

# International study shows that taste, independent of smell, is also significantly diminished in patients with COVID-19

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Smell loss became the cardinal symptom of COVID-19 early in the pandemic and has ignited research on how smell and taste function. An

international study led by the Global Consortium for Chemosensory Research (GCCR) and the Monell Chemical Senses Center has separated taste from smell in people with COVID-19, demonstrating in a large and diverse group of more than 10,000 people that taste, independent of smell, is also greatly impacted by COVID. The team recently published their findings in *Chemical Senses*.

Several previous studies have tested patients' smell and [taste](#) functions at different stages after COVID-19 diagnosis, with varying and conflicting results. While there is little doubt about the effect of COVID-19 on the sense of smell, its impact on taste perception remains less widely acknowledged.

"Our aim was to empower people worldwide by using common items available in their homes to monitor their sense of smell and taste during the peaks of the pandemic," said co-first author Ha Nguyen, Ph.D., a Monell postdoctoral fellow.

"These findings represent a unique and significant opportunity to document the impact of early COVID variants on human taste perception, an understudied and misunderstood topic. While the [general public](#) usually associates COVID with the loss of smell, our findings shed light on the less recognized effect on taste."

The team analyzed data collected using a web-based, self-assessment survey and an at-home test that asked participants to rate the intensity of smell and taste of 10 self-selected, culturally relevant household items. These came in categories such as odors—for example, coffee, asafoetida, frankincense; tastes, including sugar, [table salt](#); and such nasal and oral irritants as camphor and wasabi. They also collected demographic and [health information](#), including self-reported positivity to a COVID-19 PCR test.

Of the 10,918 participants who completed the "GCCR Smell-and-Taste Check," a simple, non-invasive, self-administered test to track the acuity of the chemical senses, 3,356 were COVID-positive and 602 were COVID-negative. The 1,267 patients awaiting test results were categorized as COVID unknown and the remaining 5,693 participants who reported no respiratory illness and were not tested for COVID were categorized according to those who reported smell and taste changes (4,445), those who reported other symptoms (832), and those who reported no symptoms (416).

COVID-positive patients reported a 21% reduction in taste intensity, a 47% reduction in smell intensity and a 17% reduction in oral irritant intensity, when compared with the group reporting no symptoms. The team also found the intensity of the smell and taste deficiencies for COVID-positive patients to be at their most intense at symptom onset. Those who received their COVID test results within seven days of completing the survey, reported the lowest smell, taste, and oral irritation intensities.

The most important finding was the ability to separate taste from smell through the use of salt and sugar, stimuli with no olfactory component, to show that the intensity of pure taste stimuli was reduced in people with COVID, compared with those without COVID or symptoms of other respiratory illnesses. These results are significant in that they support the hypothesis that COVID-19 affects taste perception independent of smell in a large and global sample.

This large study also highlighted the success of online, home-based chemosensory testing—a model of assessment emphasized during the pandemic—to glean useful results. The team notes that self-reporting of COVID diagnosis can leave a large number of people with smell or taste loss from COVID-19 unaccounted for.

The team advocates for routine smell and taste testing to benefit all patients with chemosensory effects from COVID-19 and other causes. "This will help us to further grow our understanding of how the COVID virus and other pathogens impact our sense of taste and [smell](#), and how significantly they affect our overall health and well-being. It will also provide valuable mechanistic insights useful for the development of much-needed interventions, which are currently lacking in this area," said co-senior author Parma.

**More information:** Ha Nguyen et al, Covid-19 affects taste independent of taste–smell confusions: results from a combined chemosensory home test and online survey from a large global cohort, *Chemical Senses* (2023). [DOI: 10.1093/chemse/bjad020](https://doi.org/10.1093/chemse/bjad020)

Provided by Monell Chemical Senses Center

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