

COVID - Weekly newsletter (by [\(10\)\(2e\)](#) [\(10\)\(2e\)](#) and [\(10\)\(2e\)](#) [\(10\)\(2e\)](#))

People infected with SARS-CoV-2 can develop a wide spectrum of symptoms, from nonspecific respiratory symptoms to symptoms of gastroenteritis. Current epidemiologic, virologic, and modeling reports support the possibility of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission from persons who are presymptomatic (SARS-CoV-2 detected before symptom onset) or asymptomatic (SARS-CoV-2 detected but symptoms never develop). To what extent asymptomatic or presymptomatic persons can contribute to ongoing transmission is unclear but important to explore. Important questions related to this were: From which stage are these persons contagious? What is the role of asymptomatic or presymptomatic persons in the transmission?

Results

- A patient is generally contagious during the symptomatic phase. Patients with mild and severe symptoms are able to excrete the virus (Zhang et al 2020). However, there is direct evidence (He et al. 2020, Kim et al. 2020, Zou et al. 2020) that the amount of virus detected in patients is highest around the time of starting symptoms.
- It is difficult in daily practice to indicate when symptoms exactly started.
- Modeling studies estimated the contribution of infections before the onset of symptoms at 10-60% (Ferreti et al. 2020, Ganyani et al. 2020, He et al. 2020).
- Several studies (Luo et al. 2020, Hu et al. 2020, Pan et al. 2020, Tong et al. 2020, Yu et al. 2020, Huang et al. 2020, Qian et al 2020, Zhou et al, 2020, Wycliffe Wei et al, 2020, Rothe et al. 2020) have been conducted on patient clusters, usually based on transmission within families in Asia. These studies show that a/presymptomatic transmission 1-3 days before persons developed symptoms in absence of another possible source.
- In addition to these, few cross-sectional studies (with or without follow-up) showed a/presymptomatic transmission, for instance a study by Kimball et al. 2020 in a nursing home in America where nearly half (n = 13) of the 23 positively tested subjects were asymptomatic at the time of the positive PCR test result. Ten of these eventually developed symptoms and 3 remained asymptomatic over the entire study period. There was no difference in Ct value between the asymptomatic and symptomatic persons, indicating no difference in contagiousness.

Limitations of the studies:

- o It is not always clear whether persons were entirely asymptomatic before the onset of symptoms or had possibly mild symptoms
- o Possible transmission routes were not always mentioned
- o Conditions of study settings were not always clearly defined
- o For cluster studies, it seems plausible that transmission took place within the described cluster. However, phylogenetic analyses could have been provided additional information on transmission and clustering
- o Most studies took place in China on the basis of self-reported data (reliability)
- o The marker of contagiousness was in most studies based on positive PCR test results, without ct-values or cultured virus

Conclusions

Transmission can occur 1-3 days before the onset of symptoms and a/presymptomatic transmission may play a role in the overall transmission. Based on current evidence, information of the ECDC and guidelines of several Western countries, the possibility of presymptomatic transmission of 1-3 days before the onset of symptoms should be included in our policy, especially for procedures as contact tracing.

Findings and conclusions have been approved by the members of the OMT and are published on the website: <https://lci.rivm.nl/covid-19/bijlage/onderbouwing-a-pre-vroegsymptomatische-transmissie>