

SYNOPSIS

04/22/2020

Review of “The characteristics of household transmission of COVID-19”

Article citation: Li W, Zhang B, Lu J, Liu S, Chang Z, Cao P, et al. The characteristics of household transmission of COVID-19. Clin Infect Dis. 2020 Apr 17 [Epub ahead of print]. Available from: <https://doi.org/10.1093/cid/ciaa450>

One-Minute Summary

- This study examined **household transmission dynamics of coronavirus disease 2019 (COVID-19)** in index patients (n=105) and household contacts (n=392) in Hubei province, China. The index patients (mean age 47 years) had a likely source of exposure outside of the home. When the index case was diagnosed and hospitalized, the close contacts were quarantined for 14 days in “special places” by the government. They were monitored daily for symptoms and swabbed at the beginning and half way through the quarantine period.
- Secondary transmission occurred in 64 of 392 household contacts (secondary attack rate = 16.3%). Nine of 64 (14.1%) secondary cases were asymptomatic after two weeks of follow-up.
- The **secondary attack rate was significantly lower in those <18 years** (4.0%) compared to those ≥18 years (20.5%) (odds ratio [OR] = 0.18, 95% confidence interval [CI]: 0.06-0.54).
- **When index patients were isolated while at home immediately after symptom onset until hospitalization, the secondary attack rate was zero**, compared to a secondary attack rate of 18.3% when index patients were not immediately isolated while at home.
- **Spouses of index cases were more likely to become infected (27.8%)** than other adult household contacts (17.3%) (OR = 2.27, 95% CI: 1.22-4.22).
- **Time from onset in the index patient to hospitalization (and therefore removal from the home)** (0-1 day, 2-5 days, >5 days) did not impact the extent of secondary transmission (OR = 0.90, 95% CI: 0.61-1.33).
- The median **time from symptom onset in index cases to symptom onset in household contacts was 6 days** (interquartile range [IQR]: 4-10).

Additional Information

- **Index cases must have had an exposure history within 14-days since symptom onset to:** 1) Wuhan (traveled to or from Wuhan), 2) people from Wuhan and 3) high-risk locations (e.g., hospitals, supermarkets, railway stations). Family members did not have the above exposures.
- Home isolation of the index case involved masking, eating alone and “residing” alone.
- The **median household size** was four people (IQR: 3-6).

- The authors noted that the 16.3% secondary attack rate for COVID-19 was higher than previously reported for MERS-CoV (4%) ([Drosten et al. 2014](#)), SARS (10%) ([Wilson-Clark et al. 2006](#)) and 2009 pandemic influenza A (H1N1) (13%) ([Cauchemez et al. 2009](#)).
- The authors note that the higher secondary attack rate in adults compared to children may reflect lower susceptibility in children, or different contact patterns with the index case.

PHO Reviewer’s Comments

- The data in the text and tables differed in some instances. Where there are discrepancies, the data quoted in the table is used above.
- It noteworthy that immediate self-isolation of the index patients while they were at home was associated with no secondary cases, but the duration of time the index patients remained in the home from symptom onset to hospitalization did not seem to influence the secondary attack rate. The authors note that the study had limited power to assess the impact of self-isolation of index patients while at home.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Review of “The characteristics of household transmission of COVID-19”. Toronto, ON: Queen’s Printer for Ontario; 2020.

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