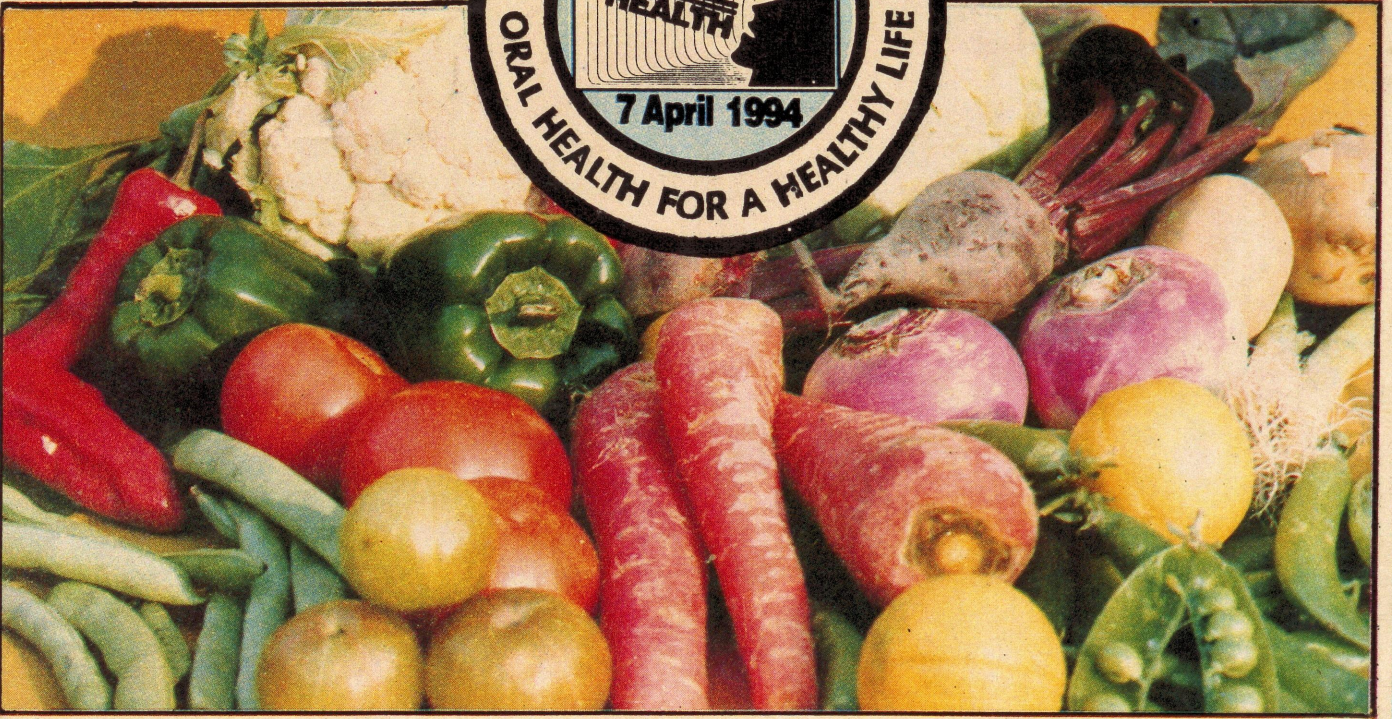
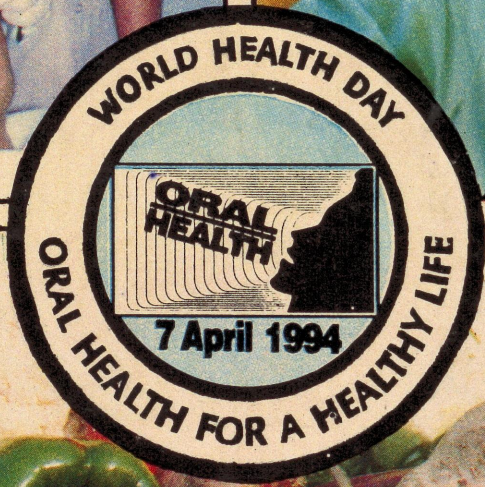
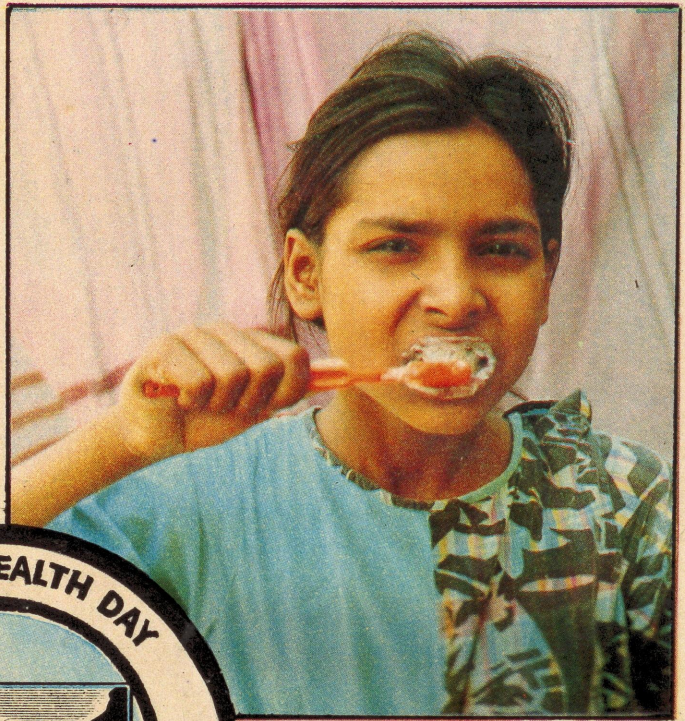
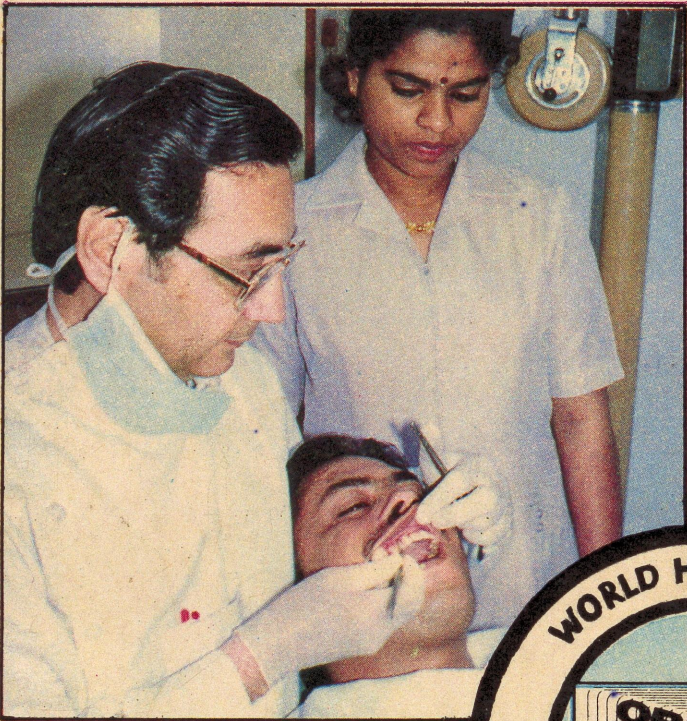


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Oral diseases such as dental caries and periodontal diseases are among the most widespread diseases in the world. They affect all populations to varying degrees.

Dental caries prevalence in India was as low as 37 per cent in 1940s with 1.5 permanent decayed teeth per child on an average. Presently, the prevalence rate of dental caries is above 80 per cent with five decayed teeth per child (on an average at the age of 16 years). Child population in India constitute about 40 per cent of total population. This means that of the 338 million child population, 270 million children are suffering from dental caries.

Oral health is concerned with functional efficiency of not only the teeth and supporting structures but also for the surrounding parts of the oral cavity and of the various structures related to mastication and the maxillo-facial complex.

The problem of oral health thus is acute. Achievement of Oral Health for All by 2000 AD entirely depends on the people's awareness about oral health problems and their prevention and also on improved infrastructure to provide better oral health care services through adequate number of trained manpower.

Keeping in view the enormity of the problem, *Swasth Hind* devotes this issue to the theme of the World Health Day, 7 April 1994:

ORAL HEALTH FOR A HEALTHY LIFE

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Articles on health topics are invited for publication in this Journal.

State Health Directorates are requested to send in reports of their activities for publication.

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ORAL HEALTH IN INDIA

Present status & future strategy to combat the problem

DR L.K. GANDHI

While the Oral health is deteriorating in India, the oral health care has continued to be modelled on the Western High-tech model. Most people have no access to adequate, affordable and acceptable oral health care services. This is due to faulty needs assessment and planning of services. The Western treatment oriented approach is inappropriate and irrelevant for the Indian situation where the population level is high and resource level low, says the author.

WHILE there is no reliable data available on oral health situation in India, various sporadic studies suggest a rising level of dental disease in India. The situation is perhaps similar to that in most developing countries in the Asia Pacific Region. The two most prevalent oral health problems in India are dental caries and periodontal disease. These are followed by malocclusion and oral cancers.

The dental caries has increased significantly since the 1940-1950's. In 1940-50, dental caries levels were reported to be 40-50 percent with an average DMFT of 1.5. In 1980's, the point prevalence had risen to 80-90 percent with a point prevalence of 5 in urban and 4 in rural areas at the age of 16 years.

The periodontal disease levels have remained increasingly high over the years and approach 90-100 percent for some population groups. Moreover, about 40-50 percent of children have malocclusion and about 40% of all cancers reported in India are oral cancers.

The number of dental personnel in the country has also steadily risen since the 1950's when the Dental Council of India (DCI) reported a dentist : population ratio of 1 : 80,000. In the 1990's the ratio has become more favourable 1 : 43,000. However, most dental surgeons and other dental personnel are clustered in towns and cities in the urban areas and the ratios for rural remote areas remain quite unfavourable. According to some studies, there is one dentist for up to half million people in the rural areas. In fact, 80% of the dentists live in urban areas whereas 80% of the population lives in the rural areas.

India is a signatory to the Alma Ata declaration 1978, which defines Health for All by 2000 AD as the ultimate goal and which is by now familiar to all of us in various parts of the globe. Surprisingly however, while the Indian Government is fully seized with the formulation of a national health policy, an action plan for restructuring oral health care and a national oral health policy has not yet been

devised. Little attention has been given by the health planners to plan oral health services and care to meet the goal of providing optimum oral health care to all by 2000 AD. The reasons are many but the prime reason is the relatively low priority accorded to oral health in the country and the other pressing health problems like population expansion and widespread communicable diseases which attract the attention of both the Government and the masses.

Against this background, there have been efforts from the professional groups and concerned professionals to urge the Government to take timely steps to control the widespread dental diseases in the country, especially in view of limited and diminishing allocated resources available to tackle it. In 1984-85, the profession's concern was evidenced in the form of a National Workshop at Bombay to plan strategies and plans to achieve Oral Health for All by 2000 AD. The Government has recently shown recognition of the problem and invited the Indian Dental Association in 1989-90 to prepare a

draft proposal for a national oral health policy. More recently, the Dental Council of India has also responded to the Government's invitation to help plan oral health care. The draft proposals from these various efforts have one thing in common. They all recognise the fallacy of continuing with a treatment based, high tech approach to oral health care in India in view of the fact that this approach has shown to be expensive and of limited value in controlling and preventing disease even in the western countries. An alternative strategy which encourages self care, prevention and health promotion needs to be developed, based on the changing concepts of the need in relation to WHO's Primary Health Care Approach.

Several recommendations, based on the preventive and promotive model of health care have been made to the Government and are under consideration but the oral health policy is as yet far from being finalised and implemented.

Existing oral health services

The existing oral health care is based on the conventional, high tech. Western model of treatment based philosophy.

The dental services are provided free of cost to everybody who demands these in hospitals and health centres. These generally include extractions and emergency care, simple fillings, prophylaxis, etc., but do not include prosthetic and orthodontic services. The resources are woefully inadequate to be able to cater to the large population in need and the services are utilised only selectively.

Dental Manpower

There is a prevailing myth that numerical increases in dental manpower will bring down dental disease and improve oral health. This philosophy leads to demands for increases in dental manpower without considering its long term

implications. What will happen when supply outstrips demand? It may start leading to unnecessary and over-treatment and an unethical, keen, cut-throat professional competition. Moreover, where is the evidence that increase in numbers will automatically distribute the manpower equally and in places such as slums, rural and remote areas where the need is the greatest? We are very much aware that till date most of them have been absorbed in major towns and cities.

Availability of Manpower—Dental Surgeons

From the data available today there are 17,154 Dental Surgeons in the country. These include 14,204 registered Part A and 2,950 registered in Part B. The estimated population is 850 Million which gives the ratio to 1 : 43,000.

Non-Professional Manpower

More emphasis on Dental Health Education has to be given through the Teachers Training Programme. This would have to be further elaborated.

There is continuing enthusiasm about the increase in the number of dental workers, but in the absence of proper goals of service and inadequate funds, what this would lead to is not very clear.

There is little evidence available all over the world, that mere numerical increases in the dental manpower have significantly contributed to improvement in oral health. And yet, large improvements in Oral Health have been reported from the industrialised countries.

Barnes and Tala (WHO, 1987) have firmly reinforced that

"the continuing reduction of disease levels is due mainly to preventive action taken by the individuals and communities rather than to

increased availability of dental manpower."

This does not, of course, mean that dental manpower is adequate or unnecessary. In fact, it tries to focus on the inappropriate, highly clinical, restorative training that is imparted to the dental personnel. What it means is that the roles of the dental professionals have to expand beyond their normal clinical duties, to widen their horizon and prepare them in assisting communities in their own health care, based on prevention and health promotion. The dental manpower in the 21st century would be much closer to and work with the people shedding their obsession with disease and treatment of its consequences.

Conclusions

In India, Oral Health is showing signs of deteriorating in a vast majority of people due to increased consumption of sugar and its products and improved socio-economic conditions. While the Oral Health is deteriorating in India, the Oral Health care has continued to be modelled on the Western High-tech model. Most people have no access to adequate, affordable and acceptable oral health care services. This is mainly due to faulty needs assessment and planning of services.

The Western treatment oriented approach is inappropriate and irrelevant for the Indian situation where the population level is high and resource are low.

There is thus urgent need to formulate a National Oral Health Policy which deserves immediate attention of the Government.

The Oral Health care in India should be modelled on a preventive and health promotion approach on the lines of the Primary Health Care Approach.

SWASTH HIND

The following recommendations are therefore made to draw the attention of the Health Planners in India :

1. A careful, thorough Situation Analysis which includes needs assessment is the first step towards planning Oral Health Care in India. This will help make available the data required for planning. The Situation Analysis must include community participation, to help people before their own needs arise, on the basis of informed decisions made through discussions with the profession.

The Situation Analysis must consider the socio-economic conditions and aspirations of the people.

2. Set up an empowered Committee of Professionals, Administrators and Politicians so that effective strategies can be planned and actually implemented based on the Situation Analysis, both at the Central and State Levels. This will help establish, forecast and monitor Oral Health needs and determine the nature of services provided from time to time.

The emphasis in planning should be based on NEEDS of the community rather than on DEMANDS from influential groups. □

**Message from DR HIROSHI NAKAJIMA
DIRECTOR-GENERAL OF W.H.O.,
on the occasion of World Health Day 1994**

Oral health has made remarkable progress in most developed countries as a result of prevention programmes which stress the optimum use of fluorides, oral hygiene and the adoption of healthy eating habits.

However, the situation is beginning to deteriorate in many developing countries, where oral diseases are on the increase and treatment costs are spiralling. Yet oral diseases are not an inevitable corollary of development. We have the means to prevent this health and economic disaster : we have to ensure that these means are implemented for all citizens everywhere.

Action is urgently needed. In the countries that have achieved sustained improvements, health policies need to be adjusted, staff have to be trained to deal with the new situation and appropriate services set up. In particular, care for the elderly should be strengthened to prevent the oral health problems linked with age. At the same time, prevention among children and adolescents must continue.

In the countries where the situation is deteriorating, this trend must be checked by launching effective prevention campaigns. We must ensure that the adoption of new life-styles and new eating habits does not lead to an increase in dental caries in populations that have always had healthy teeth. We must find ways of incorporating and encouraging traditional methods of oral hygiene which have proved their efficacy, and which are inexpensive and culturally acceptable.

Health, well-being and self-confidence are all boosted by a healthy and well-cared-for mouth, which facilitates communication and human relations.

In devoting World Health Day 1994 to oral health, the World Health Organization is endeavouring to mobilize Member States, the health professions and the general public, so that greater attention is paid to this important aspect of public health. Education and the participation of everyone are the keys to progress in oral health, without which there can be no health for all.

Let us unite our efforts so that the successes already achieved in the field of oral health can benefit everyone.

ORAL HEALTH:

An Overview

DR A. V. PUNEKAR

DR G. V. JOG

DR A. K. URMIL

A high proportion of people all over the world suffer from a variety of oral diseases. Although not an important cause of mortality, these may have sometimes serious repercussions upon the general health of the people suffering from such diseases. Oral health, a natural component of personal hygiene, somehow still remains neglected within many population groups/families. Based on information collected by the World Health Organisation over a period of two decades or so, two distinct trends are observed in the world—one towards better oral health and personal hygiene particularly in industrialized countries and the other towards a deterioration of oral health in non-industrialized/developing countries due to lack of oral health promotional activities. In countries like Sweden, Holland and USA some dental schools have been closed during the past 15 years or so due to a marked reduction in the number of dentists required, while in many developing countries, there is still a gross deficiency in trained manpower required in this field. Non-allocation of enough financial resource—mainly incriminated for this situation—is due to financial constraints.

Oral diseases: Present scenario

Dental caries and periodontal diseases are mainly responsible for most of the oral health problems. Other diseases include infections/infestations due to various pathogenic agents (bacteria, viruses, fungi, etc); nutritional

Achievement of Oral Health for All by 2000 A.D. entirely depends upon the people's awareness about oral health problems and their prevention, and also upon improved infrastructure to provide better oral health care services through adequate number of trained manpower. All health personnel, besides dentists need to be trained in prevention of dental caries, periodontal disease and oral cancer. It is hightime that we launch a separate National Programme on Oral Health making full use of International Collaborative Oral Health Development Programme already going on, feels the author.

and metabolic diseases (angular cheilosis, scurvy, dental fluorosis etc.); diseases of digestive system (pre-cancerous lesions); oral cancers, oral sub-mucous fibrosis caused due to certain habits (betel chewing, tobacco chewing, smoking, etc.); developmental defects of dental hard tissues; intrinsic staining of teeth among infants and children as a side effect of tetracycline therapy; enamel attrition (loss of tooth substance due to masticating activity see in persons who eat very hard and coarse foods/food with hard particles); abrasion (loss of tooth substance usually due to improper tooth brushing, use of clay, charcoal, etc.); erosion (loss of tooth substance due to chemical dissolution, e.g. among workers in factories where acid acidogenic compounds are used); traumatic conditions including fractures of teeth and jaws, extrinsic staining of

teeth due to various colouring agents including medicines, tobacco betel, etc., and various dento-facial anomalies including hereditary, developmental and acquired malocclusion or mal-alignment of teeth.

Oral diseases of major concern

Dental caries is a bacterial disease of dental hard tissue which begins with demineralisation of outer enamel surface and if not arrested or treated, the dissolution of enamel continues into dentine and pulp with increasing cavitation and loss of tooth substance. It is often associated with abscess formation due to secondary infection. Toothache is the common symptom of this condition. Main methods suggested for its prevention include use of fluorides—systemically (e.g. use of fluoridated

water/salt/fluoride tablets) or locally (e.g. use of fluoridated toothpaste, fluoride mouth rinses, etc.).

Periodontal diseases include a group of inflammatory and degenerative conditions of soft and bony tissue supporting the teeth. These conditions are caused by those bacteria which are normal inhabitants of the oral cavity, under certain conditions. Plaque formation is an important sign which leads to gingivitis (inflammation of gums which usually bleed following tooth brushing). The affected tooth may become loose and eventually get detached. Periodontal abscess and periodontitis are other complications. To prevent periodontal disease, it is, therefore, important that a regular and constant removal of plaque is carried out mainly by the individual although professional treatment may be required at times. Proper health education on oral hygiene is also important example use of tooth brush in a proper way/chew sticks in a correct way.

As regards precancerous conditions (white patch or leucoplakia on mucous surface, other discolorations, submucous fibrosis with inability to tolerate spicy food, stiffness of cheeks/lip, disappearance or rough papillary appearance of tongue, difficulty in stretching the tongue beyond lips or in opening the mouth, a chronic painless ulcer), their early diagnosis is the most important from the prognosis point of view. Symptom free beginning of such a condition prevents the patient from seeking early treatment. Periodic check-up of the mouth, therefore, is the only solution for early detection of this condition.

Dental Health Scenerio India

Bhore Committee (1945) and Mudaliar Committee (1961) strongly advocated expansion of dental health services in our country. Special attention was paid during the Fourth Five Year Plan on their expansion to preserve and promote the dental health of the people. The important plans included provision of dental clinic at district hospital level and establishment of school dental clinics. There were only four dental colleges conferring BDS degree during 1950-51. Their number increased to 43 during 1988-89 with total admission capacity of 1664 students. However, the dentist population ratio of one dentist per 80,000 population during 1988, still remains far from satisfactory. During 1972, nearly 90% of our population was found afflicted with periodontal diseases and over 60% from dental caries. Over 30% of cancer deaths were attributable to oral cancer. These conditions still remain a major cause of our concern even today. For example, it is felt that enough attention has still not been paid to dental health care of children. Over 90% of our children suffer from inflamed gums (gingivitis) which is found associated with hard calcified deposits on teeth (tartar/calculus) requiring removal by dentist/dental hygienist. In many cases untreated gingivitis progresses to periodontitis, a chronic destructive disease of tissues, commonly called pyorrhoea which causes looseness/early loss of teeth. A large number also suffers from time to time from acute infections of gums (necrotising gingivitis) causing painful ulceration and foul odour. 50% school children have been found suffering from dental caries (tooth

decay) in urban areas. Malocclusion or irregular alignment of teeth is another problem quite common among them. There is thus a dire need that besides regular dental check up under school health programme, the topic of dental health care should also be included in the school curriculum.

Future strategy for improving oral health

An Expert Committee in 1989 recommended that "Oral health should be considered as one aspect of the overall health and welfare of a society". Oral health, therefore, needs to be incorporated into general health programmes. The integrated approach has been regarded more beneficial. For example periodontal disease due to poor oral hygiene is related to general body cleanliness, therefore its inclusion in the teaching of personal hygiene by parents, teachers and primary health workers will go a long way in promoting self care for better overall health status.

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Oral Health Problems in Defence Personnel

—Present Status and Strategy to Control

MAJ. GENL. R. K. KHANNA

Army Dental Corps provides dental services for the Army, Navy and Air Force, in the form of a highly organised and well-knit dental care system not only for the service personnel and their families but also ex-servicemen of the three services and their dependents and for personnel of Assam Rifles, Border Roads organisation and the Coast Guards both in peace and war. Professional facilities to paramilitary forces like BSF and CRPF are also extended in field areas.

THE Army Dental Corps was founded in February 1941 with grant of commission to eight Indian Dental Surgeons. Independent mobile dental units with portable equipment were raised and sent to many theatres of war, viz., Middle East, Burma and Ceylon. Ever since the pattern has repeated itself specially in the Indo-Chinese conflict of 1962 and Indo-Pak flare ups in 1965 and 1971. Officers and men have also carried out assignments in Korea, Congo, Muscat and Oman, Indo-China, Gaza, Zambia, Bhutan, Sri Lanka and Maldives as part of UN forces. Welfare dental teams visit Nepal periodically for benefit of ex-servicemen Gurkhas. From time to time camps are organised in remote areas like Ladakh, Nagaland, Manipur and Mizoram to render free treatment to civil population.

Today the corps consists of 385 officers, 340 Dental Hygienists, 320 Dental Operation Room Assistants and 113 Dental Technicians. The officers and ancillary staff is devoted to total oral health care of

the Armed Forces personnel and entitled categories.

ORAL HEALTH PROBLEMS

The oral cavity in the principal pathway through which the body is exposed to external environment. The teeth, the gums supporting the teeth and other oral tissues are subject to certain diseases. The most prevalent dental diseases are Dental Caries and Periodontal disease.

Dental Caries : Dental Caries is a progressive disease affecting dental enamel and dentin and is prevalent in almost every decalcification of the tooth structure caused by acids produced as a result of fermentation of carbohydrates in the food by the bacteria present in dental plaques. This decalcification process starts in the pits and fissures on the tooth surface and on other areas where food debris accumulate and cannot be cleaned easily. In addition, a different kind of bacteria act on the organic component of the teeth resulting in destruction of tooth substance and cavity formation.

Periodontal disease : Periodontal disease is another important disease of structures surrounding the teeth viz., the gums, periodontal ligament, and bones which support the teeth and provides the anchorage. The bacterial plaque which accumulates around the teeth undergoes calcification and forms tartar deposits which favours growth of bacteria. This results in inflammation of gum tissues. If left untreated, the condition involves deeper tissues resulting in bone loss and mobility of teeth.

The oral disease problems in India are no different from other world populations. Incidence of dental caries and gum diseases in the Armed Forces is however lower than that observed in civil population but still it is sufficiently high to warrant prevention and control. The dental diseases are responsible for tooth loss, if treatment is not carried out in time.

Replacement of Missing Teeth : To preserve oral structures and improve masticatory efficiency, early replacement of missing teeth is carried out. Dental laboratory facilities required for fabrication of artificial dentures are available in peace as well as in field dental establishments.

Role of Army Dental Corps

The corps provides comprehensive dental care to the three ser-

Message from **DR UTON M. RAFEI** Regional Director, W.H.O. South-East Asia Region on the occasion of **WORLD HEALTH DAY 1994**

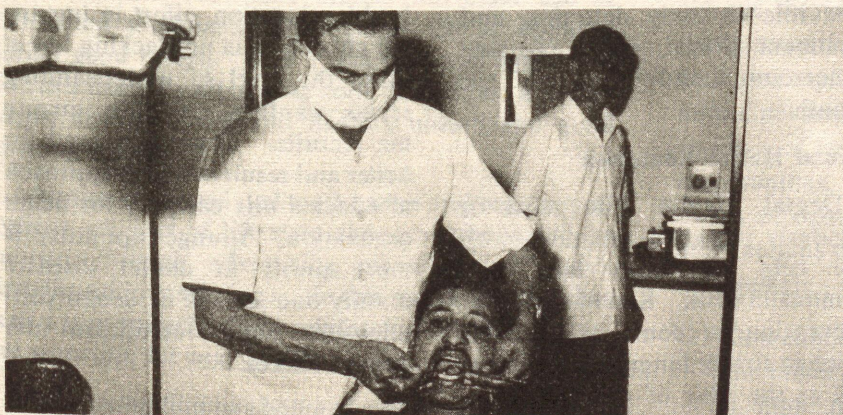
Of all the diseases prevalent in the world, oral diseases are perhaps the most widespread. No population is free from caries and periodontal diseases. And yet, there are perhaps no other diseases which are so preventable through regular oral hygiene, optimal use of fluorides and proper nutrition.

While significant progress has been achieved in oral health in most developed countries following sustained prevention programmes, the situation in some developing countries is causing concern as oral diseases are showing an increasing trend. While some diseases like oral cancer kill, people with AIDS, tuberculosis, syphilis, leprosy and herpes also have oral problems and conditions that require care.

Most Member Countries of WHO's South-East Asia Region are fortunate that only moderate to low levels of dental problems are found in children as compared to children in some developed countries. What is needed urgently, therefore, is to ensure that this situation is further improved through appropriate preventive programmes launched with and sustained through community support.

As the WHO Director-General, Dr Hiroshi Nakajima, has said; "we must ensure that the adoption of new lifestyles and new eating habits does not lead to an increase in dental caries in populations that always had healthy teeth. We must find ways of incorporating and encouraging traditional methods of oral hygiene which have proved their efficacy, and which are inexpensive and culturally acceptable".

It is hoped that this year's World Health Day theme will help to mobilize efforts in strengthening oral health and thereby ensuring a healthy life for all. △



Dental Inspection under Progress

vices, be he a soldier in high altitude or plains of the country, be he an airman serving in the highest airfield in the world or an aspiring astronaut, be he a sailor in an aircraft carrier or submarine. Dental treatment offered is of a high standard comparable with the most modern facilities available anywhere. Mobile dental teams deliver dental treatment at the doorsteps of the operationally committed troops whether in the plains of Punjab or on the dizzy and

freezing heights of Siachen. Thus the Corps endeavours to fulfil its commitment to keep the armed forces officers and men dentally fit at all times. As an added responsibility dental health care is provided to families and dependents of serving population and also ex-servicemen and their families.

STRATEGY

To achieve the above aims, the following steps are taken :

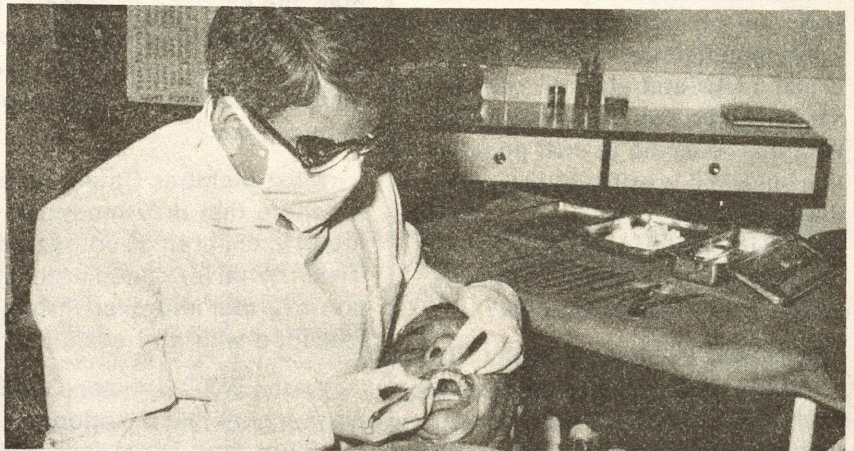
- (a) Propagation of the principles of dental health amongst troops by lectures, demonstrations and by organising dental health weeks and thereby arousing dental consciousness and encouraging the practice of preventive dentistry.
- (b) Carrying out regular annual dental examination of all personnel and allot treatment priorities.
- (c) Rendering specialist treatment when required.

Regular and periodic dental check ups and graded selection for treatment depending on the severity of condition has been the back-bone of dental health in the Armed Forces. This is further augmented by a system of prophylactic and interceptive treatment designed to reduce the incidence and severity of dental disorders. For this purpose a ratio of one dental officer and one dental hygienist per 4000 troops has been authorised.

The teeth in the oral cavity have many functions. Apart from the masticatory function, teeth help in speech and aesthetics. After loss of teeth these functions are impaired. Periodic annual dental inspections enable early recognition of oral and dental diseases and



Orthodontic Treatment with Straight Wire Appliance



Patient Undergoing Periodontal Surgery

prompt treatment saves the patient from many health hazards. By critical observation and careful questioning the dental officer is also able to recognize nutritional deficiencies and diseases of metabolism. He plays an important role in early detection and treatment of oral cancer and pre-cancerous conditions of the mouth.

Dental Health Education

Dental Health Education is regularly imparted to troops with the help of visual aids, and demonstrations. Knowledge on prevention of dental diseases is given in simple language to personnel at the time of annual dental examination and also when they report for treatment. As both

dental caries as well as periodontal diseases—are caused by bacterial plaques on teeth, lot of stress is laid on the importance of proper and adequate tooth brushing, mouth rinsing followed by other oral hygiene procedures. In dental health education, effort in imparting education is not lacking but at times the level of understanding seems wanting especially among the recruits. There is a need for better and result oriented approach to educate this category for better motivation. Younger age group is more prone to dental diseases mainly due to lack of dental consciousness before recruitment into Armed Forces.

(Contd. on Page 73)

SWASTH HIND

TOWARDS A BETTER ORAL HEALTH FUTURE

THE enormous change in oral health in industrialized countries is one of the major health success stories of this century:

- from a situation where every child had experienced toothache, most adults of 30 had nearly every tooth affected by caries and many had no teeth at all;
- to a situation where whole groups of children are totally free of oral disease, some adults of over 30 have no caries and no fillings, and where people now expect to be able to keep their teeth till the end of their life.

Even the association of dentistry with pain and frequent repair is changing to one where oral care is seen as a preventive service that maintains health and contributes to good looks and quality of life.

In spite of the dramatic change however, there is still need for repair and replacement treatment—a recent report from the United States of America, showed that at age 40, people may have as many as 30 tooth surfaces that have been affected by decay and 40% of people aged over 65 have no teeth at all. Furthermore, underprivileged groups—the handicapped, the poor, ethnic minorities—suffer more oral diseases than the rest of the population....

How has this come about? What has happened in the industrialized countries?

Community water fluoridation was the first major factor in the dramatic reduction of caries, in those countries which implemented the measure. Other measures such as salt and milk fluoridation have had similar effects. Now, the almost universal use of fluoridated toothpastes throughout life is showing similar good results. It is a fact that oral hygiene is seen as a natural part of total body cleanliness and that people desire a fresh and healthy mouth and good smelling breath.

Adoption of fluoridated toothpastes and regular oral hygiene are part of life-style changes propagated by industry through advertising on television, radio, cinema and in magazines. **In this way the industry has been a very powerful force reinforcing dentists' preventive messages for oral health.**

While prevention has boomed, care techniques have also changed beyond recognition!

MARCH—APRIL 1994

2—1/DGHS/ND/94

Compare your memories of sitting in an upright chair—the dentist standing bent over you—the painful extractions—the vibrating, noisy, slow drill—with:

Lying relaxed in a comfortable patient chair—bed—the dentist seated behind your head—a concerned and effective assistant—the high speed drill—the ultra sonic scaler—modern drug therapy and pain control—diagnosis assisted by effective technology,—almost invisible fillings—more realistic teeth replacements—implants that nearly reproduce the real tooth or teeth. Now computer assisted design of crowns and bridges, and laser surgery techniques are being added to the scene.

We must salute—engineers, researchers, manufacturers, pharmacologists, dentists and their teachers for their ingenuity and dedication in applying skills and knowledge to create this better experience of oral care.

How do these success stories match with experiences in developing countries?

In these countries we find a more varied picture. Fortunately in many countries oral health is still very good—people don't get many decaying teeth, may be only 5 or 6 in their whole lifetime; and even in old age they keep their teeth. However in some of these countries oral diseases are increasing; these increases are related to the rapid changes in dietary habits, particularly on migration to large cities. Pain and loss of teeth are much more common. In these communities, in addition to the common oral problems of dental caries and gum diseases, there are other serious oral diseases that threaten people's lives and welfare.

- Oral cancer is one of the most common cancers in the Indian sub-continent. It is also a cancer with a high mortality when undetected at a very early stage.

- Cancrum oris, a destructive type of gangrene, destroys the faces and jaws of thousands of undernourished and ill children and babies in countries where there is famine, mainly in Africa. For most of these children there is no care and no hope.
- The AIDS epidemic has resulted in many patients suffering from oral fungal infections, destructive oral ulcers and untreatable oral cancers; most will not receive even simple palliative care.

Only people who live in major cities can get reasonable treatment for oral problems. Most rural and many poor urban communities have almost no access to even basic emergency care and relief of pain. For too many people dentistry is still "pain and pay".

In some countries, the demand for care has increased so much that governments are trying to establish dental schools and in this way provide oral care services to more of the population. However, there are rarely enough teachers or funds to support this type of development; and for almost all communities these resources are needed for solving other problems. Further, traditional dentistry uses equipment that depends on electricity and clean, pressurized water—services not available to most communities in developing countries. So the services that result from such investments do not in fact provide better treatment for the vast majority of the public. **And focusing on providing treatment without a strong preventive programme will never solve the major problems, as has been experienced by industrialized countries.**

However, a total rethink of oral care possibilities is now in progress. Community preventive methods, new techniques of training—new design of equipment—basic sets of instruments—new modern materials—are being combined to bring health-promoting oral care to even the poorest community.

The Role of WHO

WHO's programme is focusing on 6 areas:

1. Ensuring that essential preventive activities are maintained—so that we don't throw away the

gains already made thus allowing the world to suffer another dental caries pandemic.

2. Demonstration of the new techniques for basic, health-promoting, economically feasible oral treatment to the public, administrators and oral care personnel.
3. Preparation of learning materials—posters, videos, computer-assisted learning packages, manuals, guides to support these changes.
4. Preparation of well designed technology for the new care—basic materials instruments and drugs.
5. Building a support network to assist communities to care for and repair children maimed by destructive diseases like noma; at the same time leading a campaign, based on improved nutrition and basic child care, to prevent such illnesses.
6. Bringing about a radical change in education of oral health care professionals.

Where should oral health be at the end of the Century?

Governments and communities should have recognized the need to develop and maintain preventive programmes for oral diseases—and communities will take responsibility for these activities.

All communities should be able to afford and manage basic health promoting oral care so that adult teeth will be retained throughout life.

Early care should be available for oral cancer patients everywhere as well as for those suffering from other disfiguring, maiming oral diseases.

Changes in the training of oral health care personnel should ensure that dentists evolve into the role of oral physicians, providing guidance on life-style and hygiene, as part of maintaining health in general and oral health in particular. They should provide special care for the full range of oral problems.

Oral health for life should be getting very close to a reality for all. □

SWASTH HIND

ORAL DISEASES: Prevention is better than cure

Oral diseases such as caries and periodontal disease (infections of the gums and of the tooth support tissues) are among the most widespread diseases in the world. They affect all populations to varying degrees.

Dental caries in the world: a situation of contrasts

THE index for measuring the extent to which a population is affected by caries is the mean DMFT, which in a group of individuals counts the average number of teeth that are Decayed, Missing (on account of caries) and Filled. It is a simple, rapid and universally applicable measurement that has been widely used for several decades.

We have drawn up a scale for severity of involvement at various key ages: 12, 35-44, 65 and over.

At age 12 the 5 level scale varies from 0.0 to 6.6 or more: a DMFT between 0.0 and 1.1 is considered very low, a figure of 6.6 or more is very high, while a moderate DMFT is between 2.7 and 4.4 decayed.

Any country undertaking an analysis of its oral health situation can compare the results with WHO's worldwide objective: by the year 2000 no more than three decayed, missing and filled teeth at age 12. By repeating the analysis at regular intervals (WHO recommends an evaluation every five years) it is possible to monitor the trend in caries prevalence, to estimate the needs for care and prevention and to adjust personnel training and services accordingly. It should be pointed out that the simplified oral health survey method developed by WHO is reliable, very inexpensive, can be used anywhere and provides comparable data both in the richest countries and in the poorest.

WHO's Oral Health Unit provides technical support for epidemiological surveys and processes country data free of charge on request.

The information collected is stored in the Global Oral Data Bank (GODB) system in the catalogue of United Nations data banks, whereby it is possible to follow the worldwide trend. Every year since 1969,

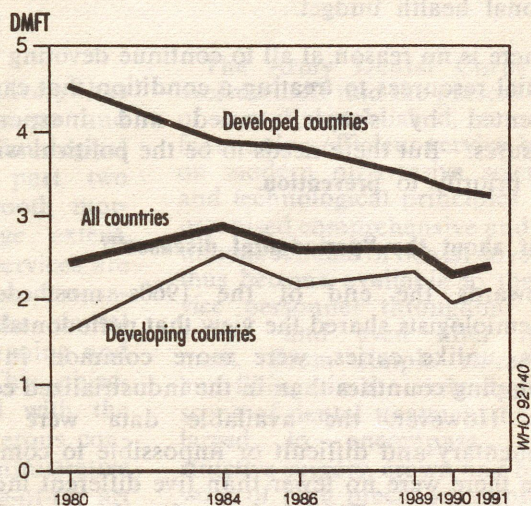
MARCH—APRIL 1994

WHO has compiled a world map of caries at age 12. In 1969 the overall picture showed sharp contrasts: the DMFT was very high, high or at least moderate (between 2.7 and 4.4) in the industrialized countries, whereas it was generally very low, low and occasionally moderate in the developing countries.

Over the next two decades there was a downward movement and sometimes a spectacular fall in the prevalence of caries in virtually all the industrialized countries.

In the developing countries the general trend is for caries prevalence to increase, **except where prevention programmes** have been set up.

Every year since 1980 the WHO Oral Health Unit has calculated the mean global DMFT at age 12, weighted for population. The resulting graphs display the trends in dental caries in the industrialized countries, in the developing countries and for mankind as a whole.



The trend in the mean since 1980 justifies measured optimism for the next 10 years, although the situation is still delicate in as much as a small increase in very highly populated countries is all that is needed to take the mean above 3.

What is the explanation for the spectacular drop in caries prevalence in some countries? How can it be prevented from rising again? How can the worsening of the situation in other countries be halted?

The reply to these three questions is **one and the same: prevention, more prevention and still more prevention.**

In the industrialized countries the promotion of oral hygiene, the widespread use of fluoride toothpastes, the introduction of fluoride into drinking-water or salt in some countries, advice on nutrition (no sweets between meals, etc.) are the factors behind an unprecedented public health success story!

Wherever community prevention programmes are set up, caries stop advancing. For example, this has happened in Bulgaria, French Polynesia and Thailand. Apart from the fluoridation of water, salt and milk, which requires more advanced technology and supervised central administration, all the methods of oral hygiene make use of simple techniques, cost little and are perfectly suited to implementation at primary health care level.

As a result of the progress made in the last 25 years, the developing countries now have the knowledge and means of prevention that will enable them to avoid the problems the industrialized countries have had to face, and indeed still are facing, at a very high price!

In most industrialized countries the oral health services still absorb between 5% and 11% of the national health budget.

There is no reason at all to continue devoting substantial resources to treating a condition that can be prevented by simple, varied and inexpensive measures. But there needs to be the political will to give priority to **prevention.**

What about the "periodontal diseases"?

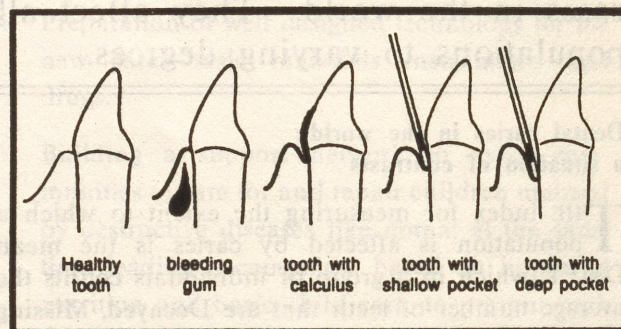
Towards the end of the 1960s most dental epidemiologists shared the view that periodontal diseases, unlike caries, were more common in the developing countries than in the industrialized countries. However, the available data were very fragmentary and difficult or impossible to compare since there were no fewer than five different indices in common use. This plethora of methods was compounded by the difficulty of collecting data from adults, a problem that is less serious in the case of caries, where the key age is 12 years.

With the definition of a periodontal index which very quickly achieved wide international acceptance, the epidemiology of periodontal diseases has made great strides. The CPITN (Community Periodontal Index of Treatment Needs) was proposed by a WHO scientific group and recommended in the early 1980s

by a joint working group from WHO and the FDI (International Dental Federation).

This index records the periodontal diseases in terms of four clinical signs:

1. Bleeding from the gum
2. Presence of calculi
3. Presence of shallow periodontal pockets
4. Presence of deep periodontal pockets.



A "periodontal pocket" is considered to be present when the gum, under the effect of inflammation and/or infection, retracts, forms a pocket and no longer adheres to the tooth. The ligaments become impaired and the tooth becomes increasingly loose.

To measure periodontal status, the mouth is divided into six parts or sextants. A specially designed probe is used to test the condition (1, 2, 3 or 4) of the gum around the tooth selected as the index tooth for each sextant.

If several clinical signs are present simultaneously, the *most severe* is selected.

WHO has compiled data on over 100 surveys carried out in the age group 35-44 years. These data should be treated with caution, since very few of them provide a national estimate. Nevertheless, they are of great interest because they consistently show a *similar pattern* of frequency and severity of involvement, which challenges some generally accepted ideas about the distribution and the etiological process of periodontal disease.

The data show that the percentage of people who have deep pockets and the mean number of sextants per person also displaying deep pockets are low to very low. This means that the severe forms of periodontal disease, those requiring complicated surgery, are far from common.

Moreover, there seems to be no difference in frequency between industrialized countries and developing countries for the *severe* forms of periodontal disease.

On the other hand, the *initial* forms (bleeding and calculus) are much more prevalent in the developing countries.

In the light of these data it may be stated that generalized periodontal destruction is rare in 40-year-old adults. Some people show some signs of such destruction, but only a limited part of their dentition is affected. It seems that the initial forms (bleeding and calculus) do not necessarily lead on to the advanced stages of the disease, except in certain minority groups.

How can these diseases be prevented?

After a few days of careful cleaning of the teeth, the bleeding stops in the vast majority of cases and the inflammation, the cause of much discomfort, also regresses.

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Today all major types of specialist equipment is available to cater for oral surgery, prostheses, periodontics, orthodontia. To meet the growing demands for advanced technical training of officers, postgraduate courses leading to MDS are conducted at Armed Forces Medical College (AFMC) Pune. Officers are also sent on study leave to encourage young dental officers to specialise. Moreover, to attract dental surgeons with postgraduate qualifications, direct permanent commission is offered to these candidates. During hostilities against China and Pakistan, services of these specialists proved invaluable in successfully managing war casualties involving facial and jaw bone injuries including reconstruction.

Courses of instructions and training for para-dental ancillary staff are also conducted at AFMC Pune and larger establishments of the Army, Navy and Airforce to

augment the dental officer task force.

Modernisation of Dental Equipment

Dental treatment delivery has become highly equipment and material oriented. Technological advancement in the past two decades has reduced tooth mortality to a very large extent. Armed Forces Dental Services are in the forefront of the modernisation programme of the dental equipment which is ongoing and continuous process. This objective is being achieved with the understanding and generous contributions of the administrative authorities. Today state-of-the-art armamentarium specific to all disciplines of dentistry is available in all the larger dental establishments.

RESEARCH

An outstanding activity of the Army Dental Corps is in the field of dental research. There are numerous clinically oriented projects which have helped improve the

Points to remember

No population is free from oral diseases such as caries and periodontal diseases, which are among the world's most widespread.

The methods and techniques of prevention are widely known: hygiene, optimal use of fluorides, nutritional advice. Wherever these methods are practised, success is guaranteed.

Whether caries or periodontal disease is the problem, regular brushing or other cleaning of the teeth is the first requirement for good oral health.

There are various possible prevention policies: hygiene for the most common and least serious forms; development of products that act against the destructive types of periodontitis. A whole field of research to protect the risk groups is opening up. □

treatment modalities and reduce chairside working time.

The Army Dental Corps has evolved itself into the present form of a well established, smoothly functioning efficient service based on modern progressive scientific and technological principles. An organised comprehensive and continuous scheme of dental cover has thus become available to the service personnel throughout their service and even after retirement. From simple extractions and fillings in the early days, the scope of dental treatment has enlarged to encompass reconstructive surgery, crown and bridge work of high precision, implantology, periodontal surgery and orthodontic treatment which is of a high standard. This has only been possible by periodic review of requirements of manpower and equipment and critical analysis of statistical data to make an endeavour for complete control over dental diseases in the Armed Forces. Our fond hope is to achieve Dental health for all in the services by 2000 AD. □

ORAL HEALTH FOR ALL THROUGH ALTERNATIVE ORAL HEALTH CARE SYSTEMS

THE prevention and control of dental caries in industrialized countries have been due mainly to use of fluorides in many different ways and to the widespread adoption of effective oral hygiene habits.

In spite of these successes the disease is not conquered in all communities. It might still be called a neglected epidemic in under-privileged and low-income groups.

There are many high risk populations in the USA:

- 97% of the homeless need oral care, black children have 65% more untreated decay than the average citizen, low income 91% and American Natives 265%.
- more than 50% of the housebound elderly have not seen a dentist for 10 years.

Traditional systems for oral care are based on various combinations of public salaried services and private practice. The public services are usually responsible for prevention, care of school children and disadvantaged groups; and private practitioners provide a wide range of treatment to the general public. All these systems are oriented in such a way that the dentist provides most of the care.

In the USA:

- 84% of 17 year olds have had tooth decay and an average of 11 tooth surfaces are damaged.
- people aged 40 to 44 have an average of 30 tooth surfaces affected by decay.
- 41% of people aged 65 or over have no teeth at all.

In developing countries, the level of dental caries was rarely as high as in industrialized countries and, in some, successful preventive activities have been implemented. However, in many there is still the threat of increasing caries related to changing diet and lifestyles.

Common oral diseases in developing countries

The burden of demand for treatment only of severe caries or periodontal disease can be "gestimated". In about one third of these populations, about 1350 million people will require pain relief treatment (extractions) 3 times in their lives. About two-thirds or 2400 million people will need 5 or more extractions.

However, in many communities these systems do not meet even the basic needs of the public. Most public services have only very low coverage; communities in low-income rural and urban areas cannot afford private oral care. Further, developing countries cannot afford to establish, staff and run education facilities for dentists; or hope to provide adequate employment opportunities for dentists trained abroad.

In all countries economic restraints, changes in demand for oral health care, political pressures to extend services to under-privileged groups, concern about quality, costs and effectiveness of care demand that alternative ways of organising oral health and care are examined and implemented.

Cost and lack of access for under-privileged and low-income groups constrain all oral health care systems.

What actions can be taken to combat this neglect, break down the barriers of cost and improve access to oral health and care? Alternative oral care systems need to be developed so that a maximum number of people can have access to and can afford oral health and care.

Several recent advances give great scope for the transformation of the delivery and quality of oral care.

These are:

- new educational technologies that make learning—both knowledge and skills—simpler and faster for all types of personnel;

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BACKGROUNDER

World Health Day—7 April 1994

“ORAL HEALTH FOR A HEALTHY LIFE”

M.S. DHILLON

The seventh of April each year is observed as the World Health Day, since it marks the date in 1948 when member countries had ratified the constitution of the World Health Organization (W.H.O.) to bring it into force. Ever since 1950, a theme related to international public health has been chosen for the World Health Day, with an appropriate slogan.

The prevalence of oral diseases the world over has prompted health authorities to focus attention on this universal problem. Concerned with the urgent need for action in promoting sound oral health and prevention of dental caries and periodontal diseases, World Health Organisation (W.H.O.) has included oral health as a specific programme under health protection and promotion. It has now dedicated the World Health Day-1994 to oral health and the slogan selected for the Day is “Oral Health for a Healthy Life.”

The Objective of the Day

The objective is to mobilise the dental profession the world over to celebrate a year of Oral Health interlinked with the World Health Day—7 April, 1994.

The governments and communities should be able to recognise the need to develop and maintain preventive programmes for oral diseases by the end of this century and the responsibility for implementing these activities should be that of the communities.

All communities should be able to afford and manage basic health promoting oral care so that adult teeth are retained throughout life.

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Early care should be available for oral cancer patients everywhere as well as for those suffering from other disfiguring, maiming oral diseases.

Oral health care personnel should ensure that dentists evolve into the role of oral physicians, providing guidance on lifestyle and hygiene, as part of maintaining health in general and oral health in particular. They should be able to provide special care for all oral problems.

By the year 2000, oral health for life should get very close to a reality for All.

Magnitude of the Problem

Oral diseases such as dental caries and periodontal diseases (infections of the gums and of the tooth supporting tissues) are among the most widespread diseases in the world. They affect all populations to varying degrees.

Since 1980 the WHO Oral Health Unit has calculated the mean global DMFT (Decayed, Missing and Filled Teeth) at the age of 12 years, weighted for population. The trend of DMFT in developed countries was between 4.5 and 6.5 in 1980 (considered to be high); it has come down to between 2.7 and 4.4 in 1991 (a moderate level). Similarly, the DMFT for all countries is just below 3 (a low level).

This shows that there are positive signs for decreasing trend in dental caries prevalence in the world. But the situation is still delicate in developing countries.

Oral Health and Developing Countries

Developing countries are today in the grip of oral diseases. The increase in incidence is related to the rapid change in dietary habits. Use of tobacco in various forms is one of the factors in increasing the incidence of oral cancer. In addition to the common problems of dental caries and periodontal diseases,

there are other oral diseases that threaten people's lives and welfare. Oral cancer is the most common cancer in the Indian Sub-Continent which is associated with a high mortality disability.

Treatment for oral problems is only available in major cities. Most rural and many poor urban communities have almost no access to even basic emergency oral care. For too many people dentistry is still "Pain and pay."

This year's theme is specially significant with regard to India, since the consciousness about oral health in our people, in general, is very low. The incidence of oral diseases is very high in all age-groups and particularly among children. The problem of dental caries has been on the increase during the last four decades both in terms of prevalence and severity. The index for measuring the extent to which a population is affected by caries is the mean DMFT, which in a group of individuals counts the average number of teeth that are Decayed, Missing (on account of caries) and Filled. It is simple, rapid and universally applicable measurement that has been widely used for several decades.

Dental caries prevalence in India was as low as 37 percent in 1940s with 1.5 permanent decayed teeth per child on an average. Presently, the prevalence rate of dental caries is above 80 percent with five decayed teeth per child (on an average at the age of 16 years). Child population in India constitute about 40% of total population. This means that of the 338 million child population, 270 million children are suffering from dental caries.

What is Oral Health?

Oral health is concerned with functional efficiency of not only the teeth and supporting structures but also for the surrounding parts of oral cavity and of the various structures related to mastication and the maxillo-facial complex. The mouth is most versatile of human organs. The food needed by the body for life processes enters through it. The first stage of digestion (mastication and grinding of food) is in the oral cavity by the tongue and teeth, the taste buds help in tasting the food and the salivary secretion is added in the mouth. The articulation of speech, our main means of communication, comes from it. Its size and shape, especially the contours of the lips, strongly affect one's personal appearance. Thus it is clear that the mouth and its principal components—the teeth, the tongue and the gums should receive the best of care. What is required is that good dental health habits be established in early life and be consistently maintained. It is a fact that

oral and general health are inseparable since oral disease may be a manifestation of or an aggravating factor in some more widespread systemic disorders. Hence improving oral health is much more significant for safeguarding general health.

Oral Health—Targets for 2000 A.D.

World Health Organization has formulated oral health objectives in the context of Health for All by the year 2000, after reviewing the available information considering the time available and the realities of achieving changes in the oral health status of populations. The targets thus indentified are :

Age (in years)	Targets
5-6	50% should be free from dental caries.
12	Three or fewer decayed, missing or filled teeth.
18	85% should retain all their teeth.
35-44	50% reduction in number of persons with no teeth (75% with 20 teeth).
65+	25% reduction in number of persons with no teeth (50% with 20 teeth)

Dental Health Care in India

The dentist-population ratio in India is 1 : 43,000. Majority of these professionals are located in the urban areas, whereas majority of our people reside in rural areas and urban slums. The majority of our rural people are illiterate, economically backward and ignorant about the simple rules of dental and general hygiene. Despite the increase in the number of Dental Colleges in India, it has not been possible to narrow the gap in the Dentist-Population ratio during the last 20 years. Moreover, mere increase in the number of dentists in an area may not be able to bring down the prevalence and severity of dental diseases. It is only with the implementation of organised preventive measures and educational intervention strategies that there could be reduction in dental caries and other dental problems.

Another problem regarding dental care in India is that such a care is at the lowest of the priorities for our people. Early symptoms of oral diseases are often unnoticed since these are considered to be of low significance. The chronic, recurrent, irreversible, cumulative and general prevalence of oral diseases have contributed to the wrong belief that oral problems are inevitable and are not preventable.

Oral Health Problems Prevalent in India

The three most important oral diseases prevalent in India are:

1. Dental caries, 2. Periodontal Diseases, and
3. Oral Cancer.

1. Dental Caries

The prevalence of dental caries has shown an alarming increase in India during the last four decades. And the problem has become acute in view of the shortage of dental care services, especially in rural India.

Dental caries are the result of decay of teeth that destroys the hard tissues of the teeth and may cause pain, infection, disfigurement and other problems. It results from interaction between three factors—bacteria, diet and host susceptibility. Formation of dental plaque is followed by production of acid by the bacteria through fermentation of ingested carbohydrates, especially sugar. The damage to the tooth requires treatment by a doctor/dentist.

FACTORS THAT MAY LEAD TO DENTAL CARIES: The most important factor in causation of dental caries is sucrose. Sweets are favourites of Indian people. No festival is complete without sweets since these are considered auspicious and are exchanged on celebrations and on festive occasions. Drinks with lot of sugar such as shikvanji (made with lemon, sugar and water), Sharbat, milk, etc. are widely drunk. Candies, chewing gums, cough lozenges also have a deleterious effect on the teeth. A decrease in salivary secretions due to increased intake of tablets like propranolol and diazepam increases the hazard of caries.

Very low level of fluoride in drinking water may also cause dental caries. A fluoride level of 0.7 to 1.2 PPM is required in drinking water for prevention of dental caries. On the other hand, higher concentrations of fluoride in drinking water lead to development of dental and skeletal fluorosis.

2. Periodontal Diseases

The term periodontal diseases refers to any disease peculiar to the periodontium or the parts thereof and covers advanced gum disease affecting gums and support jawbone. The most common diseases of this kind are gingivitis or inflammation of the gums, periodontitis, and periodontosis. The two latter conditions are commonly called pyorrhoea.

In gingivitis the gums are red, swollen, and tender and bleed easily. The cause is usually poor mouth hygiene habits which permit calculus (tar) and food particles to accumulate on the teeth and irritate the surrounding soft tissues. If gingivitis is not corrected, it may develop into periodontitis. In

this condition the gums become badly inflamed and tender and they draw away from the neck of the teeth forming pockets which become inflamed. As the condition becomes worse, the bone supporting the teeth is destroyed and the teeth become loose. Unless this condition is treated and checked in time by the dentist, the teeth eventually fall.

Adults sometimes may also be affected by another type of periodontal disease called periodontosis. In this condition, even though the mouth is kept clean the bone supporting the teeth slowly wastes away. The nutritional imbalance seems to be associated with such a disorder.

CLINICAL SIGNS OF PERIODONTAL DISEASES: There are four clinical signs of periodontal diseases:

1. Bleeding from the gum, 2. Presence of calculus (tar), 3. Presence of shallow periodontal pockets, and 4. Presence of deep periodontal pockets.

A 'Periodontal pocket' is considered to be present when the inflamed gum retracts and tooth becomes increasingly loose.

Prevention from Dental Caries and Periodontal Diseases

* Use of sweets and candies should be discouraged.

* Follow and promote the oral hygiene practices (such as rinsing of mouth with plain water after each meal and regular brushing of teeth particularly before going to bed at night and after rising in the morning).

* It is better to use paste in preference to powder with the tooth brush. Those who cannot afford tooth brush can use 'datum' (chow-stick).

* Massage gums and teeth with your finger.

* Get your teeth checked periodically for early detection and treatment of dental disorders.

* Calculus (tartar) be got removed only by a dental hygienist.

* Fluoridation of public water supplies in concentrations between 0.7 to 1.2 PPM fluoride reduces dental caries by 50-65 percent.

* Where drinking water has a very high fluoride content, defluoridation should be carried out to bring the fluoride content to the desired level.

3. Oral Cancer

Oral cancer is the most common cancer in India, and the cancer of the tongue, mouth and pharynx are the commonest cancers among oral health problems. The National Cancer Registry Project data

show that in many parts of the country oral cancer has the largest incidence amounting to 38% of the total cancers. The specific cause or causes of cancer are not known. But oral cancer may be related to chronic irritation from decayed teeth, imperfectly fitting dental appliances, chronic infections, continuous exposure to toxic substances such as tobacco (smoking, chewing, reverse smoking), betel chewing etc.

In India, it is estimated that at present 70% of men and 20% of women use tobacco in one form or the other. Of these, percentage of women tobacco users varies rather considerably in different parts of the country.

USE OF TOBACCO IN INDIA: Tobacco is commonly used in the form of smoking; and also by chewing and rubbing in the oral cavity (smokeless).

Tobacco is used in different ways *i.e.*, cigarettes, bidis; hooka; Chillum; clay pipe; chutta, dhumti being local made cheroot and bidis.

Smokeless tobacco used in India is in the form of pan or betel quid with tobacco; tobacco and lime; snuff and Nass; tobacco Mishri; Gudakha (pan masalas); tooth paste containing tobacco, etc.

There is strong evidence about the fact that tobacco use in different ways is possibly responsible for oral cancer. It has also been observed that the earlier the individual starts using tobacco, the more are his/her chances of getting oral cancer.

Moreover, tobacco usage has ramifications beyond oral cancer.

TOBACCO IS ADDICTIVE: Tobacco use in any form is addictive and habit forming. Tobacco contains nicotine and it has proved to be one of the powerful habit forming substance in scientific investigations.

MISCONCEPTIONS: There are certain misconceptions, wrong beliefs and myths in the communities on use of tobacco, for example:

1. Many people believe that *bidi* is less harmful to Cigarette smoking. It is a wrong belief since *bidi* smoking is more harmful than cigarette smoking.

2. *Hooka* is considered safe because smoke is filtered through water. It is not so because carbon monoxide is not absorbed in water.

3. Tobacco and tobacco products are used as medicine in many parts of our country. People chew tobacco for relief of toothache; smoke cigarettes or *bidis* to get relief from gastric problems. People may not be aware of the fact that tobacco use in any form is addictive and habit forming and lead to different forms of cancers in the body.

Prevention of Oral Cancer

* Do not use tobacco in any form (smoking, chewing or rubbing.)

* Betel leaf and nuts should not be used.

* Irritation from sharp teeth, broken teeth, ill-fitting dentures, etc. should be brought to the notice of a dentist and got treated.

* Periodical screening should be done for early detection of oral cancer.

NOMA—A little known Public Health Problem

On the eve of the World Health Day—1994, the World Health Organization (W.H.O.) has made a solemn appeal to everyone—doctors, public health leaders at all levels, public and private sectors, journalists to support the international programme for Noma control in all possible ways.

WHAT ACTUALLY IS NOMA? Noma is an illness which gradually destroys whole areas of the face, attacking the young ones particularly the malnourished children. It starts as ulcer in the mouth and spreads on to the cheeks, chin, palate, nose and virtually whole of the oral cavity and surrounding tissues often leaving a gaping hole in the face, eating away the bones of the eye socket and the jaw. At this stage of the disease death is usually because of septicaemia. Those who survive live with facial mutilation, speech defects and chewing difficulties.

The disease attacks children, under six years of age, with a peak incidence of 3 and 4 years of age. Weaning period is regarded as more vulnerable to infection.

The disease attacks more on malnourished children and in most of the cases it is followed by infection (parasitic disease, most commonly measles/scarlet fever/chickenpox and occasionally, malarial attack). The nutritional deficiencies observed are protein deficiencies, iron deficiency, anaemia and vitamin deficiencies.

PREVENTION AND CONTROL: It is possible to prevent, cure, treat and repair the sequelae of NOMA. The repair is lengthy, difficult and painful process and is so expensive that a very few can afford it. Hence there is an urgent need for each country to set up a "NOMA control programme", giving priority to its early detection and treatment.

Bad Breath: Another Common Problem

Unpleasant breath, known as halitosis, is as a result of disease in the mouth, neglect of general oral hygiene or it may also be due to some infection of the nose, throat, lungs or it may originate in the stomach.

In case the mouth is healthy and clean, the teeth being in good condition and bad breath still persists one should consult a physician. Indigestion, lung cancer, lung infections, diabetes, and other conditions may cause unpleasant breath. Only a physician can manage such ailments.

Mouthwashes, as are being advertised, can do nothing more than camouflage an unpleasant breath for a limited period. The only sure remedy is to find and remove the underlying cause. It is apparent that if the cause is elsewhere than in the mouth, no mouthwash can be expected to do anything. Clean and safe drinking water is just as effective for rinsing the mouth to clear it of loose food particles or soluble substances.

Remember

* Not to use teeth for opening Soda Water Bottles/Breaking Nuts, etc.

* Dental diseases are painless initially. Do not wait for the pain to come.

* Signs of periodontal diseases are bleeding from the gums, oozing pus, foul smell from the mouth, teeth drifting and loose teeth. This is also known as pyorrhoea. Do not wait for them to come and overtake you. You may lose your teeth too early.

* Any patch inside the mouth is a danger signal of pre-cancerous lesion/leukoplakia and oral sub-mucous fibrosis and these may be caused by areca-nut chewing.

Hence regular dental check up is very important. In case of any problem proper medical/dental checkup and guidance should be sought immediately.

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simplified and logical design of oral clinics that improve the workplace and substantially reduce capital costs of equipment and need for maintenance;

better materials that are easier and simpler to use.

Using these technological advances 3 types of care can be defined:

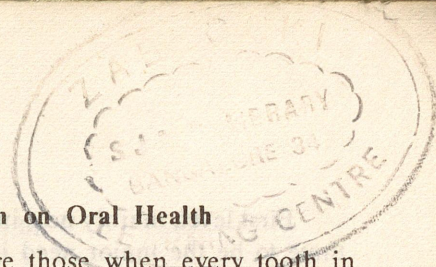
rather simple, very cost effective,

moderate level technology that is rather expensive, and

high technology, often extremely expensive.

A rational, health promoting and affordable mix of care must be planned and implemented in all countries.

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Some more Information on Oral Health

* Healthy teeth are those when every tooth in the jaw is clean and strong and is supported by solid or healthy bones and healthy gums and the tooth is free from decay or cavity.

* Milk teeth or temporary teeth in children are designed by nature to assist in chewing food, contribute to the development of the face and expression.

* Brush your teeth regularly with a soft tooth brush. Those who cannot afford a brush especially the rural people, can clean their teeth with a *Datun*.

* Plaque is the causative agent for both dental caries and periodontal diseases. Remove it by brushing the teeth, and cleaning the tongue.

* Thorough brushing/cleaning is much more important. Your tip of the tongue taken round the teeth should give you a clean and fresh feeling after brushing/cleaning.

* Do not eat sweets too often. You should not eat or drink anything sweet for more than three times in a day—twice with the meals and once in between meals. Clean and rinse your mouth after each meal.

* Tobacco used in any form may cause oral cancer, tobacco contains cancer-causing chemicals and is addictive and habit forming. Hence you should not start the use of tobacco in any form.

* Avoid quacks and the magic cures being stipulated by these people.

* Take green leafy vegetables daily.

* Take citrus fruits.

First level care includes:

Prophylaxis, removal of calculus, application of sealants, restoration of single surface caries cavities.

As a consequence of improving oral health in most **industrialized countries** the need for moderately complex care is decreasing. With further emphasis on prevention, need and demand for first level interventions will increase slightly; while the need for high technology care will probably increase for several decades due to the desire to preserve natural teeth and the increasing numbers of elderly people, who have some natural teeth.

First level, mainly non-interventive care will continue to be the major need in most **developing countries**. This type of care can now be provided by specially trained health centre personnel, rather than by the traditional dentist or auxiliary worker.

In those **developing countries** where caries is increasing, a rising demand for moderate technology care will continue over the next few decades.

A rather small need for high technology care—mainly related to repair of trauma and reconstruction after severe pathology—will remain and will eventually increase.

Moderately complex care includes multiple surface restorations, removal prostheses and extractions.

Complex oral care includes precision prosthetics, implants orthodontics, complex surgery and oral medicine.

In all countries prevention and control care can minimize the need for intervention.

In any society, high technology can only be afforded in limited amounts. It must be of good quality and appropriate.

ALTERNATIVE SYSTEMS IN INDUSTRIALIZED COUNTRIES

Increasing access to basic oral care

First level, mainly non-invasive interventions have been prepared and are being tested as part of the work of community health clinics for minority groups and low-income inner city and rural communities. The elderly and groups with special needs would also benefit from out-reach activities from such clinics which would provide health education and promotion coordinated with health-check programmes by multidisciplinary personnel. As effective, simple and acceptable care reduces the referral needs for the moderate and high technology type of care, oral care costs could be reduced by this approach to a level that can be sustained by most communities.

Some locations are experimenting with different relationships between oral care professionals, e.g. hygienists working independently in offices, in patient's homes and in institutions. Greater access is the main aim of such outreach activities.

Financing oral care

Some of the different approaches being used to finance oral care are quality control guidelines, fixed fee agreements, capitation schemes, health maintenance organizations, and rewarding increased preventive care.

Using information about the duration of acceptable care procedures, **quality control guidelines** are being prepared that indicate the average number of years each type of care should last. If a care procedure does not last the specified time, the clinician is then obliged to give re-treatment free of charge. Such guidelines are aimed at reducing unnecessary treatment which causes progressive destruction of tooth substance and higher costs of oral care.

In some countries, for most procedures, dentists can only charge **fixed fees** that are agreed between the health authorities and the professionals. They can only exceed those fees for special treatment *and* after a review of the diagnosis and proposed procedure. In countries using this system costs of oral care are not rising and in some they are decreasing.

Capitation schemes pay the dentist a fixed sum for each person enrolled as a patient in their dental clinic. For this fixed annual fee a dentist contracts to maintain the oral health of all the enrolled patients. However, patients must undertake to attend for checkups on a regular basis, or they lose their rights and have to pay for the treatment they need to restore their oral health. It seems likely that costs will be reduced by this type of programme.

Health maintenance organizations (HMO) contract with a group of oral care professionals to provide care to a group of communities or individuals, at agreed fees. HMOs are usually organized and managed by companies that specialize in health insurance. This has proved an effective way to limit the costs of providing comprehensive oral care.

In one country a project to **encourage preventive care** gives dental care managers a financial reward if disease levels do not increase in the patients in their catchment area.

ALTERNATIVE APPROACHES IN DEVELOPING COUNTRIES

Whereas the various systems being tried in industrialized countries can be of universal relevance, the developing countries have special problems in actually providing care.

Although most care needed is of the first level, minimally invasive type—dentists usually provide all types of care. The most common moderate level care given is extraction and frequently dentists resist the training and use of other types of personnel for this and even less invasive tasks. There are also situations where teeth with rather minor caries problems are extracted because that is the only treatment available, due to lack of supply of filling materials. In rural areas it is clear that, because of

SWASTH HIND

lack of oral care personnel of any type, most carious or infected teeth *are* not treated in time. Rather the disease progresses, causing intermittent pain that is endured by the sufferer and managed by avoiding use of the affected area of the mouth. Only when extreme pain or severe infection develops is an attempt made to find treatment. This is often provided by a general health worker or a traditional healer in private practice. This treatment may be extremely costly when counted in terms of loss of earnings, production lost travel costs and fees that may be as high as those charged by dentists. Delaying treatment until there is severe infection causes a high rate of debilitating and even life threatening conditions in such communities.

The approach that seems likely to provide an effective alternative solution is called Atraumatic Restorative Technique (ART) combined with community participation in local oral care organization. ART has the potential to revolutionize the type of care that can be given in the community. It is based on using dental hand instruments and glass ionomer, a rather recently developed dental filling material. The technique does not need electricity or clean piped water as do traditional dental drills and equipment. As glass ionomer sticks very well to tooth tissues, the carious teeth do not need to be cut and shaped with a dental drill as is needed when amalgam is used. This means that small caries cavities can be treated using hand instruments to scrape out and remove the diseased parts of teeth, and then cavities can be filled with glass ionomer which is also capable of having a preventive effect.

For this approach to be successful, it needs to be part of a community organization that provides both prevention and disease control care. Members of the community need to feel responsible for the good functioning and success of the service. Otherwise, people will continue to demand care only when they have pain and by that time the caries lesions will be too large to be adequately treated with this technique. The aim is to avoid having to use more traditional types of care which are invasive and too costly.

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Community participation

Alternative oral care systems based on collaboration with and participation of members of the community have the potential to change the way oral health and care services function. The community can participate through:

- involving people in prevention and promoting "self care". When people realize that toothache is not an inevitable part of life, the responsibility for active reduction of the need for moderate level interventive treatment acts as a catalyst for change;
- organizing regular community campaigns to examine people's mouths to identify early lesions while still small enough to treat with ART;
- participating in decision making about needs and priorities for oral care;
- training members of the community to provide low level care;
- use of locally constructed equipment;
- devising and managing the financing arrangements for oral care.

Associated with this and other approaches are training systems which focus on optimal ergonomic principles. A set of manuals for learning these procedures and a set of well designed, low cost equipment for both learning and care are available from WHO and UNICEF.

It is important to realize that the use of approaches such as ART and the new type of equipment and training technology is not being promoted only for developing countries. The ART methodology has potential for quality care at any level of development of society. The ergonomic approach to deliver services no matter which system is used was pioneered in Japan based on performance logic. It has now been used and adapted over many years in several dental schools, notably in San Francisco and Maryland, USA, Otago, New Zealand and Vancouver, Canada.

There really is a great potential to extend health promoting oral care to larger numbers of under-served communities around the world.

SOFT TISSUE DISEASES OF THE MOUTH

DR P. K. BANERJI

A knowledge of the soft tissue diseases of the mouth is very important. These diseases can be broadly classified as those affecting the Gingiva (gums), mucosa of the mouth (cheek) and the tongue. The author says that frequent dental check-up, at least once in six months, is very important and an early preventive and prophylactic treatment will go a long way in keeping a healthy mouth.

MOUTH is considered to be the 'gate way' to infection. Diseases of the mouth are mirror to the various diseases and general health of human body. It is said that an astute dental surgeon can help in the initial diagnosis of many a systemic diseases in their early stages itself by a thorough examination of the oral cavity.

The need of the day is to increase the general awareness regarding the importance of regular Oro Dental Check up not only for the ailments of the teeth but also of the soft tissues of the mouth namely the Gingiva (Gums), tongue and the mucosal membrane of the oral cavity. The importance of soft tissues of the mouth can be appreciated by a small example that in the present days the most dreaded diseases 'AIDS' is manifested orally in the form of H.I.V. Gingivitis, H.I.V. periodontitis, and Candidial infection in the early stages of the disease.

A knowledge of the soft tissue diseases of the mouth is important. One can broadly classify the soft tissue diseases of the mouth as those affecting the :

1. Gingiva (Gums)
2. Mucosa of the mouth (Cheek)
3. Tongue

1. *The Gingiva* : This is defined as that portion of the oral mucosa that surrounds the necks of the teeth and covers the alveolar bone. The most common diseases of the gingiva are:

1. Inflammation of the Gingiva
.....Acute or Chronic
2. Gingival Enlargement

Gingival diseases are the commonest of all the soft tissue-diseases of the mouth that affect a vast majority of the Indian population. Gingivitis—which is inflammation of the gums is caused by deposition of food debris that are degraded by Microbes of the mouth and thereby causing inflammation of the gums. If this condition is not treated early, it progresses to involve the surrounding tissues and the bone of the tooth supporting it, leading to a condition called 'Periodontitis' (PYORRHOEA) which occurs in 90% of the Indian population leading to loose mobile tooth. The old adage that 'prevention is better than cure' holds true for this and if the people are more careful about their oral hygiene and brush their teeth in proper scientific manner before going to bed and in the morning the incidence of this disease can be reduced.

If chronic irritation is left unchecked it may cause enlargement of the gums. The other causes for gum enlargement are Vit C deficiency (Scurvy), poor oral hygiene especially in epileptic patients on dilantin therapy and also in mentally and physically retarded children.

The common complaints of the patients suffering from gingivitis are swollen and spongy gums which bleed on slight touch, and foul breath. The treatment of gingivitis is aimed at removing the cause of irritation which is in the form of hard calculus deposits in and around the tooth structure. It is apt to point out and dispel the wrong notion that Scaling (Removing of tartar and dirt) of teeth will lead to loose teeth—which is a wrong concept among many Indian patients.

The other common disease of the soft tissue, common in Indians, is Oral Sub-Mucous-fibrosis. As the name suggests it leads to excessive formation of fibrous bands in the submucosal layer of the oral mucosa which manifests as difficulty in opening of the mouth, loss of elasticity of the cheek and difficulty in the movement of the tongue. The main cause of this

disease is due to chronic irritation caused to the oral mucosa by the excessive use of chillies, pan masala, catachu and Betel nut chewing which is very prevalent in our country.

Candidial Infection (Oral Thrush) is another common condition which can occur in a new born baby also. This is caused by a fungal infection (*Candida Albicans*) and occurs as a white patch, curdy over the tongue. It can also occur in patients on heavy antibiotic therapy without supportive nutritional support and in some AIDS cases. There are certain lesions of the oral cavity which are considered to be pre-cancerous in nature and should be promptly treated.

Lichen Planus is one such condition. It is seen in patients more prone to stress among mal-

nourished people. It presents as a white, shiny, lacy pattern on the cheek mucosa.

Leukoplakia is another common disease which occurs in the oral cavity. It also presents as a whitish patch on the soft tissues of oral cheek mucosa. Unlike candidial infection, these white patches cannot be wiped off.

Oral manifestation of systemic diseases like Syphilis, Tuberculosis, Scurvy, A.I.D.S., Leukemia, Anaemias, show definite positive findings as oral diseases and an early diagnosis of these diseases are sometimes made by clinical examination of the mouth. Koplics Spot as in measles is an example of this. Certain hormonal disturbances also cause swelling of gums as in the case of puberty and pregnancy in females.

Apthous Ulcer, a very common form of mouth ulcers, occurs due to malnutrition and stress conditions. Traumatic Ulcers are ulcers that occur in the mouth due to sharp teeth, ill-fitting dentures, etc.

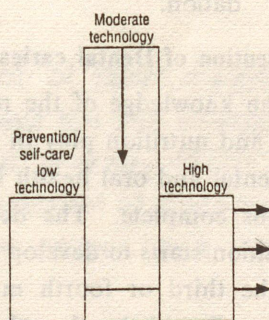
Acute Ulcerative gingivitis is commonly seen in patients who are undernourished and presents itself in the mouth as multiple, painful ulcers. It was commonly seen in soldiers during World War II and is also called as *Trench Mouth* and needs prompt attention.

It is therefore, advised that frequent dental check-up at least once in six months is very important and an early preventive, prophylactic treatment will go a long way in keeping a healthy mouth.

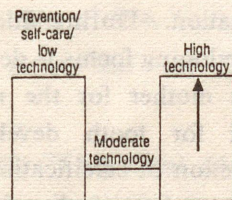
Keep smiling—Visit your dentist every six months.

CHANGING PATTERNS IN ORAL HEALTH CARE

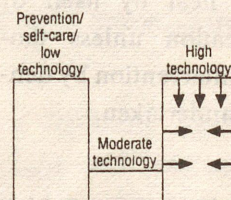
The proportion of the population taking advantage of oral health care services varies from country to country but in only a few might it be considered optimum. Total coverage is an unrealistic goal, but steps should be taken to ensure that all those who need oral health care can receive it. It is envisaged that, in industrialized countries, future oral health personnel will need to have a broad education in allied health sciences of which oral health will be a fully integrated part. In those developing countries where caries is increasing, and in those where the prevalence is still low, a strategy of primary health care should be adopted concentrating on low-technology procedures for the majority of oral health services. However, eventually, similar structural patterns are likely to prevail in both developing and highly industrialized countries as indicated in the diagrams opposite.



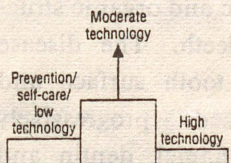
a. Changes in distribution of tasks in oral health care from past to present in highly industrialized countries



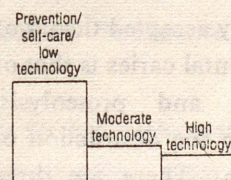
b. Distribution of tasks in oral health care in highly industrialized countries



c. Future distribution of tasks in oral health care in highly industrialized countries



d. Typical distribution of tasks in oral health care in developing countries prior to similar effects as for (a), (b) and (c)



e. Eventual future distribution of tasks in oral health care in all countries

ORAL HEALTH: DENTAL CARRIES

LT. COL. JASDEEP SINGH

Dental caries is a disease which causes a progressive disintegration of the inorganic and organic structures of the teeth. The disease starts on the surface and unless checked progressively involves the enamel; dentin and deeper vital structures of the dental pulp.

DISEASES of the teeth and their investing tissues constitute the major problems in dental public health. Dental caries is perhaps the most prevalent disease to which man is subjected.

Dental caries start early in life and many children experience it before entering the school. The importance of the disease is further highlighted since it is irreversible and does not heal by itself or through medication unless thorough surgical intervention by dental surgeon is undertaken.

Aetiology

Dental caries is a disease which causes a progressive disintegration of the inorganic and organic structures of the teeth. The disease starts on the tooth surface and unless checked progressively involves the enamel, dentin and deeper vital structures of the dental pulp.

The generally accepted theory of the cause of dental caries is that of decalcification and proteolysis, which result in the destruction of tooth structure. There are three essential factors which must be present for dental caries to occur.

The absence of any one of these elements interferes with the initiation of the disease thus providing protection against dental caries.

- (a) Susceptible Tooth structure.
- (b) Fermentable dietary carbohydrates
- (c) Presence of Micro-organism in the mouth which are capable of carbohydrate degradation.

Prevention of Dental caries

The knowledge of the role that diet and nutrition play in relation to dental and oral health is by no means complete. The deciduous dentition starts to develop as early as the third or fourth month in utero. By birth, the child's 20 deciduous teeth and perhaps the first permanent molars are in the process of development and decalcification. During this period the developing foetus is dependent on his mother for the minerals needed for tooth development. Completion of calcification of the of the crowns of the deciduous teeth and calcification of permanent teeth occurs during pos-

tuterine life, *i.e.*, after birth, mostly during the first eight years of life.

After understanding various aetiological factors and mechanism of development of dental caries, we can prevent it by adopting following simple measures.

- (i) Adopt the principle of oral health by keeping the mouth and teeth clean.
- (ii) Make it a habit to brush teeth after every meal; and when brushing is not possible to rinse the mouth thoroughly with water.
- (iii) Discourage the habit of eating in between meals.
- (iv) Reduce intake of easily fermentable dietary carbohydrates such as refined starch, sucrose (sugar) and glucose.
- (v) Discourage intake of chewy and sticky carbohydrates such as toffee, chocolate bars, caramel, chicky and allied eatables.

(vi) Encourage ingestion of water borne fluoride (when available) during the years of tooth development to make the enamel harder and resistant to acid decalcification; or by the topical (local) application of fluoride compound to teeth shortly after they erupt.

(vii) Do not neglect to take early and adequate treatment of focus of infections in the mouth and throat, particularly tonsils.

(viii) Since calcification of teeth starts before birth; intake of dietary calcium and its supplement with vitamin D dur-

ing pregnancy provides good start for the new born through reduced risk of dental caries.

In case of any dental problem, Dental Surgeon should be consulted at the earliest since negligence can result in loss of tooth which would always be a permanent in nature. □

DRINK-THE-DRUG PLAN TO TREAT MOUTH CANCER

Doctors are investigating a new way of treating oral cancers. Patients drink a light sensitive drug that concentrates in tumour tissue and is then activated by lower power laser light.

Normally, lasers are used in combination with injected tumour-killing drugs but these cause long-lasting sensitivity to light and put patients at risk of sunburn. The new idea of using an orally administered drug-aminolaevulinic acid (ALA)-means light sensitivity wears off after 24 hours.

Prof. Stephen Bown, professor of laser medicine and surgery at London's University College Medical School, says the use of injected drugs and lasers to carry out what is known as photodynamic therapy (PDT) has already proved effective against superficial cancers but the treatment of three patients with incurable advanced mouth cancers was the first time lasers had "switched-on" a drug that is swallowed.

Prof. Bown commented: "Future studies will see whether we can make the treatment accurate enough to destroy all tumour tissue. If so, we see it as a promising new treatment for pre-malignant conditions of the mouth and early oral cancers, and for superficial cancers in other parts of the body such as the colon, oesophagus and bladder. PDT has immense potential for treating small tumours without surgery."

Surgeon Mr William Grant says: "The new drug seems to be concentrated in rapidly dividing cells, which may make it useful for tumour destruction with minimal injury to surrounding tissues."

—Medical News from Britain

NUTRITION FOR DENTAL HEALTH

DR T. S. REDDY

Poor dentition, whether due to loss of teeth, dental decay or ill-fitting dentures, makes the eating uncomfortable. This results in an aversion to many kinds of foods which may in turn lead to some kind of nutritional deficiency. On the other hand, dietary habits profoundly influence the health of teeth and gums. Fortunately, most of the dental diseases can be prevented and a good dental health can be maintained simply by proper oral hygiene and proper nutrition. Though a balanced diet is essential for maintaining the overall health, it is important to know as to what are the nutrients the deficiency of which leads to dental problems, who are more vulnerable to such problems and what are the good sources of the required nutrients. Moreover, the deficiency of any nutrient may not always manifest in a physically visible symptom but if there is no deficiency, one may have more stronger and healthier teeth which is conducive to overall better health. In matters of social life and marital relations too, good looking teeth and gums, a clean mouth and a fresh breath are of paramount importance. Thus an awareness of the nutritional requirements of teeth and gums is very important for everybody.

Vitamin C

Vitamin C appears to be necessary for the proper calcification of bones and teeth. It is essential to maintain the normal state of the intercellular substance (mucopro-

Though a balanced diet is essential for maintaining the overall health, yet it is important to know as to what are the nutrients the deficiency of which leads to dental problems, who are more vulnerable to such problems and what are the good sources of the required nutrients. The deficiency of any nutrient may not always manifest in a physically visible symptom, but if there is no deficiency, one may have more stronger and healthy teeth which are conducive to overall health.

tein and collagen) in different tissues including bones, teeth and skin. Deficiency of vitamin C increases fragility of capillaries causing haemorrhages under the skin. The gums show erosion of mucous membranes at their margins and due to the increased fragility of capillaries, there is frequent bleeding. The deficiency of this vitamin increases susceptibility to infections. The deficiency also leads to malformation of bones and teeth. A decrease in the density of teeth, the loss of new dentine formation, the tissue becoming spongy, porous and brittle are other manifestations of vitamin C deficiency.

A normal person requires about 50 mg. of ascorbic acid per day. Elderly people living alone, smokers and alcoholics are at the risk of vitamin C deficiency. Stress, fatigue and illness also cause this deficiency. This vitamin

is not stored in the body and hence it has to be taken in regularly. Though many of our foods contain good quantities of this vitamin, it is lost due to cooking, storage, exposure of the foods to air, washing, peeling and drying of vegetables/fruits etc. People who do not consume vegetables and fruits and restrict their diet to only cereals, pulses and dairy products may be prone to the deficiency of vitamin C.

The green leafy vegetables are the cheap but very rich sources of this vitamin. The pulses are poor in this vitamin but the sprouted pulses contain it and most of our commonly available vegetables also contain it. As this vitamin is destroyed in cooking, it is desirable to consume some of the vegetables in the form of salads, for example, tomato, cabbage and coriander etc. Amla is the abundant source of vitamin C, but among other

fruits, perhaps guava is the cheapest and best source of this vitamin. Citrus are well known as good sources of this vitamin, but most of our Indian fruits also contain this in varying quantities. Some other good sources among the fruits are Sitaphal, pine apple, musk melon and ripe mango. Banana is a high calorie fruit with vitamin C, available throughout the year, delicious and comparatively cheap.

Vitamin D

Vitamin D favours Calcium absorption from intestine. The rate of active transport of calcium across the intestinal wall is increased by vitamin D. It promotes the absorption of phosphate if there is increased absorption of Calcium. It indirectly increases the resorption of Calcium from fully calcified bone and thus helps in the calcification of the new bone. This vitamin maintains equilibrium between bone calcium and blood calcium. On the whole this vitamin causes increased absorption, longer retention and better utilization of Calcium and Phosphorus in the body. Vitamin D helps in the normal development of teeth and in the case of deficiency, the formation of teeth becomes defective and leads to the development of dental caries. A fall of Calcium and Phosphorous levels in blood also occurs in the case of vitamin D deficiency.

The daily requirement is about 2.5 micrograms for adults and about 10 micrograms for children and adolescents. Common foods of vegetable origin do not contain this vitamin. In our country, the diet of most of the people is vegetarian and for them the main dietary sources are milk, butter and other dairy products. Another important Indian dietary source is eggs. The abundant sources are fish and their liver oils. This

vitamin, unlike vitamin C, is resistant to heat/cooking and is stored in the body. In our country, for many people, dietary sources are not sufficient to meet the vitamin D requirement, particularly the children and elderly.

The cheapest and the best way to obtain this vitamin is by exposing the body to sunlight. The body utilizes Ultra Violet rays of sunlight and 7-dehydro cholesterol in the body to make this vitamin. Hence, it is desirable to be exposed to the sunlight regularly, particularly in the case of growing children. The Indian practice of applying oil to the body and expose it to sunlight is very good in this regard. Air pollution in our cities filter the UV rays of sunlight and thus reduce the synthesis of this vitamin in the body. Very dark skin can also filter most of the UV rays of sunlight. To prevent the deficiency caused due to the consumption of vegetarian food, the foods like milk and dalda which are being fortified with this vitamin may be regularly used.

Vitamin A

The enamel of teeth is almost all a mineralized substance but originates from the same embryonic tissue that develops to form skin, the linings of body cavities and the cornea of eye all of which are dependent on vitamin A for normal development and maintenance. Thus vitamin A is very important during early tooth development. It is also necessary to keep the epithelial tissues in the body intact. Vitamin A is essential for skeletal growth and it is anti-infective by protecting body from microbes. Thus it has a role in dental/oral health.

The daily requirement of this vitamin is 3000 micrograms. According to a WHO report, in Asia, the estimated overall average

availability of vitamin A is less than that required by the population and the lack of availability of sufficient quantity of vitamin A is exacerbated by any tendency to withhold vegetables from children for cultural or other reasons. The pregnant women are likely to suffer from marked decrease in their blood levels of this vitamin. In our country, the cereal based vegetarians who do not consume sufficient quantities of milk and other dairy products and vegetables may make themselves prone to vitamin A deficiency. The chronically sick, the malnourished and the impoverished infants and children are at a high risk of this deficiency.

Vegetable sources do not supply this vitamin directly, they contain the substances known as carotenes which are converted into vitamin A in the body. The carotenes are not completely absorbed and less efficiently converted to vitamin A. Since this vitamin is fat soluble, depending on the fat content of the diet, its absorption has been reported to vary from 25—50 percent. When ghee is made from butter by methods used in our country homes, about a quarter of this vitamin content is lost. Further prolonged heating of ghee in open pan leads to further loss. Normally, under Indian conditions, 50 percent of vitamin A is lost during storage and cooking.

The easiest and cheapest way of ensuring sufficient supply of vitamin A to the body is to increase the intake of green leafy vegetables. In general, the more greener the leafy vegetables are, the higher the carotene content. About 50 grams of the common leafy vegetables a day would be sufficient for an adult or a child. But in case of infants,

young children, sick or malnourished children of all ages who cannot properly digest the fibrous leafy vegetables, it is desirable to supply the vitamin A directly from foods like butter and eggs. In addition to leafy vegetables, tomatoes, carrots and yellow pumpkin are also good sources. Among the fruits, the yellow coloured ones like mango, orange and papaya are some of the best sources of vitamin A. Foods fortified with this vitamin (like milk and dalda) are also good sources of dietary vitamin A.

Calcium

The bones and teeth are made up primarily of calcium salts and hence calcium is an important building material of bones and teeth. The recommended daily requirement of calcium is 500 mg. for adults, 600–700 mg. for adolescents and One gram for children, pregnant and lactating women. Children need relatively more calcium than do adults to meet the needs of the growing body. Expectant and nursing mothers also need higher amounts of calcium and if their diet is deficient of this mineral, it would be drawn from their bones and this might adversely affect the health of their bones and teeth.

Those who do not consume dairy products and restrict their energy intake and consume few vegetables are likely to be at the risk of calcium deficiency, particularly when the staple food is rice. Moreover, a part of the calcium in a cereal based diet is apt to be unavoidable due to the presence of phytin which interferes with the absorption of calcium. Similarly, a part of the calcium present in some leafy vegetables like spinach and amaranth and oil seed cakes like gingelly may not be available due to its association with oxalic acid. The continuous use of certain medicines has an adverse affect on the absorption or utilization of calcium, for example, antacids and laxatives reduce the

calcium, absorption while corticosteroids (anti-inflammatory) cause poor utilization of calcium.

Calcium is abundantly found in milk, cheese and green leafy vegetables. The protein of milk called caseinogen is a very rich source of calcium and hence milk and cheese are very valuable for growing children. Though all green leafy vegetables are very good sources of calcium, Amaranth, Curry leaves, Turnip greens, Colocasia leaves, drumstick leaves and cauliflower greens are very rich in calcium. Pulses also contain good quantities of calcium, particularly rich sources are Soya bean, Rajmah and Bengal gram. All other vegetables also contain some quantity of calcium. All nuts and oil seeds are generally good sources of calcium, but the richest among them is gingelly seeds. Perhaps on the quantity of calcium per gram basis, gingelly is the richest source of calcium among our commonly known foods (1450 mg./100 g.). Among other nuts/oil seeds, comparatively cheap but good sources are dry coconuts and mustard seeds. Compared with leafy vegetables, pulses and nuts; fruits are not abundant sources of calcium, though generally all of them contain this mineral. However, some commonly available good sources among fruits are lemon, nimbu, musambi, ripe tomato and wood apple. Among other foods, Jaggery and eggs also contain considerable quantities of calcium. All cereals contain small quantities of calcium but Ragi is exceptionally rich source of calcium. Drinking water also contributes calcium to the body to some extent.

Phosphorous

For dental health, Phosphorous is another important mineral because the utilization of calcium is closely related to that of phosphorous because most of the calcium is deposited in the body either in the bones and teeth as calcium phosphate. The daily

requirement of this mineral is about one gram or more. As all the cereals, pulses, nuts and oil seeds are rich sources of phosphorous and the deficiency of this mineral is rarely encountered in Indian diets. However, the elderly people who consume very nutrient poor diets and alcoholics are at the risk of this deficiency.

Fluorine

Fluorine is an essential mineral for the formation of dental enamel. It significantly reduces the early carious lesions and has an effect on bacteria in dental plaque. Fluorine is present in water and food in trace quantities. A quantity of 0.5–0.8 mg/l in water is considered safe in our country. If the drinking water contains below 0.5 mg./l, it results in dental caries. Normally an average adult consumes one mg. of fluoride daily from drinking water. Now a days fluoride tooth pastes are available and thus fluoride deficiency can be easily prevented even if the water contains less amounts of this mineral.

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ORAL HEALTH EDUCATION

DR SANJIV KUMAR BHASIN

ORAL health problems though concern primarily with dental caries and periodontal diseases but also include in its spectrum other diseases like oral cancers, diseases of oral mucosa, defects of dental hard tissues and dentofacial anomalies. While the emphasis throughout the world shifts to laying down of specific goals to achieve high levels of oral health care, the foundation of the whole process remains health education. As with diseases affecting general health, and particularly so with diseases pertaining to oral health, health education assumes paramount importance since majority of oral diseases are essentially preventable and not life threatening.

Health education regarding oral diseases can be effective only when complete, accurate and scientifically valid messages are given to the community. Health education messages in some of the common oral diseases are discussed briefly.

Dental Caries

Health education has tremendous potential to bring down the incidence of dental caries as it is largely preventable. Health education related to prevention of dental caries should include:—

- (a) Information regarding benefits of fluorides for teeth.

Health education for oral diseases can be carried out by dentists, physicians, paramedicals, school teachers, etc., in many situations and settings, e.g., at hospitals, health centres, MCH clinics, anganwadis, schools, workplaces and in the community at places like panchayatghar, meeting places and places of worship, etc.

- (b) Allaying unsubstantiated fears about the safety/efficacy of use of fluorides.
- (c) Information about risks associated with consumption of certain foods like sugars, fermentable carbohydrates and acidic foods specially in children.
- (d) Foods that contain fermentable carbohydrates, sugars and acidic foods.
- (e) Avoiding use of sugary foods as rewards specially in schools.
- (f) Safe and acceptable substitutes for foods that are cariogenic.
- (g) Importance of daily cleaning of teeth and use of fluoride toothpastes.

Periodontal diseases

In periodontal diseases the oral health education pertains mainly

to keep mouth free of long term plaque formation by either removing it or disrupting it before it matures. Thus health education is aimed primarily at maintenance of good oral hygiene. Health education should address issues as:—

- (a) Importance of cleaning teeth and gums by using toothbrushes, traditional chewsticks, etc.
- (b) Avoid excessive use of abrasive materials, e.g. baking soda, salt and certain commercial teeth cleaning materials.
- (c) Appropriate way of using tooth brushes and traditional chewsticks and the need to regularly change them after their use for a certain period of time.
- (d) Use of dental floss for effective cleaning of space between teeth.
- (e) Use of fluoride toothpastes if dental caries is also present alongwith periodontal disease.

Oral cancer

Health education should aim at:—

- (a) Encouragement and reinforcement to give up harmful habits that may lead to diseases of oral cancers, e.g. smoking, betel-tobacco chewing, etc.
- (b) Informing people about early warning signs of oral cancers and importance to seek consultation, e.g. if there is (i) any burning sensation (ii) prickly or numb area (iii) white, grey or red patch (iv) a sore that does not heal after 2 weeks in the mouth or presence of enlarged and tender glands under ears.
- (c) Removal of local irritants (e.g. excessive amounts of calculus, ill-fitting prosthesis, etc.)
- (d) Importance of early diagnosis and treatment of oral cancer.

Trauma and fractures

Health education is aimed at:—

- (a) Teaching and making public aware of methods of self protection,

e.g., use of helmets, mouth guards, safety belts and seat belts.

(b) Informing people about potential hazards in their environment, *e.g.*, avoiding dust and fumes and direct trauma at work places.

(c) Information regarding play-time accidents, domestic accidents and sports accidents.

(d) Teaching and making public aware about existing legislations to prevent traffic accidents, etc.

For other diseases like oral manifestations due to nutritional deficiencies, *e.g.*, Protein Energy Malnutrition (PEM) and Vitamin deficiencies, the health education messages are normally included in the most primary health care programmes, *e.g.*, encouraging breast feeding and proper weaning, improvement of individual's nutritional status and provision of safe water supply, etc.

Health education for oral diseases can be carried out by dentists, physicians, paramedicals, school teachers, etc. in many situations and settings *e.g.* at hospitals, health centres, MCH clinics, anganwadis, schools, workplaces and in the community at places like panchayatghar, meeting places and places of worship, etc.

It could include a whole spectrum of activities like use of mass communications, *e.g.*, posters, pamphlets, booklets, magazines, newspapers, slides, films, radio, television and videos, etc. It may be given on a one to one communication or in groups *e.g.* in schools, anganwadis and balwadi sessions.

An effective use of oral health education will go a long way in improving oral health and help in achieving specific long term objectives of high oral health care. □

SOCIAL SCIENCE RESEARCH METHODS COURSE

The Central Health Education Bureau had organised the Social Science Research Methods Course for Health Professionals from 7 February 1994 to 4 March 1994. The objective of this Course was to prepare the social scientists working in the field of health to understand the concept of social science research; and to apply the concepts in conducting research in their job situations.

Twelve participants who attended the course were drawn from

medical colleges health and family planning training Centre, State Health Education Bureaus, Director of Health Services and non-governmental organisations. The Course curriculum was based on social behavioural research methodology, and statistical methodologies with 23 theoretical sessions and 25 groupwork sessions. The Director, Central Health Education Bureau, Dr V. S. Singhal inaugurated the course.

—Medical News from Britain

Obituary



Shri S. K. Bhagat passes away

Shri S. K. Bhagat, former Technical Officer (Exhibition) in the Central Health Education Bureau expired on 1st March, 1994. He had retired from active service on the previous day, *i.e.*, 28th February, 1994 on attaining the age of superannuation.

Shri Bhagat had joined CHEB in September 1977 as Technical Officer (Exhibition), a post which he held to the last.

Earlier, he had served the Directorate of Advertising and Visual Publicity.

Shri Bhagat had arranged a number of exhibitions for CHEB—the prominent of these ranged from those set up at Pragati Maidan, Teen Murti, Tihar Jail (New Delhi) and Amethi (U.P.). He had also set up exhibitions on World Health Day, No Tobacco Day, Anti-leprosy Day, World Diabetes Day, etc. every year.

CHEB joins his family members to mourn his sudden demise.

May his soul rest in peace!

Workshop on IEC strategy on Disaster preparedness



THE Central Health Education Bureau, Directorate General of Health Services had organised a three-day Workshop on Information, Education and Communication (IEC) Strategy for Disaster Preparedness and Management from 3-5 March, 1994 at its premises in New Delhi.

The objective of the Workshop was to prepare an IEC Strategy package on reducing the impact of natural disaster on the community.

With a view to prepare the community and the grass-root level community health workers, the Workshop developed an *Illustrated guide* to be used by the community health worker for health education of the people on disaster preparedness and management.

Inaugurating the Workshop, Dr. A. K. Mukherjee, Director General of Health Services, said that in the wake of the Latur tragedy in Maharashtra, there could be no two views about the inevitability of such natural disasters.

Dr. Mukherjee said that though "one cannot prevent natural disasters altogether but one can certainly take measures to reduce the frequency and the extent of damage caused by such disasters by raising the level of preparedness of the community and the adminis-



tration". The address of Dr. Mukherjee was read out on his behalf by Dr. P. C. Rai, Officer on Special Duty, Directorate General of Health Services, as he could not attend the workshop because of an emergent business.

Realising the aftermath of natural disasters, the Govt. of India has set up a National Advisory Council on the International Decade for Natural Disaster Reduction (IDNDR). The task of which was to give specific thrust to the disaster reduction components in the sectoral development programme of the Five Year Plan, Dr. Mukherjee said.

He said, "the present scheme of financing the relief expenditure arising out of the natural calamities came into force from 1 April, 1990. Under this scheme, a Calamity Relief Fund has been constituted for each State. Of this 75 per cent is contributed by the Central Govt. and the balance by the State Govts."

Dr. N. K. Shah, WHO Representative in India said that the IEC could activate the system of the district and community level in the disaster preparedness plan and

that the module should be with the people who have to use them.

Dr. B. K. Verma, Director (Emergency Medical Relief), Directorate General of Health Services said that "unlike the USA, in our country, in the event of disasters, community level help was always readily available." But, the concept of health worker at the grass-root level keeping in view what the community expected need to be strengthened. It is here the IEC Strategy has to be developed to prepare the community level health workers to help the people at the time of disasters.

Earlier, Dr. Narendra Bihari, Additional Director General of Health Services, lighted the lamp.

Dr. V. S. Singhal, Director, Central Health Education Bureau, in his address of welcome said that natural disasters do occur. "We cannot do much to prevent them. But, we can prepare ourselves and the community to meet or mitigate the sufferings caused by the natural disasters."

Dr. S. K. Satija CMO (M&T), CHEB spoke on IEC Strategy on the preparedness and management of all the Natural Disasters. □

GLOBAL GOALS FOR THE YEAR 2000

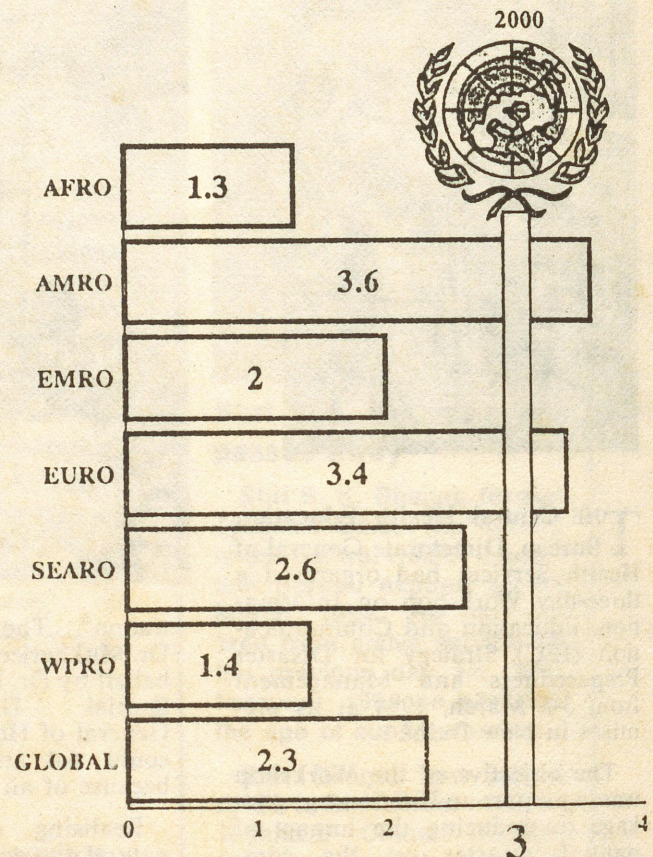
In 1979 the World Health Assembly adopted a resolution calling for the attainment of 'Health for All' by the year 2000. With this in mind, the WHO Oral Health Unit, in conjunction with the Federation Dentaire Internationale (FDI), recommended the establishment of specific oral health goals. On the way to the ultimate aim of complete oral health for all, with optimal function of teeth, jaws and associated structures, these goals propose attainable levels that represent appreciable strides towards the final target. The six goals are:

Age	Goal
05-06	50% caries free
12	DMFT \leq 3
18	85% retain all their teeth
35-44	50% reduction in number of persons with no teeth (75% with 20 teeth)
65 +	25% reduction in number of persons with no teeth (50% with 20 teeth).

A new set of global goals for the year 2010 are being developed. They will be of two types:

- Further improved health status.
- Promotion of conditions which enable communities to apply, fully, preventive capabilities.

The WHO World Health Assembly, May 1981, recognized as the first global indicator of oral health status, an average of not more than 3 Decayed, Missing, Filled permanent Teeth at the age of 12 by the year 2000. The diagram below shows the weighted mean DMFT for each WHO region in 1993 in relation to that objective.



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BOOK REVIEW

W.H.O. Issues Drinking-Water Guidelines for the 1990s

Guidelines for Drinking-water Quality, Volume 1: Recommendations (available in English; French and Spanish in preparation). Sw. fr. 46.-/in developing countries Sw. fr. 32.20. A copy of the book can be ordered from WHO, Distribution and Sales, Telephone (4122) 791 24 76, Fax (4122) 788 04 01.

The World Health Organization (WHO) has issued the most comprehensive set ever of drinking-water guidelines, designed to ensure a greater degree of public health protection.

The first volume of WHO's once-a-decade publication **GUIDELINES FOR DRINKING-WATER QUALITY*** serves as a benchmark for setting national standards. Volume 2—Health Criteria and Other Supporting Information, and Volume 3—Surveillance and Control of Community Supplies will be published in 1994. In the course of the preparation of the current edition, assessments of the health risks of 128 chemical contaminants were carried out by over 200 experts from some 40 developed and developing countries. The previous edition of the Guidelines, published in 1984, examined only 38 chemicals.

Dr Wilfried Kreisel, Executive Director responsible for Environmental Health and Chemical Safety at WHO headquarters, explains: "Safeguarding drinking-water supplies is a major health responsibility. We hope that all Governments will find a use for the new Guidelines, either in setting drinking-water standards or updating and expanding existing ones".

The new Guidelines place the greatest emphasis on the microbiological quality of drinking-water. Lack of adequate and safe water supply are together the most serious factors contributing to morbidity and mortality in developing countries. "The diseases associated with water are heavily concentrated in the developing world", comments Dr Kreisel. "They hit hardest the poorer urban and rural households of the poorer countries. Nearly half of the population in developing countries suffer from health problems directly linked to insufficient or contaminated water".

Diseases resulting from the ingestion of pathogens in contaminated water have the greatest public health impact worldwide. The current global cholera pandemic can only be resolved through the introduction of safe drinking-water supplies and appropriate levels of hygiene. Diarrhoeal diseases are among the leading causes of morbidity and mortality among children under five years of age—1,600,000,000 cases with 3,200,000 deaths per year. These diseases are usually caused by water-borne pathogens such as *Salmonella*, *E. coli*, *Shigella*, and enteroviruses.

Dracunculiasis (Guinea-worm disease) is the only water-borne disease that can be eradicated by the provision of safe drinking-water alone. Other

diseases need a combination of measures. According to WHO estimates, there are about two million cases of dracunculiasis worldwide.

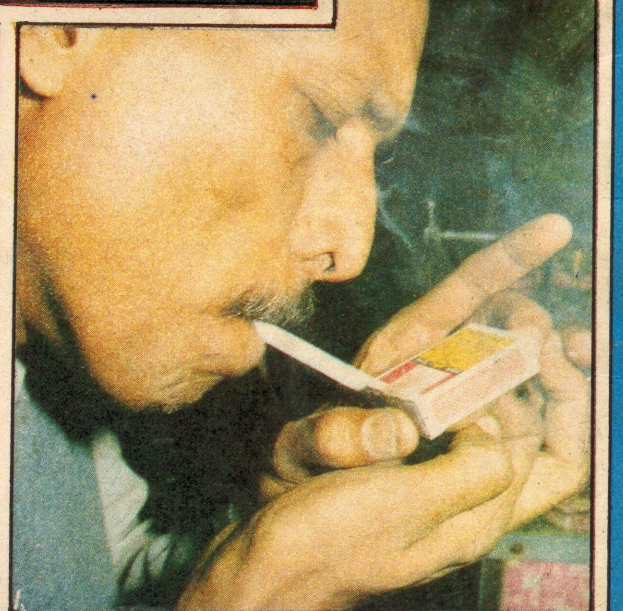
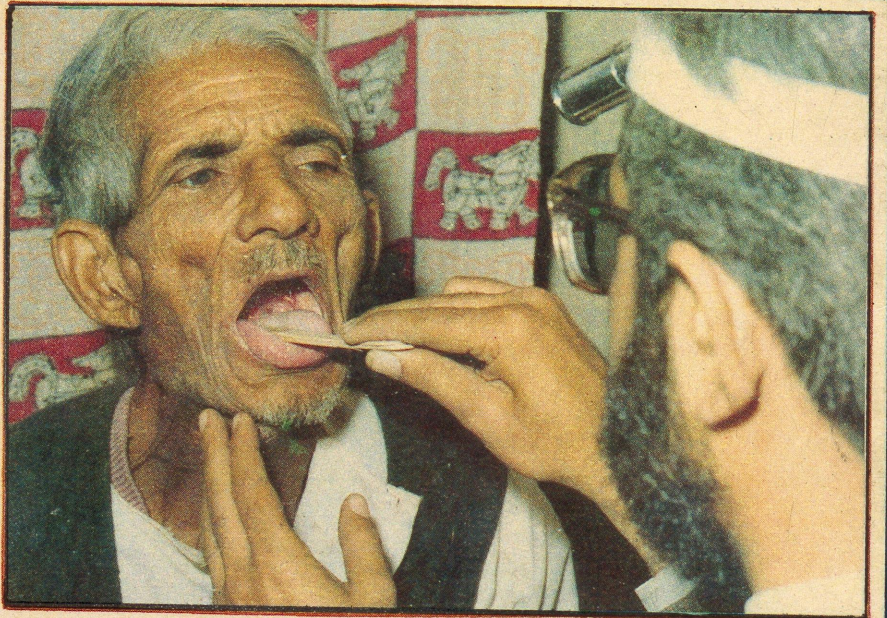
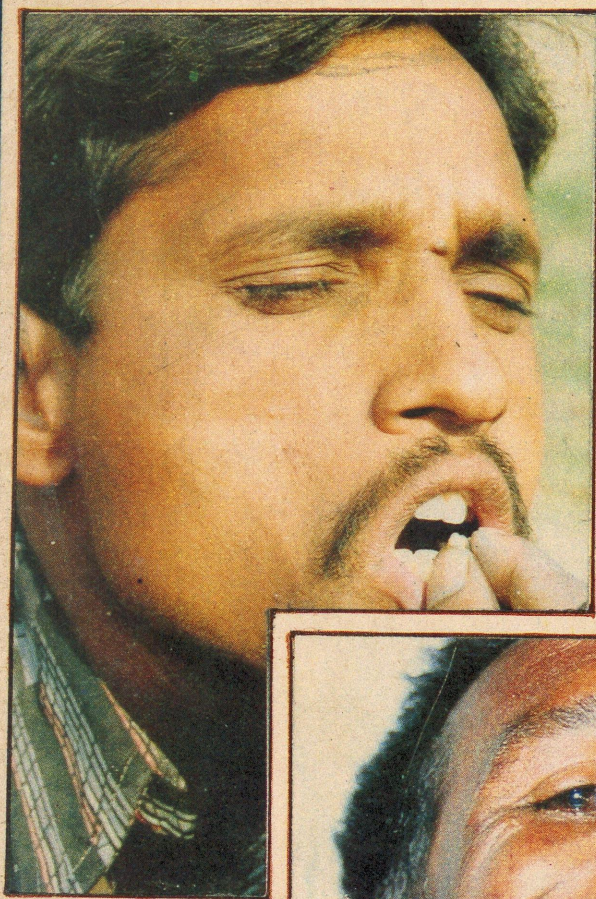
The health risks due to toxic chemicals in drinking-water differ from those caused by microbiological contaminants. There are very rarely any acute effects. For the most part, adverse effects surface after prolonged period of exposure: lead is known to cause mental retardation and disorders of the nervous system; increased exposure to arsenic creates and increased risk of skin cancer; crippling fluorosis occurs in areas where drinking-water contains excessive concentrations of fluoride. Among suspect chemicals evaluated in the Guidelines are: chlorinated alkanes, ethylenes and benzenes, aromatic hydrocarbons, pesticides, inorganic chemicals, disinfectants and disinfectant by-products.

Among other important issues, the Guidelines address the hazards of lead in water. Lead is a general toxicant that accumulates in the skeleton. It is toxic both to the central and peripheral nervous systems. Infants, children up to six years of age, and pregnant women are most susceptible to the chemical. Lead is present in tap-water primarily from household plumbing systems containing lead in pipes, solder, fittings, or the service connections to homes. Over a period of time, depending on the extent of corrosion of the pipes, the presence of lead in water may contribute to serious health problems. Having examined the latest information available WHO concluded that the guideline value for lead should be tightened. Thus, the Guidelines give the figure of 0.01 milligram per litre as compared to 0.05 in the 1984 edition.

"It can be expected that not all Water Authorities, even in developed countries, will be able to meet the guideline value immediately. Meanwhile, all other recommended measures to reduce the total exposure to lead should be implemented", stressed Dr Stanislaw Tarkowski, Director of the Division of Environment and Health at WHO Regional Office for Europe in Copenhagen, whose Division played a leading role in the work on the new edition of the Guidelines.

The new Guidelines stress protection of water supplies from microbial contamination and call for vigorous disinfection of drinking-water. The destruction of microbial pathogens is essential, and almost universally involves the use of chlorine. Although it does its job perfectly, chlorine stands accused of reacting with water constituents and creating new compounds with potentially harmful long-term health effects. In 1991, the WHO International Agency for Research on Cancer (IARC) published an evaluation of the carcinogenic risks to humans of chlorinated drinking-water. Its main conclusion was that there was inadequate evidence for the carcinogenic properties of chlorinated drinking-water.

"The risks to health from disinfectants and their by-products are extremely small in comparison to the risks associated with inadequate disinfection", points out Dr Hend Galal Gorchev, scientist with WHO's Programme on Chemical Safety. "Disinfection should not be compromised in a misguided attempt to control such by-products". □



TOBACCO OR ORAL HEALTH ?