

Report optimize the case definition of COVID-like disease in Infectieradar.

Background:

Methods:

The aim of syndromic surveillance is to monitor possible infections within the population, these can be respiratory infections, gastroenteritis infections and other kind of infections. Therefore, participants are asked about a long list of different symptoms fitting with many different type of infections. To monitor a specific infections (influenza, rotavirus infection, COVID-19) it is therefore important to define case-definition which is suitably specific, which means that when these symptoms are traced over time, they are informative about the trajectory of the outbreak of this particular infection.

In an ideal world this case-definition can be optimized using a perfect bench-mark, for example laboratory confirmed cases.

Currently the case-definition of COVID-like-disease is: fever and/or cough, with at least one other symptom from a list of x symptoms.

When this definition is too inclusive, the relevant trend can be too obscured, when it is too narrow, too many cases are missed.

Infectieradar has run for 3 weeks, and the time-tend is too short to compare the trend in Infectieradar with other time-trends, therefore the case-definition cannot be compared with another source.

To optimize the case definition we compared the symptoms of likely COVID infections, with infections likely not caused by COVID, and based on these we come up with alternative case definitions.

The aim to monitor disease is many fold. It can be used as a warning, or it can be used as an estimation of the total disease burden, or it can be used to explore differences between groups or sub-groups.

Given the unspecific nature of syndromic surveillance the specificity and sensitivity of the case definition is crucial. Which people are true positive, or false positive, or true negatives, and false negatives. A test can be very sensitive (all those with COVID are identified) but very poor in specificity (not only those with COVID are identified, but also all other infections), or the other way around, very high in specificity (no person without COVID is identified), but also many people with COVID are excluded. Based on the purpose a high specificity or high sensitivity is required.

However, participants indicate whether they think their symptoms are caused by an infection with COVID, where the answers on the question can be:

- a) No, I don't think my symptoms are caused by COVID
- b) I don't know
- c) Yes, I think I have, as the symptoms are compatible with COVID, however nobody in my surrounding tested positive

- d) Yes, I think I have, as people I interact with have had contact with a confirmed case
- e) Yes, I know, as I have direct contact with a confirmed case
- f) Yes, I know, as I am a confirmed case

Therefore the symptoms reported by those participant who answered (e) and (f) and perhaps (d) can be used to inform the case-definition until the case-definition can be adjusted toward another external golden standard. Due to the low testing capacity in the Netherland the probability that people are tested or family or friends are tested is not given. Therefore the answers cannot be used as an indication whether any participant had COVID yes or no, as many who report as being (a) or (b) might have been infected with COVID.

Descriptive results using data for 17-03-2020 until 06-04-2020;

There are 32,063 reports of symptoms among 20,103 participants. Of these 32,063 reports 13,927 match the COVID-like illness case definition, and 69 report as being a confirmed case (f), 300 as being closely related to a confirmed case (e), 923 with an indirect contact with a confirmed case (d), 3632 with similar symptoms (c), 9639 don't know, and 14556 are sure there symptoms are not related to COVID – and for 2944 reports we don't have this information.

Plot the symptoms of those who have it, with those who are indicating not to have it.