Oral Health Issues in the African Region: Current Situation and Future Perspectives

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The African region bears, in comparison with other regions, the heaviest burden of disease despite important national and regional efforts. According to the World Bank, thirty-two African countries are among the world's forty-eight least developed nations, and 80 percent of the people in the region fall into the low socioeconomic category.[1] Where affluence does occur, it is limited to a small urban elite whose lifestyles are similar to those in industrialized countries. The severe lack of financial and technical resources has had a direct impact on the health of the population. While progress is being made on a number of health-related issues in Africa, the health situation in the region gives cause for concern.

The main causes of illness and death of children who survive the neonatal period are diarrhea, acute respiratory infections, malaria, and measles, alone and in combination, and malnutrition. For women, the main causes of illness and death include complications associated with childbirth. For men and women, main causes include communicable diseases, such as malaria, tuberculosis, and human immunodeficiency virus and acquired immunodeficiency syndrome (HIV/AIDS). All of these diseases are often aggravated by emergencies and disasters, such as armed conflicts, drought, and famine, as well as inadequate access to safe water, sanitation, nutritious foods, essential drugs, primary and secondary education, and family planning. In addition, noncommunicable diseases are emerging in Africa, especially diabetes and hypertension, due to an increase in their associated risk factors (cigarette smoking, use of alcohol, obesity, and sedentary lifestyles). While poor people in Africa represented only 16 percent of the world's poor in 1985, this proportion had risen to 31 percent by 1998 and continues to increase. In 1999, 300 million people in sub-Saharan Africa were estimated to live on less than US$1 per day.[2] The presence of widespread poverty and underdevelopment in Africa means that communities are also exposed to all of the major environmental determinants of oral disease.

Table 1. Selected indicators by African region and level of development

	Sub-Sahara	North Africa	Less Developed	More Developed
Access to safe water, 1988-91	45%	82%	70%	100%
Access to local health care, 1989-90	63%	88%	89%	100%
Contraceptive prevalence, 1985-92	15%	46%	53%	72%
Population growth per year, 1990-95	3.0%	2.3%	1.9%	0.4%
Expenditures on birth (% GDP), 1980	4.4%	3.7%	4.2%	9.4%
Life expectancy at birth, 1990-95	51	62	62	74
Infant mortality rate, 1990-95	101	67	70	10
Maternal mortality rate, 1988	717	360	420	26
Adult literacy rate, 1992	51%	55%	69%	98%

Sources: U.N. Population Division. World population prospects, 1994 revision (New York: United Nations, 1995); U.N. Development Programme. Human development report, 1994 (New York: Oxford University Press, 1994); and World Health Organization (WHO) data.

Oral Health in Africa

The most prominent characteristics of oral health in Africa are 1) low to very low caries prevalence and severity, with little increase; 2) few oral care personnel and an imbalance between personnel types and population needs; and 3) rural and periurban communities without basic care or with emergency care only, due to the high cost or unavailability of other treatment. These are exacerbated by 4) logistics problems and unreliable services, partly due to poor working conditions; 5) the low priority given to oral health care due to the presence of several general health problems and enormous development needs; and 6) difficulty in adjusting to the market economy, where demand-based private services result in a lower priority for prevention programs.

Disease Patterns

Dental caries and periodontal diseases are generally considered to be the major oral health problems around the world. In African countries, however, these do not appear to be on the same order of severity as in the developed world. The oral health profile of Africa today is very different from that perceived previously. This profile of oral disease is not homogeneous across Africa. Thus, the oral diseases in each community need to be individually assessed in terms of the basic epidemiological criteria of prevalence, severity (morbidity and mortality), and age-adjusted distribution in the population. Based on this form of analysis, the major oral health problems in Africa among low socioeconomic communities, in order of severity, are cancrum oris (noma), acute necrotizing gingivitis (ANG), oral cancer, oral manifestations of HIV/AIDS, facial trauma, and dental caries.

Noma and ANG, with which noma is known to be associated, have an estimated incidence in sub-Saharan Africa of about 100,000 to 140,000 cases per year, with a mortality rate of 70 to 90 percent and an estimated prevalence of 750,000 to 1 million cases. These numbers vary from report to report, and no definitive accounts exist on noma's incidence and prevalence. There are several explanations for the inconsistency. The disease most often occurs in poor, remote locations in developing countries of Africa where there are limited, if any, means for transportation or communication. In some communities, noma is regarded as a curse, with a spell cast on a family or even an entire village. Thus, the infected child might be hidden or ignored until he or she dies. Subsequently, the death may not be reported as a case of noma but referred to as an unspecified childhood disease. With increasing poverty and given the fact that many children are malnourished or undernourished and have compromised immune systems, the prevalence of conditions such as noma is likely to increase.[3-7]

The prevalence of oral cancer is also on the increase in Africa. Annual incidence figures for oral and pharyngeal cancer are estimated at twenty-five cases per 100,000 in developing countries. The major etiological factors associated with the development of oral cancer are smoking tobacco, chewing tobacco, chewing betel quid, and heavy consumption of alco-

Table 2. Epidemiological basis for ranking the oral disease burden in low economic status communities in Africa

	Oral Disease	Prevalence	Morbidity	Mortality
1	Cancrum oris (noma)	High	High	High
2	Oral manifestation of HIV/AIDS	High	High	High
3	Oral cancer	Medium	High	High
4	Facial trauma	Very high	Medium	Medium
5	Congenital abnormalities	High	Medium	Medium
6	Harmful practices	High	Medium	Low
7	Dental caries	Medium	Low	Low
8	Chronic periodontal disease	Medium	Low	Low
9	Fluorosis	Medium	Low	Low
10	Benign tumors	Low	Medium	Low
11	Edentulism	Low	Medium	Low

Source: World Health Organization, Regional Office for Africa. Oral health in the African region: a region strategy (1999-2008). Brazzaville, Republic of Congo: World Health Organization, Regional Office for Africa, 1998.

hol. Rapid urbanization and increasing use of tobacco and alcohol are considered to greatly increase the incidence of oral precancer.[8,9]

The highest prevalence of infections by HIV/AIDS is found in Africa. Of the estimated 40 million people living with HIV/AIDS worldwide by the end of 2001, sub-Saharan Africa accounted for about 70 percent (28.5 million), although the region represents only 10 percent of the global population. In many countries in southern Africa, at least one in five adults is HIV-positive. Studies have shown that oral manifestations of HIV/AIDS are widespread and most commonly include fungal infections such as those caused by candida, necrotizing gingivitis, or oral leukoplakia. In a study conducted in South Africa in 1995, 74.4 percent of HIV-infected patients presented with one or more mucosal lesions, 30.4 percent were symptomatic at presentation, and 6 percent presented first with an oral complaint that subsequently led to a diagnosis of an HIV infection. By extrapolation, the extent of the HIV oral public health problem nationally is emphasized, as is the need for efficient HIV diagnosis and management by all health care workers.[9-12]

Chronic destructive periodontal disease occurs in a small proportion of most populations, regardless of location or socioeconomic status.[13] This is no different in Africa. Although no evidence exists of a causal relationship between gingivitis and calculus accumulation, many studies nevertheless report a high prevalence or severity of periodontal disease associated with poor oral hygiene or nutritional status. National surveys and smaller studies in Africa have shown the prevalence of dental caries (decayed, missing, or filled teeth—DMFT) to be quite low, but with substantial regional variations. WHO Regional Office for Africa data available in 2000 from thirty-nine sub-Saharan African countries on dental caries prevalence in children age twelve shows that thirteen (33 percent) have a very low DMFT (0.0 to 1.1), nineteen (44 percent) have a low DMFT (1.2 to 2.6), and seven (23 percent) have a moderate DMFT (2.7 to 4.4). Most of this (about 90 percent) represents untreated caries and the inadequacy of oral health care systems to address the problem. The situation is completely different in some Latin American countries, for example, where DMFT among twelve-year-olds ranges from high to very high (5 to 8).[14]

Table 3. Global frequency of DMFT data at twelve years

	DMFT <3	DMFT >3
% Developing countries	69	31
% Developed countries	55	45
% Africa/Southeast Asia	88	12
% The Americas	22	78

Source: World Health Organization global oral health data bank. Geneva, Switzerland: World Health Organization, 1999.

Fluorosis is endemic in certain parts of Africa, most notably among communities in the Rift Valley area of East Africa.[15,16] With high levels of malnutrition and undernutrition among children on the continent, the likelihood of fluorosis occurring even at optimal (l ppm) levels of fluoride is even greater. Maxillofacial trauma has increased alarmingly in Africa along with other forms of trauma from interpersonal violence, motor vehicle accidents, and the consequences of war.

Among the other oral conditions that have been surveyed, little is known about the prevalence of congenital malformations and benign tumors, although it is safe to assume that these conditions occur far more frequently than currently thought, due to a lack of reliable information. Harmful practices, such as the removal of tooth germs of deciduous canines, the extraction of upper and lower anterior teeth, and the trimming or sharpening of upper anterior teeth, continue to occur. Tooth loss, mostly due to caries, occurs throughout the region. The prevalence of edentulism in Africa for adults ages thirty-five to forty-four is estimated to be 1 percent, although it is much higher in some communities. The African region also faces an acute lack of recent, reliable, and comparable data and the relative absence of processes for converting data into information for planning.

Infrastructure, Education, and Training

The main barriers to providing good-quality oral health care services of any kind in African countries are related to infrastructure, services, and resource availability. Examples include services such as clean, pressurized water and electricity, which are unreliable or absent; transport and communication, which are difficult, expensive, and nonexistent in some seasons; an infrastructure and organization that cannot sustain services; and financial, human, and physical resources that are few and stretched throughout many priority areas.

Education and training are also major issues. Oral health personnel have a role in contributing to the quality of life in society; however, the way they are currently trained in Africa does not equip them to deal with community development or health. Their training focuses on specialized, urban-based, curative care with little exposure to the realities of life in Africa. In short, it is too technical; ignores the community; is not based on real oral health needs; is based on cure, not prevention; and is not subject to systematic planning and evaluation.

Africa is undergoing dramatic changes in its epidemiological profile. As a result, oral health needs and priorities have shifted, and the provision of services and the training of oral health personnel need to be flexible to respond to these changing circumstances. Most notable is the massive impact of HIV/AIDS, which makes it important for the oral health sector to enhance its skills to respond and engage more effectively in broader health promotion activities capable of uplifting community oral health in the region.

Table 4. Dental institutions and university dental schools training dentists, 2000

Country	Number
Algeria	5
Cote D'Ivoire	1
Ghana	1
Kenya	1
Madagascar	1
Nigeria	4
Senegal	1
South Africa	5
Tanzania	1
Uganda	1
Zaire (DRC)	1
Zimbabwe	1
Total	23

Source: Replies from questionnaires sent to the World Health Organization Regional Office for Africa, Brazzaville, Republic of Congo.

Determinants of Oral Health Problems in Africa

Poverty is arguably the most important determinant of health and ill health. The link between poverty and health is clear. The poor in the African region are caught in a complex poverty gap, in which low incomes lead to low consumption, which in turn results in low capacity and low productivity. The prevalence of dental diseases closely mimics the levels of social deprivation. On a continent where the majority of the population is desperately poor, preventable dental diseases such as noma are rife. Increasing urbanization has also been shown to lead to observable increases in the prevalence of oral disease, and high levels of bottle feeding in cities have been associated with high rates of baby bottle tooth decay. Greater access to alcohol is associated with higher levels of interpersonal trauma and oral cancer. Urbanization also increases access to sugar products that contribute to dental caries.

Community vulnerability to oral disease is heightened in some areas by the specific risks of worsening nutritional patterns and social habits, such as arica nut (betel leaf) chewing and tobacco use, especially among women.

Table 5. Institutions training dental auxiliaries, 2000

Country	Category of Auxiliary
Botswana	Dental therapists
Cameroon	Dental technicians
Comores	Dental assistants
Kenya	Dental laboratory technicians Community oral health officers
Malawi	Dental assistants
Mozambique	Dental hygienists Dental chairside assistants
Nigeria	Dental therapists Dental hygienists Dental technologists
Senegal	Dental nurses Dental laboratory technicians
South Africa	Dental therapists Dental assistants Oral hygienists
Swaziland	Dental hygienists
Tanzania	Assistant dental officers Dental assistants
Uganda	Public health dental assistants
Zambia	Dental nurses Dental assistants Dental laboratory assistants
Zimbabwe	Dental therapists Dental technologists

Source: Replies from questionnaires sent to the World Health Organization Regional Office for Africa, Brazzaville, Republic of Congo.

Previous Approaches

There is little doubt that previous systems of oral health care in most African countries have

Table 6. Oral health personnel in Africa*

Category	1971-81	1990	1999
Dental surgeons	1,624	2,602	10,078
Dental auxiliaries	600	1,242	2,576
Other oral health personnel**	376	551	682
Total	2,600	4,395	13,336

Sources: FDI Basic Fact Sheets (Ferney-Voltaire, France: Federation Dentaire Internationale, 1971-81 and 1990) and country reports to World Health Organization Regional Office for Africa, Brazzaville, Republic of Congo, 1999.

*South African data not included.
**Other personnel include nonoral health personnel such as maternal and child health workers, village health workers, farm health workers, and community health workers.

not improved oral health significantly. Previous approaches have been modeled on those of affluent countries and have, therefore, failed to recognize the epidemiological priorities of the region and identify reliable and appropriate strategies to address them. Efforts have consisted of providing unplanned, ad hoc, and spasmodic-curative oral health services, which in most cases are poorly distributed and reach only affluent or urban communities.[17] The main problems can be traced to lack of oral health policies and plans, inappropriately trained dentists, services that benefit only affluent and urban communities, services that are almost entirely curative, and lack of equipment and materials, supplies, and maintenance.[18]

Development Needs

A successful approach to oral health in the African region must consider these circumstances to effectively focus on the real determinants of oral disease. The needs to be addressed include equitable and universal access to affordable, appropriate, and quality oral health services through the following:

- empowering communities, especially women and families, to participate in, benefit from, and play a leadership role in identifying oral health problems, needs, and interventions;
- proper planning, administration, and evaluation of services;
- prevention-oriented services and multisectoral action, especially in relation to participatory health education and promotion; and
- proper balance between personnel types and population needs.[18]

Future Perspectives

At its 48th Session in September 1998, the World Health Organization (WHO) Regional Office for Africa reviewed and adopted an oral health strategy for Africa for the period 1999 to 2008 to assist countries in identifying priorities and planning viable programs. This strategy represents a new approach that has the potential to fundamentally improve community oral health in the African region. The long-term vision is that all people of the region, particularly women and families, should enjoy improved levels of oral health through the following:

- a significant reduction of all oral diseases and conditions that are prevalent in the region;
- equitable access to cost-effective, quality oral health care; and
- adoption of healthy lifestyles.[18]

To guide and sustain the effective implementation of this strategy, the following principles were adopted:

- The promotion of oral health and the prevention of oral diseases should be given high priority.
- Oral health interventions should be focused on the district and its communities, with particular emphasis on children, pregnant women, and other vulnerable groups.
- Interventions that have proven efficacy should be used.
- Oral health should be integrated into all public health care programs.
- Communities, especially women and families, should participate in oral health activities.

These principles of the WHO regional oral health strategy are no doubt inspiring countries in the region to pay more attention to oral health, focusing on local priorities. To more effectively use the limited resources available, the following major areas require special attention.

1. Advocacy and social mobilization

It is important to raise awareness of the need to promote oral health. Doing so will involve using social marketing and participatory methods to mobilize support from policymakers, political leaders, women in the community, training institutions, nongovernmental organizations, professional associations, business and social groups, and industry.

2. National oral health policy and plans

A major barrier to the improvement of oral health in the African region is the absence in most countries of a clear statement of oral health policy to guide oral health activities. Only 32 percent of countries in the WHO African region have a national oral health policy. Of these, few have made progress towards implementation, and none has evaluated what has been done. A compelling need exists, therefore, for national oral health policies and implementation plans that incorporate a gender perspective and emphasize prevention, early detection, and management of oral diseases.

The WHO Regional Office for Africa has prepared a manual to assist oral health managers at all levels in selecting the most appropriate policies, programs, and specific oral health interventions for their country or more localized community. The manual introduces a systematic approach for the identification of priority oral health problems and the selection of effective, evidence-based interventions compatible with the socioeconomic development of the communities involved.

3. Interpretation of data

Because the profile of oral diseases is not homogeneous across Africa, oral diseases known to exist in each community need to be individually assessed in terms of basic epidemiological criteria of prevalence, severity, and distribution by age of the population. This is a prerequisite for the meaningful ranking of community needs and the development of intervention programs to address them.

4. Severe oral problems

Severe oral diseases, such as noma, oral cancer, oral manifestations of HIV infections, and trauma, have been largely omitted in both public and private care systems in the region, as they have been from the educational programs for oral health personnel. These diseases should be given particular attention because they are the most severe oral problems that people have to live with and they increasingly have the greatest morbidity and mortality of all oral conditions in the region.

5. Oral health and general health

Oral health is an integral part of general health. Oral diseases directly affect quality of life by having a serious impact on an individual's well-being and ability to fulfill desired socioeconomic functions. Decayed and painful teeth affect dietary intake and aggravate undernutrition in children because of the inability to masticate. The consequences of conditions like oral cancer and noma can be life-threatening and often result in lifelong functional impairment and death. Oral appearances also affect self-esteem and willingness to interact with others.

The known causes of oral disease include diet, dirt (plaque), smoking, alcohol, and stress. Because these risk factors are common to a number of other chronic diseases, such as cancer, coronary heart disease, stroke, and diabetes, it is appropriate to consider a common risk factor approach. A major benefit of this approach is the focus on improving health for groups at high risk as well as for the whole population, thus reducing inequities. Promoting general health by tackling a small number of key risk factors may have a significant impact on a variety of diseases at a lower cost and greater efficiency and effectiveness than disease-specific approaches.

Oral health services are also often designed as separate and in addition to the general health care structure. In less developed countries with scarce resources, oral health activities must be seen as part of a primary health care strategy and integrated into the regular structure. Primary health care is based on the promotion of health and community involvement. It also emphasizes the provision of appropriate health services to all sectors of the population and the possibility of recognizing and referring complicated treatment needs. The incorporation of oral health into primary health care is one way to achieve economically feasible action for oral health. The overall resources for the community need to be used, thus avoiding separate supervisory and logistical support systems.

Furthermore, the impact of tobacco use on the population's oral health is alarming. The most significant effects of smoking on the oral cavity are oral cancers and precancers, increased severity and extent of periodontal diseases, and poor wound healing. The clear link between oral diseases and tobacco use provides an ideal opportunity for oral health professionals to undertake tobacco control initiatives and cessation programs. This should be done both at the client level and by using professional organizations to lobby the government to implement the WHO Framework Convention on Tobacco Control.

6. Education and training of oral health personnel

The concept and role of training and education in health development should constantly change to keep pace with societal needs. A change is clearly necessary, and important elements to effect change should be recognized.

A commitment to participatory education with multidisciplinary and interdisciplinary approaches is needed. A public health-oriented curriculum that truly involves the community and promotes critical thinking along with a caring ethos needs to be introduced. The adoption of more innovative approaches to oral health training and education also requires the development of new and more appropriate forms of evaluation. Where appropriate, it will be important to incorporate relevant aspects of traditional or alternative medicine into oral health curricula.

7. Promotion of operational research

Health research is a powerful tool to strengthen the capacity for health actions, as it can enable the discovery of new and more effective ways to deal with unsolved problems. To strengthen research capacity and promote relevant research that responds to the oral health problems and needs of communities, a research culture should be developed within national oral health programs, and the findings should be widely disseminated and used for planning purposes.

Each country in the African region needs to formulate a national health research policy based on the perceived needs of its people and the priorities derived from epidemiological data. Of very high priority in the African region is research into the complex interactions among poverty, endemic infections, and malnutrition and their relevance to oral health problems. Another research topic of high importance is the intake and use of fluoride from all sources. Extensive research is also needed to identify and promote the positive aspects of culturally accepted practices, especially as they relate to oral health care.

8. Equitable access to quality oral health services

The achievement of greater equity in oral health and access to quality oral health services is important, particularly for rural, periurban, and underserved communities. Recent advances in oral health and available technical excellence must be adapted in the forms that are economically, technically, and culturally appropriate to the African region.

African countries should ensure that priorities are directed at women, families, and the most vulnerable; establish or expand oral health services to all districts as part of existing health services; ensure allocation of appropriate resources and infrastructure based on need and vulnerability; ensure availability of appropriate equipment and adequate stock of materials, instruments, and spare parts; and ensure regular maintenance of equipment.

9. Partnership and coordination

To facilitate the implementation of oral health activities and mobilize resources, partners should be identified and a network of interested parties established. Partnerships between community interest groups and health and development workers are instrumental for the successful operation of district oral health plans. At the national level, partners include professional associations, nongovernment organizations, aid agencies, WHO, and other U.N. agencies. Women's groups deserve special attention because of the leadership role they can play. In addition, WHO collaborating centers for oral health in the region should provide expertise and resources, particularly in the areas of capacity building and research promotion.

The creation of an enabling environment for women at all levels is crucial for the attainment of the highest level of oral health. This enabling environment must be in the context of health sector reforms. Major components are health system responsiveness to the needs of women, education of female children, quality health care, elimination of gender discrimination, and an appreciation of the role of women in sustaining human life.

Coordination among partners is crucial for the implementation of oral health programs and extends well beyond the mere sharing of information. The national level is responsible for overall coordination,

as opposed to program or service delivery, and must be properly equipped for this role.

Conclusion

Oral diseases continue to be a major public health problem in the African region. They are a source of considerable pain, suffering, and disability for many, especially the poor and deprived, and oral disease management represents a significant proportion of health budgets worldwide.

A new way of interpreting and responding to oral health problems in Africa is long overdue. It should begin with a systematic, evidence-based interpretation of oral health information through the application of basic epidemiological principles at the most local level possible. Taking the unique context of each community into consideration, strategies to limit or eradicate known determinants of oral ill health and disease must be built to address the social, economic, and environmental circumstances that put communities at risk of ill health.

In general, strategies to prevent oral diseases will be most effective when priority is given to the multisectoral approach rather than a single-sector approach, population-based interventions rather than those aimed at high-risk individuals, and primary rather than secondary prevention.

Within the community, women play a paramount role in promoting health and providing care, even though these roles are not sufficiently recognized. Governments should formally acknowledge the role that women play in the society and incorporate women's values into the planning process. These actions will lead to a balanced representation of women in the nuclei of decision making and management in the political, administrative, and technical domains. Acknowledging the critical roles women play will also improve the continuum of care, especially preventive, promotive, and rehabilitative care from the family to health care institutions.

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