FDI World Dental Federation

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WHO Draft Guideline: Sugars intake for adults and children

Response from FDI World Dental Federation, Geneva, Switzerland

FDI World Dental Federation serves as the principal representative body for more than one million dentists worldwide, developing health policy and continuing education programmes, speaking as a unified voice for optimal oral health in international advocacy, and supporting member associations in global oral health promotion activities. FDI is in official relations with the World Health Organization (WHO).

Background

The FDI World Dental Federation welcomes this much-needed report and congratulates WHO on its outstanding quality. In particular we are pleased to see the importance that WHO attaches to the association between the consumption of dietary free sugars and dental caries. This is a highly-pertinent recognition that dental diseases - the most prevalent NCDs globally - still constitute a major health burden for the majority of countries, despite the improvements in oral health for some populations in the recent decades.

The extent and depth of the analysis of the relationship between dietary sugars and both weight and dental caries are very timely. The use of the systematic reviews adds weight to the proposals. We believe that the draft guideline is an important step towards a more holistic view on NCDas and their common risk factors and determinants.

Our comments are principally concerned with a) the relationship between dietary sugars and dental caries; and b) the "conditional" recommendation for further reduction of sugar intake to below 5% of total energy.

Summary of evidence: dental caries

1. **Many helpful points were set out in the report and WHO is to be congratulated on this.** The systematic review by Moynihan and Kelly is the most extensive and rigorous on the subject and will enrich the scientific literature. Notwithstanding these achievements, we believe that there are some aspects fundamentally flawed arising from a stereotyped interpretation of epidemiological data relating to the disease process of dental caries.
2. **Caries is uniquely caused by free sugars.** The only confounders on a population basis relate to the potential impact of dental care on a routine basis and the exposure to fluorides from

drinking water, toothpastes and other sources. Good evidence is available on these two confounders. The first confounder of dental care can be discarded, because even with good systematic dental care in an affluent society there is a progressive increase in the incidence of caries if sugar intakes are high, as revealed by the Dunedin study (Broadbent et al 2008, Broadbent et al 2013). The second confounder is the presence of fluoride in the drinking water. It is important to emphasize that fluoride will only contributes to the reduction of the disease but does not entirely prevent the development of dental caries. Regardless of the availability of fluoride, excessive sugars consumption will remain a major cause of dental caries.

3. **There is no evident threshold for the cariogenic effect of dietary sugars.** Recent studies have shown that there is a log-linear increase in caries rates between <1kg sugar/caput/yr. (≈0.05%E) and 5–7·5kg sugar/caput/yr. (≈2·7%–4·1%E). The positive correlation between sugars and caries was +0·7, with a log-linear relation at both lower and higher sugar intake levels for all tooth types if 1–8 years of sugar exposure is considered (Sheiham & James 2014).
4. **NUGAG should not downgrade the 5% of total energy value to conditional on the basis of only having so called "ecological" evidence.** As mentioned above, sugars are the unique causative factors of dental caries. Ecological analyses is inappropriate when several confounding causal factors are present. But this is not the case with dental caries as discussed in point 2 above. Caries is practically non-existent when sugar intakes are very low. For example, in Nigeria in the 1960s people of all ages on diets low in sugars had no caries, despite having poor hygiene and many of the variables considered to be confounders of dental disease in general.
5. **Caries does not occur unless free sugars are available**. Fluoride and tooth brushing only modify the magnitude of the relationship. Thus, ecological studies that take account of the prevailing fluoride content of drinking water and the availability and practice of tooth brushing with fluoride toothpastes allow clear limits to be set on the basis of ecological studies alone. The simple dismissal of ecological studies is inappropriate in this instance.
6. **Failure to take proper account of caries in adults.**
   The WHO text specifies that "Dental caries is a progressive disease, and being free of cavities in childhood does not mean being caries free for life." Because dental caries is the result of lifelong exposure to dietary sugars, even small reductions in risk in childhood are of significance in later life. Most dental caries occurs in adults (Bernabé & Sheiham 2014a). Taken together, the data show that dental caries levels are lower at intakes of sugars equivalent to less than 5% of total energy intake. The evidence that shows the progressive nature of dental caries throughout the life-course implies there would be further benefits from limiting free sugars intake to less than 5% of total energy intake.
   The greatest burden of caries occurs in adult life and the greatest cost of treating caries is in adults (Sheiham & James 2014). This issue does not receive sufficient attention from dentists and most policies, programmes and surveys of dental caries have focused on children. For most countries, irrespective of the DMFT levels in 12-year-olds, the percentage difference in levels of DMFT between 12-year-olds and 35-44-year-olds was above 500% and the relative difference was 5 or more. Caries levels were also very much higher in adults than in children in all countries with high percentages of their population drinking fluoridated water (Bernabe & Sheiham 2014b).
7. **A 10%E sugar value is near sugar saturation levels for maximum dental caries burden.** Because the NUGAG concentrated so much on clinical trials and cohort studies, the point that the 10%E sugar value is near sugar saturation levels for maximum dental caries burden seems to have been overlooked. For example, in low and middle income countries such as Bangladesh, Cambodia, China, Ethiopia, Ghana, Laos, Mozambique, Nepal, Nigeria, Laos, Tanzania, Uganda and Vietnam, which have annual per capita sugar intakes as low as 10Kg/year, dental caries was prevalent in 12 year olds with about 50% of them being affected (WHO 2004).

8. **Fluoride is not a substitute for drastically limiting sugars in the diet.** Whilst the benefits of fluoride in reducing and delaying sugar-induced caries are well established, this is not a substitute for drastically limiting sugars in the diet. Even in areas where fluoride use is widespread, sugar-induced caries affects over 90% of adult populations and the Report should have made this point. Whilst the importance of fluoride could be emphasized, its limitations should also be stressed. It may slow the progression of caries process, thus delaying the clinical manifestation of the disease until later in life, but the process continues because the determining factor has not been adequately controlled.
9. **The 5% objective is achievable by the food industry.** The food industry has demonstrated its capacity to adapt product composition through reformulation (International Food & Beverage Alliance 2012 Progress Report). It cannot be argued that the objective of 5% is not achievable.
10. **A 10% to 5% reduction will have a direct positive economic impact on the health care system.** WHO has previously emphasized the importance of oral health in general health and the fundamental role of prevention (A60.17). The draft guidelines (p.6) are a reminder that the cost of dental treatment is 5-10% of the global health costs in industrialised countries. The burden of NCDs on developing countries is such that any preventive measures that will reduce costs and economic loss, as well as pain for the patients, should be supported by WHO.
11. **The cost of a curative approach for the treatment of caries generated by sugars is unacceptable.** WHO estimates that oral diseases are the fourth most expensive condition to treat – if a curative approach is taken, rather than a focus on prevention. The expenditure on dental care as percentage of total health expenditure is often lower than 6% and can go as low as 0.5% in Mongolia compared to 8% in the United States (which spent more than US$ 100 billion on oral health care in 2009). In addition to direct expenses for curative treatment, indirect costs caused by poor concentration and absence due to oral disease, result in millions of school and work hours to be lost annually across the world with negative long-term economic impact, hampering individual and societal progress and development. In 1996, oral diseases resulted in 2.4 million days of work and 1.6 million days of school lost in the United States. In Thailand, 1,900 hours school were lost per 1,000 children in 2008 due to dental problems (Beaglehole, Benzian & Crail 2009)
12. **The report should have stressed the important point that caries, which is caused by dietary sugars, affects 3.9 billion people worldwide.** Furthermore, untreated caries was the most prevalent of all 291 conditions reported in the Global Burden of Disease 2010 study (Marcenes et al 2013). As the FDI has asserted, "Worldwide, oral disease is the fourth most expensive disease to treat; dental caries affects most adults and 60-90% of schoolchildren, leading to millions of lost school days each year, and remains one of the most common chronic diseases; ..." (FDI 2012).
13. **The WHO criteria for "conditional" recommendation are not met.** We believe that none of the criteria for "conditional recommendations" are met. There are no uncertainties about the four factors; the interventions have been demonstrated to be achievable in the different local set-up; and there is no need for substantial debate as the evidence is clear. <u>The 5% reduction should be a "strong" recommendation.</u>

References

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Recommendations

1. We endorse the three key recommendations in the guideline, but propose that greater emphasis is given to their applicability to adults as well as children. It is exceptionally important that caries in adults over the age of 18 year is highlighted, as this accounts for approximately 80% of the total costs of treating the disease.
2. As in the previous WHO reports on Diet, Nutrition and the Prevention of Chronic Diseases (TRS 797, 916), dental caries provides the unique opportunity to set quantitative limits for sugar intake in relation to disease. The dose response relationship between sugar and caries is actually log linear. Hence the recommendations should be based on the dose response relationship as in earlier WHO reports on the subject.
3. In both adults and children, WHO recommends that intake of free sugars should not exceed 5% of total energy. This recommendation is based on ecological studies demonstrating a linear relationship between sugars intake and dental caries. Considering the scientific evidence and the economic benefits of the suggested measures on the health care system, FDI requests that the 5% reduction is not a conditional but a strong recommendation.

Remarks

1. The successful implementation of the guidelines will require effective translation into tangible advices for people. The percentage concept will need to be related to real-life advices.
2. FDI draws inspiration from the WHO recommendation on 'health in all policies' for its recommendation 'oral health in all policies'. We do recognize that a recommended reduction in sugar consumption might have a negative impact on livelihoods and exports in some low and middle income countries for whom sugar production makes a significant contribution to the economy. Thus, policies in other areas may need to be addressed, for example:
   - Agriculture: policies to re-orient agriculture towards crops other than sugar;
   - Energy: policies to promote other uses for cane sugar, e.g. cane sugar ethanol;
   - Transport: policies to promote the use of biofuels in public transport(e.g. cane sugar ethanol in public transport);
   - Trade: policies to help countries reduce dependence on sugar exports;
   - Industry: policies to develop local ethanol production.
3. Finally FDI would like to use this opportunity to reiterate that oral disease are not a side effect of NCDs, but are a fundamental and integral component of NCDs. And that oral health should have received a proper recognition in the NCD 25 x 25 Framework, in the NCD Action plan (2013) and in WHO future plans to fight the burden of NCDs.

Research gap

1. **Lack of data on the economic costs of oral diseases generated by sugars.** The WHO draft guideline emphasizes the evidences supporting a direct link between sugars and caries. It does not however address the costs associated with caries treatment and the economic burden that sugars generates on the health care system. There is a real need to have economic data on the costs of oral diseases in terms of school and work days lost, pain, their contribution to other chronic diseases and the cost of treatment, as well as data demonstrating the benefits of prevention in particular linked to a better diet.

2. **Urgent need for quality data on oral health compared to other NCDs** The evidence reviewed by WHO supports without any doubt the link between sugar consumption and caries. However, the data available, in particular from WHO, is very poor compared to other chronic diseases. Two oral health indicators are reported in the WHO database: (a) Community Periodontal Index (CPI) and (b) Caries prevalence (DMFT). For instance, CPI data covers only 39 countries compared to 106 countries for diabetes or CVD. In the CPI data, the most frequent survey time point is 1995, while the oldest and the most recent ones are respectively 1983 and 2002. DMFT data reported are very heterogeneous, despite a standardized WHO methodology for oral health surveys. Only for 44 countries it is reported as percentage of population affected with dental caries (%DMFT). Data for its components, which are important to determine rates of untreated decay or missing teeth are not uniformly available. In addition, the most frequent survey data point is 1997 while the data ranges from 1964 until 2003.