

## SYNOPSIS

02/20/2020

# Review of “SARS-CoV-2 viral load in upper respiratory specimens of infected patients”

**Article citation:** Zou L, Ruan F, Huang M, Liang L, Huang H, Hong Z, et al. SARS-CoV-2 viral load in upper respiratory specimens of infected patients. *N Engl J Med*. 2020 Feb 19 [Epub ahead of print]. Available from: <https://www.nejm.org/doi/pdf/10.1056/NEJMc2001737>

## One-minute summary

- **Serial testing of viral loads by real-time PCR in 18 patients** from Zhuhai, Guangdong, China with symptom onset from January 7 – 26, 2020.
  - 9 males and 9 females, with a median age 59 years
  - 17 were symptomatic (of which 3 were admitted to intensive care unit), and one was asymptomatic
- Between 1 and 9 sequential specimens were obtained from each patient, totalling 72 nasal swabs (sampled from mid-turbinate or nasopharynx) and 72 throat swabs.
- For the 17 symptomatic patients, viral loads were higher soon after symptom onset compared to later. Generally, **higher viral loads were detected in nasal swabs compared to throat swabs.**
- **Real-time PCR cycle threshold\* (Ct) values from the asymptomatic patient were similar to those from symptomatic patients** (Ct of 22 to 28 for nasal swabs and 30 to 32 for throat swabs).
- Using statistical modelling, the authors report that the mean Ct values in nasal and throat swabs of severe cases (n=3) were 2.8 and 2.5 lower, respectively, than in cases with mild to moderate disease (n=14); however, this difference was not statistically significant.

## Additional information

- The real-time PCR assay was developed by the Chinese Centre for Disease Control and Prevention, and detects the N and Orf1b gene targets in COVID-19. Ct values were only presented for the Orf1b gene target.
- Of the symptomatic patients, 10/17 had fever, and all had various respiratory (i.e. cough, shortness of breath) and non-specific (i.e. headache, myalgia) symptoms. The authors report on CT scan results of 14 symptomatic patients, of which 13 had evidence of pneumonia, and the asymptomatic patient, who had an unremarkable CT scan.
- The authors suggest that the COVID-19 viral shedding pattern differs from that of SARS-CoV, and resembles that of influenza.
- One patient was tested up to 21 days post symptom onset and viral RNA was detected in the nasal swab only, albeit at a low level.
- \*PCR cycle threshold is inversely correlated to the level of nucleic acid in a specimen

## PHO reviewer's comments

- It is unclear how RNA levels correlate with transmission potential, as the presence of nucleic acid does not always indicate live virus.

## Citation

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