## Evidence does not support the reduction of added sugar intake from all food sources

Ruolin Yan, Chi Bun Chan and Jimmy Chun Yu Louie

We read with interest the Comment article by Kimber Stanhope (Guidelines to lower intake of added sugar are necessary and justified. *Nat. Rev. Cardiol.* **19**, 569–570 (2022))<sup>1</sup>, in which she criticized our recent narrative review<sup>2</sup>. We feel that our views were misrepresented and would like to clarify them.

Our original intention was to call for caution regarding the over-extrapolation of results from studies on sugar-sweetened beverages (SSBs), as Dr Stanhope correctly stated1. However, we did not intend to exonerate added sugars as being harmless to health. We were pointing out that most, if not all, the available evidence linking added sugars to ill health comes from studies on SSBs. If we follow the principles of evidence-based medicine<sup>3</sup>, the appropriate conclusion to draw is that added or free sugars from SSBs are harmful to health — and no more than that. Extrapolating results from SSB studies to demonize all forms of added sugars is not evidence-based but, instead, best guess. Even if it is the most logical line of thought, one should not 'sugar coat' such extrapolation as being evidence-based.

Dr Stanhope also claimed that we did not outline the potential negative consequences of a recommendation to reduce the intake of added or free sugars to <10% of daily energy intake<sup>1</sup>. However, we did point out in our review the possible negative consequences of blanket reductions of added or free sugars in the food supply<sup>2</sup>, such as increased exposure to artificial sweeteners in non-low-calorie products<sup>4</sup> and the nutrient dilution effect of a stringent diet that is low in added or free sugars<sup>5</sup>, which Dr Stanhope overlooked.

Evidence gathered to inform the World Health Organization (WHO) guidelines demonstrates that both solid and liquid sources of added sugars cause dental caries<sup>6</sup>. However, articles from peer-reviewed journals and the popular media that cite the WHO guidelines generally refer to the guidelines in the context of reducing the risk of being overweight or obese and rarely mention that the WHO itself concluded that the evidence linking added sugar to being overweight or obese was of only moderate to low quality<sup>7</sup>. Indeed, the WHO contradicted this conclusion

from the quality-of-evidence assessment and stated that "reducing free sugars intake to less than 10% of total energy" is a strong recommendation. Of note, the quality-of-evidence assessment used by the WHO was based on the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach that Dr Stanhope criticized Erickson and colleagues<sup>8</sup> for using to conclude that the evidence underpinning the WHO guidelines was of low quality.

We looked at the publisher's website for the article reviewing studies from >40 years ago<sup>9</sup> to which Dr Stanhope referred, but we were unable to locate it. Nonetheless, if opposing results can be found only in an article that was published in 1985 (and no newer studies have shown similar findings), perhaps it is appropriate to say that its omission did not drastically affect the conclusion of our review.

In summary, we would like to reiterate that we agree that added or free sugars from SSBs should be reduced, given that the evidence has consistently shown an association between SSBs and ill health<sup>10</sup>. We remain sceptical about the quality of the evidence (if any) on the reduction of added or free sugars from all types of food, especially solid foods, to improve overall health.

There is a reply to this letter by Stanhope, K. L. *Nat. Rev. Cardiol.* https://doi.org/10.1038/s41569-022-00793-8 (2022).

Ruolin Yan , Chi Bun Chan and
Jimmy Chun Yu Louie 
School of Biological Sciences, Faculty of Science,
The University of Hong Kong, Hong Kong SAR.

Be-mail: jimmul@hku.hk

https://doi.org/10.1038/s41569-022-00791-w

- Stanhope, K. L. Guidelines to lower intake of added sugar are necessary and justified. *Nat. Rev. Cardiol.* 19, 569–570 (2022).
- Yan, R. R., Chan, C. B. & Louie, J. C. Y. Current WHO recommendation to reduce free sugar intake from all sources to below 10% of daily energy intake for supporting overall health is not well supported by available evidence. Am. J. Clin. Nutr. 116, 15–39 (2022).
- Akobeng, A. K. Principles of evidence based medicine. *Arch. Dis. Child.* 90, 837–840 (2005).
- O, B. Y. S., Coyle, D. H., Dunford, E. K., Wu, J. H. Y. & Louie, J. C. Y. The use of non-nutritive and lowcalorie sweeteners in 19,915 local and imported pre-packaged foods in Hong Kong. *Nutrients* 13, 1861 (2021).
- Mok, A., Ahmad, R., Rangan, A. & Louie, J. C. Y. Intake of free sugars and micronutrient dilution in Australian adults. *Am. J. Clin. Nutr.* 107, 94–104 (2018).
- Moynihan, P. J. & Kelly, S. A. M. Effect on caries of restricting sugars intake: systematic review to inform WHO guidelines. J. Dent. Res. 93, 8–18 (2014).
- World Health Organization. Guideline: sugars intake for adults and children. WHO https:// www.who.int/publications/i/item/9789241549028 (2015).
- Érickson, J., Sadeghirad, B., Lytvyn, L., Slavin, J. & Johnston, B. C. The scientific basis of guideline recommendations on sugar intake: a systematic review. Ann. Intern. Med. 166, 257–267 (2017).
- Reiser, S. Effect of dietary sugars on metabolic risk factors associated with heart disease. *Nutr. Health* 3, 203–216 (1985).
- Qin, P. et al. Sugar and artificially sweetened beverages and risk of obesity, type 2 diabetes mellitus, hypertension, and all-cause mortality: a dose-response meta-analysis of prospective cohort studies. Eur. J. Epidemiol. 35, 655–671 (2020).

## **Competing interests**

The authors declare no competing interests.

## Reply to: 'Evidence does not support the reduction of added sugar intake from all food sources'

Kimber L. Stanhope

I thank Drs Yan, Chan and Louie for their Correspondence (Evidence does not support the reduction of added sugar intake from all food sources. *Nat. Rev. Cardiol.* https://doi.org/10.1038/s41569-022-00791-w (2022))¹ on my Comment article (Guidelines to lower intake of added sugar are necessary and justified. *Nat. Rev. Cardiol.* 19, 569–570 (2022))². The authors feel that their views were misrepresented and the purpose of their letter was to clarify them.

They state that the intention of their review<sup>3</sup> was not to exonerate added sugars as being harmless to health. My Comment article did not suggest that this was their intention. However, on the basis of the final sentence of their abstract — "We argue the current public health recommendations to encourage the reduction of both solid and liquid forms of free sugar intake (e.g., sugar reformulation programs) should be revised due to the overextrapolation of results