Estimation incubation period of 2019-nCoV from patients with travel history

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The incubation period of the 2019-nCoV was estimated from Chinese patients with a travel history from Wuhan, to be on average 5.6 days, ranging from 2.1 to 11 days (95% interval).

Data

Data available from google doc that compiles data on 2019-nCoV outbreak from different data sources:

https://docs.google.com/spreadsheets/d/1jS24DjSPVWa4iuxuD4OAXrE3QeI8c9BC1hSlqr-NMiU/edit#gid=1449891965

maintained by Dr. Kaiyuan Sun http://misms.net/staff/sun/

Methods

A line list is kept up to date with patients that were detected to be infected in other parts of China than Wuhan, but that traveled from Wuhan in the days prior to symptom onset. From these data the exposure window of each patient is known. These patients include 17 visitors from outside Wuhan that visited Wuhan for a limited time. For instance:

First confirmed imported nCov pneumonia patient in Shanxi: male, visited Wuhan from 01/12/2020 to 01/15/2020, symptom onset on 01/19/2020, visit clinic on 01/20/2020, 6 contacts traced.

Gives an incubation time of minimally 4 and maximally 7 days. Twenty other patients are Wuhan residents that visited other parts of China. For instance:

First confirmed imported nCov pneumonia patient in Shanghai (from Wuhan): female, 56, Wuhan residence, arrived in Shanghai from Wuhan on 01/12/2020, symptom onset and visited fever clinic on 01/15/2020, laboratory confirmed on 01/20/2020

Gives an incubation time of minimally 3 days and unkown maximum. This was set at 21 days.

From the 37 exposure windows and their dates of symptom onset the incubation period is estimated in stan assuming a gamma distribution.

Results

The gamma distributed incubation period is estimated as

- mean of 5.6 (4.5 – 6.9 CI) days
- shape parameter of 6.2 (2.6 – 12 CI)

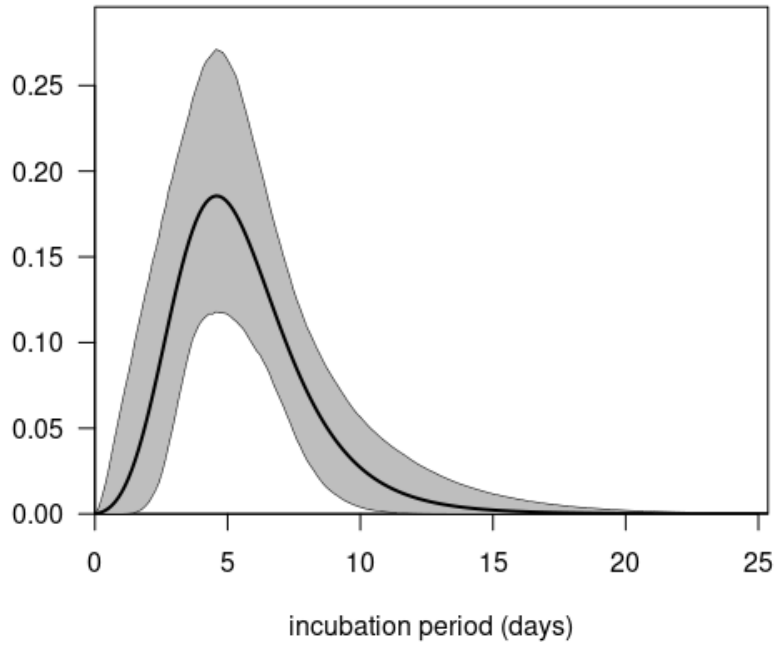

Fig. 1 Estimated incubation period distribution with mean (black line) and 95% CI (grey area).

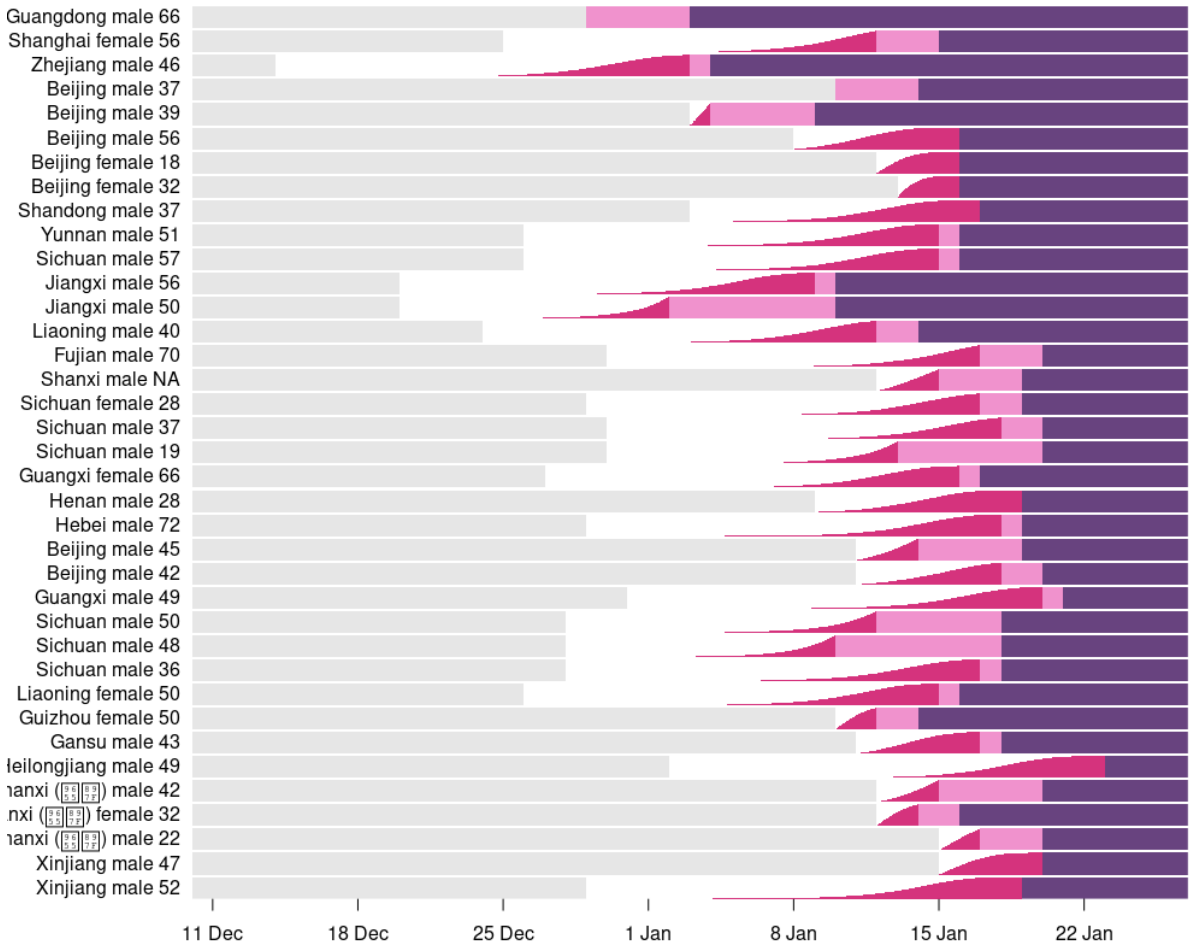

Fig. 2 Estimated time of infection for individual patients with travel history from Wuhan; showing distinct periods as unexposed (gray), exposed (white), infected but asymptomatic (pink), symptomatic (purple), with the probability of being infected (violet).