

## Challenges of optimal oral and dental health care for all according to Vision 2030

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**Abstract:** The current paper aimed to examine the challenges of optimal oral and dental health care for all in accordance with Vision 2030, through public preventive health services programs for the mouth and teeth, and discussed optimal oral health according to available epidemiological evidence on the epidemiological situation related to oral health in the population, especially adults and the elderly, with regard to Two highly prevalent oral infections (dental caries and tooth decay). loss), and the main healthcare models for dealing with this situation, by analyzing relevant historical processes in order to reveal the potential social, political and epidemiological implications of the different models, and the potential challenges for collective dentistry and oral health in overcoming these obstacles. The main findings of the study indicate that, from an epidemiological point of view, some societies are experiencing a transition in dental caries and tooth loss, which is not yet reflected in the profile of the elderly, but is initially evident in the young. Tooth loss remains high. Some aspects of the economic and political superstructure of society have an important influence on oral health indicators and existing inequalities. Oral healthcare models have relative importance and should not be neglected. Remnants of ideological movements, such as preventive medicine, may explain the current impasse in mass oral health practices, such as the superiority of definitive treatment in clinics and preventive care in schools promoted by community-based programs. Therefore, it is important to develop conceptual and theoretical ideas and increase the goals, objectives and methods of intervention to try to achieve optimal oral and dental health.

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The main findings of the study indicate that, from an epidemiological point of view, some societies are experiencing a transition in dental caries and tooth loss, which is not yet reflected in the profile of the elderly, but is initially evident in the young. Tooth loss remains high. Some aspects of the economic and political superstructure of society have an important influence on oral health indicators and existing inequalities. Oral healthcare models have relative importance and should not be neglected. Remnants of ideological movements, such as preventive medicine, may explain the current impasse in mass oral health practices, such as the superiority of definitive treatment in clinics and preventive care in schools promoted by community-based programs. Therefore, it is important to develop conceptual and theoretical ideas and increase the goals, objectives and methods of intervention to try to achieve optimal oral and dental health.

**Keywords:** Challenges - Optimal Oral - Dental Health care - Vision 2030.

**Introduction :**

Preventive medicine in general and oral preventive medicine in particular are of great importance to health organizations, governmental institutions and individuals around the world. Prevention has become the best way to save humanity from many diseases and epidemics. Also, the cost of prevention is less than the cost of treatment when the disease and its complications occur(18).

Healthy mouths facilitate communication and social relationships, as well as happiness with health and self-confidence. These are not only concerns for the quality of life, but also have a close relationship with the organic level of protection and general injuries and other damages.

Numerous major stages, plans and programs have been developed in the field of oral prophylaxis in the last decades of the twentieth century and the beginning of the twenty-first century. Because preventive dentistry is the solution to most dental diseases that can be prevented through organized, timely planning, and through preventive measures(63).

The social scourge represented by tooth loss among American adults is a topic explored in society beyond the natural interest of dentists. In Bahia, artist Bel Borba, known as the artist who most often portrays the relationship between the reality of his city and its people, recently exhibited a work of art with many "before and after" photographs of prosthetics in a number of edentulous adults; the catalogue's symbolic phrase was, "life took the teeth and the smile restored the soul(1).

In this paper, we have tried to enumerate scientific references from different sources so that the book is fully covered. The information has been narrated in a simple and easy manner in order to reach the reader clearly(60).

Oral preventive medicine: If the primary goal of oral health care is to preserve natural teeth, true failure can result in the loss of all teeth, followed directly by the high percentage of people who retain only 20 or fewer of their remaining teeth. A pertinent question is how did such a high failure rate become accepted by the public and the dental profession? Healthy teeth and healthy gums are simply beautiful, attractive and functional parts of the body and should be valued more highly by the population(13).

On the other hand, decayed teeth, swollen, red, bleeding gums, and halitosis are repulsive and unattractive. In similar circumstances, patients will not accept the destruction of any part of the body, such as an ugly or artificial nose or chest, or even any part of the body that is usually covered by clothing. So how can they accept artificial teeth? Patients will not accept having 1% of their nose replaced with amalgam or gold(48).

Imagine that you have to amputate a finger every 5 years, and replace it with a golden finger, even though this can be prevented through regular examinations once or twice a year to prevent an epidemic disease with known pathogenicity from occurring. Preventive dentistry: Preventive dentistry is that specialized branch of dentistry that deals with the prevention and interception of the progression of all dental and oral diseases, the prevention and reduction of any disability and the provision of repair as well(45).

**Preventive dentistry includes the development and use of each of the following procedures:**

- A- Avoid the onset of dental diseases.
- B- Stopping its progress.
- C- Providing repair. T- Control its speed.
- D- Reducing its complications and late effects(33).

All pathogens of most oral and dental diseases have been identified. It has been confirmed that the solution to dental diseases is based on preventing their occurrence. Prevention is an integral part of public health, and the idea of prevention can be applied at any stage of disease and dental treatment. In 1979, researchers Kandra and Shadley recorded in their study of 15,000 children between the ages of 4-15 years in India the following(19):

- 1- The incidence rate of dental caries was 49.85% . .
- 2- The highest incidence of dental caries was in the age group of 11-15 years.
- 3- The incidence of dental caries in vegetarian children was higher than in non-vegetarian children.
- 4- The number of missing or filled cavities increases as the child ages.
- 5- The largest number of missing or filled teeth was at the age of 15 years.
- 6- The greatest incidence of tooth decay was among children of high socioeconomic status. In the same city, in 1977 AD, the scientist Chowdhury and his collaborators recorded the incidence of dental caries at 44%.
- 7- This means an increase in the rate of tooth decay by 5.45% over 22 years(56).

Third: The role of society and its relationship to the development of oral preventive medicine: A- Patient Responsibility Agitation is defined as creating a willingness to act, or it is the forces of action resulting from our actions. The greatest response was achieved when the inciting factors continued for a longer period(3).



**Figure (1)**

Although this assertion may lead to a great many reflections and conclusions, current discussions about adult oral health in the national and international<sup>4</sup> literature may indicate greater concern in relation to this age group, considering that a large portion of the scientific community working on health policies and the prevention of oral problems in the 20<sup>th</sup> century focused on children and adolescents, and has had relative success.<sup>4,5</sup> In the case of USA, efforts by the government and researchers to monitor this data constantly have yielded optimistic albeit cautious results, insofar as studies reveal that the strategies implemented in the young population did not automatically benefit adults.<sup>(5)</sup>

The undoubted success of these efforts has already been evidenced in a large number of studies and from consultations with experts about the contribution of water fluoridation and the use of fluoride toothpaste in different oral contexts, together with mass access to toothbrushes and wide-scale coverage for

families. The upshot has been a reduction in dental caries and some success in preventing the early signs of periodontal disease.<sup>(7)</sup>

In USA's most recent national survey, the average DMFT index (number of decayed, missing or filled teeth) for 12-year-olds was 2.1, 25% less than the 2.8 figure recorded in 2003.

It is worth noting that the first national survey of the DMFT in 12-year-olds in USA was conducted in 1986, when the index was 6.7. In the component relating to dental caries, the average fell from 1.7 to 1.2. The percentage of caries-free children (DMFT = 0) rose from 31% in 2003 to 44% in 2010<sup>(27)</sup>.

The ideal response may sometimes result from lifelong encouragement, as opposed to short-term encouragement such as praise or increased income...

Adults should be aware of the idea that "no dentist can take more responsibility for my oral condition than I do for my mouth<sup>(42)</sup>.

" In many industrialized countries with well-regulated social health and welfare systems, patients regard the dentist as responsible for their oral health, as the doctor is responsible for their general health, and as the politician is responsible for their social happiness. It has been shown, with recent information on the pathogenesis, prevention and control of dental caries and periodontal diseases, that patients who have been well stimulated and educated about diagnosis and self-care can protect themselves and control these diseases on their own<sup>(49)</sup>

The following examples are more important about public health and health and welfare costs. It has been confirmed that among the external or environmental factors that cause cancer, unhealthy food accounts for 30% of cancers, smoking accounts for 20%, and viruses account for about 10%<sup>(38)</sup>.

The simple advice regarding food is to reduce animal fats, and increase the nutritional supply from vegetables rich in fiber, in addition to fruits, which are the cheapest and easiest to obtain in tropical and subtropical regions, where the vast majority of people live<sup>(33)</sup>.

As for cardiovascular diseases and their relationship to unhealthy food and smoking, in combination with physical inactivity, they may cause other structural problems, especially back pain. The important question is: Who is responsible for what you eat?

Or whether or not you smoke or exercise? Maintaining and controlling health is achieved through self-diagnosis and self-care<sup>(50)</sup>.

**B- Doctor's responsibility: Practitioner Responsibility** The principles of Leg Arts require clinicians to practice the profession of dentistry according to modern, scientific and well-tested methods, as if it were an art<sup>(22)</sup>.

The following conclusions about the pathogenetic mechanism, modifying factors of dental caries and periodontal diseases, and effective preventive methods have been drawn through carefully organized, long-term experimental clinical studies<sup>(1)</sup>.

- 1- Dental caries and periodontal diseases can be prevented and successfully controlled through self-care in addition to preventive professional standards.
- 2- Carious lesions on enamel, roots and even dentin can be successfully stopped.
- 3- Rebuilding the connection around the tooth is a real thing<sup>(16)</sup>.

The dental profession must be forced to focus on the prevention, control and suppression of dental caries and periodontal diseases in accordance with the principles of Leger-Arts, and must give priority to dental caries and prevention rather than progression, or at least to "prevention before progression<sup>(46)</sup>

Likewise, excessive treatment of dental caries by extraction or drilling and filling, and excessive treatment of periodontal disease by extraction, excessive scaling, surgery, or flap removal, should all be considered negligent and in one way or another inappropriate<sup>(40)</sup>.

#### **H- Age structure of the population:**

What is meant by this is the distribution of different age groups in society.

The importance of this lies in the fact that age has a clear impact on the occurrence, spread, and severity of the disease<sup>(37)</sup>.

We know that certain diseases and health problems are linked to a specific stage of life.

We cite as an example the high rate of infection and death from chronic degenerative diseases in the later stages of life<sup>(61)</sup>.

Diabetes and its oral manifestations are more dangerous for young people under thirty than for older adults, and the incidence rate Infectious hepatitis is more common in children than in young people<sup>(25)</sup>.

That is, the age composition of society clearly reflects the health and oral problems in that society.

In addition, the age composition of society has a fundamental relationship with the way society confronts its health and oral problems, as this is one of the important matters that the dentist must be aware of<sup>(18)</sup>.

#### **G- Population distribution according to sex:**

This may be explained by the existence of sex-specific diseases, such as hereditary diseases linked to sex, such as hemophilia, but the most important thing is centered on the extent of the development of the social relationship and the role that women play in maintaining oral health in terms of the long-standing customs and traditions, and the reflection of this on the extent of interaction between women and the surrounding environment and the extent of social pressures.

And the complex psychology to which both individuals of both sexes are subject. This factor is also important for a large number of periodontal diseases and tumors that affect the face and jaws<sup>(59)</sup>.

It is also worth noting that the caries-free proportion of five-year-old children rose from 40.6% to 44%. This shows a trend toward stability in the prevalence of dental caries in this group, although short of the WHO target for the year 2000, which was 50% caries-free.<sup>5</sup> Furthermore, the proportion of the DMFT decayed component remains very high, suggesting limited or no access to curative dental treatment in primary health care.<sup>(17)</sup>

The targets for dental caries in the adult population are still far from being attained<sup>(27)</sup>.

One of the probable explanations is that the strategies implemented for the American population in the 1990s, through fluoride toothpaste, expansion of water fluoridation and community-based prevention activities in the public health system for oral diseases,<sup>7,8</sup> had little effect on the adult population, which did not receive the benefits that population aged about 20 years old received in the 1990s. Cury *et al.*<sup>9</sup> called this process in USA the "90 factor" (from the 1990s), related to

the organizational and political changes of the re-democratization process that occurred in the country during this period(31).

However, in recent decades, the WHO indicators for the adult population in USA have shown little progress. The DMFT for the 65–74 age range was 27.5 in 2010, whereas it was 27.9 in 2003.<sup>7</sup> The greatest improvement was found in the 35–44 age group, which had a DMFT of 20.1 in 2003 and of 17.2 in 2010. There is no information available in the final SB 2010 report for some goals(44).

One could posit that the improvements reported in the epidemiological surveys of 1986, 2003 and 2010 are the result of improvements at school age, given that the 1986 school population has now reached young adulthood, and that we can, therefore, expect such improvements to be reflected in lower DMFT values, for example(35).

Studies reveal that the situation is different in other parts of the world, particularly in European countries, which have had DMFTs between 13.4 and 20.8 for the 35–44 year-olds, ever since the end of the last century (the 20<sup>th</sup> century). There is a trend toward a fall in tooth loss.<sup>2,10,11</sup> However, information in most countries about current national estimates for dental caries or tooth loss in adults is limited, due to problems related to the frequency of studies, the indicators and methodologies used for diagnostic criteria, sample size and data presentation.<sup>2,10</sup> Furthermore, it is known that edentulism is in decline, and this has also been investigated by the dental market, given the likely implications for specialties such as implantology.<sup>2,12</sup> We should remember that demographic trends suggest a rise in the aging population, due to a reduction in birth rates and an increase in life expectancy, related to better management of chronic non-communicable diseases (NCDs). The United Nations estimates that the proportion of the world population over 60 years old will rise from 10% in 2000 to 30% in 2150.<sup>(9)</sup>

It is noteworthy that, despite the great scientific production of epidemiology-based studies about the relationship between the social determinants of health and oral health,<sup>13-16</sup> this area has been little explored from the perspective of reasons or theories able to explain oral health inequalities.<sup>17,18</sup> Furthermore, there is a significant gap in evidence regarding the implementation of oral-health related interventions incorporating the principle of equity, in other words, the notion that it is necessary to intervene unequally where inequalities exist(16).

A review study about the effect of public health interventions on principal health issues indicates that oral health is one area which has produced the least results.<sup>(19)</sup>

American studies addressing or mapping interventions or models for oral health care<sup>20-23</sup> have not included the construction of a theoretical-conceptual framework for the social or social-dentistry field in dental practice(58).

Accordingly, and in light of the work by Paim and Teixeira,<sup>24</sup> this study aims to describe and analyze different care models as interventions to confront both the aforementioned needs and oral health issues, by analyzing work processes in health<sup>25</sup> and considering the implications of this perspective in organizing dental services(12).

With this in mind, it is important to make a critical review of national and international scientific productions related to oral health care interventions and models from the perspective of work processes in health.<sup>25</sup>

### Health care models, care models and needs

In our context, care models are understood as combinations of technology (both structured and non-structured, such as knowledge) to solve problems and meet individual and collective demands.

They include ways of arranging the technical-scientific means to intervene in determinants, risks and health-related injuries. According to Paim and Teixeira,<sup>24</sup> it is the "contents" of health systems, the practices, in other words, the working processes, that produce different types of care(34).

In other words, working processes in health refer to the way in which health activities are produced, the care, per se. The principal components of this analysis are the object of the work, the instruments, the resources and products or results of this work, as well as the producing agents. It also worth noting that these elements need to be examined jointly, since they may shape specific work processes, but only through reciprocal relationships(22)

The object of the work is the target of change, represented by what Mendes-Gonçalves<sup>(43)</sup> calls health "gaps," understood as health needs. It is not enough to simply talk of "needs," since there is a difference between essential needs and those aspects which are perceived as needs(63).

Agents are those individuals who act on knowledge in order to attain an object of work. Knowledge is the work tool, that is to say, the tool that serves to mediate human activity over objects of work, according to the social and historical process that includes social reproduction. Thus, the working environment is the assemblage of things that the worker puts between himself/herself and the object of his/her work, and that serves to direct his/her activity in relation to that same object(20).

There is a difference between material and non-material instruments. The former include equipment, instruments and materials, whereas the latter is the knowledge that coordinates material instruments within certain arrangements. These constitute the main intellectual working tools. The author emphasizes that this knowledge is also that which enables the object of his work to be attained,<sup>25</sup> what Schraiber *et al.* calls "know-how(23).

The work agent himself may be interpreted as a work instrument, and the immediate subject of the activity, to the extent that he/she brings to the working process both his/her previous project and its purpose, and other projects of a collective and personal nature.<sup>(24)</sup>

### Daily Habits to Protect Your Teeth:

- 1- Make sure you floss every day.
- 2- It doesn't matter when you do it.
- 3- Stay away from soda.

summarizes the various objects of work, instruments and agents of work,<sup>25</sup> taking into account the different health care models from Paim and Teixeira's<sup>24</sup> perspective, but focusing on dentistry. The models are described only briefly; further in-depth examination in this area is required(30).

### The principal care models

The hegemonic model has been called "privately paid medical care." Despite the ideological nature of its name, it is the best known and most practiced model, and is not exclusive to the private sector. Studies suggest that this model is also reproduced in the public dental sector.<sup>20,21,28</sup> It is based on the production of procedures and broken up into specialties, involving the uncritical consumption of technology and a focus on surgical procedures in hospitals, in the case of medical practice, and on isolated practices, in the case of dentistry(40).

It focuses on the curative aspect, and is aimed at the individual and at the biological aspects of disease; its organization is based on "free demand." This mode of organizing services reinforces the idea that only those who already have health problems will seek services, and does not include those who do not feel ill, that is to say, who do not feel the need. This compromises the comprehensiveness of care and the impact that these services will eventually have on the population's health(53).

### What is gum disease?

Gum disease starts when plaque builds up under and along the gum line. Plaque is a sticky film-like substance that's filled with bacteria. It can cause infections that hurt the gum and bone, leading to gum disease and tooth decay. Plaque also can cause gingivitis, the earliest stage of gum disease. Gingivitis causes your gums to become:

- inflamed
- tender
- red
- swollen
- prone to bleeding(46)

Fortunately, since the bone and tissue holding the teeth in place aren't impacted, this damage is reversible Trusted Source.

You can also develop periodontitis, an advanced form of gum disease. Periodontitis impacts the bones that hold your teeth in place. Left untreated, it can ruin the gums, bones, and tissues connected to your teeth.

The final stage of gum disease is advanced periodontitis. This is when the fibers and bone supporting your teeth are destroyed. It can impact your bite, and teeth may need to be removed(39).

According to the American Dental Association (ADA), signs that you might have gum disease include:

- consistently bad taste or breath.
- separating or loose permanent teeth.
- gums that easily bleed.
- gums that are swollen, red, or tender.
- gums that have pulled away from your teeth(48).

Gum disease is preventable. Here are a few ways you can help keep your gums healthy.

#### 1. Floss:

Floss at least once a day. This helps remove the plaque and food that's beyond your toothbrush's reach, according to the ADA. It doesn't matter when you floss. Do it at night, do it in the morning, or do it after lunch... just do it!

In oral health, this model has been called Market Dentistry or Private Dentistry,<sup>29</sup> although it is not restricted to the private market. As an example, one could say that traditional clinical dental practice has the objective of recovering diseased teeth through "definitive" restorations. In the case of market dentistry, caries disease is the object of work, whereas the means or instruments are the dental clinic's knowledge, and its materials are aimed at "treating" the disease. The main agent continues to be the dentist .

One of the principal criticisms here relates to an inability to regulate the individual's health needs in the private market, because capitalism reinforces inequalities to the extent that the most socially deprived individuals remain without access to dental care. This criticism was also made by Leake and Birch<sup>2</sup> in relation to the Canadian oral health system, and there is evidence that these disparities exist in other countries.(29).

On the other hand, the public health model that initially (second half of the 19th century) aimed at combating endemics and epidemics is characterized by the use of specific vertical campaigns and programs and is generally of an individual nature, with centralized administration and little or no coordination with other health activities(64).

#### 2. Get regular dental cleanings:

Your dentist can detect early gum disease symptoms if you see them on a regular basis. That way symptoms can be treated before they become more serious. A professional cleaning is the only way to remove tartar. It can also get rid of any plaque you missed when brushing or flossing. If you have gingivitis, brushing, flossing, and regular dental cleanings can help reverse it(33).

### 3. Quit smoking:

Yet another reason for smokers to quit: Smoking is strongly associated with the onset of gum disease. Since smoking weakens your immune system, it also makes it harder to fight off a gum infection, say the Centers for Disease Control and Prevention (CDC) Trusted Source. Plus, smoking makes it more difficult for your gums to heal once they've been damaged(27).

### 4. Brush twice a day:

Brush your teeth after every meal. This helps remove the food and plaque trapped between your teeth and gums. Scrub your tongue too, since it can harbor bacteria. Your toothbrush should have soft bristles and fit in your mouth comfortably, says the Mayo Clinic(9).

Consider a battery-powered or electric toothbrush. These can help reduce gingivitis and plaque more than manual brushing. Swap toothbrushes or toothbrush heads every three to four months, or sooner if the bristles start to fray(58).

### 5. Use fluoride toothpaste:

As for toothpaste, store shelves are lined with brands that claim to reduce gingivitis, freshen breath, and whiten teeth. How do you know which one is best for healthy gums? Make sure to choose toothpaste that contains fluoride and has the ADA seal of acceptance(27).

### 6. Use a therapeutic mouthwash

Usually available over the counter, therapeutic mouthwashes can help reduce plaque, prevent or reduce gingivitis, reduce the speed that tartar develops, or a combination of these benefits, according to the ADA. Plus: A rinse helps remove food particles and debris from your mouth, though it's not a substitute for flossing or brushing. Look for the ADA seal, which means it's been deemed effective and safe(16).

It doesn't matter whether your brush, floss, or rinse first. Just do a good job and use the right products(54).

The object of intervention in this case extends to the health of individuals. The instruments include preventive clinics, an individual approach to risk factors or common risk factors, with work instruments that include new knowledge about the prevention of oral diseases and new materials (the use of fluoride according to the "risk" classification, techniques to control bacterial plaque, glass ionomers to improve both the oral environment and occlusal sealants, periodontal risk therapy, etc.). This practice has demonstrated important advances, but its critics point out that it has produced care exclusively for groups considered to be a priority (schools and pregnant women, for example) and is unable to tackle structural issues, such as social inequalities, maintaining the focus on biological components, albeit more broadly (risk groups, common risk factors, etc.).(19).

Alternative models have advanced in line with previous models, from the perspective of overcoming the dichotomy of individual practices (private medical care model) and community practices (collective health model).

They seek to incorporate a broader concept of health, by using tools from epidemiology, sociology, anthropology, political science, strategic health planning, social communication and geography(13).

Among other things, they propose the incorporation of new agents, since they also include the organized population, in addition to health professionals and workers. Alternative model practices are supported beyond clinical and epidemiological determinants to include social determinants on the basis of different social groups and their living conditions. From this point on, the health surveillance model is based on interventions according to a territorial framework, working on health issues (injuries, risks and/or determinants) to offer program activities and services, including intersectoral action.24(54) .

One of the characteristics of this model is coordination between curative, promotion and prevention activities, organized on a range of care levels and working intersectorally, thus representing a great challenge. An oral health practice that includes an alternative model perspective must take into account the fact that its activities cannot be isolated from other health activities, despite its specificities. Moreover, the incorporation of health planning and programming into daily practice, as well as political-strategic analysis for the implementation of interventions and communicative action skills, are all indispensable tools for the oral health team(42).



Figure (2)

It is important to clarify that it is possible to carry out collective-preventive practices of a "preventivist" nature in alternative models. What characterizes these new approaches is the expansion of the objects of work, the ways of working and the goals. These factors do not act on a group through a single mode alone. The practice of dentistry in these alternative models is still being constructed(50).

### A brief historical analysis: the origin of the movements

Obviously, care models are produced historically, in relation to people, through social groups in conflict and in society. The discussions about the best care models to tackle the main oral health issues originate in and are closely related to the medical field. In other words, we can see that there is a clear mirroring, whereby conflicts that occur in the medical field are reflected very similarly in the dental arena(32).

Summarizes a series of political-ideological movements that have occurred in the medical field, their relationship with the field of dentistry and the likely impact of this "world of ideas" on professional practice, which is understood as the model(4).

It is worth noting that the concept of field used in this study is that offered by Bourdieu<sup>30</sup> as an autonomous social space in which different interested agents occupy relative positions within the arena of relationships that may or may not be in conflict regarding the legitimate definition of the objects of intervention, investigation, prioritization, etc. and specific interests. In this scenario, the dominant definition of what is legitimate and universal is exercised through the power relationship between the agents or institutions engaged in the struggle. In modern societies, the social cosmos is made up of a series of these relatively autonomous social microcosms which are fields, the settings of objective relationships.

These are the arenas for the logic and specific needs of the social game, known as *illusio*, in other words, the agent's sense of belonging to the game for which he fights.<sup>(27)</sup>

In the particular case of the field of medicine, a series of ideological movements have emerged since the 1950s and 60s, which have sought to tackle the crisis identified through rising medical care costs. Traditional Public Health is not considered a movement contrary to traditional medicine, in that it emerged as an arena for government operation in cities, starting with the industrial revolution; it falls outside the free market and is considered hegemonic, although it is an arena where Flexnerian medicine prevails.<sup>(30)</sup>

## Ways to Remineralize Your Teeth and Stop Demineralization

### 1. Brush your teeth

Brushing your teeth is important for removing bacteria. Cavities (also called dental caries) are primarily caused by the accumulation of *Streptococcus mutans* bacteria in your mouth(37).

According to a 2016 study Trusted Source, these bacteria are transmitted via food and drink. Brushing your teeth regularly can remove the bacteria that may lead to mineral loss and cavities(6).

### 2. Use fluoride toothpaste

Not just any toothpaste will work against demineralization.

The American Dental Association (ADA) recommends fluoride toothpaste. In fact, toothpaste won't get the ADA Seal of Acceptance unless it contains fluoride.

Fluoride toothpaste may prevent tooth decay and can also strengthen your teeth, making them less susceptible to future mineral loss(19).

### 3. Cut out sugar

Your dentist has likely warned you about sugar in the past, and for good reason. Sugar is highly acidic and interacts with bacteria in the mouth by breaking down tooth enamel.

More importantly, one study Trusted Source found that a higher *frequency* in sugar consumption led to demineralization more than the *amount* of sugar consumed.

In other words, eating sugary foods in small amounts on a regular basis can do more harm than eating the occasional sugar-laden dessert(47).

### 4. Chew sugarless gum

The role of gum in oral health has been debated for decades, but studies are showing that sugarless versions may actually promote tooth remineralization.

According to an older study Trusted Source, sugar-free gum helps remove sugar, plaque, and carbs from teeth while also encouraging your salivary glands to produce more saliva.

Gum may also act as a barrier to block mineral loss. Xylitol and sorbitol appear to be the most promising sugar-free ingredients. To reap the remineralization benefits of sugarless gum, consider chewing after or between meals(28).

### 5. Consume fruit and fruit juices in moderation

While fruit is part of a healthy, balanced diet, it can also be highly acidic. Some of the worst culprits are citrus fruits, such as grapefruit and oranges.

Fruit acids create a process of calcium chelation on tooth enamel. This means that the acids bind to calcium and strip it away. Fruit juices are even worse, as these are highly acidic and often contain added sugars.

Your best bet is to stay away from juices and to eat acidic fruits only on occasion(54).

### 6. Get more calcium and vitamins

While calcium is produced within the teeth naturally, this important mineral is stripped by acids and bacteria over time. You can replace calcium by eating calcium-rich foods. For example, a 2003 study Trusted Source found that eating calcium-rich cheese could counteract the effects of eating sugar.

If your diet is deficient in calcium, talk to your doctor about possible supplementation.

A 2012 study found that taking vitamin D supplements may help protect against cavities. Ask your doctor or dentist about taking vitamin D supplements.

You should also talk to them about daily multivitamins to be sure you're getting other needed vitamins for healthy teeth(33).

## 7. Consider probiotics

When considering probiotics for remineralization, it's important to choose strains that are naturally produced in the mouth. That way, you're replacing the good bacteria without introducing potentially harmful strains(20).

The following probiotics are potentially helpful in oral health and remineralization:

- bifidobacterium
- reuteri
- rhamnosus
- salivarius

You can find probiotics in supplement form and certain yogurt brands also contain probiotics. You'll need to take these daily for the best results(17).

## 8. Address your dry mouth

Dry mouth occurs when there isn't enough saliva production. Saliva is not only important in keeping your mouth feeling comfortable, but it also helps prevent cavities.

According to 2016 research Trusted Source, saliva is an integral part of remineralization. Saliva not only prevents dry mouth, but it also contains phosphate and calcium.

If you have dry mouth, talk to your dentist about chewing gums and rinses you can use to increase saliva activity(60).

## 9. Reduce starchy foods

Starchy foods, such as potatoes, rice, and bread, are loaded with simple carbohydrates. These increase the amount of fermentable sugars in the mouth, which can erode your teeth.

However, according to a 2003 study Trusted Source, the risk of tooth decay tends to be higher when eating starchy foods combined with sugar. For example, sweetened rice is problematic for the teeth, but plain rice is not(49).

## 10. Drink more water

Water continues to be the preferred beverage of choice by doctors, nutritionists, and dentists. It's not only naturally sugar-free, but it also helps remove harmful substances from the body.

Rinsing your mouth out with water may also help reduce demineralization when you don't have a toothbrush on hand. This technique may be especially helpful after eating acidic or sugary foods.

While coffee and tea aren't completely off-limits, they do little to remineralize your teeth. Plus, these substances can be acidic (especially coffee). Adding sugar can make these drinks even worse when it comes to oral health.

Sodas are also acidic, and often contain sugar, so they should be limited, too(38).

The Public Dental Health approach has been similar to traditional public health, in which public health dentistry formulated and performed collective oral health interventions. Furthermore, this movement was the great motivator for water fluoridation systems across the world, originating in the United States and introduced in USA by the Foundation for Special Public Health Services (*Serviços Especiais de Saúde Pública*).<sup>(31)</sup> The movement is considered a precursor to dental programming practices in USA.<sup>(17)</sup> In fact, the movement reproduced practices from the surgical-restoration paradigm. Programming practices have developed through the "incremental" model, a word which incorporates the notion of gradual increments, maintaining the already-treated group and treating the group of recent arrivals, for example, at a school. It is worth noting that the focus in this case was "dental caries."

It is also worth reflecting on the real contribution that programming made to this movement, where the centrality of the Finalized Treatment (FT) has remained and has been uncritically maintained in public oral health services to date. It is also worth noting that this type of care may limit access and emergency treatment in public health services, since it rejects individuals who do not have scheduled appointments. The assumption is that this clinical model is a private or market dental model and, therefore, prejudicial to greater access to dental treatment in public services. Accordingly, it must be both rethought and considered in relation to other perspectives(30).

The Preventive Medicine movement was specifically examined by Sergio Arouca, cited by Paim,<sup>32</sup> in a book currently considered one of the founding works of the collective health arena in USA. Arouca<sup>32</sup> points out a "preventive dilemma," in that this movement's intention was to change medical attitudes toward medical practice, so that practice could become more "preventive" through changes to medical education. The great dilemma is that changes in *attitude*, without respective structural changes—such as changes to ways of paying for procedures and changes to enhance procedures carried out in hospitals did not bring about the desired restructuring, which, in fact, did not take place(17).

Dentistry was also strongly influenced by this movement, as can be seen by the names of the newly created disciplines in the dental schools and the creation of Preventive Medicine Departments and Preventive and Social Dentistry Departments in the Schools of Medicine. It is curious to see this combination of the term "social" with that of "preventive" in dentistry, considering that preventive and social medicine perspectives are in opposite camps in the medical field(15).



Preventive and Social Dentistry, therefore, had the same aims, i.e., to change the dentist's attitude by focusing on prevention.

On the other hand, in the 1980s, the influence of the Scandinavian model was important for the dissemination of new knowledge about cariology, which scientifically legitimized a series of practices, such as supervised toothbrushing and the intensive use of fluoride(13).

The School Dental Health Program (*Programa Odontológico Escolar de Saúde*), initially established by the American Association for the Promotion of Oral Health (*Associação Brasileira de Promoção da Saúde Bucal*), was an example of this practice and is considered a model within the Preventive Dentistry movement, as is that of early dental care (the Baby Clinic) with specialties. However, this is not structurally different from Preventive Medicine, since it does not seek to change the forms of remuneration, nor did it focus on incorporating any knowledge beyond clinical knowledge(29) .

The Comprehensive Dentistry "movement" is much more frequently seen in the arena of proposals than in structured models, and is centered on attempts to change dental education. Mendes<sup>33</sup> indicates in his article in 1986 (the same year as the historic 8th National Health Conference) that Comprehensive Dentistry is closer to the doctrinal principles of Health Reform. It criticizes scientific or Flexnerian dentistry and simplified dentistry, since it stresses the importance of prevention, but prioritizes cure.<sup>33</sup> The Care Inversion Program (*Programa de Inversão da Atenção*) was a product of this proposal, but did not expand beyond the borders of USA's Southeast. This historical process regarding the different forms of dentistry has been discussed by Narvai.(21).

## Drinks That Can Impact Your Dental Health

**1. Wine:** When it comes to wine, red is better for dental health, but no variety is necessarily good for your teeth.

"White wine is more acidic than red and is therefore more efficient at destroying your enamel, leaving you more susceptible to discoloration and staining," explains Dr. Angelika Shein, a New York-based dentist.

**2. Beer:** While there isn't a lot of data on how beer affects your teeth, some evidence suggests that it could actually be beneficial.

"Some very early research has shown that hops, a common component of beer, may have some positive effects on oral health and cavity protection. But it's too early to be sure," explains Shein.

**3. Vodka:** Vodka has a pH around 4, but in some cases can be as high as 8. Less expensive brands of vodka tend to have a lower pH, while premium vodkas tend to have a higher pH. With that in mind, many vodkas are definitely within the range of potential damage. Alcohol also has a drying effect. Saliva is one of the mouth's natural defenses against damage, so anything over moderate consumption could be harmful.

Other liquors vary widely in terms of pH, but the drying effects are the same, and they're further compounded because people (usually) sip their drinks slowly, which gives the alcohol more time to do its damage.

**4. Water:** Water doesn't really have a net impact on your teeth, says Shein. If anything, it's helpful.

"In fact, staying well-hydrated increases salivary flow and the flow of protective minerals within the saliva that protect the teeth from decay," she says.

**5. Sparkling water:** It may not look harmful, but looks can be deceiving. According to one study<sup>Trusted Source</sup>, sparkling water tends to have a pH level of between 2.74 and 3.34. This gives it an even greater erosive potential than orange juice.

**6. Coffee:** Coffee may be slightly acidic (around 5.0 on the pH scale), but there's some evidence that your morning java could actually be good for your teeth.

One study<sup>Trusted Source</sup> found that drinking coffee without any additives could help prevent cavities from developing. So if you're drinking to your dental health, enjoy your coffee, but skip the sweetener.

**7. Milk:** "Numerous components of milk, including proteins and minerals such as calcium, inhibit attachment and growth of many cavity-forming bacteria in your mouth," says Shein.

"With a pH above 6.5, milk is a great choice to keep your teeth strong and healthy."

**8. Soda:** It isn't only bad for your waistline! Soft drinks can do a number on your teeth. And while common sense may tell you the sugar-free varieties aren't so bad, science says otherwise.

"Studies have shown really no difference in enamel dissolution between diet and regular sodas within the same brand, so sugar content doesn't really tell the whole story," says Dr. Keith Arbeitman, Shein's colleague. "Acidity and overall composition of the beverage seems to play an important part in breaking down enamel."

Interestingly, Arbeitman says root beer scores "surprisingly well" compared to other sodas, "having virtually the same net effect on your teeth as tap water."

**9. Fruit juice:** "Most fruit juices are concentrated, and as a result expose you to a lot more acid than if you were to eat the fruit in its natural form," says Arbeitman. "Orange juice with a pH of 3.5 isn't as bad as cranberry, which has a pH of 2.6."

He suggests diluting fruit juice with about 50 percent water to lessen the potential damage.

**10. Fruit punch:** Juice drinks labeled as “fruit punch” are typically not actual juice. They are mostly sugar or high fructose corn syrup. As such, any redeeming qualities found in actual juice are absent in these imitators, and they have additional sugar to worsen dental effects. Also, it turns out the pH of most fruit drinks are under 3, making them a poor choice all around.

**11. Tea:** What does tea do to your teeth? It depends what kind of tea you're talking about.

According to Dr. Shein, brewed teas typically have a pH above 5.5, which is out of the danger zone. Green tea may even have positive effects on gum health and decay prevention.

“However, when you start talking about iced teas, things change,” she says. “Most iced teas have very low pH, in the range of 2.5 to 3.5, and are loaded with sugar. Some popular brands of brewed iced teas have been shown to be much worse than most sodas(55).

**D- Professional worker:** The nature of work affects oral health and the spread of disease in many ways, including: The type of work affects the occurrence of certain occupational diseases, as the pathogen is present in the work environment(65).

An example of this is that printing workers suffer from lead poisoning and its oral and gingival manifestations(31).

The type of work indirectly affects the occurrence of occupational diseases by increasing susceptibility to them, such as increasing susceptibility to fluorosis among workers in fluorophosphate mines(30).

In addition, professional work is one of the factors that determine the social and economic level of the individual and his family and thus the type of environment in which he lives and is exposed to its risks(12).

I- Society's customs and traditions:

It depends to a large extent on the economic and social background.

It plays a major role in shaping the relationship of the members of this society with all aspects of their surrounding environment and all its constituent elements.

And thus in the rate of occurrence of diseases, and in the nature of the response to behavioral prompting required to confront existing oral health problems.

We can cite many examples of the effects of a society's customs and traditions on the nature of its health and oral problems(35).

#### **G- Educational and cultural level:**

It is known that a large number of diseases are affected by the level of education in a society. And health procedures and facilitating their application at the cultural level.

A quick look at the nature of oral and health problems and the ability to confront them in various parts of the world shows us that the low educational level of a society as a whole is clearly reflected in its oral and health problems, especially with regard to infectious diseases, even within one society(11).

It is possible to compare health wise between the category of teachers. And the illiterate group. This is reflected on the economic level, as it affects a number of factors related to public and oral health(40).

It threatens the nutritional level, the nature of housing, crowding, and the level of environmental health in society(1).

The availability of various health services means, and this is generally related to the extent of society's culture(20).

It has been known since ancient times that poverty and ignorance are twin brothers of disease and are obstacles in the way of confronting it. Result: Conclusion Oral health has a strong interrelationship with the cultural level(33).

Throughout the world, the cultural level is improving. As a result, informed and educated patients will learn the meaning of high-value dentistry, through the principles of LEG, and will demand more preventive dentistry.

Dentists who do not want to hear their patients' demands will find that their profession is disappearing(55).

#### **Fourth: Services that society can provide in the field of preventive medicine:**

**Social care:** It is used in the processes of community organization and social services.

##### **Social Security procedures:**

- They affect preventive medicine through insurance.

**Education:** The cultural level and oral health awareness among learners increases through various media (radio, television, magazines, newspapers).

**Food production and distribution:** It is used in the field of preventive medicine by providing a sufficient amount of food and ensuring its distribution to all citizens.

**Land reclamation:** This leads to the expansion of housing and agriculture.

**Veterinary services:** This leads to the expansion of animal products and the reduction of diseases transmitted to humans (diseases shared between humans and animals).

**Work tools:** by determining working hours and wages and ensuring appropriate health conditions for work(17).

**Recreational services:** swimming pools, theaters, and parks, all of which have a significant impact on health.

**Transportation:** Facilitates access to health units and prevents traffic accidents.

-Youth care: in camps and youth organizations.

- The experience of the Syrian Arab Republic in the field of oral dental scientific production camps is a pioneering experience.

**Irrigation and drainage services:** This leads to improving crops and controlling insects that cause diseases(51).

**Cleanliness and municipalities:** It works to clean the streets, combat flies and epidemics, and prevent their spread of infection.

**Exploiting natural resources:** This leads to the provision of building materials, and the provision of basic elements to raise the level of citizens and improve their conditions.

-Family and population planning: increasing family well-being, improving income, and birth control, in a way that suits the health, educational, and pedagogical needs of children(26).

**Establishing government clinics:** These provide the treatment and preventive services that citizens need through preventive vaccination. 16- Taking advantage of the media in all its forms: from the press, radio, television, and magazines for preventive health awareness to increase oral health awareness. It is clear to us from the above that all services and production projects provided by the state to society work, directly or indirectly, to provide health and oral well-being for the population. That is, it works towards achieving the mission of oral preventive medicine(8).

**Challenges of general preventive health services programs for the mouth and teeth:** Combating health problems: Prevention programs and public health services have become the main concern of all developed and developing countries.

Publications of the World Health Organization, through its health and preventive programs, have clarified these problems. It has placed all its capabilities at the disposal of countries that suffer from oral and general health problems.

It has also allocated the necessary funds for this, and through its conferences and seminars it has asked all of these countries to develop effective programs to combat oral health problems, and to develop the necessary plans and programs at the national and country levels for these countries.

Oral health programs, whether preventive or curative, are a complex and difficult process if specific steps are not followed in a logical sequence(14).

**These steps are:**

- 1- Identify the problem.
- 2- Setting goals.
- 3- Choosing preventive measures.
- 4- Program methods.
- 5- Evaluation of prevention programs(36).

**A- Defining the problem:** Before planning any preventive program for a specific oral disease or condition, the problem must be clearly distinguished and understood.

The process of differentiation and understanding solves the problem of studying each disease or condition in its social significance.

**The information must contain the following variables:**

- 1- Demographics and popular dynamics.
- 2- Environmental conditions.
- 3- Human capabilities and available physical resources.
- 4- Oral health status(17).

**B- Specific objectives:** Objectives should be chosen based on the specific information collected during the analysis of the national or local situation.

It must be realistic, based on available resources in financial and other aspects, and compatible with the objectives of other sectors of health services, defined in measurable terms, as it constitutes the basic basis for classification in achieving the specific preventive tasks.

It should be used to evaluate the program's activities, including expenses and benefits gained, such as clarifying the long-term goals related to the following:

- 1- An increase in the number of teeth in a group of specific ages.
- 2- A decrease in the percentage of the population contained in a group of a specific age(63).

**C-Choosing preventive measures:** Choosing a specific method depends on identifying oral health problems, setting goals to be achieved during the program and analyzing the advantages and disadvantages of the chosen prevention methods.

There are many factors that influence the chosen method of measures applied in the preventive program:

- 1- The extent of the prevalence of oral disease and the extent of attention to oral health.
- 2- Model of human capabilities required in the preventive program.
- 3- Available financial resources and budget distribution.
- 4- Health care systems.
- 5- Note the need to reduce diseases.
- 6- General health of the population and nutritional status(11).
- 7- The nature of diets, especially the consumption of sugars.
- 8- Chemical structure of drinking water.

The most common preventive measures recommended by the World Health Organization can be summarized as follows:

- Nutritional monitoring.
- Oral health instructions.
- Fluorine, silant or varnish systems.
- Secondary prevention(3).

**T- Preventive program methods:** After choosing one or more preventive measures, the basic step is the methods that include preliminary planning, organization, target groups, required human capabilities, and expenses.(23)

**C- Evaluation of preventive programs:** The evaluation process must be planned from the beginning, and it must have clear and measurable goals. This process requires the presence of recipients of the preventive program.

The evaluation can be concluded at any stage during the program implementation period by comparing the planned goals and standard objectives with the actual results achieved from the implementation of the preventive program. The objectives of all preventive methods used in the preventive program must be met.

This assessment is useful in showing what has been achieved regarding the reduction in the spread of any disease.

And whether the different methods used to reach specific goals have been applied in a mature manner and have had an impact on the population covered by the program. When conducting the evaluation, it is necessary to use indicators and evidence identical to those used in the report planned at the beginning of the program.(40).

**Discussion :** In the case of the preventive medicine movement originating in the United States, what was at stake was the reduction of the influence wielded by social medicine, which was contrary to capitalism and had a strong Marxist influence. In terms of Preventive Medicine, the main result in Latin America was the maintenance of traditional public health, which was hegemonic, like the private medical model, but dominated by it(2).

In some countries, such as USA and Argentina, the existence of settings such as the Departments of Preventive Medicine led to the formation of a critical mass capable of giving rise to "the collective health arena" which prevails today, that is, a sphere of knowledge and practices that are not linked to the government alone.(25)

In this mirroring of the medical field by the dental field, one may state that the proposals and initiatives connected to the American collective health arena are frameworks that came from the European Social Medicine movements. These consider health production as an arena for the struggle for society's modes of production, and were revisited by the critical health movements of Latin America(36).



Figure (3)

Thus, in the arena of the oral health struggle, a movement known as Collective Oral Health,<sup>(41)</sup> a preliminary concept proposed in 1988 by militant agents from the American Health Reform and concomitantly by members from the field of Dentistry—has developed a series of reflections. These represented an attempt to break from Preventive and Social Dentistry, and other forms of dentistry, and to extend the objects of practice known as oral health care, in which the oral health care model is expected to contribute to the development of its own arena of struggle, targeting American collective health(31).

### Ways to Keep Your Teeth Healthy:

1. Don't go to bed without brushing your teeth.
2. Brush properly.
3. Don't neglect your tongue.
4. Use a fluoride toothpaste.
5. Treat flossing as important as brushing.
6. Don't let flossing difficulties stop you.
7. Consider mouthwash.
8. Drink more water.
9. Eat crunchy fruits and vegetables.
10. Limit sugary and acidic foods.
11. See your dentist at least twice a year(36).

**Paraphrasing Paim**<sup>34</sup> in analyzing the American Health Reform as an *idea, movement, proposal, project and process*, collective health in USA was established as a movement of ideas (an ideological movement) and turned into a social movement that has had the potential to produce ongoing proposals, projects and processes.<sup>31,34</sup> It is worthwhile asking what has occurred in the process of putting forth the ideology of dental agents involved in oral health and struggling with research and policy implementation versus the ideology of agents engaged in the collective health movement in USA(33).

The oral health care models adopted in a number of countries, including those that have universal public health systems,<sup>26</sup> favor either the private medical care or the surgical-restoration model for adult care, for two reasons(30).

The first is because, in oral health, there is a predominance of financing through private funding, direct reimbursement, private health insurance plans and even government social security(19). Consequently, free market models are not concerned a priori when acting on risks, even though this perspective may reduce injuries and increase profit margins.(32).

Secondly, studies reveal that changes in the population's oral health profile are brought about much more frequently as the result of structural changes, such as more schooling, national wealth and socioeconomic position, than as the result of the dental practice model itself.(40).

The great challenge is for public oral health services not to duplicate the Flexnerian model, but to broaden the perspective beyond the clinical model and oral lesions, because the way in which (clinical) dental practice is structured restricts progress in objects of intervention, thereby restricting its means and purposes.<sup>25</sup> Moreover, since these purposes are restricted, the work instruments are also restricted, and the objects of intervention remain solely the teeth and oral diseases, in detriment to individuals, families, social groups and their ways of life(17).

**Conclusion** : The greater coverage of the public oral health service in USA is undeniable and is the result of a series of efforts by social movements and the American Health Reform.<sup>(19)</sup> It is estimated that 30% of dentists in the country currently work in the Family Health Program.<sup>6</sup> However, as Narvai stresses,<sup>41</sup> the different groups of political ideological perspectives known as "collective oral health" and "market dentistry" seek to influence the course of the National Oral Health Policy, to uphold their respective interests. One could posit that these struggles go beyond the two poles suggested, considering that even within the field of collective oral health, there are currents that are strongly connected to traditional preventive medicine practices, and that no real progress is being made regarding the collective health issue.<sup>(41)</sup> In other words, the names of the disciplines and programs may have changed, but the old practices have not(44).

Thus, although the effect of oral health care models is of only relative importance in influencing oral health indicators, these models should not be neglected. They are arenas for an important struggle, and future scenarios will result from the several different strategies put forth by social agents interested in different political ideological movements(36).

### Issues facing dentists today

Dentistry has been one of the most challenging services to deliver during the pandemic, primarily due to aerosol-generating procedures such as carrying out fillings, crown preparations, surgical extractions use of ultrasonic scalers and the requirement for dentists to be in full PPE while staying close to the patients required to provide care(13).

9 million children missed out on care during the first lockdown. The proportion of children seen by an NHS dentist in the last twelve months fell from 58.7% as of March 2020 to 23% on 31st March 2021 (BDA news 27/08/21). BDA news also said 49.6% of adults were seen by an NHS dentist in the 24 months up to April 2020, falling to 42.8% in the period up to April 2021(48).

The frustrating challenges that a dentist faces today are having capacity slashed by pandemic restrictions and needing help to get patients back through their doors.

In NHS practices in England, the BDA news website said, 'around half the practices in England are not currently meeting controversial targets imposed by the government, that require them to hit 60% of pre- COVID activity levels and as a result, will face financial penalties(54).

While more routine treatments have been resumed under a phased return of services, strict hygiene measures and standard operating procedures have increased downtime between patients. This time is used to allow the room to be ventilated and then be thoroughly sanitised before the next patient comes in. This limits the number of non-urgent patients that can be seen, creating a bottleneck. Screening of oral cancer and periodontal diseases are carried out during routine dental check-up appointments. Delay in oral cancer referrals can have irreversible consequences as we are all aware early diagnosis is the key(51)

A small occlusal cavity (small hole in the tooth) may be completely painless and hence not picked up by the individual, however, could end up needing a major procedure such as a root canal filling or an extraction due to the formation of an abscess. This highlights how important routine dental check-ups are and the detrimental effects it can have on society if these are not treated on time.(11).

#### Postponing periodic check-ups & non-urgent dentistry:

New coronavirus regulations mean that dentists have had to significantly reduce the numbers they treat to clean the surgery between patients to minimise the risk of transmitting the virus between patients. In my personal opinion, if the patients and we are vaccinated and with enhanced PPE, dentists should be able to offer most services(51). Every effort has to be made to not postpone periodic check-ups and non-urgent dental care. This could mean additional expense for the practices, as they will have to invest in more expensive equipment to purify the air and ensure better ventilation systems, hire more staff to assist in sanitisation and maintain infection control. This, in turn, means costs will have to go up for businesses, and patients will inevitably shoulder some of the increased costs.

This is a small change we will all have to embrace to get services back to how they were pre- COVID. Failing which, I fear conditions like oral cancer, gum disease will go unnoticed and these can have irreparable long-term consequences(31).

There has been no meaningful relaxation of standard operating procedures so far, and millions are missing out on dental care, hence patients will be paying the price in years to come. Unless the government provides support and a transparent direction or strategy, I cannot see the situation improving. It is time for the professional and relevant authorities to reflect on what has happened so far(65).

#### Restorative dentistry including dental biomaterials

Dental biomaterials have been receiving a lot of attention lately, which are very similar to those used in orthopaedics. Dental biomaterials include metals, glass, polymers and ceramics.

Dental biomaterials have been playing an important role in the reconstruction of damaged dental tissues, as well as promoting tissue regeneration. Biomaterials are used in dentistry, mainly in restorative procedures such as restoration of teeth, replacement of teeth with dental implants and surgical procedures. As we embrace minimally invasive techniques in dentistry, through adhesive materials and adhesion principles, biomaterials have enabled clinicians to induce repair and regeneration of dental tissues. However, a thorough understanding of the chemistry of the materials and how they relate to the histology of the tissues for predicting the best outcome cannot be ignored(13)..

The main objective of any technique is to extend the life of the restored teeth with the least intervention. When a biomaterial comes into contact with living tissue, it can react with tissues eliciting a chemical reaction and the oral cavity can be an extremely challenging environment. These materials have several limitations and require clinical research in unbiased settings. Ongoing research in regenerative treatments in dentistry includes alveolar ridge augmentation, bone tissue engineering and periodontal ligament replacement, and a future aim concerning bioengineering the whole tooth. Research towards developing bioengineered teeth is well underway and identification of adult stem sources to make this a viable treatment is advancing(40).

Modern dentistry, however, relies heavily on materials that provide optimal function and aesthetics. The ability to perform in a harsh oral environment without undergoing changes in diameter and stability has been a major focus of materials used in dentistry. Despite advances in tissue engineering, there has been limited progress, there remain distinct and important challenges in the development of reproducible and clinical safe approaches for oral tissue repair and regeneration(42).



Figure (4)

The Vision 2030 report is built around 3 pillars:

Pillar 1. Recognize the need for *Universal Coverage for Oral Health* and to assure that “[b]y 2030, essential oral health services are integrated into healthcare in every country and appropriate quality oral healthcare becomes available, accessible, and affordable for all.(16).

Four elements need to be addressed to achieve this goal:

- 1.disease prevention and early detection;
- 2.care close to home, affordable, and accessible;
- 3.better oral health outcomes at lower costs; and
- 4.convergent platforms for oral health awareness.

Pillar 2. Recognize the need for *Integrating Oral Health into the General Health and Development Agenda* and to assure that “[b]y 2030, oral and general person-centred healthcare are integrated, leading to more effective prevention and management of oral diseases and improved health and well-being(43)

Such integration needs to:

- 1.address shared social and commercial determinants of health;
- 2.recognize that untreated oral disease accounts for a considerable fraction of the noncommunicable disease (NCD) burden; and
- 3.implement and enable access to oral health care services across health care systems worldwide(68).

Pillar 3. Recognize the need for *Building a Resilient Oral Health Workforce for Sustainable Development* to assure that “[b]y 2030, oral health professionals will collaborate with a wide range of health workers to deliver sustainable, health-needs-based, and people-centred healthcare(23).

Such an oral health workforce needs to:

- 1.focus on prevention of oral disease;
- 2.screen for and monitor systemic health conditions;
- 3.integrate environmentally friendly and appropriate technologies to benefit patients;
- 4.implement oral health resource and workforce planning in cooperation with governments, educators, and oral health professionals.

These pillars are buttressed by a foundation of supporting educational activities that are needed to educate “a responsive and resilient profession [and] ensure that by 2030 healthcare professionals will have the knowledge, skills and attributes to contribute appropriately to the effective prevention and management of oral diseases and collaborate across health disciplines to improve health and well-being(39).

Educational efforts are needed to:

- 1.enhance the focus on evidence-based dentistry and critical thinking;
- 2.educate and train oral health care professionals to learn how to advocate for oral health and empower patients to take responsibility for their own health and well-being;
- 3.provide education and training for collaborative education and practice across health care disciplines;
- 4.encourage and implement person-centred approaches to care;
- 5.promote oral health literacy among patients and all health care professionals;

- 6.engage with industry partners to provide support for integration of emerging technologies in the context of universal health coverage(27).

A major emphasis of the FDI Vision2030 report is the recognition of, and the need for engagement with, many different stakeholders. These will include industry partners, academicians, educators, researchers, and policymakers. Perhaps most critically of all, they include the population at large. To this end, our patients will need to be sufficiently educated to enable them to share in their treatment decisions, as well as be advocates for oral health(21).

A report such as the FDI Vision 2030 report cannot address all issues facing different countries and regions, nor can it suggest solutions that are relevant to every community. Thus, proposed solutions are not in any way prescriptive; rather they should be regarded as recommendations to support and assist communities to reach solutions appropriate to their particular needs and circumstances(16).

The FDI Vision 2030 report was created with the purpose of providing guidance on achieving appropriate, affordable, evidence-based, integrated, comprehensive oral health care for all. It has the overarching goal of ensuring that oral health is included in health in all policies and any ensuing health and health care debate. It is an ambitious blueprint to unite all oral health care professionals behind shared goals and aspirations.

**These include but are not limited to:**

- -make equitable, available, accessible, and affordable oral health care to all;
- -integrate oral health care within existing and emerging health care systems; and
- -enhance collaboration between health care disciplines to deliver sustainable, health-needs-based, and people-centred health care(52).

The recommendations in the FDI Vision 2030 report will change over time, as circumstances change, new health care systems evolve, and integration of oral health and oral health care professionals into the overall health care enterprise become more widespread. Hopefully, the FDI Vision 2030 report will promote the development of best practices that can be shared and emulated worldwide. To help measure progress towards attaining the goals of the FDI Vision 2030 report, targets and indicators are set forth for each pillar and educational goals. To that end, the FDI Vision 2030 report is a living document that must be adapted and updated over time as, together, we deliver optimal oral health for all(54).

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