

# COVID-19 Evidence Update

COVID-19 Update from SAHMRI, Health Translation SA  
and the Commission on Excellence and Innovation in Health

25 March 2020

**“What is the prevalence, and if available positive predictive value, negative predictive value and sensitivity and specificity of anosmia in the diagnosis of COVID-19?”**

## Executive Summary

Currently evidence is not available to estimate the predictive value, sensitivity and specificity of anosmia in the diagnosis of COVID-19.

Only one published study (not peer reviewed) is available. It found that that 5.1% of hospitalised patients infected with COVID-19 in China reported loss of smell and 5.6% reported loss of taste.

Multiple, seemingly independent reports by clinician experts (professional communication or anecdotal evidence) report observations of high prevalence of anosmia and dysgeusia. It is reported that 30% of patients testing positive for COVID-19 in South Korea (where testing is widespread) have had anosmia as their major presenting symptom. In Germany, estimates indicate that a sample of more than 2 in 3 confirmed cases have anosmia.

Clinician reports draw to these symptoms being observed in asymptomatic or mild cases and are calling for public communication and widespread testing in the presence of these symptoms. There are also calls for data collection to enable an estimate of positive predictive value and negative predictive value.

## Context

- Anecdotal evidence from clinicians has mounted on the potential link between COVID-19 and anosmia<sup>1</sup> and dysgeusia<sup>2</sup>, notably in symptom free or mild cases.
- Clinicians and medical associations have called on WHO to add anosmia, hyposmia, and dysgeusia to list of symptoms to inform screening. WHO are currently reviewing this.
- General population prevalence of anosmia and hyponosmia (in the absence of COVID-19) has been estimated to be between 2.7 and 24.5% (1). Population studies have also demonstrated that prevalence increases with age (2). Olfactory function is known to be also impaired by smoking (3).
- *Note: we refer to the virus as SARS-CoV-2 and the disease as COVID-19*

<sup>1</sup> the loss of the sense of smell, either total or partial

<sup>2</sup> a distortion of the sense of taste

## Key summary from the evidence

### 1. Published evidence (not peer-reviewed)

- One published study reported on a study of 214 patients admitted to hospital in Wuhan with severe SARS-CoV-2 infection. 5.1% of patients reported loss of smell, 5.6% of patients reported loss of taste. Difference by severity of COVID-19 were not significant (4).
- Plausible biological mechanism: In a Letter to the Editor BMJ (31 Jan 2020) Gulistan Bahat MD, Professor, Internal Medicine, Geriatrics, Istanbul University) suggested that the ACE inhibition that is present in COVID-19 infections may be the cause of the loss of smell/taste symptomatology, which seems to be specifically common in COVID-19 infections. (Note: The letter included No primary citing of observations, referred to the reports from ENTUK) (5).

### 2. Professional correspondence from medical professionals and associations

Prof Claire Hopkins (BMBCh, MA FRCS(ORLHNS) DM(Oxon)), President of British Rhinological Society & Prof Nirmal Kumar (President of ENT UK) (6)

Publisher: ENT UK

Professional correspondence indicates that there is:

- ‘Good evidence from South Korea, China and Italy that significant numbers of patients with proven COVID-19 infection have developed anosmia/hyposmia.
- In Germany it is reported that more than 2 in 3 confirmed cases have anosmia.
- In South Korea, where testing has been more widespread, 30% of patients testing positive have had anosmia as their major presenting symptom in otherwise mild cases.’
- ‘there is a chance the apparent increase in incidence could merely reflect the attention COVID-19 has attracted in the media, and that such cases may be caused by typical rhinovirus and coronavirus strains, it could potentially be used as a screening tool to help identify otherwise asymptomatic patients, who could then be better instructed on self-isolation’.

### The American Academy of Otolaryngology – Head and Neck Surgery position statement (7)

‘Anecdotal evidence is rapidly accumulating from sites around the world that anosmia and dysgeusia are significant symptoms associated with the COVID-19 pandemic. Anosmia, in particular, has been seen in patients ultimately testing positive for the coronavirus with no other symptoms. **We propose that these symptoms be added to the list of screening tools for possible COVID-19 infection.** Anosmia, hyposmia, and dysgeusia in the absence of other respiratory disease such as allergic rhinitis, acute rhinosinusitis, or chronic rhinosinusitis should alert physicians to the possibility of COVID-19 infection and **warrant serious consideration for self-isolation and testing of these individuals.**’

### Stanford University School of Medicine Departments of Otolaryngology-H&N Surgery and Neurosurgery statement (8)

In a statement focused on excess risk to ENTs of COVID-19, there was inclusion of information received from an Italian colleague Dr. Puya Deghani-Mobaraki, reporting “the possible loss of smell and taste that this virus brings. They are not only seeing it in their patients, but they have noticed it within their own ranks, in otherwise healthy asymptomatic doctors, at rates far above what could be considered normal.”

### 3. Selected News Reports of Clinician Observations:

- Iran News (09 March 2020) reports on *Loss Of Sense Of Smell Among Iranians Coinciding With Coronavirus Epidemic*, citing Deputy Chairman of **Iran's Rhinology Association (and ENT Surgeon)** Dr. Ebrahim Razmpa "During the last month there is a sudden, unexpected and unbelievable jump in cases of weak sense of smell and difficulty with vision", reported across the country." "The first theory revolves around the impact of coronavirus, which seems to be more probable". "The second possibility is that the phenomenon is related to increasing exposure to chemicals in washing and disinfecting materials, which are being used frequently in recent weeks as a preventive measure against the deadly virus." (9).
- Frankfurter Allgemeine Hendrik **[In German]** reports on **Virologist** (Hendrik StreeckBonn) who went from house to house and to every infected person in the district of Heinsberg, particularly affected by Covid-19. "Almost all infected people we interviewed, and this applies to a **good two thirds, described a loss of smell and taste lasting several days.**" They reported interviewed 100 infected but non-hospitalised cases. They also noted that Diarrhea also occurred in our infected people in 30 percent of the cases, which is more common than previously thought (10).
- Liberoquotidiano (In Italian) reported from Sacco hospital in Milan: out of **100 patients recovered, 87 of them had three symptoms: loss of smell, taste** and diarrhea (the first two very common) "in the final stage" (11).

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**Searchers:** Nikki May and Dr Ingrid Lensink, Aimee Brownbill

**Expert input:** Prof Steve Wesselingh, Prof David Lynn

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## APPENDIX

### Analysis and summary of studies included:

#### FURTHER MODELLING

Neurological Manifestations of Hospitalized Patients with COVID-19 in Wuhan, China: a retrospective case series study

Authors: Ling Mao, Mengdie Wang, Shengcai Chen, Quanwei He, Jiang Chang, Candong Hong, Yifan Zhou, David Wang, Yanan Li , Huijuan Jin , Bo Hu

Date: 25 Feb, 2020

Publisher: medRxiv preprint

Peer-review: No

**Background:** Retrospective case series set in three designated COVID-19 care hospitals in Wuhan, China. Study of the neurological manifestations of patients with coronavirus disease 2019 (n=214, laboratory confirmed diagnosis of severe SARS-CoV-2 infection [note: reported as appears in abstract; later reported as hospitalised patients]). Reported that of the Of 214 patients studied, 88 (41.1%) were “severe” and 126 (58.9%) were “non-severe patients” [note: reported as appears in abstract]. Clinical data were extracted from electronic medical records and reviewed by a trained team of physicians. Neurological symptoms fall into three categories: central nervous system (CNS) symptoms or diseases (headache, dizziness, impaired consciousness, ataxia, acute cerebrovascular disease, and epilepsy), peripheral nervous system (PNS) symptoms (hypogeusia, **hyposmia**, hypopsia, and neuralgia), and skeletal muscular symptoms.

#### Key results:

Hyposmia was observed in 11 patients (5.1%) of patients.

The difference between severe patients (n=3 (3.4%)) and non-severe patients (n=8 (6.3%)) was not significantly different (note: and likely underpowered).

The most common symptoms at onset of illness were fever (132 [61.7%]), dry cough (107 [50.0%]) and anorexia (68 [31.8%]). Seventy-eight (36.4%) patients had nervous system symptoms: CNS (53 [24.8%]), PNS (19 [8.9%]) and skeletal muscles (23 [10.7%]). In patients with CNS symptoms, the most common complaints were dizziness (36 [16.8%]) and headache (28 [13.1%]). In patients with PNS symptoms, the most common complaints were hypogeusia (12 [5.6%]) and hyposmia (11 [5.1%]).

**Caveats:** all data were abstracted from the electronic medical records, certain patients with neurological problem might not be captured if their neurological symptoms were too mild, such as with hypogeusia and hyposmia. Because most patients were still hospitalized and information regarding clinical outcomes was unavailable at the time of analysis, it was difficult to assess the effect of these neurologic manifestations on their outcome, and continued observations of the natural history of disease are needed.