Researchers estimate the true prevalence of COVID-19 taste loss

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Reports of taste loss, a symptom of COVID-19, have been on the rise over the last two years. The taste dysfunction comes in different forms, including ageusia (total taste loss), hypogeusia (partial taste loss), and

dysgeusia (taste distortion).

While taste loss can be a distressing experience, scientists have been skeptical about whether reports of taste loss are genuine. Their doubts stem from knowledge that taste loss was rare prior to COVID-19 and can often be confused with smell loss, because the two senses are closely linked.

Nevertheless, in a recently published paper, researchers from the Monell Chemical Senses Center show that reports of taste loss are in fact genuine and distinguishable from smell loss. The research paper, published in *Chemical Senses*, examines the prevalence of taste loss in COVID-19 patients and how the way the symptom was measured might impact the prevalence estimate.

The effort was the largest undertaken to date. The research team reviewed data from 241 studies that assessed taste loss and were published between May 15, 2020, and June 1, 2021. The publications were selected out of an original pool of 712 publications screened by Monell's research team, an unprecedentedly large number of articles to be included in a single analysis.

Collectively, the 241 selected studies included 138,785 COVID-19 patients. Among these patients, 32,918 reported some form of taste loss. Eventually, the overall estimate of the prevalence of taste loss following was 37 percent. In other words, "about four in every 10 COVID-19 patients experience some form of taste loss," said first author Mackenzie Hannum, Ph.D., a postdoctoral fellow in the lab of Danielle Reed, Ph.D..

In addition, the team found that age and sex influenced the prevalence of taste loss. Middle-aged (36 to 50 years old) individuals have the highest prevalence of taste loss out of all age groups. And female patients are more likely to lose their sense of smell than their male counterparts.

To assess taste loss, studies included in the analysis used different approaches: self-reports or direct reports. "Self-reports are more subjective and can be in the form of questionnaires, interviews, health records, for example," said Hannum. "On the other hand, direct measures of taste are more objective. They are conducted using testing kits that contain various sweet, salty, and sometimes bitter and sour solutions given to participants via drops, strips, or sprays."

Based on a previous analysis on smell loss by the same Monell research team, direct tests were expected to be a more sensitive measure of taste loss than self-reports.

This time, however, their findings were different—whether a study used self reports or direct measures of taste did not impact the estimated prevalence of taste loss. In other words, objective direct measures and subjective self-reports are as good as each other in detecting taste loss.

"Here self-reports are backed up by direct measures, proving that loss of taste is a real, distinct symptom of COVID-19 that is not to be confused with smell loss," said coauthor Vicente Ramirez, a visiting scientist at Monell and a doctoral student at the University of California, Merced. "Taste and smell loss have been emphasized in the context of COVID-19, yet only 18 out 241 studies included an objective measurement of this sense. There is definitely a gap between how these symptoms are being treated and how critical they are for public health."

This study hints towards ways of narrowing this gap, given that solution-based taste tests are more sensitive indicators of taste loss than other direct measures. Simple tastes dissolved in water may be easier to detect without other distractors like food textures. They also offer more experimental control as they are not as affected by the amount of saliva in a study participant's mouth, "providing opportunities for advancements in developing standardized taste tests," said Reed.

The research team emphasizes the need for taste assessment to become standard clinical practice, for example at an annual physical check-up. In addition to being the first step to helping people cope with taste loss, establishing such baseline procedures would help physicians to identify patients with this dysfunction, either from long-COVID, aging, or medications like chemotherapy.

Now that it is clear that taste loss is a symptom of COVID, Reed said, "it is time to turn to the tongue" to learn why taste is affected and to start on how to reverse or repair the loss.

More information: OUP accepted manuscript, *Chemical Senses* (2022). DOI: 10.1093/chemse/bjac001

Mackenzie E Hannum et al, Objective Sensory Testing Methods Reveal a Higher Prevalence of Olfactory Loss in COVID-19–Positive Patients Compared to Subjective Methods: A Systematic Review and Meta-Analysis, *Chemical Senses* (2020) doi.org/10.1093/chemse/bjaa064

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