

ESTIMATING ASYMPTOMATIC AND SYMPTOMATIC TRANSMISSION OF NOVEL CORONAVIRUS DISEASE 2019 IN SELENGE PROVINCE, MONGOLIA

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Abstract

Background: Following a locally transmitted case in Sukhbaatar city, Selenge province, we conducted a study with two objectives. First, we aimed to estimate the basic reproduction number of COVID-19, leveraging the epidemiological and clinical characteristics observed in the first 67 confirmed cases. Second, we aimed to model the outbreak considering different patient profiles - asymptomatic, symptomatic, and pre-symptomatic - with the goal of predicting the ultimate scale of the epidemic in the scenario of uninterrupted transmission. **Methods:** We conducted a prospective case study following the WHO FFX cases generic protocol. The rapid response teams collected the surveillance data from November 14–29, 2020. We created a stochastic process to draw many transmission chains from this greater distribution to better understand and make inferences regarding the outbreak under investigation. **Results:** The majority of the cases involved household transmissions (35, 52.2%), work transmissions (20, 29.9%), index (5, 7.5%), same apartment transmissions (2, 3.0%), school transmissions (2, 3.0%), and meetup transmissions (1, 1.5%). The posterior means of the basic reproduction number of both the asymptomatic cases, R_0^{Asy} and pre-symptomatic cases R_0^{Pre} (1.35 [95% CrI 0.88-1*86] and 1*29 [95% CrI 0*67-2*10], respectively), were lower than that of the symptomatic cases. **Conclusion:** Our study highlights the heterogeneity of COVID-19 transmission across different symptom statuses and underscores the importance of early identification and isolation of symptomatic cases in disease control. Detailed contact tracing data with advanced statistical methods, can be applied to other infectious diseases, facilitating a more nuanced understanding of disease transmission dynamics.

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R_0 Posterior Distributions



