CHANGING PATTERNS OF ORAL HEALTH IN DEVELOPING COUNTRIES

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1. INTRODUCTION

Control of dental caries can only become a reality to third world countries if the trends actually observed, mainly in the field of organization of oral health services and training of human resources, are reverted.

The success reached by a group of highly developed countries, which after a long period of continuous increase in dental caries levels are now achieving to dramatically reduce them and turn their concern towards periodontal diseases and malocclusion, is unlikely to be duplicated in the context of developing countries.

The task of finding a proper way, efficient and at a reasonable cost, towards maintaining the low DMF-T coefficients observed mainly in Africa and Asia as well as reducing the high levels of caries attack affecting populations such as in Latin America, is an urgent effort to be undertaken by about 4,400 million people in over 140 small and big countries of the so called developing world.

2. EPIDEMIOLOGY AND INCOME

In socioeconomic terms, the status now achieved by developed countries is approximately equivalent, and putting aside arguments about differences between particular moments in time, to a situation prevailing in developing countries forty or

fifty years ago.

The differences accumulating among countries in this half century are depicted in Table I, which reflects data of 104 countries in a total of 4,200 million people, about 96% of the world population in 1981.

Population weighted averages, for 12-years-old DMF-T, sugar supply in grams/day and per capita Gross National Product (GNP), are presented in three different brackets of income. One aims at establishing the outline of the more appropriate courses of action, from the dental point of view, to be followed by the lower and middle income brackets, corresponding to developing countries.

a. Low Income Countries

In 45 out of the 104 countries, comprising 62% of total population and with an average per capita GNP of US$ 395, the average 12-years-old DMF-T is just 1.56, coinciding with a low sugar consumption figure of a daily 23 grams per person.

Dental caries are present in a lesser degree precisely in less developing countries, the opposite of what is known about transmissible diseases and malnutrition, tipical sequels of poverty. A diet based on natural food, poor in carbohydrates, ensures a relative immunity to the disease.

This is the prevailing situation basically in Africa and asiatic countries where, with few exceptions, health budgets are low and curative or preventive mass programmes are virtually unknown. In spite of a high periodontal disease prevalence, availability of dental human

TABLE I

DENTAL CARIES INDEX (12-YEARS-OLD DMF-T), GROSS NATIONAL PRODUCT (GNP) PER CAPITA, DAILY SUGAR SUPPLY PER CAPITA AND POPULATION, FOR 104 COUNTRIES DIVIDED IN THREE GROUPS ACCORDING TO INCOME LEVELS

INCOME LEVEL	NUMBER OF COUNTRIES	POPULATION mid 1981 (in millions)	DMF-T 12-years-old- (average)	GNP PER CAPITA (in US$ 1981)	SUGAR SUPPLY PER CAPITA 1981 (in grams per day)
LOW INCOME	45 1/	2 606.7	1.56	395.06	23.01
MIDDLE INCOME	22 2/	478.7	4.84	2 088.10	104.41
HIGH INCOME	37 3/	1 130.4	3.79	8 838.52	108.34
TOTAL	104	4 215.8	2.53	2 851.28	54.96

NOTES= 1/. includes all African countries, except Lybia, and others with per capita income up to US$ 1,000: Angola, Argelia, Botswana, Burundi, Cameroon, Central African Rep., Egypt, Ethiopia, Gambia, Ghana, Ivory Coast, Kenya, Liberia, Malawi, Mauritius, Morocco, Mozambique, Nigeria, Senegal, Sierra Leone, Somalia, Sudan, Swaziland, Tanzania, Togo, Uganda, Upper Volta, Zaire, Zambia, Zimbabwe, Bangladesh, Burma, China, India, Indonesia, Mongolia, Pakistan, Philippines, Sri Lanka, Thailand, Yemen Arab Rep., Yemen Dem.Rep., Papua New Guinea, South Africa, Bolivia.

2/. includes countries with per capita GNP from US$ 1001 up to US$ 3000, except for Argelia, Botswana, Ivory Coast, Mauritius and South Africa, which are in the Group 1 by geographical considerations: Iran, Jordan, Korea Rep., Malaysia, Syrian Arab Rep., Fiji, Argentina, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Costa Rica, Cuba, Mexico, Dominican Rep., Portugal, Hungary, Romania and Yugoslavia.

3/. includes countries with per capita GNP above US$ 3001: Lybia, Hong Kong, Iraq, Israel, Kuwait, Saudi Arabia, Singapore, Venezuela, Bahamas, Barbados, Trinidad Tobago, Austria, Belgium, Cyprus, Denmark, Finland, France, German Fed.Rep., Greece, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, Japan, Australia, New Zealand, Canada, USA, Bulgaria, Czechoslovakia, German Dem.Rep., Poland and USSR.

SOURCES= 1983 WORLD BANK ATLAS - STATISTICAL BULLETIN, Int.Sugar Org.,London,Dec. 1983 - WHO: Dental caries level,May 1983.

resources is very low.

In some limited urban areas it has been object of concern to realize that there is a sharp increase in dental caries level specially among children, due to modernization and incorporation of sugar to their diet. Children living in Peking, Bangkok and Addis Ababa, for instance, are now more subject to caries than their rural counterparts.

Health education projects have failed mainly among poorer populations which have not yet satisfied their general basic needs.

b. Middle Income Countries

A relative improvement in economic conditions - as it was observed for the 479 million inhabitants (11% of the total) distributed among 22 nations with an average per capita GNP of US$ 2,088 - results paradoxically in acute deterioration in oral health related to dental caries. The 12-years-old DMF-T jumps to 4.84 and individual sugar consumption raises to 104 grams a day, 3.0 and 4.5 times higher than such averages in poorer countries respectively.

The majority of middle income nations have spent their meager financial resources in training an increasing number of dentists, duplicating the model of practice followed by richer countries from where they import technology, materials and equipment. The results for the followers of such path have been disappointing because services are eminently curative and based on market laws. In market economies the high prices practiced in dental services renders them out of reach for a large part of the population.

Some programmes with an innovating content, bringing more practical solutions of large social effect at low cost, as in Brazil, Cuba and Mexico, constitute just a timid attempt reaching a low coverage considering the total population.

c. High Income Countries

The group comprises 37 countries with 1,100 million inhabitants, an average per capita GNP of US$ 8,800, a high daily sugar consumption rate of 108 grams and a DMF-T of 3.79.

In the wake of their economic development, specially during the last forty years, such nations virtually achieved to eliminate extreme poverty and solve their basic social problems in areas such as health, nutrition, housing, education and clothing. In the dental sector however consumption of carbohydrates kept growing and dental caries spread to almost the whole of the population. The number of dentists increased at the pace of the dental caries level or even higher, reaching in some cases the proportion of 1:800 inhabitants. As a result curative activities were extended to a peak within a process that, as a whole, was undoubtedly highly expensive.

More recently, however, under the growing influence of generalization of preventive measures and methodic attention to priority groups from the epidemiologic point of view, dental caries indices start to decrease in a limited number of nations as it can be seen in Table II. However, preference for preventive methods directed to the individual and emphasis on the private practice of dental profession have imposed the slowness that marked the process in some areas.

The reasons for the diminishing prevalence of dental caries in developed countries cannot obviously be found within the limited universe of dental practice. The role played by greater availability of resources in societies at large, satisfaction of basic needs, improvement of average cultural standards in the population and massive investments in the health sector as a whole, certainly has a decisive synergic influence on the changes observed in the area of dental care.

TABLE II

REDUCTION IN THE DENTAL CARIES LEVEL
ACCORDING TO 12-YEARS-OLD DMF-T INDEX
IN EIGHT INDUSTRIALIZED COUNTRIES

COUNTRY	FORMER DMF-T		UP-TO-DATE DMF-T		PERCENT
	YEAR	AVERAGE	YEAR	AVERAGE	REDUCTION
AUSTRALIA	1975	4.8	1983	2.7	43.7
FINLAND	1975	7.5	1981	4.0	46.7
IRELAND	1972	5.4	1980	4.4	18.5
NETHERLANDS	1974	7.5	1982	3.9	48.0
NORWAY	1973	8.4	1982	4.4	47.6
NEW ZEALAND	1973	6.0	1983	3.3	45.0
U.K.	1973	4.7	1983	3.0	36.2
U.S.A.	1965	4.0	1980	2.7	32.5

Sources: - WHO - Oral Health Global Indicators for 2000: Dental Caries Level at 12 Years. May, 1983, Geneva.

- Joint FDI/WHO Working Group 5 - Interim Report, presented by C. E. Renson in Tokyo, Japan, November, 1983.

The evident impossibility for the developing countries to follow the way developed countries achieved to control dental caries must be stressed in this analysis over the three groups. Developing countries lack the necessary financial resources and cannot wait for fifty years under the pressure of famine and poverty affecting the majority of their population. As traditional suppliers of cheap raw materials and labor at times, poorer nations aiming at overcoming their critical problems in the short run will have to conquer a higher degree of independence at the economic and political levels and settle the escalating monetary debt to the international capital.

3. GUIDELINES FOR ACTION IN ORAL HEALTH IN DEVELOPING COUNTRIES

There is, therefore, an apparently insoluble problem for the developing countries once the model applied by the developed countries cannot be directely duplicated among them and it is impossible to keep the trend to imitate, a time honored tendency in developing countries now shaked by severe economic crisis. However, even accepting it is not possible to devise a uniform course of action for the innumerable existing situations, it is considered viable, and moreover necessary, to define a set of basic guidelines, to be followed by such countries, bearing higher probability of success.

Two general principles are the columns over which the dental care policy of developing countries shall be built: the universalization of a basic nucleus of services accessible to all people independently of social, ethnical or economic background; and regionalization making action programmes to be locally defined taking into account economic possibilities and social and epidemiologic characteristics of populations in each region of

each country.

Such basic guidelines are now embodied into their fiv more significant components, encompassing: basic attention prevention; development of human resources; input production; an responsibility for execution and financing. Whenever appropriate solutions considered viable for countries of middle or low incom are stressed within the considerations on the relevant component

a. Basic Attention

Once the more acute problems in the country are identified curative actions shall be used to reduce the accumulate demand for treatment, thus minimizing the suffering of th population. As this is the most expensive line of th programme, it shall concentrate on essential needs to avoi unnecessary waste. In countries where dental caries is th most prevalent oral disease, the age bracket of 6 to 1 years deserves maximum emphasis in the attempt to break th epidemiologic chain at that level. In areas of lower incom however, taking in consideration the importance o periodontal diseases, the young adult population is the mai target of the dental care system. In both cases urgen dental care shall be available in sufficient amplitude t cover the poorer strata of the population, in this case no discriminating age or any other existing barriers.

All other activities, considered non prioritary, shall be included as services under market laws, to be defined within the relationship pacient-dentist, o according to the expansion possibilities of the dental attention system as a whole in the nonmarket economies.

Educational activities, very weak when taker alone, have better effects when coupled with preventive and

curative projects, aiming at adequacy in utilization of such services and at transferring scientific knowlegde to ensure self-protection against oral diseases.

b. Prevention

In middle income countries, massive methods of prevention constitute almost the only option available to favorably influence the prevailing epidemiologic picture. Some formal restrictions, as the ones preventing addition of fluor to drinking water under the shield of respect to individual choice about what shall be consumed or not, would be disastrous when applied to poorer societies where simple availability and access to food is at times unwarranted.

In practice, the chances of success in reducing DMF-T are limited to compulsory ingestion of fluorides in water or, alternatively, in common table salt. Processes involving self-topical application of fluor shall be used only in limited populational groups under favorable conditions (as in primary schools), due to its lower preventive potential and inherent operational difficulties vis-a-vis massive methods.

In areas showing low DMF-T index a preventive programme based on two equally important lines is advisable: one line is the prophylactic attention to check the progress of periodontal diseases in their initial phase or even avoiding their appearance; and the other comprising the prevention of dental caries, directed to higher risk groups specially to young students who, under the influence of high carbohydrate consumption, are more frequently affected by the disease. Considering basically cases of countries where there are few groups showing DMF-T index above the low domestic average, eg. Thailand and China, it seems possible

to control dental caries specifically within each group by means of methods such as mouthrinsing, topical applications or a combination of appropriate preventive measures tailored for closed communities.

c. Development of Human Resources

Training of dental personnel at non academic level, mainly of Operating Auxiliaries, is essential to materialize the objectives involved in increasing the coverage in developing countries. There is no reason to stimulate the formation of new Dentists, the most expensive and complex type of professional in the set of human resources involved in oral health, once we realize that the bulk of the accumulated demand concentrates around dental caries and periodontal diseases, problems requiring a relatively simple technology and unsophisticated mechanical skills to be dealt with.

This is a basic issue evidenced by the fact that when only Dentists are involved, around 80% of the cost of services falls in the personnell category. It is not the case, however, to stimulate two years long courses after High School, a common situation in relation to dental nurses. It is possible to qualify an Operating Auxiliary to perform good quality fillings, extractions and basic periodontal care in an essentially operational training course taking about six months as it has already been demonstrated for instance, in Mexico and Venezuela.

d. Input Production

Another critical point to the expansion of oral health services lays in the availability, at reasonable cost, of basic inputs as dental equipment, instruments and

medicine. Import of such items from producers located i developed countries bear the implication of escalatin expenditures developing world cannot afford. Unfortunatel the growing sophystication of the so called "poin technology" exerts an almost irresistible attraction ove the health professionals in poorer nations.

However, domestic production of simplifie equipment at low cost and reasonable standards of qualit and ergonomics is clearly viable, thus making room fo interrupting the dependency in this field. In what regard medicines and clinical materials the situation is les clear. In the majority of cases third world countries lac autonomous technology and would require support fro international organizations in the health sector to generat such knowledge.

Production of simplified inputs, starting wit dental equipment, shall be developed within each country t satisfy the domestic demand posed by national programmes Only in specific cases, as in small countries wher intercommunication is easy, production at a regional leve should be encouraged.

e. Responsibility for Execution and Financing

The large number of people in need living in eac country of the third world displaces the responsibility fo establishing national dental programmes to the government.

In market economies the private sector has it role in rendering services to people who can afford suc services either directly or through schemes of pre-paymen without governmental intervenience.

Equipamento simplificado instalado em um Auditório, para atendimento de escolares. Ao colocar o odontólogo em um espaço mais amplo de trabalho, sua produtividade aumenta. Programa Integrado de Saúde Escolar. Brasília. Brasil.

Simplified equipment in an Auditorium for the treatment of primary school children. By placing the dentist in a large environment, his productivity is optimized. School Health Integrated Program. Brasília. Brazil.

"Técnica de Higiene Dental" atende a uma criança em sua própria carteira escolar. A falta de equipamento sofisticado não pode se constituir em uma barreira para a prestação de cuidados odontólogicos. Programa Integrado de Saúde Escolar. Brasília. Brasil.

Operatorist Auxiliar treating a child at his own school desk. The lack of sophisticated equipment mustn't constitute an impediment for dental care. School Health Integrate Program. Brasília. Brazil.

No México, "Técnicas-Operadoras" formadas em 6 meses, realizam extrações e restaurações em todas as suas fases, sob supervisão profissional. Serviços Coordinados de Salud Publica en El Estado do México. Nezahualcoyotl. México.

In Mexico, Dental Nurses trained in 6 months, are capable of carrying out such operations as extractions and fillings, under professional supervision. Coordinated Public Health Services in the State of Mexico. Nezahualcoyotl. Mexico.

Após receber um ano de treinamento operacional, uma enfermeira (nível secundário) é capaz de realizar uma odontologia básica de boa qualidade e assim aumentar a cobertura da população chinesa. Faculdade de Estomatologia. Escola de Medicina de Pequim. República Popular da China.

After a year's training. A nurse is able to provide good quality basic dentistry, thus helping to reach a wider public in China. Faculty of Stomatology. Beijing Medical College. People's Republic of China.

In places where health is a responsibility of the social security, the indirect rendering of services (such as payment made to autonomous professionals to assist the population) is not advisible given the numerous drawbacks inherent to such mode of action.

Financing of the programmes shall be provided through taxation with the addition of social security revenues when applicable. Partial or total coverage of service costs by the population shall, wherever possible, be avoided in poorer countries because it entails a severe obstacle to expansion of coverage in practice.

4. THE ROLE OF INTERNATIONAL INSTITUTIONS

The support of international organizations involved in this sector, specially WHO and FDI, is essential to the effective implementation of a oral health policy embodying the objective of an increasing access to basic services and control of most prevalent epidemiologic problems.

The fact that developing countries encompass the majority of world population, the more severe problems and lack resouces of any kind help to consolidate the idea that priority actions of international organizations should be turned towards them.

In order to materialize such priority, both WHO and FDI should decentralize their actions, strenghtening the regional management of activities, supporting working teams including local actions in areas critically underdeveloped, in addition to assisting nations in their task of implementing programmes tailored according to the general guidelines already established.

The starting point towards a decentralized policy

consists in grouping countries according to their epidemiological similarities, in addition to geographical, economic and political factors which would ensue the characterization of each group.

As industrialized countries, middle income countries and poorer countries clearly constitute three distinct groups on the dental point of view, such classification seems to be a natural framework, besides providing a starting point to the redirection of efforts which would facilitate the action of international organizations and provide more active help to all people in the world.