SPI-M-O: Consensus Statement on 2019 Novel Coronavirus (Covid-19)

Date: 17th February 2020.

Major changes and additions to the previous consensus statement are highlighted in red (Not highlighted is the change in name from 2019-nCoV to Covid-19)

Incidence

1. The number of symptomatic cases of Covid-19 in China is estimated to be at least 10 times higher than the number of cases they have confirmed.

2. The ascertainment rate and severity profile of cases recorded in different locations will vary depending on the sensitivity of different surveillance systems. Confirmed cases in China are likely to include a relatively higher proportion of moderate to severe infections, whereas case recording outside China is likely to be more sensitive to mild cases, including some that are asymptomatic.

Reproduction number and doubling time

3. The basic reproduction number (R_0) is the average number of secondary infections produced by a single infected individual in an otherwise entirely susceptible population. This is a measure of the epidemic potential of an infection. The critical issue is whether R_0 is greater than one. The doubling time is the time it takes for the number of new infections to double in size.

4. Both the reproduction number and doubling time are dependent on the characteristics of the population so may be different in the UK, and may be different in different groupings within the UK.

5. The reproduction number seen in the city of Wuhan in the early stages of the outbreak are estimated to be in the region of 2 – 3. It is not yet clear how this has changed in the last two weeks, or what the reproduction number is in other parts of China. There is insufficient data available to determine whether there is sustained transmission outside of the province of Hubei, but it is likely to be the case.

6. If a reproduction number in the region of 2 – 3 occurred in the UK it would correspond to around 80% of the population becoming infected. Not all of them would be symptomatic.

7. The doubling time in Hubei was estimated to be 3 – 5 days in the earlier stages of the outbreak.

8. It is a realistic probability that outbreaks outside China cannot be contained by isolation and contract tracing. If a high proportion of asymptomatic cases are infectious, then containment is unlikely via these policies. Countries with less effective health care systems are less likely to be able to contain sustained outbreaks.

9. Population-wide reduction in contact rates, for example through the mass closure of schools, will impact transmission regardless of the importance of asymptomatic transmission but the potential effectiveness of such measures is unclear.

Epidemic timescales

10. The overall duration of epidemics within countries are likely to be longer than for a typical influenza pandemic given the current estimates of a higher reproduction number and longer serial interval.

11. Modelling predicts that it is highly likely that the epidemic in Wuhan will peak before the end of February.

12. Cases in the rest of China might be expected to peak around 2 months later than in Wuhan. The importation risk in other countries is likely to increase as the number of cases grows in the rest of China.

13. If the epidemiological parameters in the UK are comparable to China, then a peak in case numbers might be expected approximately 2 – 4 months after the establishment of widespread sustained transmission.

14. All else being equal, the higher the reproduction number, the shorter the time until epidemic peak. A change in the modelled basic reproduction number of ± 0.5 from the central estimate of 2.5 changes the time to peak by around 3 – 4 weeks.

15. For a fixed reproduction number in the region of 2 – 3, an increase of one day in the doubling time will delay the peak by approximately 20 days.

16. There were differing views within the group about the likelihood of sustained transmission in the UK both currently and in the near future. Some believe it is a realistic possibility that sustained transmission in the UK will become established in the coming weeks while others believe this likelihood is higher and that there may already be sustained transmission.

Relative risk of epidemics in other countries

17. The relative risk of cases in countries outside China has been shown to be correlated with air passenger levels. Countries with a higher volume of travel to and from China have been more likely to experience cases. Whilst it is to be expected that this will continue to be the case, transport patterns are changing, so the relative risk is expected to as well.

Fatality Ratio

18. The Infection Fatality Ratio (IFR) is the proportion of people infected by Covid-19 who die. The Case Fatality Ratio (CFR) is the proportion of people with clinical symptoms who die. The Hospitalised Case Fatality Ratio (HFR) is the proportion of people hospitalised due to severe symptoms who die.

19. These ratios are not homogenous across groups and will likely depend on several factors such as an individual's age and co-morbidities. They will also vary between countries, especially depending on the effectiveness of and access to healthcare.

20. Derivation of the IFR in China is difficult due to the level of uncertainty in ascertaining the total number of infected individuals.

21. Precise estimates of the CFR in China are not possible because of both under-ascertainment of cases and the time lag between symptomatic cases and deaths (the average time between symptom onset and death in early cases from China has been 15 days, with wide variation). Current estimates of the average CFR seen to date are in the range 0.25% – 4%.

22. Current estimates for the fatality rate for people hospitalised in China, who primarily have pneumonia and/or other severe symptoms, are around 15%.

23. Limited evidence from China suggests that severe cases are more common in older age groups and those with other health conditions. It is unclear how Covid-19 affects children and children's role in transmission.

Hospitalisation rate

24. The hospitalisation rate is currently unknown and greatly influenced by access to health-care.

Serial interval

25. The serial interval is the average time between symptom onset in primary and secondary infections. Current estimates of the average serial interval vary from 3 – 8 days.

Incubation period

26. The incubation period is the delay between an individual becoming infected and developing symptoms. Current estimates give an average incubation period of 5 days (range 1 – 11 days). This is approximately twice as long as for influenza. The maximum incubation period is used to define the period required for isolation, currently believed to be 14 days.

27. The long incubation period means isolation of contacts of cases would need to be lengthy and that entry screening is likely to be ineffective.

Seasonality

28. It is currently unclear whether any seasonality in transmission can be expected with Covid-19. If there is a seasonal element in Covid-19, it may be lower than other respiratory infections due to the longer serial interval. The seasonality in extant coronaviruses may be partly driven by mixing patterns (i.e. school holidays) as well as environmental factors.

Operational considerations

29. Real-time forecasting models rely on deriving information on the epidemic from surveillance. If transmission is established in the UK there will necessarily be a delay before sufficiently accurate forecasts in the UK are available.

30. Preliminary forecasts and accurate estimates of epidemiological parameters will likely be available in the order of weeks and not days following widespread outbreaks in the UK (or a similar country). While some estimates may be available before this time their accuracy will be much more limited.

31. The UK hospitalisation rate and CFR will be very important for operational planning and will be estimated over a similar timeframe. They may take longer depending on the availability of data.

Annex: Reasonable Worst Case

32. SPI-M-O concluded that given the current evidence for Covid-19, and the associated uncertainties, the RWC for pandemic influenza would be an appropriate planning scenario at that point. SPI-M-O will keep updating their assessment of the reasonable worst case as the outbreak progresses.

33. For reference, the pandemic influenza RWC can be found in the SPI-M Modelling Summary available at https://www.gov.uk/government/publications/spi-m-publish-updated-modelling-summary.