Prevalence of caries and edentulousness among 65–74-year-olds in Europe

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Reviewed in this article are epidemiological studies included in the WHO Global Oral Data Bank for noninstitutionalized European adults aged 65–74 years for the period 1986–96. Edentulous percentages, decayed, missing, filled teeth (DMFT) index, and data on the mean number of teeth are presented.

At least one representative study had been carried out in 48% of the countries, with the quantity of information from countries with developed market economies being similar to that from countries with economies in transition. The proportion of 65–74-year-olds who were edentulous varied from 12.8% to 69.6%, the mean number of teeth ranged from 15.1 to 3.8, and the DMFT index from 22.2 to 30.2.

The observed disparities in the oral health status among older European adults suggest that it may be possible to develop and implement oral health policies that take into account geographical and socioeconomic differences in populations.

Introduction

Almost all industrialized countries are witnessing a demographic evolution characterized by the aging of their population. A theory of demographic transition has been proposed to account for this, whereby every population, at a certain stage of its history, passes from a situation where there is a balance between high fertility and high mortality to one where there is a balance between low fertility and low mortality (*1*). This demographic transition is related to a decrease in infant mortality, increase in life expectancy, and falling fertility (*2*).

Europe is currently experiencing such a transition, although differences in the rhythm of changes can be observed between western European countries, with developed market economies, and eastern European countries, with economies in transition. In 1990, over-65-year-olds represented 15.0% of the 120 million inhabitants of 52 European countries, by 2005 they will represent 16.5%, and by 2025, 22.4%. Demographic projections indicate an inversion in the former pyramidal distribution of population by age groups. By 2020, over-65-year-olds will be more numerous than children aged less than 15 years. In the course of the next 25 years, the elderly cohort is predicted to increase by 82%, whereas the total number of persons of working age, i.e. those aged 20–64 years, will increase by only 46% and newborns by only 3% (*3*).

The economic, social, and health consequences of this aging process are so important that health authorities are paying particular attention to the elderly population. However, globally, there have been not only demographic changes but also political and economic transitions associated with social and cultural evolution. These changes further emphasize the need to renew health policies at all levels.

The increase in life expectancy associated with changes in the organization of the workplace — retirement age being lowered in some countries and increased in others and also less job security — have introduced a new definition of "the elderly". Classification based on chronological age of individuals is no longer sufficient since there is also a need to take into consideration the degree of dependence, quality of life, and level of sociability (*4*, *5*). The majority of active or retired people remain within the scope of the economic system, while dependent older people have a higher probability of being institutionalized (*6*).

The planning of oral health services is directly dependent on qualitative health information. In Europe, the oral care system is oriented mainly towards ambulatory care. Oral health care provided at home is rare and care provided in institutions seems to be slightly more structured. In any case, the countries of the European Union have no common strategy for providing oral health care for functionally dependent elderly people.

Since 1979 the WHO Oral Health Programme (ORH) has promoted and undertaken activities in favour of developing oral health policy for

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senior citizens. The main actions have included the following:

— the establishment in 1982 of oral health goals for elderly cohorts (aged 65–74 years) within the framework of Health for All by the year 2000 (*7*);

— in 1985, support for the creation of the International Gerodontology Association;

— participation in joint WHO/Fédération Dentaire Internationale working groups on oral health of the elderly; and

— a recommendation in 1987 to evaluate the oral health status and treatment needs of the WHO index age group (65–74 years) (*8*).

In industrialized countries gerodontology is an evolving discipline as evidenced, for example, by the establishment of specific courses covering it in French dental schools, beginning in the academic year 1998; and the availability of Master's courses in gerodontology in the United Kingdom.

The consequences for dentists related to the provision of services for older people are very important. The great improvement in children's oral health and the generally good oral care coverage for adults, associated with the growing numbers of dentists in the European Union, provides an opportunity to rethink oral care practices for older persons.

There is a clear need to have reliable information on the health status of the older population groups; however, a synthesis of oral health data for over-65-year-olds in Europe is not currently available. This lack of data is a handicap to evaluating the oral health status of elderly cohorts in Europe with respect to countries' stated health objectives and policies.

This article reviews the epidemiological studies of oral health status of noninstitutionalized individuals aged 65–74 years in the WHO European Region for the period 1986–96.

Materials and methods

Data were selected from the information in the WHO Global Oral Data Bank (GODB). This data bank, created in 1969, was developed to satisfy the needs for information on oral health and diseases at both national and global levels and to enable disease trends and their probable impact to be monitored and evaluated.

The data in the GODB are derived from three main sources:

— oral health surveys developed in collaboration with WHO;

— articles in the scientific literature covered by MEDLINE; and

— official reports from WHO regional offices, ministries of health and research institutions.

All survey data are assessed scientifically before deciding whether or not to include them in the data bank. Any study included is categorized according to the methods used, its representativeness, and characteristics of the sample. Data from studies included in the GODB are not necessarily representative of a national situation for a given country.

The studies selected for inclusion in the GODB satisfy the following criteria:

— they were from Member States of the WHO European Region;

— they covered the age group 65–74 years, one of the WHO index age groups retained in the database (5–7 years, 12 years, 35–44 years, and 65–74 years);

— only national or provincial/regional surveys were included; and

— they had been carried out over the period 1986–96.

Data from small surveys of one locality, urban or rural samples only, those covering fewer than 100 subjects, as well as data derived from special groups, such as the institutionalized elderly, were excluded. For countries presenting more than one survey for the study period, only the most recent one was included. A total of 39 studies covering 27 European countries were reviewed, and 38% were excluded.

The data presented include the proportion of edentulous people, the mean number of teeth, the DMFT index and, when available its decayed teeth (DT), missing teeth (MT), and filled teeth (FT) components. Generally DMFT and the mean number of teeth are reported for the whole sample, including those with no teeth.

Results

Number of available surveys

Oral health statistics on dental caries and/or edentulousness for the age group 65–74 years were available for 24 of the 50 countries in the WHO European Region. For 55% of the countries, only regional data on the prevalence of dental caries were available.

The quantity of data from countries with developed market economies was similar to that from

countries with economies in transition. National data or data providing reasonable national estimates were available for three Eastern European and for three Western European countries. The sample of the French survey, although regional, was selected with a view to providing information at a national level. Nationally representative data for this age cohort were sparse for northern Europe and only the United Kingdom had a national figure. With the exception of Iceland, the Scandinavian countries reported surveys of elderly people, but used different age groups for dental caries, and therefore no data from them could be included in this review. However, information on edentulousness at age 65–74 years was available for four Scandinavian countries. Southern European countries were represented by Italy, Spain, and the former Yugoslavia. For the period covered, none of the European countries had carried out more than one national and/or regional study.

Edentulousness

Data on the proportion of edentulous 65–74-year-olds were available for 21 countries (Fig. 1) and varied from 12.8% in Italy to 69.6% in Iceland. In five countries more than 50% of the population aged 65–74 years were edentulous. In Eastern European countries the levels were mainly 30–50%, whereas in Western European countries the distribution was more heterogeneous.

Dental caries and tooth mortality

The oral health status of the elderly population varied slightly according to the region of Europe. The mean DMFT and the mean number of teeth for populations aged 65–74 years are reported for 18 countries (Table 1).

On average, 65–74-year-olds had 20 missing teeth, the mean number varying from 15.1 in France to 3.8 in Hungary. Disparities in the distribution of this variable were observed between Eastern European countries, where more teeth were missing, and Western European countries.

The DMFT values ranged from 22.2 in Georgia to 30.2 in Hungary. The majority of countries had a DMFT in the range 23–28. For the United Kingdom and Netherlands, with the highest percentage of edentulous population in this study, the DMFT figures were reported only for dentate subjects. As is clear from Table 1, missing teeth (MT) was the most important component of the DMFT, accounting for more than 50% of the index for all the countries covered. In four Eastern European countries the MT component accounted for more than 80% of the index. The dental status of persons with filled teeth varied from one part of Europe to another: the F/DMF ratio varied from 0.5% to 34.4% and the F index was distinctly higher in Western European countries. By comparison, some countries (Georgia, Spain, Poland, former Yugoslavia) have a very low ratio of filled teeth. In most of the countries for which there is data, the need for conservative care is low since most of the affected teeth have already been treated by extraction or by fillings.

Discussion

This article is a synthesis of data on the prevalence of edentulousness, dental caries and number of missing

Fig. 1. **Proportion of endentulous individuals aged 65–74 years in WHO European Region, 1986–96.**

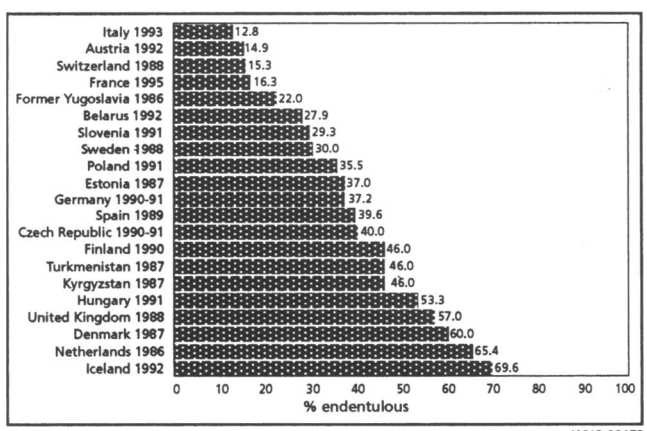

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Table 1: **Caries prevalence (DMFT) among 65–74-year-olds, WHO European Region, 1986–96**

Country	Year	*n*	No. of teeth	DT	MT	FT	DMFT	Remarks[a]
Austria	1992	121	11.6	1.0	20.4	6.5	27.9	RS
Belarus	1992	426	9.4	1.6	22.6	2.6	26.8	RS
Czech Republic	1990–91	840	8.4	2.7	23.7	1.2	26.6	RS
France	1995	603	15.1	1.1	16.9	5.2	23.3	RS
Georgia	1986	238	11.0	1.0	21.0	0.1	22.2	RS
Germany	1990–91	2797	6.7	1.2	25.3	2.2	28.7	NS
Hungary	1991	213	3.8	1.2	27.7	1.3	30.2	RS
Iceland	1992	326	NA[b]	2.2	14.6	9.2	26.2	NS
Italy	1993	327	13.2	3.2	18.8	4.3	26.3	RS
Latvia	1993	1067	NA	1.7	20.0	3.2	24.9	NS
Netherlands[c]	1986	132	18.1	1.6	13.9	6.9	22.3	NS
Poland	1991	1173	6.6	1.9	25.4	1.7	29.0	RS
Russian Federation	1990	108	12.8	0.4	19.2	7.7	27.3	RS
Slovenia	1991	116	6.7	1.7	24.3	3.0	29.9	RS
Spain	1989	493	8.1	1.0	23.8	0.5	25.2	RS
Switzerland	1988	124	14.4	0.4	17.6	9.4	27.4	NS
United Kingdom[c]	1988	179	NA	1.0	16.9	5.7	23.6	NS
Former Yugoslavia	1986	541	NA	1.7	25.5	0.9	28.0	NS

[a] NS = national survey; RS = regional survey.
[b] NA = data not available.
[c] Dentate subjects only.

teeth in adults aged 65–74 years for period 1986–96 in the WHO European Region. It reflects the minimum level of standardized information on oral health needed to recognize tendencies and to make international comparative assessments or for planning purposes. The approach described has its limitations, i.e. the degree of precision of the information, which is particularly connected with specificity of the age group studied. The literature underlines the difficulty of determining the cause of tooth mortality from surveys based on the DMFT index (*9*). The epidemiology of other oral problems such as root caries, periodontal diseases and oral mucosal lesions was not undertaken. On the other hand, people's behaviour and factors that influence the demand and use of oral health services for old people should be taken into consideration for better management and planning of oral health (*5*).

The noninstitutionalized elderly represent about 96% of the elderly population over 65 years of age in Europe (*3*). Thus, the data presented here can be considered to be representative of autonomous and healthy senior citizens or those who are partially handicapped. The data in the GODB are of an acceptable level of representativeness for 48% of countries in the WHO European Region, within a context in which the recent restructuring of the former Soviet Union increased the number of European countries from 34 to 53.

The results we have reported provide a schematic vision of the oral health status of 65–74-year-olds in Europe. In every part of Europe with similar socioeconomic, cultural and health levels — Northern Europe, Southern Europe, Eastern and Western Europe — there are data available for one country that can be used to provide an estimate of the oral health status of neighbouring countries. The quantity of the available oral health data for this age cohort is much lower than that available for the other WHO index age groups in the GODB. For the same period (1986–96), 95% of European countries had caries data for 12-year-old children (*10*) and 55% for adults aged 35–44 years (*11*). Furthermore, the great majority of countries produce national studies regularly for 12-year-olds; for example, the Nordic countries have an annual recording system and France has carried out five national studies over the last 5 years.

For the age cohort >65 years there is little information on oral health before 1986. None of the European countries has a regular oral health recording system that provides information about the elderly age cohorts. Therefore, it is not possible to make any conclusions about longer-term changes in the oral health status of the European elderly. The fifth point in the WHO/Fédération Dentaire Internationale goals for the year 2000 concerning the 65–74-year age group was a 25% decrease in the percentage of edentulous individuals (*7*). Because of the lack of earlier data, it is difficult to evaluate the impact or efficiency of oral health policies that were implemented to reach this target.

The level of edentulousness is the main indicator for the oral health status of senior citizens (*12*). Disparities in the percentage of edentulous persons were apparent, according to the part of Europe;

however, there is no obvious reason for this nor is it possible to present a classification of oral health status region or by group of countries according to the level of equivalent illness. Some countries in Western Europe — Austria, France, Italy, Switzerland — had the lowest percentages of edentulous individuals, while the United Kingdom and the Netherlands had exceptionally high levels (*13*). The observed variation in edentulousness is not restricted to European countries. Other industrialized countries, e.g. USA (28.5%), Japan (20.3%), Canada (36.6%), Australia (50.0%) and New Zealand (60.0%), show widely different levels (*13*). Patterns of edentulousness need multifactorial explanations, since environmental, cultural, economic, sociological and health/care determinants intervene without the possibility of evaluating the respective impacts (*5*, *14*).

Our analysis leads to the conclusion that treatment of 65–74-year-olds for dental caries is not the main priority. The mean number of decayed teeth per individual was low compared with the mean number of extracted or filled teeth. High quality treatment using new technologies associated with effective prevention over the whole lifespan are needed to lower rates of edentulousness. Differences might occur between the needs and demands of the elderly, corresponding to social, medical and economic factors. Research that acknowledges the complexity of the experience of aging in different social and economic contexts is therefore needed (*15*).

Résumé

Prévalence des caries et proportion de personnes édentées chez les 65-74 ans en Europe

Dans cet article, on passe en revue les études épidémiologiques incluses dans la Banque mondiale OMS de données bucco-dentaires concernant les 65-74 ans européens hors institutions, pour la période allant de 1986 à 1996. On indique le pourcentage des personnes édentées, l'indice des dents cariées, absentes, obstruées (CAO), et le nombre moyen de dents.

Au moins une étude représentative a été effectuée dans 48% des pays, sachant que les données provenant des pays développés à économie de marché sont en quantité égale à celles des pays en transition économique. La proportion de personnes édentées chez les 65-74 ans variait de 12,8% à 69,6%, le nombre moyen de dents était de 15,1 à 3,8 et l'indice CAO de 22,2 à 30,2.

Les disparités observées en matière de santé bucco-dentaire chez les adultes européens d'un certain âge donnent à penser qu'il est possible de concevoir et de mettre en oeuvre des politiques de santé bucco-dentaire prenant en compte les différences géographiques et socio-économiques des populations.

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