

Letter to Editor

Reply: taste loss as a distinct symptom of COVID-19: a systematic review and meta-analysis

Mackenzie E. Hannum¹, Riley J. Koch¹, Vicente A. Ramirez^{1,2}, Sarah S. Marks¹,
Aurora K. Toskala¹, Riley D. Herriman¹, Cailu Lin¹, Paule V. Joseph^{3,4}, Danielle R. Reed^{1,*}

¹Monell Chemical Senses Center, 3500 Market St, Philadelphia PA 19104, United States,

²Department of Public Health, University of California Merced, Merced, CA 95348, United States,

³Division of Intramural Research, National Institute of Nursing Research, National Institutes of Health, Bethesda, MD, United States,

⁴Division of Intramural Research, National Institute of Alcohol Abuse and Alcoholism, National Institutes of Health, Bethesda, MD, United States

*Corresponding author: Monell Chemical Senses Center, Philadelphia PA 19104, 267-280-3248, United States. Email: reed@monell.org

Letter to the Editor: our reply

We acknowledge the concerns that we may have overestimated COVID-19-associated taste loss. This overestimate may have arisen from including studies (a) using unvalidated, improvised sensory tests and those (b) with biased participant selection.

Upon review, we were in error in including six biased studies (Lechien et al. 2020a, 2020b; Cao et al. 2021; Le Bon et al. 2021; Schwab et al. 2021; Singer-Cornelius et al. 2021). By ‘biased’, we mean that the sample was potentially enriched with patients with chemosensory loss. We removed these studies, and the analysis was re-conducted, with no change in the primary or secondary outcomes or conclusions (a revised version of the paper is being prepared).

We retained the studies using improvised methods because excluding those conducted during the pandemic’s early months when early coronavirus variants were more potent in causing chemosensory loss (Menni et al. 2022) might result in an underestimate of taste loss.

We agree with the authors of the *Letter to the Editor* that as more taste-loss studies with validated methods are available, investigators conducting future meta-analyses may wish to exclude those early studies.

We regret the error in the original analysis and are grateful to the authors of the *Letter to the Editor* (Hintschich et al. 2023) for bringing it to our attention.

####

References

Cao AC, Nimmo ZM, Mirza N, Cohen NA, Brody RM, Doty RL. Objective screening for olfactory and gustatory dysfunction during the

COVID-19 pandemic: a prospective study in healthcare workers using self-administered testing. *World J Otorhinolaryngol Head Neck Surg.* 2021;8(3):249–256.

Hintschich CA, Liu DT, Hummel T. The psychophysical assessment of gustatory dysfunction in COVID-19. *Chem Senses.* 2023;48:bjad011. doi:10.1093/chemse/bjad011

Le Bon SD, Payen L, Prunier L, Steffens Y, Horoi M, Vaira LA, Hopkins C, Lechien JR, Saussez S. Making scents of loss of taste in COVID-19: is self-reported loss of taste due to olfactory dysfunction? A prospective study using psychophysical testing. *Int Forum Allergy Rhinol.* 2021;11(10):1504–1507. doi:10.1002/alr.22815

Lechien JR, Cabaraux P, Chiesa-Estomba CM, Khalife M, Plzak J, Hans S, Martiny D, Calvo-Henriquez C, Hopkins C, Saussez S. Objective olfactory testing in patients presenting with sudden onset olfactory dysfunction as the first manifestation of confirmed COVID-19 infection. *medRxiv.* 2020a. doi:10.1101/2020.04.15.20066472

Lechien JR, Chiesa-Estomba CM, De Siati DR, Horoi M, Le Bon SD, Rodriguez A, Dequanter D, Blecic S, El Afia F, Distinguin L, et al. Olfactory and gustatory dysfunctions as a clinical presentation of mild-to-moderate forms of the coronavirus disease (COVID-19): a multicenter European study. *Eur Arch Otorhinolaryngol.* 2020b;277(8):2251–2261.

Menni C, Valdes AM, Polidori L, Antonelli M, Penamakuri S, Nogal A, Louca P, May A, Figueiredo JC, Hu C, et al. Symptom prevalence, duration, and risk of hospital admission in individuals infected with SARS-CoV-2 during periods of omicron and delta variant dominance: a prospective observational study from the ZOE COVID Study. *Lancet.* 2022;399(10335):1618–1624.

Schwab J, Jensen CD, Fjaeldstad AW. Sustained chemosensory dysfunction during the COVID-19 pandemic. *ORL J Otorhinolaryngol Relat Spec.* 2021;83(4):209–218.

Singer-Cornelius T, Cornelius J, Oberle M, Metternich FU, Brockmeier SJ. Objective gustatory and olfactory dysfunction in COVID-19 patients: a prospective cross-sectional study. *Eur Arch Otorhinolaryngol.* 2021;278(9):3325–3332.