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Sugars and dental caries

14 August 2025

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Key facts

- Dental caries (also known as tooth decay or dental cavities) is the most common noncommunicable disease (NCD) worldwide, affecting 2.5 billion people.
- Even though dental caries is preventable, it poses a major health burden in many countries and affects people throughout their lifetime, causing pain, discomfort, difficulties in eating and sleeping, tooth loss and reduction in quality of life.
- The consumption of free sugars^[1] in foods and beverages is the most common risk factor for dental caries and is a shared risk factor across several NCDs.
- Limiting the intake of free sugars to less than 10% of total energy intake – and ideally to less than 5% – minimizes the risk of dental caries throughout the life course.
- WHO recommends that children under 2 years of age should not consume any sugar-sweetened beverages.
- WHO recommends implementation of a package of cost-effective policies for healthy diets including taxation of sugar-sweetened beverages (SSBs) as a fiscal policy measure to reduce sugars consumption.
- Cost-effective minimally invasive interventions for oral health are available.

Overview

Dental caries is a major public health problem globally and is the most widespread noncommunicable disease (NCD). It is prevalent throughout the life course and affects both permanent teeth and deciduous (first) teeth. It is estimated that there are 2 billion people with permanent teeth with caries and 510 million children with deciduous teeth with caries.

Consumption of free sugars is a major risk factor for overweight, obesity and dental caries. Dental caries can be prevented by avoiding dietary free sugars. Simple and cost-effective interventions are available to help people reduce their sugars consumption, and prevent dental caries. Simple, minimally invasive treatment for caries can be provided in primary health-care settings, without the need of a dental chair or specialist equipment.

Severe dental caries can lead to tooth loss and impair quality of life. The consequences of untreated dental caries include:

- **physical symptoms such pain, discomfort or chronic systemic infection;**
- **functional limitations such as challenges eating, speaking, breathing or sleeping; and**
- **detrimental impacts on emotional, mental and social well-being.**

Dental caries affects all age groups, and can start with the eruption of the first teeth (deciduous teeth). The condition increases in prevalence in adulthood. In children, dental caries often leads to absence from school. For adults, dental caries is associated with absence from work, and may negatively affect employment opportunities and reduce productivity.

In low-income settings, the majority of dental caries goes untreated. Teeth affected by caries are often extracted (pulled out) when they cause pain or infection. Prevention and treatment for dental caries is usually not part of national health benefit packages. This often leads to catastrophic costs and significant financial burden for families and communities. Improving integration of oral health care services in primary health care and health benefit packages would improve access to prevention and management of oral diseases that better respond to the needs of populations.

The total direct expenditure for oral diseases among WHO's 194 Member States amounted to US\$ 387 billion or a global average of about US\$ 50 per capita in 2019. This represents about 4.8% of global direct health expenditures. At the same time, productivity losses from oral diseases were estimated at about US\$ 42 per capita, totaling around US\$ 323 billion globally.

Risk factors

There is a clear relationship between sugars consumption and dental caries. Dental caries results when plaque forms on the surface of a tooth and converts the free sugars (all sugars added to foods and beverages by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and fruit juices) contained in foods and beverages into acids that destroy the tooth over time. A continued high intake of free sugars, inadequate exposure to fluoride and a lack of removal of plaque by toothbrushing with fluoride toothpaste containing 1000-1500 ppm concentration can lead to dental caries.

The burden of dental caries is also influenced by social determinants of health, which comprise the social, economic and political conditions that influence oral diseases, including access to safe water, sanitation and hygiene. There is a strong and consistent association between socioeconomic status and the prevalence and severity of dental caries. It disproportionately affects poor, vulnerable and/or marginalized members of societies, often including people who are on low incomes; people living with disability; older people living alone or in care homes; people who are refugees, in prison or living in remote and rural communities; and people from minority and/or other socially marginalized groups.

Additionally, the burden of dental caries is also affected by commercial determinants, which are the strategies used by some private-sector actors to promote products and choices that are detrimental to health. This includes marketing, advertising and sale of products that cause oral diseases and conditions, such as foods and beverages that are high in free sugars.

Prevention and control

Population-wide strategies to reduce the consumption of free sugars are a key public health approach to reduce the burden of dental caries. Such interventions include:

- **nutrition labelling: front-of-pack or other interpretative labelling to inform about sugars content, including mandatory declaration of sugars content on pre-packaged food;**
- **reformulation limits or targets to reduce sugars content in foods and beverages;**
- **public food procurement and service policies to reduce the offer of foods and beverages high in sugars;**
- **policies to protect children from the harmful impact of food marketing, including for foods and beverages high in sugars; and**
- **taxes on sugar-sweetened beverages (SSBs) and on sugar or foods high in sugars.**

Many oral diseases including dental caries can be prevented and treated in their early stages with cost-effective interventions. Integrating a set of essential oral health care services into national universal health coverage benefit packages using the public health care approach will have a significant impact on reducing the global burden of dental caries by improving availability and accessibility to quality care. Such interventions include the use of topical fluoride and simple restorative techniques as part of comprehensive patient-centred oral health care.

Challenges

Often, dental caries does not receive adequate priority in health planning due to an underestimation of the true burden and impact of the disease. The focus of interventions is generally characterized by an isolated disease approach and a focus on costly clinical

treatment, rather than on integrated cost-effective public health strategies that address entire populations, focusing on shared risk factors for NCDs and strategies to reduce the impact of the commercial determinants of health.

Unequal distribution of oral health professionals and a lack of interprofessional collaboration with other primary health care workers means that access to essential oral health services is often low. Out-of-pocket costs for oral health care can be major barriers to accessing care. Paying for necessary oral health care is among the leading reasons for catastrophic health expenditures, resulting in an increased risk of impoverishment and economic hardship.

WHO response

Following adoption of the [Resolution of Oral Health \(WHA74.5\)](#) at the World Health Assembly in 2021, there is renewed momentum on oral health policy and integration into the broader NCD and UHC agendas. In response to the mandate outlined in the Resolution, WHO developed the [Global strategy on oral health](#), adopted in May 2022, and included the [Global oral health action plan 2023–2030 \(GOHAP\)](#) in the report on noncommunicable diseases (NCDs), submitted to the WHA in 2023. The Action Plan includes a range of actions for Member States, WHO, international partners, civil society organizations and the private sector to promote the reduction of sugars consumption and its impact on dental caries.

As part of the [NCD Implementation road map 2023–2030](#), WHO updated cost-effectiveness analyses that informed the menu of policy options for NCDs and their shared risk factors, entitled [Tackling NCDs: Best buys and other recommended interventions for the prevention and control of noncommunicable diseases](#). This guidance is a tool to support countries in prioritizing and scaling up the implementation of impactful and feasible interventions relevant to their national context.

WHO has included the impact of dental caries in its analysis of taxing sugar-sweetened beverages (SSBs) as a cost-effective way to support healthier diets. It strongly recommends implementing SSB taxes and offers detailed guidance on how to do so. Additionally, WHO advises against using non-sugar sweeteners for weight control or reducing the risk of noncommunicable diseases, which may impact existing policies that promote product reformulation.

[1] Free sugars include all monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, as well as sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.

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