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SYNOPSIS

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Review of "Temporal dynamics in viral shedding and transmissibility of COVID-19"

Article citation: He X, Lau EHY, Wu P, Deng X, Wang J, Hao X, et al. Temporal dynamics in viral shedding and transmissibility of COVID-19. Nat Med. 2020 Apr 15 [Epub ahead of print]. Available from: https://doi.org/10.1038/s41591-020-0869-5

One-Minute Summary

- This study **investigated the timing of viral shedding** in coronavirus disease 2019 (COVID-19) patients (n=94) and **modeled infectiousness patterns** using infector-infectee transmission pairs (n=77) inside and outside China.
- In the viral shedding study, **viral RNA loads in 94 patients peaked at symptom onset, becoming undetectable at 21 days post symptom onset (PSO).**
- In 77 infector-infectee transmission pairs, the fitted gamma distribution estimated a **mean serial interval of 5.8 days** (95% confidence interval (CI): 4.8-6.8) and a **median serial interval of 5.2 days** (95% CI: 4.1-6.4); 7.6% of all serial intervals were negative.
- The authors inferred that **infectiousness began 2.3 days (95% CI: 0.8-3.0) before symptom onset, peaked at 0.7 days (95% CI: -0.2-2.0) before symptom onset** and declined by 7 days PSO. The authors estimated the **proportion of presymptomatic transmission was 44%** (95% CI: 25-69).
- The authors conclude that **viral shedding in COVID-19 patients may begin 2 to 3 days prior to the onset of symptoms**, decreasing once symptoms appear. The infectiousness pattern of COVID-19 more closely resembles that of influenza than SARS.
- The authors suggest that **contact tracing should take into account index case activities 2 to 3 days prior to symptom onset,** and **social distancing for all plus enhanced personal hygiene** would be key to controlling community spread of COVID-19.

Additional Information

- Viral RNA was detected by quantitative RT-PCR on throat swabs.
- All suspected and confirmed cases admitted from January 21 to February 14, 2020 to a hospital in Guangzhou with at least one throat sample testing positive for COVID-19 were selected for the viral shedding study.
- The median age of 94 patients in the viral shedding study was 46.0 years (interquartile range [IQR]: 33-61), with equal distribution by sex and a median of 4 (IQR: 3-5) throats swabs performed on each patient (from symptom onset up to 32 days PSO).
- Upon admission, no patients were classified with severe or critical infection; however, during hospitalization, 16 (17%) infections were severe and 4 (4%) were critical.

- Government and media announcements from China and elsewhere were used to identify the infector-infectee pairs (47 pairs in China, 29 pairs outside China in Asia, 1 pair in the United States) that showed a clear epidemiologic link.
- The authors acknowledge that recall bias may influence their estimates of serial intervals, only if there was a difference in symptom recall between infector and infectee pairs. In addition, it is unclear whether various treatment regimens affected viral shedding patterns.

PHO Reviewer's Comments

- Viral shedding pattern was based on detection of viral RNA and may not reflect infectiousness.
- Quality and reliability of data on exposure and symptom onset for the infector-infectee pairs may vary as these were extracted entirely from various public announcements.

Citation

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