Challenges to improvement of oral health in the 21st century – the approach of the WHO Global Oral Health Programme

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Chronic diseases and injuries are overtaking communicable diseases as the leading health problems in all but a few parts of the world. This rapidly changing global disease pattern is closely linked to changing lifestyles, which include diets rich in sugars, widespread use of tobacco and increased consumption of alcohol. These lifestyle factors also significantly impact on oral health, and oral diseases qualify as major public health problems owing to their high prevalence and incidence in all regions of the world. Like all diseases, they affect primarily the disadvantaged and socially marginalised populations, causing severe pain and suffering, impairing function and impacting on quality of life. Traditional treatment of oral diseases is extremely costly even in industrialised countries and is unaffordable in most low and middle-income countries. The WHO global strategy for prevention and control of noncommunicable diseases and the ‘common risk factor approach’ offer new ways of managing the prevention and control of oral diseases. This document outlines the current oral health situation and development trends at global level as well as WHO strategies and approaches for better oral health in the 21st century.

Key words: WHO, oral health, health policy, common risk factors, health promotion, disease prevention

The burden of oral disease
Despite vast improvement in global oral health, problems still persist in many communities and populations around the world, particularly among the underprivileged in both developed and developing countries. The distribution and severity of oral diseases vary in different parts of the world and within the same country or region. Dental caries remains a major oral health problem in most industrialised countries, affecting 60–90% of schoolchildren and the vast majority of adults. Figure 1 highlights the dental caries experience among 12-year-old children in the six WHO regions in the year 2000, based on the DMFT Index. Currently, the dental caries level is high in several American and European countries, while it appears less severe in most African countries. However, the incidence of dental caries is predicted to increase in many developing countries in Africa, particularly as a result of a growing consumption of sugars and inadequate exposure to fluorides.

In many developing countries access to oral health services is limited and teeth are often left untreated or are extracted to
Figure 1. Dental caries experience (DMFT) of 12-year-old children according to WHO regional offices. (Source: WHO Global Oral Health Data Bank and WHO Oral Health Country/Area Profile Programme, 2000)\(^1,2\).

Figure 2. Dental caries experience (DMFT) of 12-year-olds in selected EMRO and AFRO countries\(^1,2\).

relieve pain or discomfort. This is reflected in the components of the DMFT index as shown for some AFRO and EMRO countries in Figure 2. Throughout the world, losing teeth is still seen by many as a natural consequence of ageing. While some industrialised countries have in recent years experienced a positive decline in tooth loss among adults, the proportion of edentulous adults aged 65 years and older is still high (Table 1).

WHO developed oral disease surveillance systems several years ago\(^1\). The first global map of DMFT among 12-year-olds was presented in 1969 and showed a high prevalence of caries in industrialised countries and generally low values in the developing countries. Over a number of years an increasing number of epidemiological studies documented a pattern of change in caries prevalence, i.e. increasing levels of caries in certain developing countries and a decline in many industrialised countries. Several oral epidemiological studies have been carried out applying WHO methodology and criteria\(^3\). Figures 3–4 present the current global maps of dental caries levels among children aged 12 and adults aged 35–44 years\(^1,2\).

According to the WHO Oral Health Data Bank\(^1\) in 1980 DMFT values at age 12 were available for 107 of 173 countries. Of these, 51\% had 3 DMFT or less, while the remaining 49\% had higher values. In the year 2000, data were available for 184 countries as recorded in the WHO Oral Health Country/Area Profile Programme\(^2\). Of these, 68\% had less than 3 DMFT. The caries decline observed in many developed countries (Figure 5) was the result of public health measures coupled with changing living conditions, lifestyles and improved self-care practices. It must be stressed that dental caries, as a disease, is not eradicated but only controlled to a certain degree.

Globally, most children have signs of gingivitis and, among adults, the initial stages of periodontal diseases are prevalent. Figure 6 illustrates the periodontal health status of 35–44-year-olds by WHO region\(^1,2\), using the so-called Community Periodontal Index. Severe periodontitis, which may cause tooth loss, is found in 5–15\% of most populations. Studies show that smoking is a major risk factor for adult periodontal disease, responsible for more than half of the periodontitis cases in this age group\(^3\). Risk decreases when smokers quit, and the prevalence of periodontal disease has indeed decreased in countries experiencing reductions in tobacco use\(^3\).

The prevalence of oral cancer is particularly high among the male population, and is the eighth most common cancer worldwide\(^4\).
Table 1 Prevalence of edentulousness (%) of elderly reported for selected countries throughout the world (Source: WHO Global Oral Health Data Bank and WHO Oral Health Country/Area Profile Programme, 2000).^1^2

<table>
<thead>
<tr>
<th>WHO region/country</th>
<th>% edentulous</th>
<th>Age group (yrs)</th>
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<tr>
<td><strong>Africa</strong></td>
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<tr>
<td>Gambia</td>
<td>6</td>
<td>65+</td>
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<tr>
<td>Madagascar</td>
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<td>65–74</td>
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<td><strong>The Americas</strong></td>
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<td>Canada</td>
<td>58</td>
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<tr>
<td>USA</td>
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<td><strong>Eastern Mediterranean</strong></td>
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<td>Egypt</td>
<td>7</td>
<td>65+</td>
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<tr>
<td>Lebanon</td>
<td>20</td>
<td>64–75</td>
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<td>Saudi Arabia</td>
<td>31–46</td>
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<td><strong>Europe</strong></td>
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<td>Albania</td>
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<td>Austria</td>
<td>15</td>
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<td>United Kingdom</td>
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<td><strong>South-East Asia</strong></td>
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<td>India</td>
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<td>Indonesia</td>
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<td>Sri Lanka</td>
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<td>Thailand</td>
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<td>Cambodia</td>
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<td>China</td>
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<tr>
<td>Malaysia</td>
<td>57</td>
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<tr>
<td>Singapore</td>
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(Figure 7). Incidence rates for oral cancer vary in men from 1–10 cases per 100,000 inhabitants in many countries. In south-central Asia, cancer of the oral cavity ranks amongst the three most common types of cancer. Sharp increases in the incidence rates of oral/pharyngeal cancers have been reported in several countries and regions such as Denmark, Germany, Scotland, central and eastern Europe and, to a lesser extent, Australia, Japan, New Zealand and the USA. In Asia, the age standardised incidence rate of oral cancer per 100,000 population ranges from 0.7 in China to 4.6 in Thailand and 12.6 in India. The high incidence rates relate directly to risk behaviours such as smoking, use of smokeless tobacco (e.g. betel nut or miang chewing) and alcohol consumption. In Thailand, for example, the prevalence of smoking is about 60%, betel nut chewing 15% while alcohol consumption is 35%.^7^ Qat is a leafy narcotic substance popular in several countries in East Africa and the Arabian Peninsula. It can be consumed in the form of tea or smoked like tobacco, although the most common mode of ingestion is by chewing the fresh leaves. Consumption of qat can lead to adverse oral effects including oral mucosal lesions, dryness of the mouth, discolouration of teeth and periodontal problems.

The regions of the world have different oral health profiles. Countries in Africa and Asia must urgently address a number of very serious oral conditions including noma (cancrum oris), ANUG (acute necrotising ulcerative gingivitis), oral pre-cancer and cancer. Cases of noma are reported for young children aged 3–5 years in Africa, Latin America and Asia (Figure 8); 90% of them die without having received any care. Africa and Asia have the highest prevalence of HIV/AIDS and analyses have shown that oral manifestations of this disease often include candida infections, hairy leukoplakia, oral ulcers and gingival bleeding, necrotising periodontitis, leukoplakia and Kaposi’s sarcoma. Most, particularly developing, countries still lack reliable data on the frequency and severity of oro-dental trauma. Some Latin American countries report dental trauma in about 15% of schoolchildren, while prevalence rates of 5–12% are found in children aged 6–12 years in the Middle East. Recent studies in certain industrialised countries have revealed that dental traumatic injuries are on the increase, ranging from 16–40% among 6-year-olds and 4–33% among 12–14-year-olds. A significant proportion of dental trauma derives from sports injuries, unsafe playgrounds or schools, road accidents or violence. In industrialised countries, the costs of immediate and follow-up care for dental trauma patients are high.

Estimates of the frequency of different traits of malocclusion are available from a number of countries, primarily in northern Europe and north America. Prevalence rates of dento-facial anomalies are reported at 10%, according to the Dental Aesthetic Index. Malocclusion is not a disease but rather a set of dental deviations, which in some cases can influence quality of life. There is insufficient evidence that orthodontic treatment
enhances dental health and function. Treatment is often justified by the potential enhancement of social and psychological well-being through improvements in appearance. Diagnosis and treatment of craniofacial anomalies such as cleft lip and palate present a number of challenges to public health. Oro-facial clefts occur in around 1 per 500-700 births, the rate varying substantially across ethnic groups and geographical areas and appear to be environment-related, a higher risk being associated with the mother’s use of tobacco and alcohol and her nutritional level. There is to date no consistent evidence of trends over time, nor is there consistent variation by socioeconomic status, but these aspects have not
yet been adequately studied\textsuperscript{11}. Other conditions that may lead to special health care needs include Down syndrome, cerebral palsy, learning and developmental disabilities, and genetic and hereditary disorders with oro-facial defects. There are many parts of the world, in particular parts of Africa, central Asia, eastern Europe, India and the Middle East, for which there is little or no information available on the frequency of craniofacial anomalies.

**Oral disease burdens and common risk factors**

Given their prevalence worldwide, oral diseases are major public health problems. Their impact on individuals and communities in terms of pain and suffering, functional
Figure 7. Comparison of the most common cancers in males in more and less developed countries, in 2000 (Source: WHO International Agency for Research on Cancer, 2003).

Figure 8. Cases of noma reported around the world (Source: WHO Oral Health Programme, Geneva, Switzerland).
impairment and reduced quality of life is considerable, and they are the fourth most expensive to treat in most industrialised countries. Were it available in many low-income countries, treatment of dental caries in children alone would exceed the total child health care budget.

A core group of modifiable risk factors is common to many chronic diseases and injuries. The four most prominent NCDs, cardiovascular diseases, diabetes, cancer and chronic obstructive pulmonary diseases, share common risk factors with oral diseases that are lifestyle-related and preventable. The greatest burden of all diseases is on the disadvantaged and socially marginalised. A major benefit of the common risk factor approach is the focus on improving health conditions for the whole population as well as for high risk groups, thereby reducing inequities. The WHO Global Strategy for the prevention and control of noncommunicable diseases represents a new approach to managing the prevention and control of oral diseases. Continuing surveillance of levels and patterns of risk factors is of fundamental importance to planning and evaluating community preventive activities and oral health promotion.

**WHO strategies and approaches in oral disease prevention and health promotion**

The WHO’s goals are to build healthy populations and communities and to combat ill-health. Four strategic directions provide the broad framework for the WHO’s technical work and also have implications for the Oral Health Programme.

- Reducing the burden of oral disease and disability, especially in poor and marginalised populations.
- Promoting healthy lifestyles and reducing risk factors to oral health that arise from environmental, economic, social and behavioural causes.
- Developing oral health systems that equitably improve oral health outcomes, respond to people’s legitimate demands, and are financially fair.
- Framing policies in oral health, based on integration of oral health into national and community health programmes, and promoting oral health as an effective dimension for development policy of society.

The threat posed by noncommunicable diseases and the need to provide urgent and effective public health responses led to the formulation of a global strategy for prevention and control of these diseases, endorsed in 2000 by the 53rd World Health Assembly (resolution WHA 53.17). Priority is given to diseases, including oral diseases, which are linked by common, preventable and lifestyle related risk factors (e.g. unhealthy diet, tobacco use).

Key socio-environmental factors involved in the promotion of oral health are outlined in Figure 9, which also shows important modifiable risk behaviours. The high relative risk of oral disease relates to sociocultural determinants such as poor living conditions, poor access to safe water or sanitary facilities, low education levels, and lack of traditions, beliefs and culture in support of oral health. Communities and countries with inappropriate exposure to fluorides also have a higher risk of dental caries. Control of oral disease depends on the availability and accessibility of oral health systems but risk reduction is only possible if services are oriented towards primary health care and prevention. In addition to the distal sociocultural and environmental factors, the model emphasises the role of intermediate, modifiable risk behaviours, i.e. oral hygiene practices, sugars consumption (amount, frequency of intake, types) as well as tobacco use and excessive alcohol consumption.

Clinical and public health research has shown that individual, professional and community measures are effective in preventing most oral diseases. However, optimal intervention in relation to oral disease is not universally available or affordable because of escalating costs and limited resources. This, together with insufficient emphasis on primary prevention of oral diseases, poses a considerable challenge particularly for developing countries and countries with economies and health systems in transition.

Opportunities exist to expand oral disease prevention and health promotion knowledge and practices among the public through community programmes and in health care settings. However, there are profound oral health disparities across and within regions and countries. These relate to socioeconomic status, race or ethnicity, age, gender, or general health status. Underserved population groups are found in both developed and developing countries. In many countries, moreover, oral health care is not fully integrated into national or community health programmes.

The major challenges of the future will be to translate knowledge and experiences of disease prevention into action programmes. Social, economic and cultural factors and changing demographics all impact on the delivery of oral health services in countries and communities and the ways in which people care for themselves. Reducing disparities requires far-reaching, wide-ranging approaches that target populations at highest risk of oral disease, and improve access to existing care. Meanwhile, in several developing countries the most important challenge is to offer essential oral health care within the context of primary health programmes. Such programmes should meet the basic health needs of the population, strengthen active outreach to the community, organise
Health promotion and oral health

Health promotion deals with the broader determinants of health and seeks to reduce risks through sensitive policies and actions. Promotion of health in the settings where people live, work, learn and play is clearly the most creative and cost-effective way of improving oral health and, in turn, quality of life. Increasing urbanisation as well as demographic and socio-environmental changes require comprehensive oral health action. It is unlikely that improvements in oral health can be achieved by isolated interventions that target specific behaviours. The most effective, sustainable interventions combine social policy and individual action through which healthy living conditions and lifestyles are promoted.

At the global level, WHO will provide the technical and policy support needed to enable countries to integrate oral health promotion with general health promotion. The development of programmes for oral health in targeted countries focuses on:
- Identification of health determinants; mechanisms in place to improve capacity to design and implement interventions that promote oral health.
- Implementation of community-based demonstration projects for oral health promotion, with special reference to poor and disadvantaged population groups.
- Building capacity in planning and evaluation of national programmes for oral health promotion and evaluation of oral health promotion interventions in operation.
- Development of methods and tools to analyse the processes and outcomes of oral health promotion interventions as part of national health programmes.
- Establishment of networks and alliances to strengthen national and international actions for oral health promotion. Emphasis is also placed on the development of networks for exchange of experiences within the context of the WHO Mega Country Programme.

In accordance with WHO overall priorities, the Global Oral Health Programme has adopted the following strategic orientations and priorities for action.

Priority action areas for global oral health

Oral health and fluorides

Research has shown that fluoride is most effective in dental caries prevention when a low level of fluoride is constantly maintained in the oral cavity. The goal of community-based public health programmes should thus be to implement the most appropriate means of maintaining a constant low level of fluoride in as many mouths as possible. Fluorides can be obtained from fluoridated drinking water, salt, milk, mouthrinse or toothpaste, as well as from professionally applied fluorides; or from combinations of fluoridated toothpaste with any of the other fluoride sources. There is clear evidence that long-term exposure to an optimal level of fluoride results in diminishing levels of caries in both child and adult populations.

However, it is important to be aware that an excessive fluoride intake has undesirable side effects. Experience has shown that it may not be possible to achieve effective fluoride-based caries prevention without some degree of dental fluorosis, regardless of which methods are chosen to maintain a low level of fluoride in the mouth. Public health administrators must seek to maximise caries reduction while minimising dental fluorosis.

Fluoride is being widely used on a global scale, with much benefit. Millions of people worldwide use fluoridated toothpaste, and/or are exposed to fluoridated water or fluoridated salt or other forms of fluoride applications (clinical topical fluorides, mouthrinses, tablets/drops). However, populations in many developing countries do not have access to fluorides for practical or economic reasons. Experiences from Africa tell that this is particularly the case for rural populations (Figure 10).

In WHO Technical Report Series No. 846 on *Fluorides and oral health*, the recommendation on use of fluoridated toothpastes reads as follows:

*Because fluoridated toothpaste is a highly effective means of caries control, every effort must be made to develop affordable fluoridated toothpastes for use...*
in developing countries. The use of fluoride toothpastes being a public health measure, it would be in the interest of countries to exempt them from the duties and taxation applied to cosmetics.

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Recent local studies have shown that affordable fluoridated toothpaste is effective in caries prevention and should be made available by health authorities in developing countries. One of WHO’s policies is to support this measure. This is particularly important in light of the changing diet and nutritional status in these countries. The WHO Global Oral Health Programme is currently undertaking further demonstration projects in Africa, Asia and Europe in order to assess the effects of affordable fluoridated toothpaste, milk fluoridation and salt fluoridation.

Diet, nutrition and oral health

Diet and nutrition affect oral health in many ways. Nutrition, for example, influences craniofacial development, oral cancer and oral infectious diseases. Dental diseases related to diet include dental caries, developmental defects of enamel, dental erosion and periodontal disease. WHO/FAO recently published a Global Strategy on Diet, Physical Activity and Health, based on analysis of the best available evidence on the relationship between diet and physical activity patterns and the major nutrition-related chronic diseases. The strategy aims at reducing the growing burden of NCDs in both developing and developed countries. Recommendations are made to facilitate the formulation of regional strategies and national guidelines to reduce the burden of nutrition-related chronic diseases. Among other recommendations, free (added) sugars should remain below 10% of energy intake and the consumption of foods/drinks containing free sugars should be limited to a maximum of four times per day. In order to minimise the occurrence of dental erosion, which seems to be closely related to the consumption of acidic beverages, the amount and frequency of intake of soft drinks and juices should be limited. For countries with high consumption levels it is recommended that national health authorities and decision-makers formulate country-specific and community-specific goals for reduction in consumption of free sugars. Many countries currently undergoing nutrition transition do not have adequate fluoride exposure. It is the responsibility of national health authorities to ensure implementation of feasible fluoride programmes for their country.

The WHO Oral Health Programme contributes to the implementation of the Global Strategy on Diet, Physical Activity and Health. There are many intervention activities at national level but the following areas should be addressed:

- Oral health services
- Schools: curricula, school lunches and school health
- Food industry, supermarkets
- Restaurants, catering, etc.
- Non-governmental organisations (NGOs) (health related and others)
- Legislation and policy
- Media
- Monitoring, surveillance and research.

Ministries of Health should ensure that mechanisms for intersectoral collaboration are carefully considered. Strategies include taxation and pricing, food labelling, school lunch policies and support to nutrition programmes.

Tobacco and oral health

Prevalence of tobacco use has declined in some high-income countries but continues to increase in low-income and middle-income countries, especially among young people and women. Undoubtedly, the increasing number of smokers and smokeless tobacco users among young people in some parts of the world will considerably affect the general and oral health of future generations. The prevalence of tobacco use in most countries is highest among people of low educational background as well as the poor and marginalised. In most countries in Africa and the Middle East the use of tobacco is higher among males than females (Figure 11).

Cigarette, pipe, cigar and bidi smoking, betel quid chewing (pan),
guinhka use and other traditional forms of tobacco have several effects in the mouth\(^1\). Tobacco is a risk factor for oral cancer, oral cancer recurrence, adult periodontal diseases and congenital defects such as cleft lip and palate in children. It suppresses the immune system’s response to oral infection, compromises healing following oral surgery and accidental wounding, promotes periodontal degeneration in diabetics and adversely affects the cardiovascular system. Moreover, the risks of tobacco use greatly increase when it is used in combination with alcohol or areca nut. Most of the oral consequences of tobacco use impair quality of life, be they as simple as halitosis (bad breath), as complex as oral birth defects, as common as periodontal disease or as troublesome as complications during wound healing.

The WHO Oral Health Programme has designed several strategies to control tobacco-related oral diseases and adverse conditions. Within WHO, oral health-related activities are integrated in the overall WHO tobacco-free initiative. Externally, the Programme encourages the adoption and implementation of WHO tobacco-cessation and control policies by international and national oral health organisations. There are many ethical, moral, and practical reasons why oral health professionals should strengthen their contributions to tobacco cessation programmes, including the following:

- They are especially concerned with the adverse effects in the oropharyngeal area of the body that are caused by tobacco practices
- They meet children, youths and their caregivers on a regular basis, and thus have opportunities to influence individuals to entirely avoid tobacco, postpone initiation or quit using tobacco before they become strongly dependent
- They often have more time with patients than many other clinicians, providing opportunities to integrate education and intervention
- They often treat women of childbearing age, and thus are able to inform such patients about the potential harm to their babies from tobacco use
- They are as effective as other clinicians in helping tobacco users quit and results are improved when more than one discipline assists individuals during the quitting process
- They can build their patient’s interest in discontinuing tobacco use by showing actual tobacco effects in the mouth.

The WHO Oral Health Programme supports the inclusion of oral cancer prevention as part of national cancer control programmes, based on careful planning, monitoring and evaluation, and partnership building.

**Oral health through Health Promoting Schools**

The Health Promoting School can be characterised as a school constantly strengthening its capacity as a healthy setting for living, learning and working. To help individuals and groups advocate Health Promoting Schools, WHO has produced an ‘Information Series on School Health’. Guidelines are given on how to assist school and community leaders in improving the health and education of young people, and individual documents in the series encourage schools to address one or more important health issues. Training-of-trainers programmes for schoolteachers are conducted to increase national capacities for integration of oral health promotion in schools.

External factors have a tremendous impact on how adolescents think and behave; the values and behaviours of their peers are increasingly important while parents and other family members continue to be influential. Factors within the wider environment are also significant (e.g. mass media, industries, community institutions). Programmes aimed at improving the oral health of youth need to take these factors into account, for example in relation to consumption of sweets, sugary beverages, tobacco and alcohol. Effective alliances between the home, schools, oral health professionals and community organisations can control risks to oral health in young people.

The WHO Oral Health Programme has prepared an oral health technical document to strengthen the implementation of an oral health component of the Health Promot-
ing Schools programme. Strong arguments for oral health promotion through schools include the following:

- Pupils and students can be accessed during their formative years, from childhood to adolescence. These are important stages in people’s lives when lifelong oral health related behaviour as well as beliefs and attitudes are being developed.
- Schools can provide a supportive environment for promoting oral health. Access to safe water, for example, may allow for general and oral hygiene programmes. Also, a safe physical environment in schools can help reduce the risk of accidents and concomitant dental trauma.
- The burden of oral disease in children is significant. Most established oral diseases are irreversible, will last for a lifetime and have an impact on quality of life and general health.
- School policies, the physical environment and education for health are essential for the attainment of oral health and control of risk behaviours, such as intake of sugary foods and drinks, tobacco use and alcohol consumption.
- Schools can provide a platform for the provision of oral health care, i.e. preventive and curative services.

The WHO compiles and consolidates research on interventions that can improve health through schools in order to build capacity at national level and to monitor the health status of children and teachers. The WHO Oral Health Programme has developed methodologies for process and outcome evaluation of school oral health.

**Oral health improvement amongst the elderly**

In many developing countries, particularly in Asia and Latin America, increases of up to 300% of the elderly population are expected by 2025. By 2050, there will be 2 billion people over the age of 60, 80% of them living in developing countries. As people age, their susceptibility to chronic and life-threatening diseases as well as acute infections increases, exacerbated by compromised immune systems. Cancer, cardiovascular diseases, diabetes, infections and poor oral health, most notably tooth loss and severe periodontal conditions, are more prevalent in this age group and lead to death, disability and reduced quality of life.

Among the elderly, high prevalence of co-morbidities and barriers to care are observed, together with oral health care challenges in relation to:

- Changing dentition status
- Caries prevalence with unmet need for care
- Periodontal pocketing/loss of attachment and poor oral hygiene
- Edentulousness and limited oral functioning
- Denture related conditions, ill-fitting removable dentures
- Oral cancer
- Xerostomia
- Craniofacial pain and discomfort.

Barriers to oral health care among the elderly are considerable. Impaired mobility impedes access to care, particularly for those who reside in rural areas with poor public transport. The situation is worsened in developing countries when oral health services and domiciliary care are not available. Given that some older people may experience financial hardship following retirement, the cost or perceived cost of dental treatment, together with negative attitudes to oral health, may deter them from visiting a dentist.

The WHO Oral Health Programme intends to develop strategies for improved oral health of older people. Based on experiences from demonstration programmes in countries, national oral health planners are encouraged to integrate systematic oral health activities towards improved quality of life.

**Oral health, general health and quality of life**

Oral health is integral to general health. Those with ill health are at greater risk of oral diseases that, in turn, further complicate their overall health. Some general health diseases manifest in the mouth, and oral lesions may be the first signs of other life-threatening diseases such as HIV/AIDS. Moreover, some common medications and therapies used to treat general health conditions can compromise the health of the mouth and oral functioning. In recent years, much research has demonstrated the impact of oral health on quality of life. The experience of pain, endurance of dental abscesses, problems with eating and chewing, embarrassment about the shape of teeth or about missing, discoloured or damaged teeth can adversely affect people’s daily lives and wellbeing. A number of oral health related quality of life measures have been developed to assess the functional, psychological, social and economic implications, measures that are highly relevant to the evaluation of community oral health programmes.

The WHO Oral Health Programme will provide analysis for policy and analysis of policy information instrumental to the integration of oral health into national and community health programmes. Such initiatives include state-of-the-science analysis and establishment of global databases on oral health, general health and common risk factors.

**Oral health systems**

More than 20 years after its widespread adoption, the strategy of Health for All through primary health care still has not been fully implemented. In many countries,
national capacity and resources – human, financial and material – are still insufficient to ensure availability of and access to essential, high quality health services for individuals and populations, especially in deprived communities. Oral health services transition coincides with the general trend in health services reform. In several industrialised countries, oral health services are made available to the population, comprise preventive and curative services, and are based on either private or public systems. Meanwhile, people in deprived communities, certain ethnic minorities, homeless, homebound or disabled individuals and the elderly are not sufficiently covered by oral health care. In developing countries, oral health services are mostly offered from regional or central hospitals of urban centres and little, if any, importance is given to preventive or restorative dental care. Many countries in Africa, Asia and Latin America have a shortage of oral health personnel and generally the capacity of the systems is limited to pain relief or emergency care. In Africa, the dentist to population ratio is approximately 1:150,000 against about 1:2,000 in most industrialised countries, and significant proportions of children and adults have never seen a dentist (Table 2).23,24

The WHO Oral Health Programme supports the development of oral health services that match the needs of the country. The work to orient oral health services towards prevention and oral health promotion is carried out in collaboration with the regional offices and the WHO country offices. A basic package of oral care has been put together.25 For developing countries in particular, primary health care models for essential oral health care are encouraged and several community demonstration projects based on sociocultural conditions are supported or carried out jointly with the WHO Oral Health Programme. Moreover, the WHO Oral Health Programme has designed an oral health component for the project Integrated Management of Adolescent/Adult Illness – Guidelines for First-level Facility Health Workers in Low Resource Setting.26

**HIV/AIDS and oral health**

The HIV/AIDS epidemic is the fastest-growing threat to development today and the epidemic is particularly severe in sub-Saharan Africa and Asia. National programmes, international organisations, civil society, communities and individuals have responded to the epidemic. The initial efforts were often weak and scattered as the full nature and scope of the threat were not fully understood. As the epidemic has progressed, understanding of its complex causes and effects has increased. The greatest challenge in responding to HIV/AIDS at present is to ensure that proven, gender sensitive strategies for prevention and care are widely implemented to a level where there will be significant impact on the epidemic.

The WHO Oral Health Programme can make important contributions to the early diagnosis, prevention and treatment of this disease. A number of studies have demonstrated that about 40–50% of HIV-positive persons have oral fungal, bacterial or viral infections, often occurring early in the course of the disease.27 Oral lesions strongly associated with HIV infection are pseudo-membranous oral candidiasis, oral hairy leukoplakia, HIV gingivitis and periodontitis, Kaposi’s sarcoma, non-Hodgkin lymphoma, and dry mouth owing to a decreased salivary flow.

The WHO Oral Health Programme has prepared a guide28 to provide a systematic approach to the implementation of epidemiological studies of oral conditions associated with HIV infection; to provide guidelines for the collection, analysis, reporting and dissemination of data from such studies; and to facilitate comparison of findings from different studies. It also aims to encourage oral health personnel and public health practitioners to make oral health status an integral part of optimum case management and of surveillance activities of the diseases associated with HIV infection. Activities may focus on:

- Identification of the most indicative oral manifestations of HIV/AIDS
- Involvement of oral health personnel in the documentation of HIV/AIDS to ensure appropriate medical evaluation, prevention and treatment
- Training of other health professionals on how to screen for oral lesions and extra-oral manifestations; using the ‘train the trainer’ approach to reach health care workers at community or village level
- Dissemination of information on the disease and its prevention through every possible means of communication
- WHO technical support to meetings at regional or interregional levels aiming at sharing country experiences in monitoring HIV/AIDS prevention and lifestyle modification through campaigns and community programmes.

## Table 2  Percentage of children/adults never having seen a dentist during lifetime in selected EMRO and AFRO countries

<table>
<thead>
<tr>
<th></th>
<th>Jordan23</th>
<th>Tanzania24</th>
</tr>
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<tbody>
<tr>
<td>6 years</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>12 years</td>
<td>11</td>
<td>26</td>
</tr>
<tr>
<td>35–44 years</td>
<td>82</td>
<td>76</td>
</tr>
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**Oral health information systems, evidence for oral health policy and formulation of goals**

In 1981, WHO and the FDI World Dental Federation jointly formu-
lated goals for oral health to be achieved by the year 2000, as follows:

- 50% of 5–6 year-olds to be free of dental caries
- The global average to be no more than 3 DMFT at 12 years of age
- 85% of the population should have all their teeth at the age of 18 years
- A 50% reduction in edentulousness among 35–44-year-olds, compared with the 1982 level
- A 25% reduction in edentulousness at age 65 years and over, compared with the 1982 level
- A database system for monitoring changes in oral health to be established.

The establishment of oral health information systems remains a challenge for most countries of the world. The WHO Oral Health Programme is prepared to assist countries in their efforts to develop such systems, which include data additional to epidemiological indicators. The information obtainable through a health information system may be usefully categorised into the following interrelated subsystems:

- Epidemiological surveillance
- Service coverage of the population
- Service records and reporting
- Administration and resource management
- Quality of care provided
- Oral health programme monitoring and outcome evaluation.

At WHO, information systems are being established for the surveillance of global trends in oral disease and risk factors. The WHO Global Oral Health Data Bank compiles valuable information for monitoring the global epidemiological picture and trends over time in oral health. The WHO Oral Health Programme has initiated integration of the existing database with other WHO health databases and surveillance systems on risk factors.

The WHO Oral Health Programme provides modern global health information systems through:

- Revision of the WHO Oral Health Surveys Basic Methods, taking new oral disease patterns into account (e.g. dental erosion and consumption of soft drinks) and allowing recording of quality of life and risk factors to oral health (including risk behaviours such as dietary habits, tobacco use, alcohol consumption, and oral health care habits).
- Development of procedures for management and analysis of data based on the use of information technology.
- Linking the Global Oral Health Data Bank with the Country/Area Profile Programme information system.
- Development of methodologies and approaches for evaluation of the effectiveness of community oral health programmes, focusing on health promotion and disease prevention. Such an evaluation also includes process documentation in order to allow sharing of experiences from programmes.

The formulation of new WHO goals has been initiated. WHO, FDI and IADR have jointly prepared new goals for the period up to the year 2020. The objectives and targets have been broadened in order to cover significant indicators related to oral health and care of population groups. The global goals are primarily designed to encourage health policy-makers at regional, national and local levels to set standards for oral health in relation to pain, functional disorders, infectious diseases, oropharyngeal cancer, oral manifestations of HIV infection, noma, trauma, craniofacial anomalies, dental caries, developmental anomalies of teeth, periodontal disease, oral mucosal diseases, salivary gland disorders, tooth loss, health care services and health information systems. The WHO Oral Health Programme will support countries directly as well as through regional and country offices in their formulation of goals, targets and standards of oral health.

Research for oral health

Research is the systematic process for generating new knowledge. Advances in knowledge, however, have not yet benefited developing countries to the fullest extent possible. It has been estimated, for example, that only 10% of funding for global health research is allocated to health problems that affect 90% of the world’s population. Clear disparities in economic strength, political will, scientific resources and capabilities, and access to global information networks have, in fact, widened the knowledge gap between rich and poor countries. The WHO Oral Health Programme contributes to the process of redressing the imbalance in the distribution of knowledge about oral health, so that the results of research will benefit everyone in a sustainable and equitable manner. As knowledge is a major vehicle for improving the health of poor people in particular, the WHO Oral Health Programme will focus on stimulating oral health research in the developed and the developing world to reduce risk factors and the burden of oral disease, and to improve oral health systems and the effectiveness of community oral health programmes. In particular, more research should be devoted to: inequity in oral health; the psychosocial implications of oral health/illness; diet, nutrition and oral health; tobacco cessation programmes; oral health – general health – quality of life interrelationships; and HIV/AIDS.

The WHO Oral Health Programme intends to stimulate oral health research for, with and by developing countries in several ways:

- Supporting initiatives that will
strengthen research capability in developing countries so that research is recognised as the foundation of oral health policy.

- Increased involvement of WHO Collaborating Centres in oral health in high-priority areas of research within national, regional or interregional centre networks.
- Encouraging oral health research training programmes at local level or based on interuniversity collaborative ‘sandwich’ programmes.
- Providing universities in developing countries with easy access to the scientific literature within oral health and online access to scientific articles.
- Reducing the 10/90 gap in oral health research through work within the framework of the Global Forum for Health Research

This forum provides support to priority-setting methodologies, dissemination of findings and measurement of results in order to break the vicious circle of ‘ill health and poverty’.

Conclusion

Unhealthy dietary habits, smoking and other tobacco use, alcohol consumption and stress are some of the common risk factors for many NCDs, including oral disease. The WHO Global Oral Health Programme will enable effective execution of the common risk factor approach in disease prevention and health promotion. While there has been encouraging improvement in oral health in many countries over the past few decades, much work remains to be done. With many challenges ahead, it is important to build on our achievements, and on strategies that work.

To implement oral health programmes globally, the WHO Regional Offices are important and existing partnerships must be strengthened, notably with national and international NGOs and WHO Oral Health Collaborating Centres. WHO will coordinate global alliances within the international oral health community, with a view to sharing responsibilities for implementation of the global strategy. One major task for WHO will be to map the changing patterns of oral diseases and to analyse their determinants, with particular reference to poor or disadvantaged populations. WHO’s work for oral health will also focus on devising tools for intersectoral collaboration, community participation, supportive policy decisions, oral health care reform, and development of community-based strategies for oral disease control.

This report highlights the priority areas for the Global Oral Health Programme and provides a framework for implementation. Good communication and concerted actions are essential for success. The WHO Regional Offices play a significant role in this process. With the expert contribution of the WHO Collaborating Centres, support from NGOs and commitment at national, regional and local level in the Member States both within and beyond the profession, the Global Oral Health Programme will achieve its goals for improved, equitable and sustainable oral health.

References


