WHY AND **HOW** TO INTEGRATE ORAL HEALTH INTO THE **NCD** AND **UHC** RESPONSES

Briefing note for policymakers

FDI World Dental Federation (FDI) and the **NCD Alliance** have joined forces to ensure that oral health is embedded into strategies addressing noncommunicable diseases (NCDs) and Universal Health Coverage (UHC). Together, the organizations are calling for the implementation of comprehensive evidence-based policies that integrate oral health promotion and oral healthcare into NCD prevention and control and UHC benefit packages, to address health inequalities, whilst adapting to the evolving needs of populations.

This briefing note is for policymakers and provides key evidence-based messages on the associations between oral health and NCDs, and the role of oral healthcare within health systems. It aligns with FDI's **Vision 2030: Delivering Optimal Oral Health for All**.

fdi FDI World Dental Federation

NCD Alliance

Acknowledgments:

This briefing note was developed by FDI World Dental Federation together with the NCD Alliance in October 2021. It has received contributions from FDI's Science Committee, International Association for Dental Research, Noma-Hilfe-Schweiz, Smile Train, and Stowelink.

FDI World Dental Federation
Chemin de Joinville 26
1216 Geneva
Switzerland

www.fdiworlddental.org

Table of contents

DEFINITIONS

What is oral health?

Oral health has been defined by FDI as being multifaceted including the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and disease of the craniofacial complex.[1]

WHO recognizes oral health as a key indicator of general health, well-being, and quality of life; and it relates to a wide range of oral diseases, e.g., tooth decay and loss, periodontal (gum) disease, oral cancer, orofacial clefts, noma, oro-dental trauma, and oral manifestations of HIV infection.[2]

What are noncommunicable diseases (NCDs)?

The term NCDs often refers to the five conditions on which the NCD response has focused until recently – cancer, cardiovascular disease (CVD), chronic respiratory disease, diabetes, and mental and neurological disorders; but it also includes many other conditions of public health concern, such as oral diseases, which are also highly prevalent and closely associated with the most prioritized NCDs.

POLICY BACKGROUND

The COVID-19 pandemic has amplified the importance of continued and uninterrupted access to NCD health services, including oral healthcare. According to the World Health Organization (WHO), oral health services were among the most affected essential health services during the pandemic, with 77 per cent of countries reporting partial or complete disruption.[3] Oral diseases are highly associated with other NCDs and are the most prevalent diseases globally, so the lack of access to services has had a dramatic impact on people's oral health and general health outcomes and has exacerbated health inequities both within and between countries.[4] **Oral health is essential for general health, making oral healthcare an essential health service and oral health professionals, essential health workers.**

In the midst of this health emergency, in May 2021, the World Health Assembly approved a **resolution on Oral health (WHA74.5)**, considered to be a "landmark" by WHO's Director-General, Dr Tedros Adhanom Ghebreyeus. This resolution puts oral health back on the global health agenda, and it formally recognizes the need to address oral health as an integral element of both the NCD and UHC responses. The resolution is an implementation-oriented document that asks WHO to develop a 2022 Global strategy on tackling oral diseases, a 2023 Action plan for public oral health with 2030 targets, technical guidance, and NCD "best buys"* on oral health management, together with the recommendation to consider noma as a neglected tropical disease.

In parallel, **civil society and academia are working together** to ensure health promotion, oral healthcare, and other NCD services receive the necessary attention in order to meet people's needs. In January 2021, FDI launched **Vision 2030** with guidance and examples on how we can respond to oral diseases and inequalities as part of the NCD and UHC agendas. FDI and the NCD Alliance have also been working closely with the **International Association for Dental Research** (IADR) to strengthen the evidence for oral health integration and oral disease prevention and control. With representation from experts involved in FDI's Vision 2030 and the NCD Alliance, **The Lancet Commission on Oral Health** was also established in 2020 to provide policy guidance on health system reforms addressing oral health from a social justice angle.

Oral health has often been isolated within health systems in many countries, separating the mouth from the body at the health system level and underestimating the importance of oral health for general health. **Synergies to reduce overall health system costs by early and cost-effective oral health interventions and referrals for other NCDs continue to be a missed opportunity.**

This has been the tendency in health systems design and financing, despite the strong associations between oral health and NCDs, the high prevalence of oral diseases that can be prevented, and the social disparities that affect access to optimal oral health.

* The **NCD "best buys" and other recommended interventions** are a set of policy recommendations by WHO based on their cost-effectiveness to prevent the four main NCD risk factors – tobacco, alcohol, unhealthy diets, and physical inactivity – and manage four NCDs: cancer, cardiovascular disease, chronic respiratory disease, diabetes. Depending on their cost-effectiveness analysis (CEA), these policy recommendations are categorized as: "best buys" when the CEA is ≤ I$100 per DALY averted in lower and middle-income countries; effective interventions when CEA is above I$100; and other recommended interventions from WHO guidance if CEA is not available. As requested by the new resolution on Oral health, WHO plans to develop a list of "best buy" policy recommendations for oral health management in 2024. *Source: WHO. Tackling NCDs: 'best buys' and other recommended interventions for the prevention and control of noncommunicable diseases. Geneva: WHO; 2017. Available from: https://apps.who.int/iris/handle/10665/259232.*

FIVE KEY MESSAGES TO MOTIVATE ACTION

1. Oral health is a key indicator of general health, well-being, and quality of life, which is why oral diseases should be prioritized as part of the NCD and UHC responses. This can be supported by strong oral health information systems.

The facts

- **Oral diseases**, including tooth decay, tooth loss, and periodontal disease, **affect around 3.5 billion people globally**, almost half of the world's population.[5] As oral diseases start to develop early in childhood, they are also an **indicator of socio-economic status** in both children and adults.
- **Tooth decay (dental caries) in permanent teeth is the most prevalent disease worldwide**, affecting more than 1 in 4 people, and 520 million children suffer from caries of primary teeth.[5] If tooth decay is not treated early, **caries can lead to painful abscesses or even sepsis**, spreading the infection to the body and requiring tooth extraction and more complex and costly interventions.[6,7]
- Between 2016 and 2017, the **most common reason for hospitalization of children aged five to nine years** in England was tooth extraction due to dental caries; and similar data can be found in Australia, Israel, New Zealand, and the USA.[8]
- **Early tooth loss has negative consequences** on the quality of life of those affected throughout their life course. This reiterates the importance of good oral health from early childhood and the role social determinants play in children's development and health.
- **Oral diseases often manifest together with other NCDs** in the form of co-morbidities, which are conditions occurring at the same time, in the same person, because they share the same risk factors, or because some diseases predispose individuals to developing others.[9]
- There is strong evidence on the **two-way relationship between diabetes and periodontal health**: Periodontal disease is the sixth most prevalent disease worldwide[5] and a common complication of diabetes; it can also affect blood glucose control increasing the risk of diabetes complications.[10]
- Higher prevalence of **hypertension** (commonly known as high blood pressure and a risk factor for CVD complications) has also been observed in people with poor periodontal health.[11] Oral bacteria has been linked with the development of **dementia, CVD, and systemic infection**.[12,13,14] Periodontal disease has been associated with a higher risk of severe complications from **COVID-19**.[15]
- Within the field of oral health there are other serious inequities and devastating conditions. **Cleft lip and/or palate (also known as orofacial clefts)**, the most common craniofacial congenital anomalies, affect approximately 1 in 700 births with considerable ethnic and geographical variations. Low prevalence rates of orofacial clefts in certain regions could be due to the high rates of infant mortality and lack of surveillance capacity. Indeed, orofacial clefts are **a severe birth defect leading to high rates of infant mortality in rural and poor settings** when there is no timely access to quality surgery.[16]
- Since the 1990s there is an **absence of global data on noma**, a bacterial but non-contagious necrotizing disease that starts as a gingivitis in mainly children aged 2–6 years, quickly spreading with a 90% fatality rate, demonstrating the urgent need for stronger oral health surveillance. In 1998, it was estimated by WHO that there are 140,000 new cases of noma every year mostly happening in sub-Saharan Africa and in peri-urban and rural areas, given the **association of noma with extreme poverty.**[17] Both noma and orofacial clefts often lead to lifelong disability and may result in social exclusion.
- **Standardization and integration of oral health indicators** within national health information systems is a crucial step to know the true and growing prevalence of oral diseases and co-morbidities across countries, allowing re-prioritization of programmes according to populations' needs and monitoring of progress within and between countries.
- Oral health indicators can also help **measure well-being**. Sustainable Development Goal 3 has a twin objective to one, ensure healthy lives, and two, promote well-being for all at all ages, and the latter requires indicators that measure quality of life.

FIDEL, 30 YEARS OLD

A health advocate with lived experience of noma, Switzerland

"I remember I was outside playing with my brother when the gum started to itch. I was around 3 years old, few memories remain. Next thing I had was a feeling of burning. I think the headache masked the pain in my cheeks and I remember the odour.

On the upper jaw, I lost every tooth but one. The right side of my face was obliterated. Based in Burkina Faso, I had to go to Switzerland to get operated, and it was only when I was 14 years old that I received a prosthesis (before I would have a gum replacement). I had to re-learn how to speak, eat, and especially chew.

In total, I had over 6 years of intense speech therapy and daily training in front of the mirror. It was hard and I was often sad and fed-up. But my mother motivated me and she never gave up. When I get sick, the first thing which gets swollen is my mouth and I have to take out my prosthesis so it doesn't hurt. I must go quite often to the dentist just to replace the fixture. Today, I have managed to eat normal, but must avoid things that require much chewing.

Call to actions

- Show political will and ensure decision-makers **consider oral health services as essential and integrate them** within health systems with adequate financial and human resource allocation.
- Ensure the 2022 Global strategy on tackling oral diseases and 2023 Action plan for public oral health **recognize the oral disease burden within the NCD response and seek to address the associations between oral health, NCDs, and well-being**. To implement this at the national level, oral health must be part of national NCD action plans and strategies.
- **Use standarized oral health indicators for oral diseases and risk factors** and integrate them systematically within national health information systems, given the intersections between oral diseases, NCDs, and well-being. National monitoring and surveillance will be essential to support research, ensure policy and workforce planning is needs-based, and raise the profile of devastating conditions such as orofacial clefts and noma.

2. Oral diseases and other NCDs share modifiable risk factors, and joint prevention is possible through a multisectoral response and existing cost-effective solutions.

The facts

- Oral diseases and other NCDs share common modifiable risk factors, namely **tobacco use, alcohol use and unhealthy diets**.
- Dental caries – the most prevalent disease worldwide – do not occur in the absence of **free sugars**[¥]; while the increase in high sugar diets in both high-income and increasingly in low- and middle-income countries (LMICs) is also impacting the prevalence of type 2 diabetes and obesity, even among children.[18]
- **Tobacco use and alcohol use are associated with periodontal disease**[19,20] and are strongly implicated in the development of **many cancers** – including lip and oral cavity cancers, which are the leading cause of cancer mortality among men in India and Sri Lanka.[21]
- Tobacco use also comprises **smokeless tobacco** (including tobacco that is chewed, kept in the mouth or sniffed), which is estimated to be used by more than 300 million people worldwide, with a higher use prevalence in South and Southeast Asia.[22] Chewing tobacco (such as areca nut and betel quid) is associated with a **higher risk of oral cancers**.[23]
- In the past few years, there is increasing evidence on the possible health risks of electronic nicotine delivery systems (ENDS), including **e-cigarettes**, and heated tobacco products (HTPs). E-cigarette smokers report, for example, **mouth and throat irritation, periodontal damage, and respiratory disease**. Therefore, advising the use of e-cigarettes for smoking cessation has been heavily discouraged among health professionals.[24,25]
- Alcohol consumption increases the risk of **traumatic dental injury**. Also, **alcoholic drinks often contain high amounts of sugar**, or are consumed with other beverages high in sugar, combining and increasing the risk of developing oral diseases and other NCDs.[26]
- Health professionals including dentists have a role in raising awareness about NCD risk factors among their patients.[27] However, it is also imperative to **adopt a set of evidence-based policies to address the root causes of these risk factors**, including the social and commercial determinants of health, and unhealthy industry interference in policymaking.
- While there is **strong evidence on the role that public regulation** has in reducing the harm caused by unhealthy commodity industries, there is a lack of evidence on the effectiveness of industry self-regulation.
- **Interference by unhealthy commodity industries** has been a persistent obstacle to governments developing and implementing NCD policies. Tactics include orienting their corporate social responsibility to obtain positive media coverage and leverage relationships with governments, and intensifying lobbying activities to stop, delay, and/or weaken health regulations.[28]
- WHO identifies **NCD "best buys" and other recommended interventions** that are evidence-based and cost-effective to improve NCD prevention and management at country and regional levels. Many of the already existing recommended interventions offer significant benefits for oral health, including policies to reduce all forms of tobacco use, alcohol use, and unhealthy diets with interventions to reduce intake of sugar and ultra-processed foods.
- Existing "best buys" and other recommended interventions range **from taxation and labelling of unhealthy commodities to promoting exclusive breastfeeding for the first six months of life and other interventions at the clinical level**, such as oral cancer screening in high-risk groups,[29] where dentists play an important role.[30]
- There is a "best buy" on **vaccination against the human papillomavirus (HPV)** in the context of cervical cancer management, and it is notable that HPV is also associated with an increasing incidence of oral cancers.[31]
- There are also **significant inequalities in exposure to NCD risk factors**, which further exacerbates health inequalities and is compounded by the lack of access to health promotion, oral healthcare, and other NCD services.[32]
- Dental caries and obesity often start developing early in childhood, even before children attend school. **Prevention interventions at the pre-school and community levels** are therefore crucial, including during pregnancy.
- Pregnant women are at higher risk of developing hypertension and diabetes,[33] and experience hormonal changes that can increase the risk for periodontal disease. Thus, **maternal, newborn and children health (MNCH) and school programmes** should also provide health promotion and basic oral health services.

¥ **Free sugars** are sugars added to foods and drinks, and sugars naturally present in honey, syrups, and fruit juices. *For more information, please refer to: WHO. Guideline: sugars intake for adults and children. Geneva: WHO; 2015. Available from: https://www.who.int/publications/i/item/9789241549028.*

Call to actions

- Ensure the 2022 Global strategy on tackling oral diseases and 2023 Action plan for public oral health **address NCD risk factors**, as part of the oral health response, **with a focus on public regulation and population-wide interventions**.
- **Implement existing cost-effective measures** (including WHO's NCD "best buys" and other recommended interventions) **to reduce tobacco use, alcohol use, and unhealthy diets, in particular sugar intake**, including through tax increases, advertising restrictions, clear nutrition labelling, improving food environments in public institutions, and increasing awareness and access to clean water in order to reduce consumption of sugary drinks.
- Evaluate the above and other prevention strategies for their benefits to oral health, including through cost-benefit assessments, to **make the case for long-term investment in prevention and identify new prevention measures** that can be scaled up, supporting governments in their decision-making.
- Strengthen health professionals' education and collaboration to **ensure oral health professionals and other professionals working within MNCH, school, or pre-school programmes can deliver brief interventions** on NCD risk factors.

3. Poor oral health is a risk factor for NCDs, and thus health systems can be optimized and strengthened by integrating oral health promotion and oral healthcare services for all.

The facts

- Given the associations between oral health, NCDs, and general health, **poor oral health should also be considered a risk factor for NCDs beyond oral diseases**, which illustrates the need for interventions to protect oral health that are population-wide.
- Oral diseases **disproportionately impact people from LMICs and marginalized groups** with limited access to health promotion, oral healthcare, and other NCD services. This exacerbates existing social and health inequalities, given that oral diseases lead to preventable long-term pain resulting in a significant number of lost work and school days, making oral health a clear indicator of overall population health, well-being, and quality of life.[35]
- **Oral healthcare is also one of the most expensive health services** for both health systems and households. Worldwide, oral diseases and conditions accounted for US$357 billion in direct costs and US$188 billion in indirect costs in 2015.[36]
- In the European Union (EU), **oral diseases were the third highest driver of health expenditure** in 2015 among NCDs, after diabetes and CVD.[37] However, **less than one-third of oral healthcare expenditure is covered by government or compulsory insurances** across EU countries (2018 figures).[38] This demonstrates the limited financial protection available for oral healthcare and the exposure to high out-of-pocket expenses for low-income families.
- In LMICs, coverage of oral health services is often very low or non-existent, **exposing households to a higher risk of catastrophic health expenditure**[Ŧ] if they receive dental treatment,[39] or even entirely precluding access to oral healthcare.
- Despite the wealth of evidence demonstrating the important role oral health plays in securing general health, **oral healthcare is rarely included in countries' UHC benefit packages**. This is the case even in high-income countries. In the EU, only the national health systems of Croatia, Germany, and Slovakia cover more than half of the countries' total oral healthcare expenditure.[38] A lack of integration and funding of oral health within overall healthcare systems persists,[40] while studies have shown fewer hospitalizations for at-risk patients who receive integrated medical and oral healthcare services.[41]
- Low socio-economic status has been associated with a higher prevalence of caries among children and adolescents, even when there is full coverage for oral healthcare services.[42] **Oral health literacy interventions and basic packages of oral healthcare should also be made available at the primary healthcare (PHC) level** to ensure communities can access and afford to meet their oral health needs.[43]
- In terms of oral health promotion, given the proven efficacy, cost-effectiveness, and safety of fluoride for reducing the prevalence of dental caries and improving oral health, **policies to increase access to fluoridated toothpaste, and community-based fluoridation where appropriate**[§], are of paramount importance.[44, 45]

Ŧ **Catastrophic health expenditure** can be defined as a household's contribution to the health system due to health expenditure that exceeds the household's capacity to pay. This capacity threshold has been established at 40% of the household's income. *Source: Xu K, Evans DB, et al. Household catastrophic health expenditure: a multicountry analysis. Lancet. 2003;362(9378): 111–7. Available from: https://doi.org/10.1016/s0140-6736(03)13861-5*.

§ For instance, **water fluoridation** is an effective and safe way to systematically protect oral health in populations with a moderate to high risk of tooth decay and reduce oral health inequalities. The recommended level of fluoride needs to be provided and therefore, fluoridation needs to be accompanied by quality control measures and regular monitoring. There might be regions with water naturally rich in fluoride, or where fluoride is already available through other sources (e.g., through fluoridated milk, salt, or dietary supplements). *Source: FDI. Promoting Oral Health through Water Fluoridation. FDI Policy Statement adopted by the FDI General Assembly: September 2014, New Delhi, India. Original version adopted by the FDI General Assembly: November 2000, Paris, France. New Delhi: FDI World Dental Federation; 2014. Available from: https://www.fdiworlddental.org/promoting-oral-health-through-water-fluoridation*.

STEPHEN, 25 YEARS OLD

An NCDs/health advocate living with multiple chronic conditions, Kenya

"I remember that before making the bold decision to finally have my first decayed tooth extracted, I suffered a long time with the pain because treatment was inaccessible and expensive and had to be paid out of pocket.

The toothache meant that I could not eat properly, concentrate in class, or sleep well. This had a clear impact on my health and eventually, when the nerve pain became unbearable, I had several teeth extracted and replaced with dentures – a costly process. I believe oral health services need to be more accessible to the millions of people who currently have no availability, to safeguard their quality of life.

Call to actions

- Ensure the 2022 Global strategy on tackling oral diseases and 2023 Action plan for public oral health **consider poor oral health as a risk factor not only for oral diseases but also other NCDs**, integrating both oral health promotion and oral healthcare services into UHC benefit packages.
- **Implement population-wide measures for oral health promotion** that aim to increase oral health literacy and access to fluorides where appropriate, promoting good oral hygiene habits as a way of also protecting general health and overall well-being.
- In addition to the already existing NCD "best buys" and other recommended interventions, **leverage the upcoming NCD "best buys" on oral health management** tasked to WHO in the resolution on Oral health, which will identify cost-effective prevention and treatment interventions that can be made available at PHC level as **part of country-specific basic packages of oral healthcare**.
- Improve access to oral health services and **ensure supportive policies for marginalized groups** to reduce health and social inequalities. For instance, oral health services included within UHC benefit packages should not be exclusive to a specific population group only (e.g., in some countries, oral healthcare is only covered for children) and special oral health support should be provided to people who may have limited access or difficulties to perform self-care interventions, such as people living with disabilities and older people.

4. Good oral health can positively impact NCD treatment outcomes so there is a need to invest in more multidisciplinary research and interprofessional collaboration across care teams.

The facts

- There is strong evidence that for people living with diabetes, good periodontal health leads to improved blood glucose control, reduces the likelihood of hospitalization, and lowers the cost of treating diabetes.[46] This is just one example of **the role that oral healthcare can play for the optimal management of NCDs**, and to improve quality of life.
- It is estimated that 30–35% of **people undergoing cancer treatment** (radiotherapy and/or chemotherapy) will suffer from oral manifestations such as dry mouth, bleeding, and mucositis, requiring oral healthcare.[47]
- **People living with other conditions, such as chronic kidney disease or HIV/AIDS**, also often develop oral manifestations that should be treated by dental teams to maximize their health outcomes and well-being.[48, 49]
- **People born with orofacial clefts**, a relatively common congenital condition affecting 1 in 700 births,[16] have an increased risk of developing dental caries, periodontal disease, and other maxillofacial, dental and well-being issues across their life course, making oral healthcare an essential component of their care. This often requires oral health professionals to coordinate with other specialists – such as surgeons, otolaryngologists, and speech therapists in multidisciplinary care teams.[50]
- **Integrated care practices require policies that better enable and support collaboration between health professionals**, allow referrals and the exchange of dental and medical records for professionals to make informed decisions, and make care truly people-centred. This collaborative approach needs to be anchored in the education of health professionals, receiving training on the needs, forms, and evidence for integrated care.
- There is an association between periodontal disease and **poorer hypertension treatment outcomes**, although further research is needed to determine the direct positive impact of periodontal treatment in blood pressure control.[51] There is also growing evidence on the association between oral health and the **risk of complications following a kidney transplant**,[52] and the importance of receiving oral healthcare prior to transplant interventions in general.[53]
- **More multidisciplinary research is needed to assess the impact and cost-effectiveness of oral treatment in these NCD interventions**, making the case for integrated care and optimal NCD management. **Research and surveillance need be supported in parallel** to ensure results are based on the latest data, and the scope of oral health research needs to span across health, behavioural, and social science disciplines to better understand both the complexity of clinical associations between oral and general health, and the challenges in implementing dental public health interventions and integrating oral health services.

** To learn more about the role of intra- and interprofessional collaboration in the oral health response, please refer to **Vision 2030**'s pillar 3: *Building a resilient oral health workforce for sustainable development.*

DR CAMPODONICO

Paediatric dentist and presurgical orthopedist at Fundación Gantz, Chile

"As a paediatric dentist, my goal is good oral health for my patients. Sadly, over 60% of children born with a cleft under the age of 6 already experience caries and/or periodontal disease.

To achieve good oral health for patients with cleft, oral health professionals have to work in a team that includes not only the patient, their family, and other caregivers, but also the non-oral health professionals of the comprehensive cleft care team. Education in preventing oral diseases will give the whole care team the tools to speak the same language, provide comprehensive oral health guidance during appointments, and reinforce these messages over time, inviting patients and caregivers to participate in their own oral healthcare. This is the best way to achieve our goal: healthy, happy, smiling children and adults.

Call to actions

- Ensure the 2022 Global strategy on tackling oral diseases and 2023 Action plan for public oral health **address challenges around health professionals' education, planning, and collaboration**, and **support multidisciplinary research**.
- **Include oral health in the curricula of all health professions**, and ensure oral health professionals' education addresses diseases associated with oral health and the **practicalities of multidisciplinary care**, providing guidelines on NCD risk factors, and protocols for screening and risk assessment.
- **Strengthen interprofessional collaboration** between oral health and other health professionals to improve prevention and management of co-morbidities between oral diseases and other conditions, **for example, by sharing medical and oral health records, and reinforcing referral mechanisms**.
- Support and promote **research into the scale, nature, and patterns of co-morbidities of oral diseases and their impact and interactions with NCD treatments**, and into the effectiveness of interventions for oral health and NCDs, including also social and behavioural interventions that tackle NCD risk factors and determinants.

5. Engaging people living with oral diseases, communities, and health professionals is crucial to successfully integrate oral health into the NCD and UHC responses.

The facts

- In 2004, general and oral health was recognized as a basic human right by the Nairobi Declaration[††]; and **the right to participation in decision-making is intrinsic to the right to health**.
- The experience of people living with oral diseases and other NCDs and their expertise in terms of identifying real gaps in meeting people's needs is a powerful asset in **ensuring that NCD and social policies, programmes, and services are effective and relevant to the beneficiaries** they are intended to serve.
- The **meaningful involvement of people living with oral diseases and multiple conditions will be key** to the implementation of the WHO resolution on Oral health in order to ensure an effective national response at the community and PHC level.
- **Civil society organizations (CSOs) are also a crucial force in overcoming NCDs**, ensuring countries can work towards reduction of health inequalities and integration of oral health and NCDs into existing health programmes. The role of CSOs can be summarized by the **"four A's"**: Advocacy, Access, Awareness, and Accountability.[56] They are key agenda-setters, implementers, educators, and watchdogs, always working in close collaboration with the people living with or affected by NCDs, their communities, and the health and care workforces.
- **Communities' in-depth knowledge of the reality on the ground is a major asset** in identifying and addressing inequalities and implementation bottlenecks, supporting the development of optimal approaches that can be adopted in different contexts. CSOs are closely involved in community life and help raise awareness not only of NCDs and their risk factors, but also about the importance of demanding policies and actions from decision makers, monitoring industry influence, and holding governments accountable for delivering on their promises.
- Furthermore, **health and care workers including dentists and other oral health professionals should also be key stakeholders in the planning and implementation of NCD interventions**. Dental teams play an important role beyond the direct provision of oral healthcare, for instance, performing screenings for oral cancer, diabetes, and hypertension, and referrals for early diagnosis of NCDs following a risk assessment.[30,54,55] They can also deliver tobacco cessation support, raise awareness on alcohol and substance abuse, and provide nutritional advice.[27] "If every tobacco user attending oral healthcare facilities is provided with brief tobacco interventions, it will have a major impact on tobacco use prevalence" (WHO, 2017).[57]
- **Dental teams have a social responsibility towards the people they serve and shall aim for the highest standards of patient safety, quality care, and sustainability**. For instance, dentists prescribe 10% of antibiotics and have a crucial role in preventing oral infections, raising awareness about antimicrobial resistance, and limiting their prescriptions when it is only safe and necessary – antibiotics need to work, when we need them.[58] Prevention is also key in the phase down of dental amalgam use in the context of the Minamata Convention on Mercury, bringing the opportunity to promote less invasive dentistry, find alternatives to dental amalgam that are accessible, affordable, durable, and environmentally friendly, and improve waste management.
- **Other health and care workers, including community health workers, also have a role** in promoting oral health literacy at the community and PHC level, increasing awareness about the importance of oral health.

†† **The Nairobi Declaration on Oral Health in Africa: A Commitment to Action**, was adopted on 15 April 2004 by Member States representatives participating in the "Planning Conference on Oral Health in the African Region" organized by FDI and WHO from 14 to 16 April 2004.

CRIS, 23 YEARS OLD

A health advocate living with cleft lip and palate, Philippines

"I am grateful to have participated in dialogues around NCDs and represent individuals who are born with a cleft.

Growing up, I did not have the opportunity to receive the surgery and care I needed and this became a challenge for me and my family. It not only affected my physical well-being, but also my psychosocial health. Now that I have received the care I needed, I hope to be able to speak out for those who are not as fortunate in my own little way. I try to speak and represent the cleft community as best as I can and have offered to support others individuals who may need some guidance and encouragement. I hope that through more engagement opportunities, we can raise awareness about these challenges and contribute to policies and actions that truly give others an opportunity to receive timely care and enable them to live happier, healthier, and more productive lives.

Call to actions

- Ensure the 2022 Global strategy on tackling oral diseases and 2023 Action plan for public oral health **recognize oral health as a fundamental human right**, and with that, the right of people and communities to participate in decision-making.
- **Consult and meaningfully involve people living with oral diseases and other NCDs** in the planning, development, and implementation of oral health, NCDs, and UHC programmes in line with the **Global Charter on Meaningful Involvement of People Living with NCDs**.
- **Collaborate with CSOs, including professional bodies**, to ensure that public health policies address the current gaps in services and access for the most excluded, and share information about your actions with them so that they can hold governments and international organizations accountable to their commitments.
- **Engage health professionals across specialties** in the planning, development, and implementation of oral health, NCD, and UHC policies in order for these to encourage interprofessional collaboration and respond to the challenges that health professionals face to ensure patient safety, quality care, and sustainability in their practice.

SNAPSHOT OF SOME ASSOCIATIONS BETWEEN ORAL DISEASES, OTHER CONDITIONS AND NCD TREATMENTS

DEMENTIA: There is strong evidence showing that periodontal pathogens can play an important role in the development of Alzheimer's disease.[12]

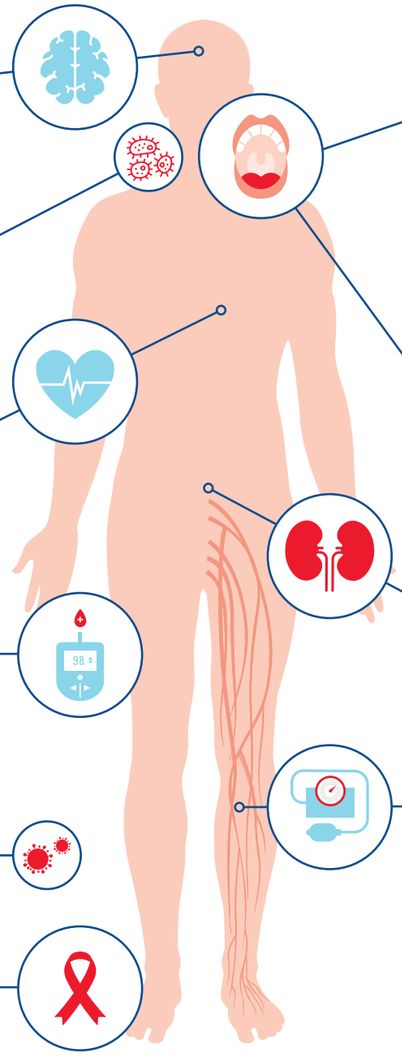
NOMA: A multifactorial and non-contagious necrotizing disease that starts as a gingivitis in young children with a fatality rate of 90%. It is associated with extreme proverty, malnutrition, coinfections such as with measles, and poor oral hygiene.[17]

CARDIOVASCULAR DISEASE (CVD): Poor periodontal health has been linked with the development of CVD through the systemic inflammation caused by oral bacteria.[14]

DIABETES: There is a two-way relationship with periodontal disease. People with diabetes have an increased risk of periodontal disease, and treatment of periodontal disease improves blood glucose levels.[10] Dental teams can provide screening for diabetes identifying patients at risk, contribute to the optimal management of diabetes, and make referrals when relevant.

COVID-19: Periodontal disease has also been associated with a higher risk of severe complications from COVID-19.[15]

HIV/AIDS: People living with HIV infection often develop oral manifestations that should be treated to maximize their quality of life.[49]



OROFACIAL CLEFTS: A relatively common congenital condition that has lifelong physical and psychological implications for those affected, resulting in an increased risk of developing oral diseases, and often leading to social exclusion.[50]

ORAL CANCER: Oral cancer has been associated with alcohol use, all forms of tobacco use (including smokeless tobacco), and HPV; and 70% of oral cancers are preceded by premalignant oral lesions that can be treated if detected on time. Dental teams can provide screening for oral cancer identifying premalignant oral lesions and make referrals when relevant.[30]

CHRONIC KIDNEY DISEASE (CKD) AND TRANSPLANTS: People living with CKD often develop oral lesions; and oral health has been associated with the risk of complications following a kidney transplant.[48,52]

HYPERTENSION: Higher prevalence of hypertension has been observed in people with periodontal disease, and the latter has been associated with poorer hypertension treatment outcomes.[11,51] Dental teams can provide screening for hypertension identifying patients at risk and make referrals when relevant.

CANCERS: People living with cancer and undergoing radiotherapy and/or chemotherapy often develop oral manifestations such as dry mouth, bleeding, and mucositis.[47]

Given the strong associations between oral health and NCDs, poor oral health should also be considered a risk factor for NCDs beyond oral diseases, promoting access to integrated care services that include oral health promotion and oral healthcare.

APPENDICES

Appendix 1:

Summary of main NCD 'best buys' and other recommended interventions to improve oral health[29]

	"Best buys" (effective interventions with a cost-effectiveness analysis, CEA, ≤ I$100 per DALY averted in LMICs)	**Effective interventions** with CEA >I$100 per DALY averted in LMICs	**Other recommended interventions** from WHO guidance (CEA not available)
Tobacco use	Excise taxes and prices on tobacco products. Plain or standardized packaging, and/or large graphic health warnings. Bans on tobacco advertising, promotion, and sponsorship. Smoke-free spaces to reduce exposure to second-hand smoke in all indoor workplaces, public places, public transport. Mass media campaigns to educate public about harms.	Cost-covered and population-wide support for tobacco cessation to all those who want to quit tobacco use.	Measures to minimize illicit trade in tobacco products. Bans on cross-border advertising (i.e., including social media channels, etc.). Mobile phone-based tobacco cessation services.
Harmful use of alcohol	Excise taxes on alcoholic beverages. Bans on alcohol advertising. Restrictions on the physical availability of retailed alcohol (i.e., reducing hours of sale).	Sobriety checkpoints to enforce drink-driving laws and blood alcohol concentration limits. Brief psychosocial intervention for persons with hazardous and harmful alcohol use.	Minimum prices for alcohol, and review of prices in relation to level of inflation and income. Minimum age for purchase or consumption of alcoholic beverages and reduce density of retail outlets. Bans on promoting alcoholic beverages to young people (i.e., via sponsorships and activities). Prevention, treatment, and care services for people living with alcohol use disorders and comorbid conditions. Labelling and availability of consumer information on harm of alcoholic beverages.
Unhealthy diets		Reduction of sugar consumption through effective taxation on sugar-sweetened beverages.	Promotion and support for exclusive breastfeeding for the first 6 months of life. Subsidies to increase the intake of fruits and vegetables. Restrictions on portion and package size to reduce energy intake. Nutrition education and counselling in different settings (e.g., pre-schools, schools, workplaces, and hospitals) to increase intake of fruits and vegetables. Nutrition labelling to reduce total energy intake, sugars, sodium, and fats. Mass media campaign on healthy diets, including social marketing.
Diabetes	Effective glycaemic control for people living with diabetes, along with standard home glucose monitoring for people treated with insulin to reduce diabetes complications.		
Cancer	Vaccination against HPV (2 doses) in girls aged 9–13 years.		Oral cancer screening in high-risk groups (i.e., tobacco users, areca nut and betel quid chewers) linked with timely treatment.

Appendix 2:

References

1 Glick M, Williams DM, et al. A new definition for oral health developed by the FDI World Dental Federation opens the door to a universal definition of oral health. *International Dental Journal*. 2016;66(6): 322–4. Available from: https://doi.org/10.1111/idj.12294

2 WHO. Oral health. Available from: https://www.who.int/health-topics/oral-health [Accessed on 10 August 2021]

3 WHO. *Pulse survey on continuity of essential health services during the COVID-19 pandemic. Interim report*. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuity-survey-2020.1

4 FDI. Dental disaster: One year after first lockdowns dentists around the world confront the consequences of the COVID-19 pandemic on people's oral health. Media release on 18 March 2021. Available from: https://www.fdiworlddental.org/dental-disaster-one-year-after-first-lockdowns-dentists-around-world-confront-consequences-covid-19 [Accessed on 10 August 2021]

5 GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet*. 2020;396: 1204–22. Available from: https://doi.org/10.1016/S0140-6736(20)30925-9

6 Dave M, Barry S, et al. An evaluation of sepsis in dentistry. *Br Dent J*. 2021;230(6): 351–7. Available from: https://doi.org/10.1038/s41415-021-2724-6

7 Mannan S, Tordik PA, et al. Dental abscess to septic shock: a case report and literature review. *J Endod*. 2021;47(4): 663–70. Available from: https://doi.org/10.1016/j.joen.2020.12.016

8 WHO. *Ending childhood dental caries: WHO implementation manual*. Geneva: WHO, 2020. Available from: https://www.who.int/publications/i/item/ending-childhood-dental-caries-who-implementation-manual

9 Valderas JM, Sibbald B, Salisbury C. Defining Comorbidity: Implications for Understanding Health and Health Services. *Ann Fam Med*. 2009;7(4): 357–63. Available from: https://doi.org/10.1370/afm.983

10 Casanova L, Hughes FJ, Preshaw PM. Diabetes and periodontal disease: a two-way relationship. *British Dental Journal*. 2014;217: 433–7. Available from: https://doi.org/10.1038/sj.bdj.2014.907

11 Munoz Aguilera E, Suva J, et al. Association Between Periodontitis and Blood Pressure Highlighted in Systemically Healthy Individuals. *Hypertension*. 2021;77(5): 1765–74. Available from: https://doi.org/10.1161/HYPERTENSIONAHA.120.16790

12 Beydoun MA, Beydoun HA, et al. Clinical and Bacterial Markers of Periodontitis and Their Association with Incident All-Cause and Alzheimer's Disease Dementia in a Large National Survey. *J Alzheimers Dis*. 2020;75(1): 157–72. Available from: https://doi.org/10.3233/jad-200064

13 Choi S, Kim K, et al. Association of Chronic Periodontitis on Alzheimer's Disease or Vascular Dementia. *J Am Geriatr Soc*. 2019;67: 1234–9. Available from: https://doi.org/10.1111/jgs.15828

14 El Kholy K, Genco R, Van Dyke TE. Oral infections and cardiovascular disease. *Trends in Endocrinology & Metabolism*. 2015;26(6): 315–21. Available from: https://doi.org/10.1016/j.tem.2015.03.001

15 Marouf N, Cai W, et al. Association between periodontitis and severity of COVID-19 infection: A case–control study. *J Clin Periodontol*. 2021;48: 483–91. Available from: https://doi.org/10.1111/jcpe.13435

16 Mossey PA, Modell B. Cobourne MT (ed). Cleft Lip and Palate. Epidemiology, Aetiology and Treatment. *Front Oral Biol*. 2012;16: 1–18. Available from: https://doi.org/10.1159/000337464

17 WHO Regional Office for Africa. *NOMA is a severe disease: It is treatable if detected and managed early!* Brazzaville: WHO Regional Office for Africa; 2016. Available from: https://www.afro.who.int/sites/default/files/2017-07/Information_brochure_EN.pdf

18 Peres MA, Macpherson LMD, et al. Oral diseases: a global public health challenge. *Lancet*. 2019;394(10194): 249–60. Available from: https://doi.org/10.1016/S0140-6736(19)31146-8

19 Zhang Y, He J, He B, Huang R, Li M. Effect of tobacco on periodontal disease and oral cancer. *Tobacco Induced Diseases*. 2019;17(40). Available from: https://doi.org/10.18332/tid/106187

20 Pulikkotil SJ, Nath S, et al. Alcohol consumption is associated with periodontitis. A systematic review and meta-analysis of observational studies. *Community Dent Health*. 2020;37(1): 12–21. Available from: https://doi.org/10.1922/cdh_4569pulikkotil10

21 Bray F, Ferlay J, et al. *Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer Journal for Clinicians*. 2018;68: 394–424. Available from: https://doi.org/10.3322/caac.21492

22 Siddiqi K, Husain S, et al. Global burden of disease due to smokeless tobacco consumption in adults: an updated analysis of data from 127 countries. *BMC Med*. 2020;18(222). Available from: https://doi.org/10.1186/s12916-020-01677-9

23 Asthana S, Labani S, et al. Association of Smokeless Tobacco Use and Oral Cancer: A Systematic Global Review and Meta-Analysis. *Nicotine & Tobacco Research*. 2019;21(9): 1162–71. Available from: https://doi.org/10.1093/ntr/nty074

24 Ogawa H, Kateeb E. *The Effects of E-cigarettes on Oral Health*. Geneva: FDI World Dental Federation, 2021. Available from: https://www.fdiworlddental.org/effects-e-cigarettes-oral-health

25 Xie W, Kathuria H, et al. Association of Electronic Cigarette Use With Incident Respiratory Conditions Among US Adults From 2013 to 2018. *JAMA Netw Open*. 2020;3(11): e2020816. Available from: https://doi.org/10.1001/jamanetworkopen.2020.20816

26 Grocock, R. The relevance of alcohol to dental practice. *Br Dent J*. 2017;223: 895–9. Available from: https://doi.org/10.1038/sj.bdj.2017.997

27 Yonel Z, Sharma P. The Role of the Dental Team in the Prevention of Systemic Disease: the Importance of Considering Oral Health As Part of Overall Health. *Prim Dent J*. 2017;6(3): 24–27. Available from: https://doi.org/10.1308/205016817821930980

28 Collin J; Ralston R, et al. *Signalling Virtue, Promoting Harm: Unhealthy commodity industries and COVID-19*. Geneva: NCD Alliance, SPECTRUM; 2020. Available from: https://ncdalliance.org/resources/signalling-virtue-promoting-harm

29 WHO. *Tackling NCDs: 'best buys' and other recommended interventions for the prevention and control of noncommunicable diseases*. Geneva: WHO; 2017. Available from: https://apps.who.int/iris/handle/10665/259232

30 Yahya IB, Anagnostou F. *Oral cancer: Prevention and patient management*. Geneva: FDI World Dental Federation; 2018. Available from: https://www.fdiworlddental.org/sites/default/files/2020-11/fdi-oral_cancer-prevention_and_patient_management.pdf

31 Pytynia KB, Dahlstrom KR, Sturgis EM. Epidemiology of HPV-associated oropharyngeal cancer. *Oral Oncol*. 2014;50(5): 380–6. Available from: https://doi.org/10.1016/j.oraloncology.2013.12.019

32 Hosseinpoor AR, Bergen N, et al. Socioeconomic inequalities in risk factors for non communicable diseases in low-income and middle-income countries: results from the World Health Survey. *BMC Public Health*. 2012;12(912). Available from: https://doi.org/10.1186/1471-2458-12-912

33 Weissgerber TL, Mudd LM. Preeclampsia and diabetes. *Curr Diab Rep*. 2015;15(3): 9. Available from: https://doi.org/10.1007/s11892-015-0579-4

34 Wu M, Chen SW, Jiang SY. Relationship between gingival inflammation and pregnancy. *Mediators Inflamm*. 2015;2015: 623427. Available from: https://dx.doi.org/10.1155%2F2015%2F623427

35 Glick M, Williams DM, et al. *Vision 2030: Delivering Optimal Oral Health for All*. Geneva: FDI World Dental Federation; 2020. Available form: https://www.fdiworlddental.org/vision2030

36 Righolt AJ, Jevdjevic M, et al. Global-, Regional-, and Country-Level Economic Impacts of Dental Diseases in 2015. *Journal of Dental Research*. 2018;97(5): 501–7. Available from: https://doi.org/10.1177/0022034517750572

37 Supplementary appendix to Peres MA, Macpherson LMD, et al. Oral diseases: a global public health challenge. *The Lancet*. 2019;394(10194): 249–60. Available from: https://www.thelancet.com/cms/10.1016/S0140-6736(19)31146-8/attachment/dc75b56b-9a20-4977-aac0-39e681076ecc/mmc1.pdf

38 OECD/European Union. *Health at a Glance: Europe 2020: State of Health in the EU Cycle*. Paris: OECD Publishing; 2020. Available from: https://doi.org/10.1787/82129230-en

39 Bernabé E, Masood M, Vujicic M. The impact of out-of-pocket payments for dental care on household finances in low and middle income countries. *BMC Public Health*. 2017;17(109). Available from: https://doi.org/10.1186/s12889-017-4042-0

40 Wang TT, Mathur MR, Schmidt H. Universal health coverage, oral health, equity and personal responsibility. *Bull World Health Organ*. 2020;98(10): 719–21. Available from: https://dx.doi.org/10.2471%2FBLT.19.247288

41 The Primary Care Collaborative. *Innovations in Oral Health and Primary Care Integration: Alignment with the Shared Principles of Primary Care*. Washington D.C.: The Primary Care Collaborative, 2021. Available from: https://www.pcpcc.org/sites/default/files/resources/PCC_Oral_Health_Primary_Care_Integration.pdf

42 Verlinden DA, Reijneveld, SA, et all. Socio-economic inequality in oral health in childhood to young adulthood, despite full dental coverage. *Eur J Oral Sci*. 2019;127: 248–53. Available from: https://doi.org/10.1111/eos.12609

43 FDI. *The Challenge of Oral Disease – A call for global action. Oral Health Atlas*. 2nd ed (eds. Benzian H, Williams DM). Geneva: FDI World Dental Federation; 2015. Available from: https://fdiworlddental.org/oral-health-atlas

44 Wong MCM, Clarkson J, et al. Cochrane Reviews on the Benefits/Risks of Fluoride Toothpastes. *Journal of Dental Research*. 2011;90(5): 573–9. Available from: https://doi.org/10.1177%2F0022034510393346

45 Yeung, C. A systematic review of the efficacy and safety of fluoridation. *Evid Based Dent*. 2008;9: 39–43. Available from: https://doi.org/10.1038/sj.ebd.6400578

46 Persson GR. Diabetes and Periodontal Disease: An Update for Health Care Providers. *Diabetes Spectr*. 2011;24(4): 195–8. Available from: https://doi.org/10.2337/diaspect.24.4.195

47 Brennan MT, Spijkervet FKL, Elting LS. Systematic reviews and guidelines for oral complications of cancer therapies: current challenges and future opportunities. *Support Care Cancer*. 2010;18: 977–78. Available from: https://doi.org/10.1007/s00520-010-0855-4

48 Oyetola EO, Owotade FJ, et al. Oral findings in chronic kidney disease: implications for management in developing countries. *BMC Oral Health*. 2015:15(24). Available from: https://doi.org/10.1186/s12903-015-0004-z

49 Petersen PE. *Policy for Prevention of Oral Manifestations in HIV/AIDS: The Approach of the WHO Global Oral Health Program*. Geneva: WHO; 2006. Available from: https://www.who.int/oral_health/publications/policy_prevention_oral_manifestations_hiv_aids.pdf

50 Mossey P, Murugan M, et al. *Oral health in comprehensive cleft care*. Geneva: FDI World Dental Federation; 2020. Available from: https://www.fdiworlddental.org/oral-health-comprehensive-cleft-care-0

51 Pietropaoli D, Del Pinto R, et al. Poor Oral Health and Blood Pressure Control Among US Hypertensive Adults. *Hypertension*. 2018;72(6): 1365–73. Available from: https://doi.org/10.1161/HYPERTENSIONAHA.118.11528

52 Zwiech R, Bruzda-Zwiech A. Does oral health contribute to post-transplant complications in kidney allograft recipients? *Acta Odontol Scand*. 2013;71(3-4): 756–63. Available from: https://doi.org/10.3109/00016357.2012.715203

53 Eun-Jung K, Dong-Jin K, et al. Importance of oral health and dental treatment in organ transplant recipients. *International Dental Journal*. 2020;70(6): 477–81. Available from: https://doi.org/10.1111/idj.12585

54 Rao SS, Ramana Reddy KV, et al. Is screening in dental office an effective method of detecting undiagnosed hypertension? *Indian J Dent Res*. 2018;29(4): 534–9. Available from: https://doi.org/10.4103/ijdr.ijdr_298_17

55 Glurich I, Bartkowiak B, et al. Screening for dysglycaemia in dental primary care practice settings: systematic review of the evidence. *International Dental Journal*. 2018;68(6): 369–77. Available from: https://doi.org/10.1111/idj.12405

56 NCD Alliance. *Bridging the Gap on NCDs: From global promises to local progress – Discussion paper.* Geneva: NCD Alliance; 2020. Available from: https://ncdalliance.org/sites/default/files/resource_files/Bridging%20the%20Gap_Brief_FINAL.pdf

57 WHO. *WHO monograph on tobacco cessation and oral health integration*. Geneva: WHO; 2017. Available from: https://www.who.int/publications/i/item/who-monograph-on-tobacco-cessation-and-oral-health-integration

58 Thompson W, Williams DM, et all. *The essential role of the dental team in reducing antibiotic resistance*. Geneva: FDI World Dental Federation; 2020. Available from: https://www.fdiworlddental.org/resource/fdi-white-paper-essential-role-dental-team-reducing-antibiotic-resistance

Connect with us

advocacy@fdiworlddental.org

www.fdiworlddental.org

FDIWorldDentalFederation

fdiworlddental

fdiworlddental

FDI World Dental Federation