

DIET AND ORAL HEALTH

Unhealthy diet and poor nutrition affect the teeth and growth of the jaws during development and later during the life-course. The most significant effect of diet is in the mouth, particularly in the development of dental caries (Fig. 1 and 2) and enamel erosion.

Dental erosion is associated with dietary acids, of which a major source is soft drinks.

Scientific evidence shows an association between intake of free sugars and dental caries.

Nutritional status affects teeth pre-eruptively, though this is less important than the post-eruptive local effect of diet. Undernutrition, coupled with a high intake of sugars, may exacerbate caries.

Dental caries and obesity are strongly linked due to common dietary risk factors.

Dental diseases and tooth loss have a considerable impact on self-esteem, ability to eat, nutrition and health both in childhood and older age. In older people, extensive tooth loss may limit intake of healthy foods, impair nutrition and increase the risk of chronic diseases.

FACTSHEET

on oral health and
sugars intake

KEY FACTS

Tooth decay (dental caries) is the most common noncommunicable disease in Europe.

Severe dental caries may lead to pain and discomfort.

Dental caries impacts nutrition, general health and quality of life.

Dental caries is a frequent cause of absenteeism at work or school.

Dental caries and obesity are linked due to common risk factors.

Free sugars¹ are a crucial causal factor in the development of tooth decay and obesity.

Confectionery, cakes, biscuits, sweetened cereals, sweet desserts, sucrose, honey and preserves are the most common sources of free sugars.

Sugar-sweetened drinks, including fruit juices and milk-based sweetened drinks, contain free sugars.

Other foods such as bread, pasta sauce and soups also contain free sugars.

As recommended by WHO, limiting free sugars intake to less than 10% and ideally even further to less than 5% of total energy intake minimizes the risk of diet-related disease throughout the life-course.

¹ Free sugars include all monosaccharides and disaccharides added to foods and drinks by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates (WHO Guideline on sugars intake for adults and children: http://www.who.int/nutrition/publications/guidelines/sugars_intake/en/)



Fig. 1. Child dental caries



Fig. 2. Painful, severe early childhood caries



PUBLIC HEALTH PROBLEMS

Diseases of the mouth are a highly prevalent noncommunicable disease in European countries.

Between 20% and 90% of 6-year-old children have dental caries, and at age 12, an average of 0.5–3.5 permanent teeth are affected by this disease.

In European countries, nearly 100% of adults have experience of this disease and between the ages of 35–44 years, an average of 10–20 teeth have dental decay (Fig. 3 and 4).

Dental caries is a major cause of complete loss of natural teeth and this condition affects 30% of older Europeans in the age group 65–74 years. The prevalence rate of older people having lost all their natural teeth varies by country from 5% to 51%.

INEQUITY IN ORAL HEALTH

Across Europe the disease conditions are particularly frequent or severe among underprivileged and disadvantaged population groups, and socioeconomic factors also play a crucial role in the scope of services covered by primary oral health care. In many countries, both poor children and adults are underserved by dental care since access to dental care is not equitable.

ECONOMIC BURDEN

Diseases of the mouth are a costly burden to health care services. The treatment of dental diseases is expensive, accounting for between 5% and 10% of total public health care expenditures in European countries. In the European Union, the annual cost of dental care is estimated at 79 billion euros.

WHAT IS HAPPENING?

Dental caries, dental erosion and periodontal disease are major dental diseases.

Dental caries

Dental caries (cavitation) occurs due to loss of tooth substance (enamel and dentine) by acids formed by bacteria in so-called dental plaque. This process is due to the bacterial metabolism of sugars derived from the diet. Early stages of dental caries are often without symptoms, while advanced stages of dental caries may lead to pain, infections and abscesses, or even sepsis. Advanced stages often result in tooth extraction (pulled out). The development of caries is influenced by the susceptibility of the tooth, bacterial profile, quantity and quality of the saliva, low levels of fluoride, and amount or frequency of intake of sugars.

Poor salivary flow or salivary deficiencies make some individuals more susceptible to dental disease.

Dental erosion

Dental erosion is the progressive irreversible loss of tooth substance that is chemically etched away from the tooth surface by dietary extrinsic and/or intrinsic acids. Erosion reduces the size of the teeth and in severe cases leads to total tooth destruction.

Periodontal disease

The main overriding factors of periodontal disease are poor oral hygiene and the use of tobacco. In addition, evidence shows an association between diet and periodontal disease. Severe vitamin C deficiency may result in scurvy-related periodontitis. Malnutrition may also exacerbate periodontal and oral infectious diseases.

EXAMPLES OF SUGAR-RICH FOODS AND DRINKS

Confectionery, cakes, biscuits, sweetened cereals, sweet desserts, sucrose, honey and preserves are common sources of free sugars.

Sugar-sweetened beverages, including fruit-based and milk-based sweetened drinks and 100% fruit juices, are a primary source of free sugars.



Fig. 3. Adult dental caries of lower jaw teeth



Fig. 4. Adult dental caries of upper jaw

DENTAL CARIES - A PREVALENT CHRONIC DISEASE

Dental caries is a major cause of complete loss of natural teeth and this condition affects 30% of older Europeans in the age group 65–74 years. The prevalence rate of older people having lost all their natural teeth varies by country from 5% to 51%.

COMMON FOODS AND DRINKS	SUGAR TSP	COMMON FOODS AND DRINKS	SUGAR TSP
Snickers bar (52.7 g)	6.75	Carrot cake (1 medium slice)	3.00
3 Musketeers bar (60 g)	10.00	Chocolate mousse (1 medium portion)	3.00
Milk chocolate M&M's (47.9 g)	7.50	Fruitcake (1 medium slice)	5.00
		Ice cream (1 scoop)	3.00
Coca-Cola (one can)	8.25	Honey Smacks (per 100 g)	14.00
Pepsi-Cola (one can)	8.75	Golden Grahams (per 100 g)	8.75
Sprite (one can)	8.25	Cocoa Puffs (per 100 g)	9.25

WHAT CAN WE DO ABOUT IT?

The WHO Guideline on sugars intake for adults and children, published in March 2015, includes a strong recommendation for both adults and children to reduce daily intake of free sugars to less than 10% of total energy intake. A further reduction to below 5% of total energy intake would protect oral health throughout the life course. In addition, adequate exposure to fluoride should be promoted to prevent dental caries.

PREVENTION IS THE KEY TO HEALTH

Population-wide strategies to reduce free sugars consumption are the key public health approach that should be prioritized as a matter of urgency.

Implementation of public health strategies to promote appropriate exposure to and use of fluoride should be encouraged.

Fluoride is a key agent in reducing the prevalence of dental caries. Population-directed strategies may include fluoridation of water, salt or milk, and the use of fluoride-containing toothpaste.

The large financial benefits of preventing dental diseases should be emphasized to policy-makers and administrators.

FOCUS ON THE YOUNG

Effective prevention in particular on young people.

- Promoting healthy nutrition and oral hygiene practices through school health programmes;
- Providing nutritionally sound school lunches, which highlight foods that protect against dental caries such as milk and cheese;
- Banning soft drink and snack vending machines, and the sale of sweets and unhealthy foods inside or just outside school premises;
- Discouraging linkages between sports and soft drinks;
- Promoting pre-natal good nutrition and breastfeeding for at least six months;
- Encouraging caregivers to support healthy dietary habits in children.

FOCUS ON OLDER PEOPLE

Food and meal policy for older people should include:

- Promoting healthy food and drinks for older people in care homes;
- Encouraging older people to eat regularly, including breakfast, lunch and an evening meal;
- Limiting foods and drinks high in sugar to mealtimes;
- Discouraging snacking on sugary foods and drinks throughout the day as this can cause tooth decay;
- Ensuring that older people drink water rather than sugary soft drinks; and
- Making sure that food catering services provide a balanced diet.

WHO RESPONSE

Public health solutions that prevent dental caries and other oral diseases are most effective when integrated with the prevention and control of other noncommunicable diseases, based on the principles of addressing common risks and the wider shared social determinants of health.

Implementing policy measures to promote the reduction of free sugars intake is an effective way of addressing the burden and impact of dental caries in countries.

These include:

- taxing sugar-sweetened beverages, as well as foods with a high free sugars content to discourage the consumption of these foods and beverages which are contributing to increased free sugars intake, in particular in children and adolescents;
- implementing clear nutrition labelling, including the information on sugars contained in a product;
- regulating all forms of marketing and advertising of food and beverages high in free sugars to children through the use of the nutrient profile model, which helps identify products high in free sugars;
- improving the food environment in public institutions, particularly schools, through regulating the promotion and sales of foods and beverages high in free sugars;
- removing all sugar-sweetened beverages and foods for sale and service from hospitals, schools (including kindergartens and pre-schools), universities, public buildings and public workplaces; and
- increasing access to and awareness of clean water as a drink that is safe for teeth.

RELATED LINKS

Guideline: Sugars intake for adults and children. Geneva: World Health Organization; 2015 (http://www.who.int/nutrition/publications/guidelines/sugars_intake/en/, accessed 17 November 2017).

Moynihan P, Kelly S. Effect on caries of restricting sugars intake: systematic review to update WHO guidelines. *J Dent Res.* 2014; 93(1):8–18 (<https://www.ncbi.nlm.nih.gov/pubmed/24323509>, accessed 17 November 2017).

Schwendicke F, Thomson WM, Broadbent JM, Stolpe M. Effects of taxing sugar-sweetened beverages on caries and treatment costs. *Journal of Dental Research* 2016;95:327–32 (<http://jdr.sagepub.com/content/95/12/1327.full>, accessed 17 November 2017).

World Oral Health Report 2003. Geneva: World Health Organization; 2003 (http://www.who.int/oral_health/publications/world-oral-health-report-2003/en/, accessed 17 November 2017).

Resolution WHA60.17. Oral health: action plan for promotion and integrated disease prevention. Sixtieth World Health Assembly, Geneva, 14–23 May 2007. Geneva: World Health Organization (http://apps.who.int/iris/bitstream/10665/22590/1/A60_R17-en.pdf?ua=1, accessed 17 November 2017).

O'Mullane DM, Baez RJ, Jones S, Lennon MA, Petersen PE, Rugg-Gunn AJ et al. Fluoride and oral health. *Community Dent Health* 2016;33:69–99 (<https://www.ncbi.nlm.nih.gov/>

Moynihan P, Makino Y, Petersen PE, Ogawa H. Implications of WHO Guideline on Sugars for dental health professionals. *Community Dent Oral Epidemiol.* 2017;00:1–7. <https://doi.org/10.1111/cdoe.12353>
professionals. 23 October 2017

[pubmed/?term=Community+Dental+Health+\(2016\)+33%2C+69%E2%80%99399](https://pubmed.ncbi.nlm.nih.gov/?term=Community+Dental+Health+(2016)+33%2C+69%E2%80%99399), accessed 17 November 2017).

Petersen PE, Ogawa H. Prevention of dental caries through the use of fluoride – the WHO approach. *Community Dent Health* 2016;33:66–8.

For further information, visit <http://www.euro.who.int/en/health-topics/disease-prevention/oral-health>.

CONTACT

WHO Regional Office for Europe, Copenhagen, Denmark

Dr Poul Erik Petersen
WHO Senior Consultant, Oral Health Programme
petersenpe@who.int

Dr Gauden Galea
Director, Division of Noncommunicable Diseases and
Promoting Health through the Life-course
galeag@who.int

World Health Organization Regional Office for Europe

UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark

Tel: +45 45 33 70 00 Fax: +45 45 33 70 01

Email: eucontact@who.int

Website: www.euro.who.int