% to 50% of total expenditure. It is therefore possible that between EUR 2,000 million and EUR 3,000 million were spent in the private sector. Thus the estimate for the total expenditure on oral healthcare (public plus private) in the UK in 2001/2002 was between EUR 5,000 and 6,000 million.

DESCRIPTION OF THE ORAL HEALTHCARE SYSTEMS IN THE ACCESSION COUNTRIES IN 2003

CYPRUS

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In 2001, the Republic of Cyprus had a population of 689,471. There were 649 dentists (296 female and 353 male) giving a dentist population ratio of 1:1,077. As there is no dental school in Cyprus all dentists have obtained their primary qualifications abroad: 71% in Greece, 4% in Bulgaria, 4% in Germany, 9% in Romania, 4% in Russia and 8% in UK and USA.

Only 6% of dentists work for the Public Health Services (with 37 in the Dental Services of the Ministry of Health and 7 in the Armed Forces Dental Service). These dentists are not allowed to practice privately. The others are private practitioners. Two specialties, oral and maxillofacial surgery and orthodontics are accredited and the accreditation of oral surgery, as a separate specialty, is under way. There are 25 qualified orthodontists and 11 maxillofacial surgeons. Many dentists have undergone postgraduate training in endodontics, paedodontics, preventive dentistry, dental public health, periodontology and prosthetics and practice these specialties in Cyprus. There are 180 dental laboratory technicians and three dental hygienists. Thirty-seven (unqualified) dental nurses (assistants) work for the public sector and an estimate of 150 for the private sector.

Any citizen is entitled to receive oral healthcare from public dental clinics, which are situated in the District General Hospitals and in the urban and rural health centers. There are 56 such dental clinics. In addition, there are four mobile dental units for the School Dental Service. The Ministry of Health sets the level of fees for services provided by the public dental clinics. Fees vary according to the annual income of the patients concerned (all civil servants are entitled to reduced fee oral healthcare in public hospitals). There are also some private dental insurance schemes (i.e. Cyprus Telecom and banks' funds that offer dental care to employees and their families). The financing of public dental clinics is met from taxation. The dental service of the Ministry of Health has two sections, the preventive and the curative. The former offers oral health education and preventive care to all children, ex-

pectant mothers, young parents, parents of children with special needs, and selected groups of public employees such as teachers. It also screens school children. About 7% of the population has access to water that leaves the ground with a fluoride content of 1ppm or more. The curative section of the dental services offers restorative, endodontics, pediatric dentistry, periodontology, removable prosthetics and oral and maxillofacial surgery.

Since 1992, the dental service of the Ministry of Health has purchased restorative dental treatments from the private sector. Government dentists have examined public school children in 5th grade of elementary schools countrywide, and referred those children in need of active treatment to the private sector. After this treatment has been carried out government dentists may check the work.

About 85% of all oral healthcare is delivered in private practice and the rest by the public dental services. No reliable data exists for the percentage of the population utilizing dental services. However, one of the objectives of the public dental services is to increase the number of people visiting a dentist by 10%.

A new General Health Insurance System for all citizens and including oral healthcare, is being introduced. The government will finance approximately 50% of the scheme's total budget and the remaining 50% will be shared equally by employers and employees.

Epidemiology

The most recent national survey indicated that in 2000, the mean DMFT score for 12-year-olds was 1.8 (Savvidou, 2003).

Costs

In 2002, about 6% of GNP was spent on publicly funded health services. About 1% of GNP was spent on oral healthcare, 97% of which was spent in the private sector. The public dental services received 1.3% of the total budget of the Ministry of Health (EUR 2.5 million in 2002).

CZECH REPUBLIC

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The Czech Republic has a population of approximately 10 million. In 2002 there were 7,645 registered dentists (stomatologists) of whom 67% were female and an estimated 6,735 dentists were in active practice. The dentist/patient ratio is thus 1:1,514. Most dentists (87%) work in private practice. About 7%, work in municipal health centers and 6% work in hospitals, at universities or in the armed forces.

As about 40% of the active dentists are older than 50 years, the size of the dental workforce is expected to decrease in the near future. Dentists must register with the Ministry of Health, the Czech Dental Chamber (CSK) and their regional authority. The CSK statutorily maintains a register containing the dentists' data, including qualifications and professional performance information and there is a statutory requirement for all dentists to undertake continuing professional education in order to maintain their registration.

Most (97%) of children and adolescents up to 18 years of age, pensioners and 67% of the adults are covered by an obligatory tax-financed public health insurance run by nine state-approved health insurance companies. The rest of the population is insured or in one of 14 other health insurance schemes and employees sick funds. The sick funds are self-regulating under national legislation. Contractual health insurance is only of a supplementary nature.

In 2003, about 90% of dental care was delivered by private dentists. The remaining 10% was provided by university clinics, municipal health centers, the armed forces and hospitals. Less than 1% of dentists (mainly in Prague and in the other larger cities) work completely privately, outside the health insurance system. Most dental technicians work in private laboratories.

The health insurance scheme (HIS), identical for all health insurances and sick funds, covers the costs of the 'standard' dental care of children up to 18 years of age in full with the exception of some prosthodontics and fixed orthodontics for which special rules apply. Topical applications of fluorides, fissure sealants and other in-office preventive items are not included in standard dental care. The HIS also covers basic dental care of

adults (twice a year dental examination and calculus removal, necessary local anesthesia, amalgam fillings, endodontics, periodontal treatment, dento-alveolar surgery, resin crowns and simple removable dentures). The costs of tooth-colored fillings and other, more complex prosthodontics are covered partly by the HIS (up about 30% of the costs) and partly by patients themselves. Implantology is not covered. Overall, about 70% of all oral healthcare costs are paid for from the HIS and the remainder by patients themselves. Dental care of children and adolescents is provided predominantly by private dental practitioners, who are either general practitioners or specialists in children's dentistry.

The training of dentists has followed a stomatological pattern and takes place in one of five medical faculties which produces 180–220 dentists annually. Undergraduate training lasts six years, the first three of which are predominantly medical. A further two years postgraduate dental training is then required before dentists are registered to practice independently. Those who wish to specialize then train for a further three years, as do general dentists who wish to take a higher degree in general dentistry. The specialties of maxillofacial surgery, orthodontics, periodontology, prosthetic dentistry and paedodontics are recognized. As a consequence of joining the European Union curricula have currently been harmonized with those in the EU. Education of dental hygienists started in 1999 when one state school and two private schools were opened. Thus the number of hygienists is still low. Dental assistants usually follow a four-year training program as medical nurses or a six-year program as stomatological nurses.

Epidemiology

In a recent national survey carried out for the Institute of Dental Research (Broukal and Mrklas, 2003) 42.9% of the 5-year-olds, 28.5% of the 12-year-olds and 7.2% of the 18-year-olds were seen to have no visible caries. The mean DMFT values were 2.6 for the 5-year-olds, 2.5 for the 12-year-olds and 5.6 for the 18-year-olds. Previous Institute of Dental Research surveys have indicated that in 1997, 0.4% of 35 to 44-year-olds were edentulous and that in 2002, 33.6% of 64-year-olds were edentulous.

Costs

According to Czech Statistical Office the cost of total healthcare was EUR 42,398,687, and cost of oral healthcare was EUR 237,250 in 2002. In 2000 WHO estimated that 7.3% of GNP was spent on all healthcare and estimated per capita GNP was $US 13,780 (World Bank). No data for the total cost of oral healthcare in both public and private sectors have been reported to the CECDO.

ESTONIA

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In 2001, Estonia had a population of 1,434,068. Many reforms and structural changes to the oral healthcare system have been initiated since 1991 when the country regained its independence. The number of private dental clinics has increased from 328 in 1998 to 468 in 2001. This increase has occurred mainly in towns. The number of dentists, who now work predominantly as private practitioners, has increased from 753 in 1990 to 1,094 in 2001. At present 90% of the dentists in Estonia work in private practice. The overall dentist/population ratio is 1:1,311 but the ratio varies and in some rural areas there are no dentists. Eighty-seven per cent of all Estonian dentists are female. General nurses are used as dental assistants as so far there is no education of dental assistants or hygienists. At present, there are two dental hygienists in the country.

Both private and public dental services are paid for in part or fully by the state funded, national sick fund (Central Health Insurance Fund and Regional Health Insurance Funds). Since 2003, all dental treatment (including prevention and orthodontics) for children up to 18 years of age is paid for by this fund. The fund also offers the following benefits: retired persons (63 years and older) can reclaim the cost of prosthetic treatment at a rate of up to EUR 130 once in a three year period; adults can reclaim up to EUR 10; pregnant women up to EUR 30; and those with children of less than 1 year, up to EUR 20 once a year. The present Estonian social tax system was founded in 1992. Under this system, employers pay the equivalent of 33% of salaries into national funds, including social insurance (20%) and health insurance (13%).

There is one dental school in Estonia at Tartu University, which admits 30 students per year, who are paid for by the state plus up to 10 additional students who have to fund their studies themselves. There are postgraduate programs in clinical dentistry (3 years), orthodontics (3 years) and in oral and maxillofacial surgery (5 years) and the graduates from these programs are officially certified as specialists. In 2000, there were also five dentists who specialized in periodontology, 120 in prosthodontics, 66 in paedodontics and one in oral medicine.

The mean number of visits to the dentists has decreased from 1.7 per inhabitant (1991) to 1.3 (2001). The number of treated and extracted teeth has stabilized in the period 1998–2001. As a consequence of gaining independence, a wider range of materials is now available and a wider range of treatment modalities is practiced. Orthodontics and prosthetics have benefited, and in particular fixed appliances, metallo-ceramic crowns and bridges and implants are now readily available.

In 1996, a ten-year program to prevent oral diseases was launched. It has been financed by Ministry of Social Affairs and the Estonian Sick Fund, and was also supported by private companies. Information booklets, pamphlets, videos and transparencies are distributed and television and internet programs have been produced. Kindergarten children and schoolchildren throughout Estonia were examined and preventive measures, including applications of fluoride varnishes and fissure sealants were performed and oral hygiene instruction given. In 2001, 104,490 Estonian children (well over 50%) received preventive treatment.

Epidemiology

A survey performed in 2000/2001 revealed a high prevalence of caries in the deciduous teeth of 5 to 6-year-olds. Only 25% had no visible caries. The prevalence in 12-year-olds was moderate, with a national mean DMFT of 2.4 (Russak, 2003). There were variations in different regions of Estonia, depending on the fluoride content of local drinking water (from 0.03 mgF/litre in South Estonia to 7.0 mgF/litre in West Estonia). Not surprisingly, dental fluorosis was seen mainly in West Estonia.

Costs

The national statistical institute reported that in 2001, some 6.6% of GDP was spent on healthcare and 0.25% on oral healthcare.

HUNGARY

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The republic of Hungary has a population of about 10 million. In 2002, there were 5,500 registered dentists of whom about 4,700 were active in practice and 66% were female. These dentists were supported by 230 dental hygienists and an estimated 5,000 dental nurses and 2,300 dental technicians.

Before the political changes in the early 1990 s, nearly all dental clinics were state owned, maintained by District Governments at a local level and employing dentists on a salary. Many clinics have since been sold or rented to dentists. Privatization was seen as the way to raise more money for oral healthcare. To facilitate the process, District Governments made loans available to dentists. At present, the majority of dentists practice privately. Almost all Hungarians have insurance and are members of a public healthcare scheme. The National Health Insurance Fund (OEP) is financed by compulsory contributions with employers contributing 75% and employees 25%. Complementary health schemes and voluntary mutual health funds have more than 300,000 members, and 70% of their total expenditure is spent on dental treatments. About 70% of the dentists have a contract with OEP and 20% practice on an entirely private basis. Of the 3,400 dentists contracted to the OEP, about 70% also have an independent practice. The other 30% are employed in the public dental service. Some of these also work part-time in independent practice.

Up to the age of 18 years Hungarians receive free oral healthcare from the public dental service. If the parents choose private care, they have to pay for it. Expectant mothers, military personnel, people with work-related illnesses and pensioners also receive free care. Patients between the age of 18 and 60 years obtain oral screening, emergency care, conservative treatments and oral surgery free of charge but must pay a portion of the cost of all

other treatment and about 90% for treatment involving laboratory work (crowns, bridges and dentures). Prevention programs have been weak, and only 0.3% of the population has access to drinking water with a fluoride content of 1ppm, or more.

There are four dental schools in Hungary located in Budapest, Debrecen, Pécs and Szeged. Five specialist categories; oral surgery, orthodontic, pediatric dentistry, periodontology, oral radiology are accredited. Since 2000, there has been a nationwide compulsory continuing educational program. In the last few years programs for training dental hygienists have started in different cities.

Epidemiology

The oral health of the Hungarian population is rather poor. In 2001, about 2 million children and 4.5 million adults visited a dentist, about 65% of the population. In 2000, the national mean DMFT figure for 12-year-olds was 3.8 (Szöke and Petersen, 2000). Oral cancer mortality is high (17 deaths per 100,000 inhabitants per year).

Costs

In 2002 5.5% GNP was spent on healthcare, and 0.19% on dentistry (Central Office of Statistics, 2003). In 2000 the total expenditure of the health Insurance Fund was about EUR 3,285 million of which EUR 4.73 million was spent on dentistry.

LATVIA

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In 2000, Latvia had a population of just under 2.5 million. During the last nine years, dental auxiliary staff numbers have increased by 25%. In 2002, there were 1,692 dentists (89% women), 99 dental therapists, 153 dental hygienists, 1,023 dental nurses or general medical nurses certified in dentistry, dental assistants, and 537 dental technicians. Dental auxiliaries (excluding dental hygienists) are trained at a specialized auxiliary school. Dental therapists and dental hygienists practice under the supervision of a dentist. Membership of the Latvian Dental Association is mandatory for all practicing dentists, 33% of whom are employed in public sector and 67% in private practices. The offices of the Dental Association are located within the only dental school in the country, which is in Riga.

At present, the dental school graduates, 35–45 dentists and 24 dental hygienists annually. Between 1993 and 1995 a revised curriculum for undergraduate dentists and dental hygienists was introduced. After graduating, young dentists are obliged to work for at least two years under the supervision of an experienced dentist before they are permitted to undertake independent practice. Specialist training may be undertaken and lasts three years for orthodontics, periodontology, paedodontics, prosthodontics and endodontics and five years for oral and maxillofacial surgery.

Since regaining independence in 1991 there have been many changes. Before 1991 oral healthcare was provided free of charge to the whole population by the state. At present, with some exceptions, adults pay for their oral healthcare out of their own pockets and with the exception of orthodontic treatment, a publicly financed sickness fund covers treatment costs for children up to 18 years of age. In 2002, the average cost per child per year was EUR 20 and 50% of children sought oral healthcare. Regional sickness insurance schemes reimburse dentists for health promotion and education on a capitation basis according to the number of children cared for. Oral healthcare, including oral hygiene instruction and scaling and polishing is reimbursed on a fee for item of service. Groups of adults who are eligible for state financed oral healthcare include: 18 to 27-year-olds who have been called up for military service and adults who were victims of the Chernobyl nuclear catastrophe (government resolution 'Healthcare Strategies in Latvia 1996'). The oral healthcare system for Latvia is under the overall control of the Ministry of Health and the State Dental Centre, who plan, direct and monitor its delivery. Private insurance is becoming more popular, especially among affluent people and quality control systems for the treatment provided have been built into the schemes.

In 1993, Latvia was one of the European countries with the highest caries levels in all age groups and poor oral hygiene habits. To address this problem, in 1994, a National Preventive Program was established in the Oral Health Centre at the Institute of Stomatology in close cooperation with the State Dental Centre and WHO Collaborating Centre

in Continuing Dental Education in Riga. Between 1994 and 1999, twenty-two local district oral health centers were established in cooperation with the sickness funds, local governments, school councils and dental and general medical staff. In 1998 a system of assessment of effectiveness of these centers in the provision of preventive and curative care was established, based on regular accounting of oral health data in defined age groups measured against 'Evaluation criteria'.

In 1992, a mandatory requirement was introduced that required all dentists and auxiliaries registered in Latvia to undertake re-certification examinations. During the period 1992 to 2003, 1,707 dentists and other dental personnel (including 99 dental therapists) have passed this re-certification examination. In January 2001, a further mandatory requirement was introduced for all dentists who had been registered in Latvia to complete a minimum of 250 hours of continuing professional education every five years. Auxiliary personnel have the same requirements but the number of hours differs from group to group. In Latvia the competent authority that maintains dentists' registration and dental practice accreditation (every five years) is the state agency of health statistics and medical technologies in cooperation with the State Dental Centre. Since 2001, this agency has also been required to monitor the health and safety regulations and quality assurance in all of the 702 dental practices in Latvia. In the current climate of transition, the oral healthcare delivery system in Latvia can be described as a hybrid model with elements of the Bismarkian and Nordic models.

Epidemiology

Caries levels in 12-year-olds have improved over the last few years from a mean national DMFT figure of 5.8 in 1993 to 3.5 in 2002 (State Dental Centre, 2003).

Costs

It has been reported that in 2002, the percentage of GNP spent for healthcare in the public sector was 3.5% and that GNP spent on oral healthcare was 0.054%. However, in 2000, the WHO reported that total expenditure on all aspects of healthcare in all areas (private and public) was 5.9% of GNP. As 67% of all Latvian dentists work mainly in the private sector, total expenditure on all aspects of dentistry is far higher and can be estimated at 0.18% of GNP in 2000.

LITHUANIA

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The Republic of Lithuania has a population of 3.5 million, about 19% of whom were less than 15 years old. In 2002, there were 2,490 registered dentists, some 83% of whom were female, and 171 were hygienists. Oral health services are provided in both the public and private sectors, with about 43% of the dentists in public service and about 44% in private service. About 13% of dentists work part-time in public and part-time in private practice. In Lithuania there was one dentist per 1,400 inhabitants in 2002.

Oral healthcare expenses may be reimbursed from state or municipal funds, mandatory health insurance funds, supplemental health insurance funds, and from voluntary contributions by patients. Only essential oral healthcare services are provided free of charge. The Ministry of Health sets the fees for the services provided by state, district and municipal institutions. Private fees are set by dentists themselves but they must not be more than 60% higher than those established by the Ministry of Health.

The national health insurance system scheme offers reimbursement of the cost of oral healthcare and treatment. Public oral healthcare is free of charge for children and teenagers under the age of 18 years and disabled adults. A recent study has indicated that in the groups sampled regular attendance at the dentist by 12-year-olds fell from 54% in 1993 to 48% in 2001 and that in both years just over 66% of attendances were for emergency treatment. The same study also investigated changes in oral hygiene and sugar intake (Aleksejūnienė et al, 2002). There are about 500,000 (14%) inhabitants aged over 65 years in Lithuania. In theory they should receive prosthetic treatment free of charge. However, due to the lack of financial resources the provision of free-of-charge prosthetic treatment is very limited. Adult dental care in the public dental service is partly funded by reimbursement from public insurance and partly paid for by the patient.

Patients can visit any dentist but in the private sector they are expected to pay all the expenses.

In 2002, there were 920 private dental clinics with 1,418 general practitioners and 264 specialized dentists (including orthodontists, periodontists, endodontists, prosthodontists, paedodontists and oral surgeons). About 39% of patients visited private dentists of whom about 10% were less than 15 years old. The state and more or less all 41 municipalities also carry out a national caries prevention program. At present, due to financial constraints, it consists mainly of educational programs.

Epidemiology

A recent study has indicated that there has been a reduction in the national mean DMFT figures for 12-year-olds from 4.9 in 1993 to 3.6 in 2001. The corresponding figures for 15-year-olds indicated a fall form 7.2 to 5.1. In the 2001 DMFT figures, the FT component for 12-year-olds was 0.9 and for 15-year-olds it was 1.8. The corresponding MT components were 0.2 and 0.4 (Aleksejūnienė et al, 2004). The same study also indicated some improvement in the oral hygiene of children and suggested that this might be due to better access to western standard oral hygiene products. Improved access to fluoridated toothpaste may account for the improvement in mean DMFT figures. Sales of these products started in 1991 and universal accessibility occurred after 1993.

Costs

WHO reported that in 2000, 6.0% of GNP was spent in Lithuania on all healthcare (both publicly and privately funded). In 2001, about 5.3% of the Compulsory Health Insurance fund was allocated to refund patients for dental care, EUR 22.2 million. For both public and private dentistry, the total expenditure was EUR 41.1 million.

MALTA

Hector Galea, Formerly Ministry of Health, Malta

In 2000, the Maltese Islands had a population of 0.383 million and a population density of 1,210/sq.km. Twenty nine per cent were 21 years old or younger and 17% 60 years or older. The number of practicing dentists was 130, 22% hold postgraduate qualifications and 23% were women. The dentist/population ratio was 1:2,946. The state employed 56 salaried dentists (43% of practicing dentists) in the public hospitals and primary healthcare service. There were 21 registered dental hygienists, with 17 working in the public dental services. Of the 25 registered dental technicians 13 are also employed by the state. There is no formal training of dental nurses (chairside assistants). The public primary healthcare service offers basic dental care to children and adults. Referrals to the Central School Dental Clinic or the hospital are made according to established guidelines.

The general population is entitled to examinations and preventive care, as well as periodontics and oral surgery and hospitalization, which is provided free of charge by the public dental services. In addition, the primary healthcare service offers emergency care on Sundays and holidays. Children (0–15 years) and special categories including institutionalized patients, the police and members of the armed forces of Malta, receive basic dental care free of charge. Other treatment is only offered to adults under special circumstances. Approximately 50,000 children are examined annually in state and private schools; on average 30% are referred for treatment.

The public dental services are financed by the state from general taxation. Private patients usually pay on a fee for item of service basis. Most adults use the services of the private sector. It is estimated that 80% of restorative dental care is performed there. None of these dental care costs are refunded by the state. In addition, although approximately 25% of the population have a private health insurance, it covers a very limited range of dental treatment.

Epidemiology

The last national study for caries prevalence indicated a mean national DMFT figure for 12-year-olds of 1.6 in 1996 (Galea, 1997).

Costs

In 2002, the gross per capita GNP was just under EUR 10,000. Costs of oral healthcare amounted to

an estimated 0.4% of GNP of which approximately one sixth was funded by the public dental services. The Ministry of Health budgets for healthcare represented 6% of GNP.

POLAND

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In 2000, Poland had a population of just under 39 million and over 22,000 dentists, some 21,500 of whom were in active practice and 80% of whom were female. There were also some 2,300 dental hygienists and an estimated 8,000 dental technicians plus about 3,500 dental nurses and chairside assistants. There are ten dental schools in Poland that currently admit some 700 students per year, whose education is paid for by the state plus additional students who have to fund their own studies. The curriculum lasts for five year and is in transition from the stomatological pattern to the odontological pattern. Undergraduate training is followed by one year's vocational training which is compulsory in order to gain a license to practice. Eight specialties are recognized. They are: oral surgery, orthodontics, periodontology, prosthodontics, paedodontics, endodontics, community and public health and maxillofacial surgery. Specialist training lasts between three and six years depending on the specialty.

Dental care in Poland is available under the public health insurance system and also within the private sector. There is a compulsory health insurance system and salaried employees are required to belong to one of the 17 regional sickness funds, to which they contribute with about 7.5% of their salary. This sum also covers healthcare for the contributors' families. Health insurance contributions for the retired are paid by the Social Insurance Institution, which pays out the state retirement pension. The unemployed are not covered by the health insurance system. The national health fund finances the provision of healthcare for employees and their children, including basic dental services. The fund contracts with individual dentists and group practices to provide services in their region, and allocates the volume of treatment which any individual dentist or practice may carry out. Patients are free to choose a dentist from among those who have a contract with the fund. It is planned that from 2004, several kinds of contract will be available. These will include contracts for general dental care, emergency dental care, dental care of HIV positive and AIDS patients, dental care of patients with severe learning problems and patients with craniofacial neoplasms.

The services and materials guaranteed under the public insurance system are specified by the Ministry of Health, and include preventive services (examinations, oral hygiene instruction, topical fluoride application, fissure sealing), diagnostic procedures, X-rays (limited to 2 per patient per year), biopsies, curative services (treatment of caries, endodontic treatment of single-rooted teeth in adults), endodontic treatment of all teeth in those aged 18 years and under, treatment of lesions of the oral mucosa, extractions, basic periodontal treatment, basic emergency treatment of traumatized patients, and orthodontic treatment with removable appliances. Preventive procedures for children with a high risk of caries are given preference in the allocation of public funds and are covered by a special preventive program supported by the state budget.

Patients receiving treatment under the public insurance system, may obtain procedures and/or materials not financed by the sickness fund privately, by a co-payment, subject to availability at the practice concerned. In addition, to the public health insurance system, dental care is also provided by a private sector, which offers the whole range of services, with patients free to chose a dentist. As well as receiving services provided directly by dentists, children are covered by a school-based program of oral health education. This program is led by teachers and is targeted at children attending the first class of primary school (7-year-olds). It is planned that by 2005, this program will cover 90% of 7-year-olds. It is also planned to re-introduce school nurses who will be responsible for prophylactic measures among children, including supervised tooth brushing with fluoride products.

Epidemiology

In 2000, a national study indicated a mean national DMFT score for 12-year-olds of 3.8 (Wierzbicka, 2000).

Costs

In 2000, WHO reported that some 6.0% of GNP was spent on healthcare. The planned budget for

the provision of oral healthcare in the public sector in 2003 was EUR 208,000,000. An estimated 0.18% of GNP was spent on oral health in all sectors, both public and private.

SLOVAK REPUBLIC

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In 2003, the population of the Slovak Republic was just over 5.5 million and there were 3,055 registered dentists, of whom an estimated 2,960 were active and 61% were female. There were also 210 dental hygienists, 2050 dental technicians, 80 clinical dental technicians and an estimated 2,500 dental nurses. There are three dental schools in the Slovak Republic and a total of 47 entrants to these schools in 2002. At present, the curriculum follows a stomatological pattern with the first years of a six-year course devoted to general medicine and the last years to clinical training in both medicine and dentistry. After completing the six-year course graduates are required to work in accredited clinics for a further three years before they are licensed for independent practice. Specialist training is available and the specialties of orthodontics, periodontics, prosthodontics, pediatric dentistry and oral and maxillofacial surgery are recognized. Continuing professional education throughout a dentists working life is a mandatory requirement.

All citizens of the Slovak Republic are compulsory insured with one of five health insurance companies. The Slovak Dental Association (Chamber of Dentists) has attempted to harmonize the catalogue of dental services available in the compulsory healthcare system. In 2000, an amendment to the law governing the provision of oral healthcare within the compulsory insurance scheme defined which basic treatments should be provided free to patients, listed all treatments and services that could be provided within the scheme, and set the level of patient part-payments for other treatments (in addition to, and above the basic free treatment). Later that year there was a reduction in public funding for dentures and patients were required to pay 60% of the cost of dentures.

The goal is to implement a model of multi-source financing, provided by a basic health insurance system and complementary health insurance and supplemented by patient contributions and direct payments. This will develop the existing financing model, which allows the utilization of all sources of finance accessible in the Slovak Republic.

At present, 82% of dentists work as private dentists without a fixed salary. The vast majority of these have agreements with insurance companies. However, some 269 do not have such agreements and work totally privately. The other 18% are salaried employees. Of these just over half work for private dentists and the others, some 249, in public clinics and other public institutions; and 13 in the armed forces.

The insurance companies pay fees to both public and private clinics. Thus fees paid for treatment carried out by salaried dentists in both public and private clinics go to their employers (other private dentists or public organizations). The 73% of all dentists who work privately, without a salary, each have an agreement with the insurance company and work in a district assigned by an administrative public dentist. They work mostly in former public institutions, where they rent the premises and sometimes also the equipment. They are paid by the health insurance company according to their output. However, health insurance companies have fixed amounts of funds allocated to oral healthcare and once the annual allocation is reached, they stop payment to dentists.

Private dentists without an agreement with an insurance company either rent their premises or work in private premises with their own equipment. They are paid directly by their patients and are free to set their own fees.

Epidemiology

The most recent results available indicate that in 1998 the national mean DMFT for 12-year-olds was 4.3 and 12% had no visible caries (Markovska, 2001).

Costs

The Slovakian GNP in 2001 was EUR 23,000 million. In the same year, the total health budget was EUR 1,590 million of which 80% came from public sources. This represented 6.9% of GNP. Oral healthcare expenditure represented 0.2% of GNP.

SLOVENIA

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In 2002, the Republic of Slovenia had a population of just under 2 million. There is one dental school in the country with an intake of 50 students per year. At present, the curriculum lasts for 6 years and is based on a stomatological pattern. All graduates have to undertake a mandatory year's vocational training and pass a state licensing examination, before they are permitted to practice. There are 1,240 active dentists in Slovenia, 15% of whom have postgraduate qualifications and specialize in one aspect of oral healthcare. The specialties of orthodontics, periodontics, oral surgery, endodontics, prosthodontics and oral maxillofacial surgery are recognized. There is compulsory continuing professional education (CPE) and periodic re-licensing can only occur if the requisite quota of CPE has been completed. More that 70% of Slovenian dentists are female. Over half of all dentists are over 50 years of age. Approximately 50% work in the public sector and 50% in the private sector. Eighty per cent of those working in the private sector have a contract with the National Health Insurance system; 20% work without such a contract. The majority of dentists work with full-time assistance from a chairside nurse. There are no dental hygienists in Slovenia. However, a school for dental hygienists has opened in the autumn of 2003.

Oral healthcare is provided free of charge to all those under 18 years of age. For people who have health insurance (95% of the population), 85% of the costs of oral healthcare are covered, with the exception of fixed and removable prosthodontics which have a 25% cost cover. Dental implants and fixed appliance orthodontics are not covered and have to be paid for in full by patients without any reimbursement from the insurance system.

Epidemiology

In 2002, the national mean DMFT score for 12-year-olds was 1.7 and 40% had no visible caries (Vrbič, 2003). Periodontal disease is prevalent and about 25% of the adult population have some advanced periodontal breakdown (a CPITN score of 4).

Costs

Healthcare expenditure was 7.9% of GNP in 2002. Oral healthcare expenditure from public sources was about 0.62% of all healthcare (about EUR 50 per capita). There are no data for the costs of oral healthcare in the private sector.

SUMMARIZED DATA ON WORKFORCE

In 2000, some 298,000 dentists provided oral healthcare for a population of over 456,000,000 in the member states of the existing EU/EEA plus the accession states. Over 50% of these dentists worked in either France, Germany or Italy. There were fewer dentists in all the accession states than in either Germany or Italy (Table 1). The active dentist/population ratio was very high, around 1:1,000 patients in Greece, Denmark, Finland, Iceland and Sweden (Fig 1). In addition, with the exception of Greece, there were also relatively high numbers of dental hygienists in these countries (and some clinical dental technicians in Denmark and Finland) who also provide clinical treatment for patients (Table 2). Relatively few active dentists are currently found in Portugal (Table 1 and Fig 1). However, this situation is likely to change in the next five years as new dental schools have opened and the intake has doubled in the last five years. In 2000, in the current EU/EEA member states the range of active dentist/population ratios was from 1:3,100 in Portugal to 1:830 in Greece with a mean of 1:1,480. The range of active dentist/population ratios in the accession states was slightly narrower (from 1:2,760 in Malta to 1:1,160 in Cyprus) with a mean of 1:1,760, slightly higher than in the existing EU/EEA states (Table 1 and Fig 2). It is also noticeable that with the exception of Cyprus and Malta, in all other accession states dentists are predominantly women (Table 1).

The data sets for dental technicians and dental nurses include many estimates as, unlike dental hygienists, they are not registered in many member states. It is also difficult to know whether or not the numbers for dental technicians from some countries include all those who work in dental laboratories or only those who have completed a full training in dental technology. It is therefore difficult to comment on these data in Table 2.

Numbers of dental schools in each of the EU/EEA member and accession states and en-

Table 1 Populations, Active Dentists, Male and Female Dentists in the EU/EEA and Accession States in 2000

Member state	Population	Active Dentists	Male Dentists %	Female Dentists %
EU/EEA				
Austria	81,102,000	3,802	64%	36%
Belgium	10,161,000	8,514	64%	36%
Denmark	5,293,000	4,884	50%	50%
Finland	5,176,220	4,890	33%	67%
France	59,079,000	40,153	68%	32%
Germany	82,187,616	63,202	64%	36%
Greece	10,645,000	12,858	48%	52%
Iceland	281,000	277	73%	27%
Ireland	3,786,900	1,800	70%	30%
Italy	57,748,160	48,319	68%	32%
Liechtenstein	31,000	28	no data	no data
Luxembourg	412,000	262	72%	28%
Netherlands	15,925,513	7,284	83%	17%
Norway	4,469,976	3,900	60%	40%
Portugal	10,210,553	3,320	61%	39%
Spain	39,423,678	17,538	63%	37%
Sweden	8,872,294	7,594	58%	42%
UK	59,755,660	26,500	68%	32%
Total	381,568,370	255,169		
Accession States				
Cyprus	757,000	649	57%	43%
Czech Republic	10,272,503	6,735	33%	67%
Estonia	1,369,515	1,032	13%	87%
Hungary	10,210,971	4,800	34%	66%
Latvia	2,372,984	1,611	12%	88%
Lithuania	3,499,500	2,611	17%	83%
Malta	385,809	140	75%	25%
Poland	38,646,200	21,300	20%	80%
Slovak Republic	5,400,679	2,714	39%	61%
Slovenia	1,977,229	1,163	34%	66%
Total	74,792,390	42,759		
Grand Total	456,360,760	297,928		

trants to these schools in 2000 are shown in Table 3. Since 2000, four additional schools have opened in Spain. The numbers of entrants to schools in Poland in 2000 were higher than usual and by 2002 had reduced to nearer the expected quota of 700 per year. Reports from CDOs to the CECDO indicate that, in general, apart from Poland, Portugal and Spain, in the other member and accession states there has been little change in the numbers entering dental schools since 2000.

There are few dental hygienists in both the current EU/EEA and accession states in comparison with the numbers in Canada, Japan and the USA. A recent study has shown that in 1998 there were more

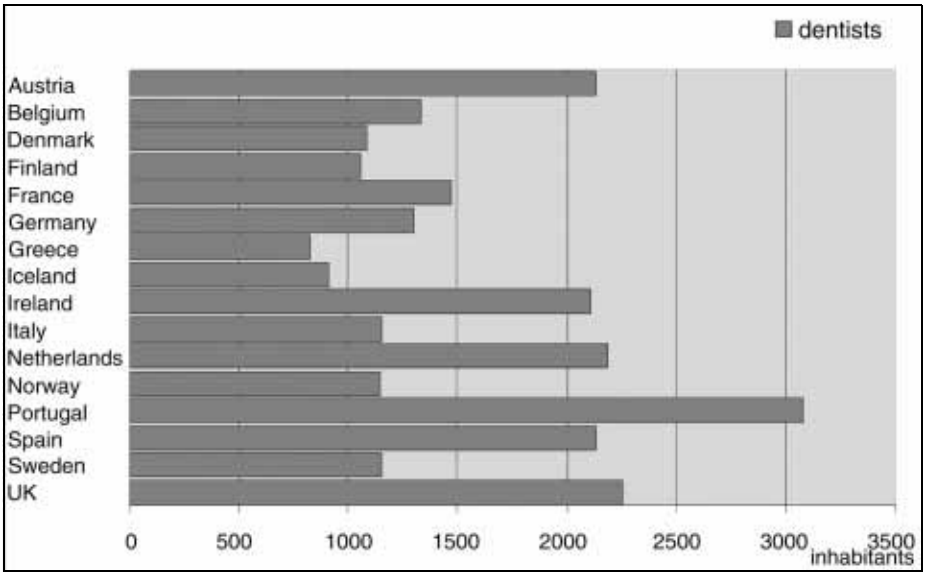

Fig 1 Population to Dentist Ratios in EU/EEA Member States in 2000.

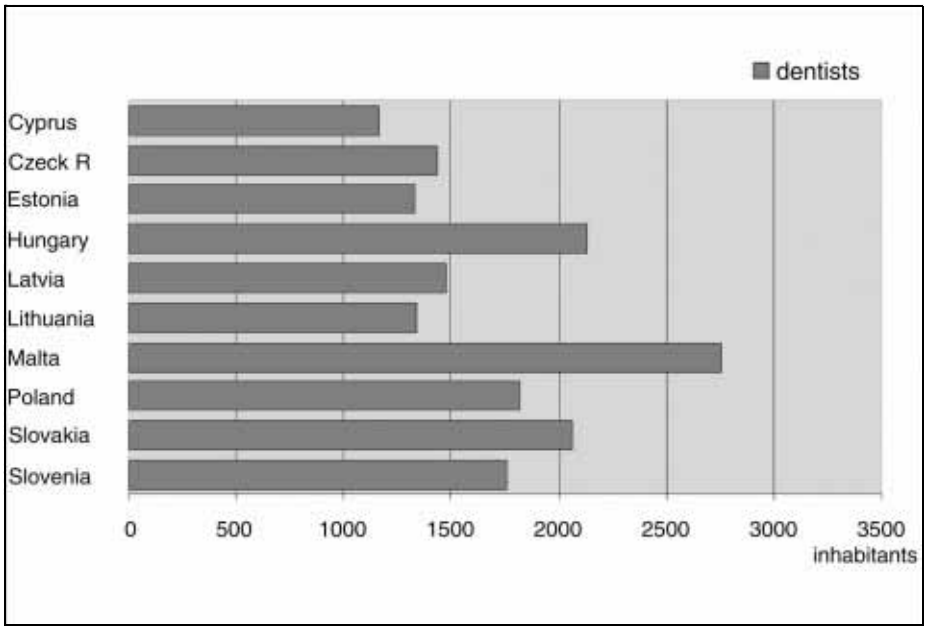

Fig 2 Population to Dentist Ratios in the Accession States in 2000.

dental hygienists in Canada, with a population of just over 30 million than in the current EU/EEA with a population of over 380 million (Eaton et al, 2003). It is therefore interesting to note that dental hygienists are currently working in nine of the accession states and will be working in the tenth (Slovenia) in the near future as a school for dental hygienists opened in this state in autumn 2003 (Table 2).

SUMMARIZED DATA ON COSTS

The cost data in this publication should be viewed with caution. For many countries they represent estimates because it is very difficult to ascertain exactly how much is spent in the private sector or on oral healthcare in hospitals. The data for percentages of national GNP spent on all aspects of healthcare in 2000 (Table 4) represent health spending in both public and private sectors. Although the range is relatively narrow (from 5.8% in Luxembourg to 10.6% in Germany), when these percentages are applied to the figures for per capita GNP (in purchasing power parities) in 2000, prior to the advent of the euro, the range for actual spend per capita becomes far wider (from $US 398 in Latvia to $US 2,756 in Germany); and in spite of spending a relatively low percentage of its GNP on

Table 2 Dental Hygienists, Technicians, Nurses and Clinical Dental Technicians in the EU/EEA and Accession States in 2000

Member state	Dental Hygienists	Dental Technicians	Dental Nurses	Clinical Dental Technicians
EU/EEA				
Austria	0	3,250	(e) 7,000	0
Belgium	0	(e) 2,250	(e) 900	0
Denmark	935	1,600	(e) 7,200	386
Finland	1,270	883	6,834	361
France	0	(e) 6,500	(e) 16,500	0
Germany	100	55,397	122,830	0
Greece	0	(e) 3,000	(e) 2,000	0
Iceland	30	75	306	0
Ireland	174	250	(e) 2,700	0
Italy	1,480	(e) 50,000	(e) 60,000	0
Liechtenstein *	No data	No data	No data	0
Luxembourg	0	(e) 60	(e) 250	0
Netherlands	1,750	3,314	(e) 11,800	275
Norway	1,010	393	(e) 3,500	0
Portugal	172	850	(e) 3,200	0
Spain	1,000	(e) 7,000	(e) 20,000	0
Sweden	2,780	1,350	(e) 14,000	0
UK	3,984	(e) 8,200	(e) 30,000	0
Total	15,685			
Accession States				
Cyprus	3	180	235	0
Czech Republic	200	4,570	7,060	0
Estonia	2	240	930	0
Hungary	230	(e) 2,200	(e) 5,000	0
Latvia	105	557	667	496
Lithuania	112	654	1224	0
Malta	22	27	100	0
Poland	2,300	(e) 8,000	(e) 3,500	0
Slovak Republic	216	1,547	(e) 2,500	80
Slovenia	0	438	1,273	0
Total	3,190			
Grand Total	18,875			

e = estimate

healthcare, in actual terms Luxembourg appears to have spent the second highest per capita sum ($US 2,740).

No estimates of percentage of GNP spent on oral healthcare in 2000 were forthcoming from some countries. Although there are no reliable estimates of this variable from dental sources in both Greece and Italy, it was possible for CDOs to obtain them from national household expenditure surveys which included a question on spending on dentistry. The

Table 3 Numbers of Dental Schools and Undergraduate Entrants to Dental Schools in the EU/EEA and Accession States in 2000 as Reported to the CECDO

Member state	Schools	Entrants
EU/EEA		
Austria	3	150
Belgium	6	140
Denmark	2	160
Finland	2*	70
France	16	781
Germany	32	2,315
Greece	2	319
Iceland	1	7
Ireland	2	78
Italy	31	1,123
Liechtenstein	0	0
Luxembourg	0	0
Netherlands	3	260
Norway	2	113
Portugal	7	550
Spain	11	1,160
Sweden	4	200
UK	13*	882
Total	133	8,223
Accession States		
Cyprus	0	0
Czech Republic	5	130
Estonia	1	30
Hungary	4	190
Latvia	1	50
Lithuania	2	93
Malta	1	6
Poland	10	1,253
Slovak Republic	3	60
Slovenia	1	40
Total	28	1,852
Grand Total	161	10,075

* Excludes Eastman Dental Institute, University College London and University of Turku, where no undergraduates are taught.

available data suggest that, in 2000, with the exception of Cyprus, Malta and Slovenia, the member states of the EU/EEA spent a higher percentage of GNP on oral healthcare than accession states (Table 4). The estimated actual spends appear to show a wide variation with less than EUR 25 per capita apparently spent in the majority of the accession states and more than EUR 170 per capita spent in five of the existing EU/EEA member states.

DISCUSSION

CHANGES IN CARIES PREVALENCE IN 12-YEAR-OLDS

A recent study which investigated the methodologies used to produce mean 'national' DMFT figures for 12-year-olds has demonstrated that many studies reported are not national but regional or local, and they were not performed in the same year. Also a wide range of criteria for the diagnosis of caries and sampling techniques are used in different 'national' studies. This means that the results are not comparable between countries (Eaton, 2002). Data for mean 'national' DMFT figures of 12-year-olds which were reported to the CECDO in 1996 and 2003, together with the references for the data reported in 2003 are shown in Table 5. The same data were reported both years by Iceland, Italy, Luxembourg and Malta and it appears that no more recent studies have taken place in these states. In the majority of the other 23 states the reported data suggest that the prevalence of caries in 12-year-olds may have fallen during the time between the studies reported.

As can be seen from the dates of the references for the studies reported to the CECDO in 2003, the relevant studies were first reported between 1998 and 2003. Some may well have taken place before the dates shown in the references and not all are available in published literature. It is therefore unsafe to interpret the data other than by concluding that the prevalence of dental caries in 12-year-olds is likely to have fallen in the majority of existing and accession member states of the EU/EEA since the mid-1990 s.

Previous publications have commented on the difficulties of gathering standardized data for oral healthcare provision in Europe (Anderson et al,

Table 4 Gross National Product* and Expenditure on Health and Oral Healthcare in the Member States of the EU/EEA and Accessions States in 2000

Member state	Per Capita National GNP $US **	% Spent on Health	Spent per capita *** $US	Estimated % Spent on Oral Health	Estimated Spend **** Per Capita
EU/EEA					
Austria	26,330	8.6	2,171	0.45	117
Belgium	27,470	8.7	2,269	0.30	82
Denmark	27,250	8.3	2,428	0.33	99
Finland	24,570	6.6	1,667	0.45	113
France	24,420	9.5	2,335	0.60	120
Germany	24,920	10.6	2,756	0.94	234
Greece	16,860	8.3	1,390	1.10	184
Iceland	29,554	8.9	2,626	0.65	173
Ireland	25,520	6.7	1,944	0.33	75
Italy	23,470	8.1	2,040	0.76	176
Luxembourg	45,470	5.8	2,740	0.20	91
Netherlands	25,850	8.1	2,255	0.37	94
Norway	30,344	7.8	2,373	0.39	131
Portugal	16,990	8.2	1,469	no data	no data
Spain	19,260	7.7	1,539	no data	no data
Sweden	23,970	8.4	2,097	0.74	178
UK	23,550	7.3	1,774	0.39	92
Accession States					
Cyprus	11,291	7.9	1,415	1.0	113
Czech Republic	13,780	7.3	1,031	no data	no data
Estonia	9,340	6.1	556	0.25	24
Hungary	11,990	6.8	846	0.19	23
Latvia	7,070	5.9	398	0.18	13
Lithuania	6,980	6.0	420	0.19	13
Malta	9,130	8.8	803	0.4	36
Poland	9,590	6.0	578	0.18	18
Slovak Republic	11,040	6.9	690	0.2	22
Slovenia	17,310	8.6	1,462	0.62	50*****

* Expressed in Purchasing Power Parities
** In $US, Source: World Bank
*** In $US. Source: WHO website www.who.int/country/at Oct 2003
**** Total spend public plus private
***** Public only

1997; Eaton, 2002). The difficulties are often cultural but can also be because data are not collected in some countries.

Normally, when many authors are involved in the writing of a paper there can be some problems in keeping the paper consequent and homogenous. This can be seen in the country descriptions but it has to be highlighted that when the systems are very different the same style of describing them cannot always be applied. The way of reporting reflects history and culture in the member states and also different interpretations of the same words in different languages. On the other hand, each description in this paper has focused on the most im-

Table 5 Changes in Reported Mean 'National' DMFT Figures for 12-year-olds

Member state	DMFT mean reported to CECDO		Reference for 2003 Figure
	in 1996	in 2003	
EU/EEA			
Austria	3.0	1.0	ÖBIG, 2003
Belgium	2.7	1.1	Declerck et al, 2002
Denmark	1.2	0.9	SCOR 2002
Finland	1.2	1.2	STAKES, 2000
France	2.6	1.9	Hescot and Roland, 1998
Germany	2.3	1.2	Pieper, 2001
Greece	2.7	2.2	Moraitaki-Tsami et al, 1998
Iceland	1.5	1.5	Eliasson, 1998
Ireland	1.2	1.1	Whelton et al, 2003
Italy	2.1	2.1	Marthaler, 1996
Luxembourg	2.3	2.3	WHO, 1990
Netherlands	0.7	0.6	Truin et al, 1999
Norway	1.4	1.5	Statens Helsetilsyn, 2001
Portugal	3.2	1.5	Almeida et al, 2003
Spain	2.3	1.1	Llodra, 2002
Sweden	1.3	1.0	Socialstyrelsen, 2003
UK	1.4	0.9	Pitts et al, 2002
Accession States			
Cyprus	No Data	1.8	Savvidou, 2003
Czech Republic	2.7	2.5	Broukal and Mrklas, 2003
Estonia	4.1	2.4	Russak, 2003
Hungary	3.8	3.8	Szöke and Petersen, 2000
Latvia	5.8	3.5	State Dental Centre, 2003
Lithuania	3.8	3.6	Aleksejunienė, 2004
Malta	1.6	1.6	Galea, 1997
Poland	5.1	3.8	Wierzbicka, 2000
Slovak Republic	4.1	4.3	Markowska, 2001
Slovenia	2.6	1.7	Vrbic, 2003

portant debates in every single country and can therefore be claimed to be more informative than strictly standardized descriptions would have been. Information on costs was especially difficult to obtain, partly due to the fact that in some countries no information on the costs of private dental care is available. A further complication is that the oral healthcare systems in virtually all EU/EEA and accession states are constantly evolving.

The authors of the individual country reports have endeavored to be accurate and objective in their reporting and have conferred with colleagues and those with specialist knowledge of some areas of their reports to confirm the facts and data that they have reported. The reliability of the statistical information on oral healthcare reported on the CECDO database and other databases such as those of WHO, EUROSTAT and the OECD have recently been reviewed (Eaton, 2002). It was concluded that all national oral health data needed to be interpreted with caution. When they exist, comparisons with contemporary data and reports gathered

Fig 3 Organization of oral healthcare in Europe.

by other individuals or groups can be used to validate findings. In this context, the authors of an independent survey of oral healthcare in Europe published in 1997 found that the data on workforce numbers reported to them was within 10% of that report in the same year in the CECDO database (Anderson et al, 1998).

BROAD CHARACTERISTICS OF THE DIFFERENT MODELS FOR THE PROVISION OF ORAL HEALTHCARE

As the descriptions of the individual countries show, systems for the finance and organization of general healthcare in the EU Member States have their roots in national, historical, political and socio-economical traditions. However, in most member states, general healthcare is financed either through general taxation or via social insurance, which can be viewed as an hypothecated (specific) tax. Social insurance funds may be managed independent of the government (European Parliament, 1998).

In many member states, the administration and financing of oral healthcare does not follow the general health model. The provision of oral healthcare often operates outside the mainstream healthcare system and the role of private services is more significant. Italy provides an example of this pattern as it has a virtually entirely private oral healthcare system but a public National Health Service for general healthcare. In a previous publication (Widström and Eaton, 1999) it was suggested that in broad terms there were five patterns for the administration and financing of oral healthcare in the existing EU/EEA: the Nordic, Bismarkian, Beveridgian, Southern European and Hybrid models. The accession of new member states to the EU, brings a new model – the Eastern European, which is currently in transition (Fig 3).

Typically in the Nordic countries (Denmark, Finland, Norway and Sweden) there is a large public dental service (PDS) with salaried personnel financed by general or local taxation. In these countries the state has a central role in guidance and supervision. This central role is recognized by the fact that all the Nordic countries have a nationally appointed CDO. There is also a private sector that may or may not be subsidized through public health insurance. Iceland is an exception among the Nordic countries as it has no PDS. In this model the concept of a dental team is well developed and some aspects of oral healthcare are provided by dental hygienists, and in Denmark and Finland, by clinical dental technicians.

The Bismarkian model is found in Austria, Belgium, France, Germany, Luxembourg and in the Netherlands. It is based on statutory sickness insurance that reimburses some or all of the costs of oral health dental care and it is financed by employers and employees. In these countries national or regional sick funds negotiate with dental associations about fees. The public sector, with salaried oral healthcare workers, is insignificant. With the exception of Germany and the Netherlands, there is virtually no 'team dentistry' in these member states and, to date, expect for France and the Netherlands, none has appointed a dentist as a national CDO.

The Beveridgian system is unique to the United Kingdom. Most general dental care has been provided by independent dentists in contracts with the National Health Service (NHS). However, there are small salaried public dental services that are located in community and hospital clinics. Free care is provided for children and subsidized care for adults. In the last ten years a growing proportion of oral healthcare has been provided outside the NHS under private contracts. Team dentistry is playing an increasing role in the provision of care with dental hygienists and therapists, and, in the near future, clinical dental technicians providing some clinical care. Each of the four countries within the United Kingdom has a national CDO. A hybrid model is found in Ireland, which has adopted some features of the Beveridgian system and has a rapidly growing salaried public dental system. Ireland has an appointed CDO.

The Southern European model found in Italy, Portugal, Spain and to some extent, Greece as well as in Cyprus and Malta, is predominantly private without governmental involvement. Limited insurance schemes, often organized by employers, are available for some groups. Public services may be available to provide some treatment for children and to treat dental emergencies. There is some team dentistry as dental hygienists work in all of the Southern European countries with the exception of Greece. Government appointed CDOs are found in Cyprus, Greece and Malta.

In Eastern Europe (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) there used to be universally free or almost free public oral healthcare. Since the political changes, which started in 1989, this pattern has changed and public sector provision has been reduced in all eight countries. In most of them, the majority of oral healthcare is now provided in the private sector. Some countries are already working with, or have plans for, insurance based oral healthcare. Dental hygienists work in seven of the eight countries and, from October 2003, will be trained in the eighth country (Slovenia). All eight have national CDOs.

Changes are occurring within the oral healthcare systems in the old EU/EEA and new EU member states. It is important to highlight that even within the different models the variations between countries are wide, and no two have exactly similar systems.

ORAL HEALTHCARE FOR THOSE UNDER 18 YEARS OF AGE

The range of approaches in different countries can be illustrated by differences in services for those under 18 years of age (Table 6). Some countries provide organized and often free basic oral healthcare services through Public Dental Service to pre-school and school children. In many of these countries all – even the youngest children – are included in the system. In the Nordic countries between 80–95% of children are seen by a dentist or a dental hygienist every year (Widström et al, 2004). In several countries, other than the Nordic countries, screening is provided by dentists (or by physicians in Belgium) in schools for all children or for those in certain age groups or geographical areas. Parents of the children who have been screened and who are perceived as being in need of treatment then receive a recommendation to contact their own dentist for treatment.

Follow-up after screening varies. In a French study only 27% of 7-year-old schoolchildren in affluent

Paris suburbs, who had been perceived as needing treatment for dental caries received necessary treatment (Azogui-Lévy et al, 2003). In another study in Northern Ireland after screening of 5 to 7-year-old children 46% of the children with caries received treatment (Donaldson and Kinirons, 2001).

In Eastern Europe resources for oral healthcare of children have been reduced in many countries (Widström et al, 2001) and more responsibility is placed upon the parents to organize treatment for their children. However, this change is not limited to the accession countries and in the last ten years the provision of organized, publicly funded oral healthcare in schools has ceased in the Czech Republic, Estonia, Iceland, the Netherlands and the Slovak Republic. However, in the same period of time, in some of the autonomous regions of Portugal and Spain public funds have been used for the first time to fund oral healthcare for some age groups of children. Private practitioners provide the care in these countries and are paid via capitation based contracts with their regional authorities (Cortes et al, 2003).

ORAL HEALTHCARE FOR ADULTS

In most EU countries adults can obtain treatment subsidized either from general taxation or national insurance systems and provided by private (non-salaried) dentists (Table 7). However, the proportion of the adult population and the range of treatments available in such subsidized systems varies widely. In some countries, particularly those in Southern Europe and some in Eastern Europe, few adults are fully covered by either public or private insurances and most adults pay most, if not all, of the costs of their oral healthcare, without any subsidies direct to the providing dentists. In the last decade there has been a growth in private insurances for oral healthcare. In most countries some free or subsidized care is available for certain special needs groups of adults. In addition, it is usual for specialist treatments for acute problems such as following facial trauma and oral cancer to be provided free of charge in hospitals.

No two countries have identical systems to fund oral healthcare for adults and there are wide variations from country to country in both levels of subsidy and the range of free or subsidized treatments available. However, in 2003, in general, the countries in the north and west of Europe were more likely to provide free or subsidized oral healthcare for adults, and those in the south and east were less likely to do so.

Table 6 Oral Healthcare Arrangements for under 18-year-olds in the EU/EEA and Accession States

EU/EEA	Public service available provided by salaried dentists	Organized screening (examinations)	No special care arrangements
Austria		(X)	X
Belgium		(X)	X
Denmark	X		
Finland	X		
France		(X)	X
Germany		X	X
Greece	(X)		
Iceland			X
Ireland	X	X	
Italy		(X)	X
Luxembourg		(X)	X
Netherlands			X
Norway	X		
Portugal	(X)		X
Spain	(X)		X
Sweden	X		
UK	X	X	
Accession States			
Cyprus	X	X	
Czech R.			X
Estonia		X	X
Hungary	X		
Latvia	X		
Lithuania	X		
Malta	X	X	
Poland	X		
Slovakia			X
Slovenia	X		

(X) system does not cover all schools and/or all age groups

UPTAKE OF SERVICES

Reports from only ten member states included data on uptake of oral healthcare services. As a result

Table 7 Arrangements for Oral Healthcare for Adults in the EU/EEA and Accession States

EU/EEA	Public service available for adults provided by salaried dentists	Private service subsidized by national health insurance scheme	Additional private insurances available	Private care without subsidy
Austria		X	X	X
Belgium		X		X
Denmark	(X)	X	X	X
Finland	X	X		X
France		X	X	X
Germany		X	X	X
Greece	(X)	X		X
Iceland		(X)		X
Ireland	(X)	X	(X)	X
Italy				X
Luxembourg		X	(X)	(X)
Netherlands		X	X	X
Norway	(X)		X	X
Portugal		(X)	X	X
Spain			X	X
Sweden	X	X		(X)
UK	(X)	X	X	X
Accession States				
Cyprus	X	X		X
Czech R.		X		X
Estonia		X		X
Hungary		X		X
Latvia	X	X		X
Lithuania	X	X		X
Malta	(X)		X	X
Poland		X		X
Slovakia		X		X
Slovenia	(X)	(X)		X

(X) = limited access

these data are not presented in a table. Two of the ten were accession states. The other eight were existing members of EU/EEA. Reported uptake was highest in the Nordic countries. In Sweden it was reported that over 90% of those under 18 years of age had attended a dentist in the previous year and of those aged between 19 and 65 years at least 83% had attended in the previous year. In the south of Europe Portugal reported that overall fewer than 30% of its population had attended a dentist during the previous year. In Spain the estimated figures were 47% for under 18-year- olds, 38% for those aged between 19 and 64 years, and 20% for those over 65 years. The two accession states (Hungary and Lithuania), the United Kingdom and Ireland reported percentages between 40 and 66%. It can be speculated that the higher percentages for attendance in the Nordic states may be the result of fewer patients per dentist (less than 1,200 per dentist), the widespread use of dental hygienists, relatively high average per capita incomes, a well-developed public dental service with free treatment for all those under 18 years of age and a high awareness of the importance of good oral health in the population.

The numbers of dentists in both Spain and Portugal are likely to rise rapidly in the near future as a result of several private dental schools opening recently and very large increases in intakes to dental schools. Furthermore over the last 18 years since these two states joined the EU their average per capita income has grown and, in the case of Spain, is now approaching the mean for the EU. Although other factors will clearly play a part, it will be interesting to see if these factors lead to significant increases in the percentage of the populations of these countries attending the dentist each year, i.e. higher utilization of services. On the other hand, the closure of the public dental services in the accession states has probably reduced the uptake of services in these countries.

FUTURE CHALLENGES

At the end of the 20th century, systems for the delivery of general healthcare have been the target of different reforms in many European countries. The aim has been to control the constantly rising costs due to higher demands from ageing populations and increasingly expensive medical technologies and pharmaceuticals. As oral healthcare has generally operated outside the mainstream healthcare system, and its costs have mostly been met by the patients out of their own pockets, in some of the existing member states of the EU/EEA reform of oral healthcare systems has not received the same political priority. The biggest changes in Euro-

pean oral healthcare have occurred in Eastern Europe after the fall of communism. There has been wide scale privatization of the previously public dental services. However, most of the accession states seem to be developing insurance systems to cover treatment costs. In existing EU/EEA states, where they exist, the public oral healthcare services, such as those in the Nordic countries, still have strong political support and expansion has occurred (e.g. in Finland and Sweden). In Southern Europe the concept that public oral healthcare services should be provided for the treatment of children and special needs groups appear to have gained some acceptance. In UK, which has had a unique pattern for the delivery of oral healthcare, major changes in the delivery, commissioning and remuneration of oral healthcare services are planned in the near future. Control of fees for general dentistry within the UK National Health Service will devolve from central to local level and there will be a change in emphasis from treatment of disease to achieving and maintaining oral health in the local population.

In the current economic climate, some EU member states, which operate a Bismarkian pattern for their oral healthcare provision, are experiencing financial problems in models where health insurance funds offer wide population coverage, comprehensive treatment and benefits connected with frequent dental visits. These problems may lead to change in the near future.

Overall evaluation of systems for the provision of oral health and the outcomes should lead to better oral healthcare policies. The experience of many members of the CECDO is that to improve the situation, data on oral health status, use of services and treatment results and costs need to be collected in all countries in a way that makes comparisons reliable. Cost-effective best practice models, including appropriate use of clinical dental auxiliaries, should be encouraged. Also consumers should be aware of the possibility of good self-care to prevent or limit dental disease. There is general agreement in the Council that targeting oral healthcare resources more effectively requires better information. This theme has been recognized by the European Commission and a series of projects relating to improving the quality of health data in the EU are planned (European Commission, 2002).

Although it may be resisted by some individuals and governments, it is entirely possible that in the long run there will be increasing pressure to harmonize the national health and social security systems and to have an EU-wide system for social and healthcare provision, thus overcoming the current variations in standards of care from member state to member state. However, although the accession of the ten new member states may slow this process, in the future it is difficult to see how citizens of the EU will continue to accept the paradox that there is freedom to move from one state to another state but a lack of effort to provide similar standards on health and social care throughout the Union.

From an economic point of view, it is pertinent to note that in the 28 members states of the extended EU/EEA in 2000 the population of 456 million was served by an oral healthcare workforce of approaching 900,000 (one third of whom were dentists) at an estimated cost of some EUR 54 billion.

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