

# EC Request 129: Quarantine period for COVID-19: does the evidence support shortening from 14 to ten days?

## Background / Member State request

Date of request: 27 August 2020

Requesting Member State: [REDACTED]

From : [REDACTED], Referat 611 - Gesundheitssicherheit, Krisenmanagement national

*"during the HSC meeting yesterday there was a trend that several MS will reduce the quarantine from 14 days to 10 days, especially with regard to travellers coming from risk areas without symptoms.*

*We therefore ask you for an ECDC scientific opinion and advice on reducing the quarantine period from 14 to 10 days taking into account the incubation period and other relevant data.*

*It would be helpful to have this advice in place for our discussion next Tuesday within the HSC."*

## Quarantine in the context of individuals that are contacts of confirmed cases – does the evidence support a shortening of quarantine from 14 to ten days?

### ECDC expert opinion

**Based on the evidence described below, ECDC considers that there is not sufficient evidence to support a decrease in the COVID-19 incubation period from 14 to ten days. ECDC continues to monitor and review the evidence as it becomes available to ensure timely updates in its assessments.**

In light of the current state of knowledge and available literature - ECDC estimates that the reduction from a 14-day to a 10-day quarantine would result in a **loss of detection of secondary symptomatic cases among close contacts of confirmed cases of around 6%**, and considers

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this to be large enough to have public health relevance in a scenario where the level of exposure is high (such as quarantine of close contacts).

The below ECDC assessment is based on five studies (two systematic reviews and three original articles) looking at the range of SARS-CoV-2 incubation time after exposure to infection.

## Evidence-base supporting the opinion

In July 2020, ECDC received a similar request in light of recently published systematic reviews and meta-analyses on the incubation period for COVID-19.

Below follows a summary of these studies on which ECDC has based its opinion.

The systematic review done by [Wei et al](#) which compiled 56 studies, which include 4 095 COVID-19 cases. Based on their findings, the authors conclude that SARS-CoV-2 shows a long, dispersed incubation time, which could explain the extent of the virus' global spread. Furthermore, based on their analyses authors considered the 14-day quarantine period sufficient to trace and identify symptomatic infections among an active monitoring population. As per ECDC assessment, this study does not provide strong evidence for the decrease of the quarantine time.

Using parameters and data from *Wei et al.* to estimate the impact of a 10-day quarantine vs 14 days, and assuming full compliance with quarantine measures, ECDC analysed the impact and found that the total number of expected secondary cases would be around 560 for a population of 10 000 contacts, where the *default "risk of contacts of people with symptomatic infections"* being infected is 0.063.

Taking the above into account, for a quarantine length of 10 days:

- 57 contacts are expected to develop symptoms after 10 days; that is around 10% of the total of the expected cases (= 90% detected before the 10 days).
- 23 contacts are expected to develop symptoms after 14 days; that is around 4% of the total expected cases (= 96% detected before the 14 days).
- taking into account the total number of cases, about 2.5 times more undetected cases could be expected if the quarantine period is shortened from 14 to 10 days (57 vs 23), which would contribute to the additional further transmission.

For a quarantine period of 14 days:

- the detection rate would be 96%, implying that an additional 6% of cases would be captured by a 14-day quarantine compared to a ten-day quarantine.

For a disease, where rigorous and wide-spread testing is advocated and where strict control strategies are recommended and are in place:

- having 10% of cases going undetected (in the scenario of a day 10 quarantine) can be considered as "high", especially when the absolute number of people under quarantine is high.
- Gaining an additional 6% in case detection can be considered as important, especially for a high incidence emerging disease such as COVID-19, where an effective treatment or vaccine is still lacking, and where quarantine, as well as strong physical distancing, remain the most "efficient" tools to reduce further transmission.

These conclusions apply in the scenario of exposure to confirmed cases where the level of exposure is high, as in the example above, which is based on the results of quarantine of close contacts in Ningbo City, China. In situations where the risk of exposure to cases is lower, or in the specific case of returning travellers from areas of high endemicity without documented exposure to confirmed cases, the marginal effect of secondary case detection by maintaining a quarantine up to day 14 will be low.

A number of limitations to this review should be noted:

- the lack of the peer-review of several of the included studies (pre-prints),

- the possibility that some data were used repeatedly in more than one study,
- the limited number of studies from outside mainland China, and
- the high heterogeneity in the sample size of the individual studies included.
- it is not clear what definitions were used for 'contact persons' in the papers used to generate the graph.
- this analysis does not consider the further impact of asymptomatic cases, due to the lack of data on infectivity in these cases, however the proportion of asymptomatic cases is significant (up to 16%) and the viral loads in them tend to decrease slower than in symptomatic cases.
- all our calculations assume that the exposure to COVID-19 is well defined and documented by the public health team on site.

The systematic review and meta-analysis by [McAloon et al](#) shows that the pooled parameter estimates resulted in a median incubation period of 5.1 (4.5, 5.8) days, whereas the 95<sup>th</sup> percentile was 11.6 (9.5, 14.2) days.

A number of limitations of this study also warrant being highlighted:

- it is limited to the inclusion of publications up to 8<sup>th</sup> April 2020;
- the meta-analysis is limited to seven studies;
- the majority of studies suitable for inclusion in the final analysis modelled incubation period as a lognormal distribution, and
- a random effects meta-analysis of the parameters of these distributions was conducted.

In addition, three additional peer-reviewed publications after April 2020 (i.e. not included in the Wei et al. systematic review or McAloon et al.) have considered the question of quarantine.

1. The publication of [Shen et al.](#) describes a cluster of seven COVID-19 cases, where the incubation period ranged 4-12 days, with median of 7 days.
2. In the study by [Yang et al.](#) the median incubation period of COVID-19 was assessed to be 5.4 days (bootstrapped 95% CI 4.8–6.0), and the 2.5<sup>th</sup> and 97.5<sup>th</sup> percentiles are 1 and 15 days, respectively. 95% of symptomatic cases showed symptoms by 13.7 days (95% CI 12.5–14.9) and 99% showed symptoms by 17.8 days (95% CI 15.9–19.7). The authors draw a conclusion that "the current practice of 14-day quarantine period in many regions is reasonable".
3. The study by [Kong et al.](#) includes 10 cases of a cluster. In this study, all cases had an incubation period of less than 14 days, the median incubation period being 6.0 days (interquartile range, 3.5-9.5 days).