COVID-19 from an Asymptomatic Contact

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An outbreak caused by coronavirus disease 2019 (COVID-19) occurred in Wuhan City, Hubei Province, China, in December 2019. Up to February 21, 2020, at least 75570 cases have been reported. Most of the patients had a history of visiting Hubei Province or contacting with people who had ever stayed in or passed by Hubei Province, or exposed to symptoms[1]. Some patients got infected only from asymptomatic contacts. This study aimed to report the epidemic features and lab identification of a patient confirmed with COVID-19 infection only from asymptomatic contact.

A 44-year-old man, who lives in Nanchang, Jiangxi province, China, suffered from cough on January 27. Fever symptoms appeared on January 28, with a maximum temperature of 38.8°C, accompanied by cough, sore throat, headache, fatigue, muscle ache, joint ache, and other symptoms. The symptoms continued until he was

hospitalized on January 30. Coronavirus conventional polymerase chain reaction (PCR) assay was positive for the throat swab sample (Figure 1).

Before the onset of symptoms, on January 23, 2020, the patient, wearing masks and gloves, along with his wife and son, drove from Nanchang to Honghu City, Hubei Province, where his parents and brother live. They arrived on the same day and did not stop by any of the expressway service areas on the way home. After arriving, they stayed at home. In addition, his parents stayed at home for at least 20 days with his younger brother's family before they went back. His younger brother and one of his brother's children visited Wuhan on January 5 and came home on January 6, 2020. After staying with his parents and brother's family for 3 days, on January 25, the patient drove back to Nanchang. On the way home, they stopped by the Tongshan service area, Hubei Province, without close contact with any other person. After arriving home, none of them left their residence(Figure 2,3).

He is not obese and denied previous basic disease. On admission (January 30, 2020), the physical examination revealed a body temperature of 38.8°C, a respiratory rate of 19–21 breaths/min, a pulse of 62–88/min, and a blood pressure of 76/128 mm Hg. The initial chest radiograph showed a glass density shadow of both lungs, but high-resolution computed tomography on February 3, 2020 (day 4 of illness), showed multiple, ground-glass opacities located in both subpleural spaces (Figure 4). The laboratory tests showed mild changes in the numbers of neutrophils and lymphocytes. During admission, he developed nasal congestion, cough, sputum, and pleuritic chest discomfort (Figure 5).

On January 31, 2020, his routine examination revealed a white blood cell count of 4.4 × 109/L, lymphocyte count of 0.6 × 106/L, and C-reactive protein level of 4.9 mg/L. The lung HRCT examination at 20:00 p.m. showed significantly larger lung lesions than on the previous day.

Before the patient's visit to Honghu, his relatives, including his parents and brother's family, had no particular disease caused by contact and clustering, except for the 2-day stay at Wuhan. After the patient was hospitalized, the results of coronavirus conventional PCR assay of his brother's family, performed twice every other day, were negative(Figure 6). He neither went to any farmer's market nor was a farmer's market present near his residence. He denied any exposure to a febrile patient or wild animals, or visits to wet markets, including the seafood market in Wuhan. His wife and son, two close contacts with the last contact on January 30, 2020, had no symptoms or signs till February19, 2020.

It is difficult to know exactly the incubation period and infection period of COVID-19 pneumonia [2]. What made the problem more confusing was that who passed the infection to him could not be predicted because any of the relatives could have served as an intermediary of the virus (Figure 7). None of his relatives showed signs of infection, not even a slight cough till February 19, 2020. The coronavirus nucleic acid testing produced negative results for all four of them, except his parents and one of his nephews. No suspected or confirmed cases were reported in Nanchang within 14 days of his departure from the site on January 23.

This case highlights the possibility of developing Severe Acute Respiratory

Syndrome Coronavirus 2(SARS-CoV-2) infection and epidemic from asymptomatic infection. This indicates the need for contact isolation, especially for those who return from the epidemic area without symptoms [3-4]. In addition, this report suggests that in the early phase of COVID-19 pneumonia, routine screening can miss diagnosing patients who are virus carriers. how common are such transmissions of asymptomatic infection remains to be determined. The scale of transmission from asymptomatic contact during the early phase of infection needs to be explored urgently. Thus, highlighting travel history is of paramount importance for the early detection and isolation of SARS-CoV-2 cases.

Ethical review committee: Centre for Diseases Prevention and Control of Easten Theater, Nanjing (2020003).

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Ethics approval and consent to participate

The ethics committee approved the study. Written informed consent has been obtained from the patient in accordance with the Declaration of Helsinki.

Competing interests

The authors declare that they have no competing interests.

Figures and Legends

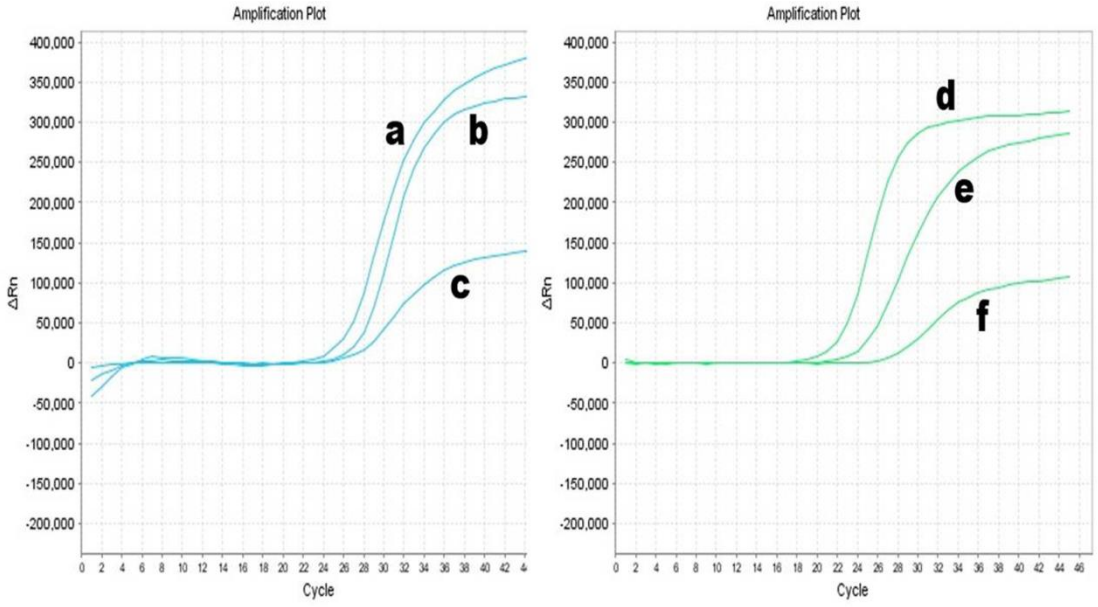

Figure 1: Imaging of the patient using reverse transcription PCR. A：Positive Control of ORF1ab(a), N(b), E(c).B： Specimen Detection of ORF1ab(d), N(e), E(f).

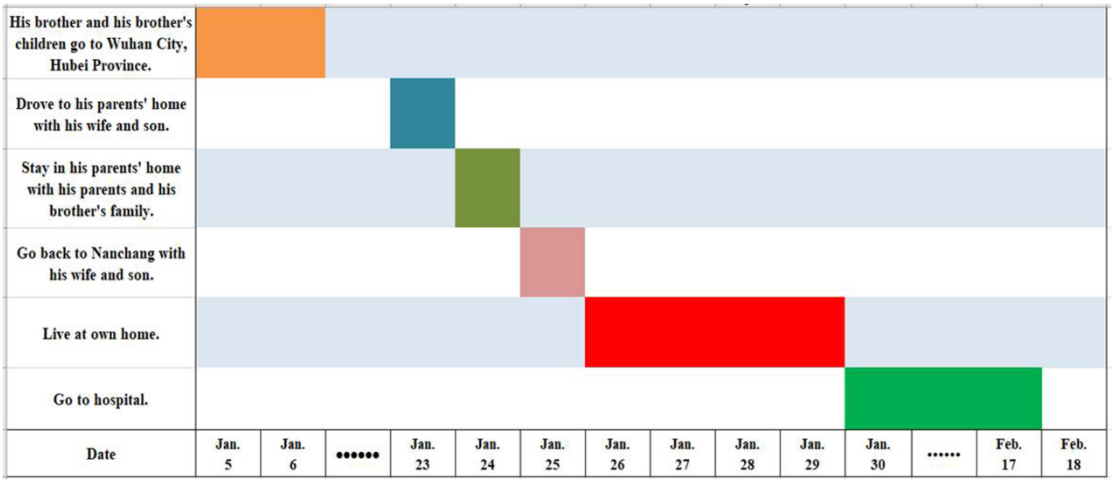

Figure 2. Travel and residence history of the patient and his family.

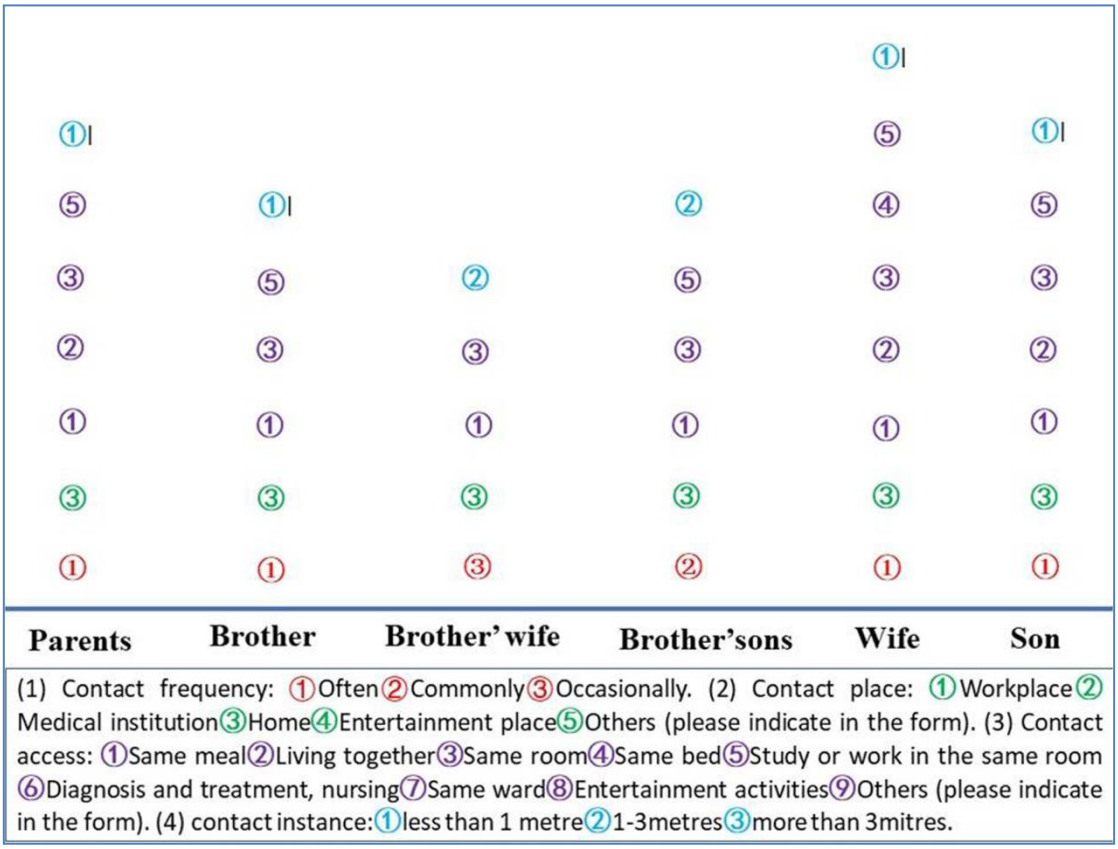

Figure 3. Contact styles of the patient with his relatives and families.

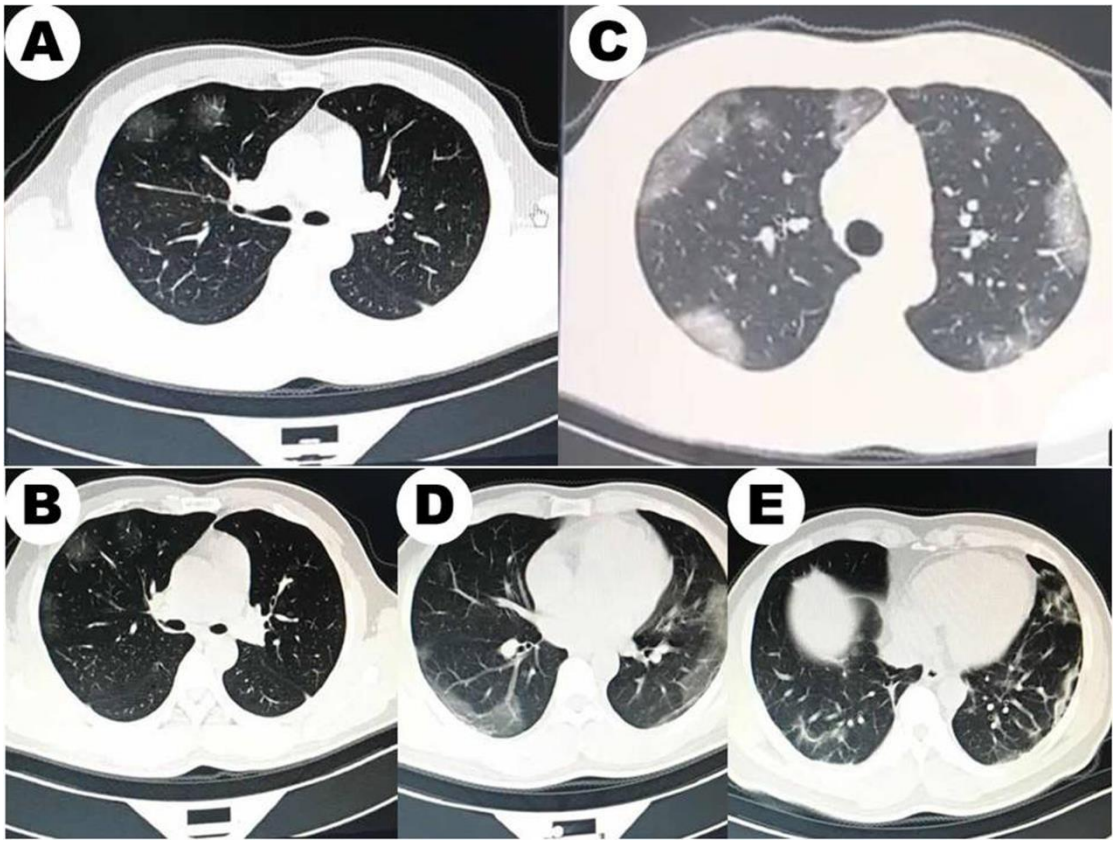

Figure 4. Chest imaging of the patient. (A-B) Chest CT scans of the lung on January 30 and January 31, 2020 (3-4 days after the symptom onset) slight pulmonary infiltration. (C-D) The CT scans taken on February 03, 2020 (8 days after the symptom onset) obvious pulmonary infiltrates. (E) The CT scans taken on February 10, 2020 (15 days after the symptom onset). CT: high-resolution computed tomography.

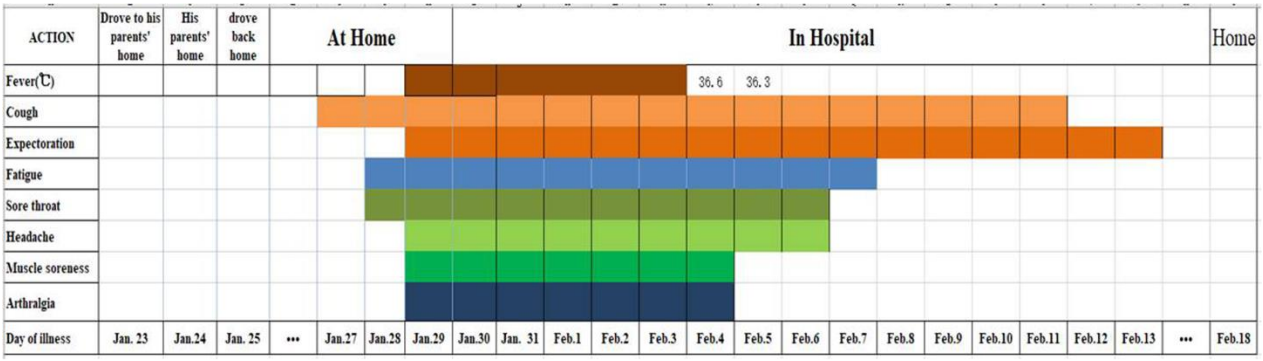

Figure 5. Symptoms and maximum body temperatures according to the day of illness,, January 27 to February 18, 2020.

Figure and Legend

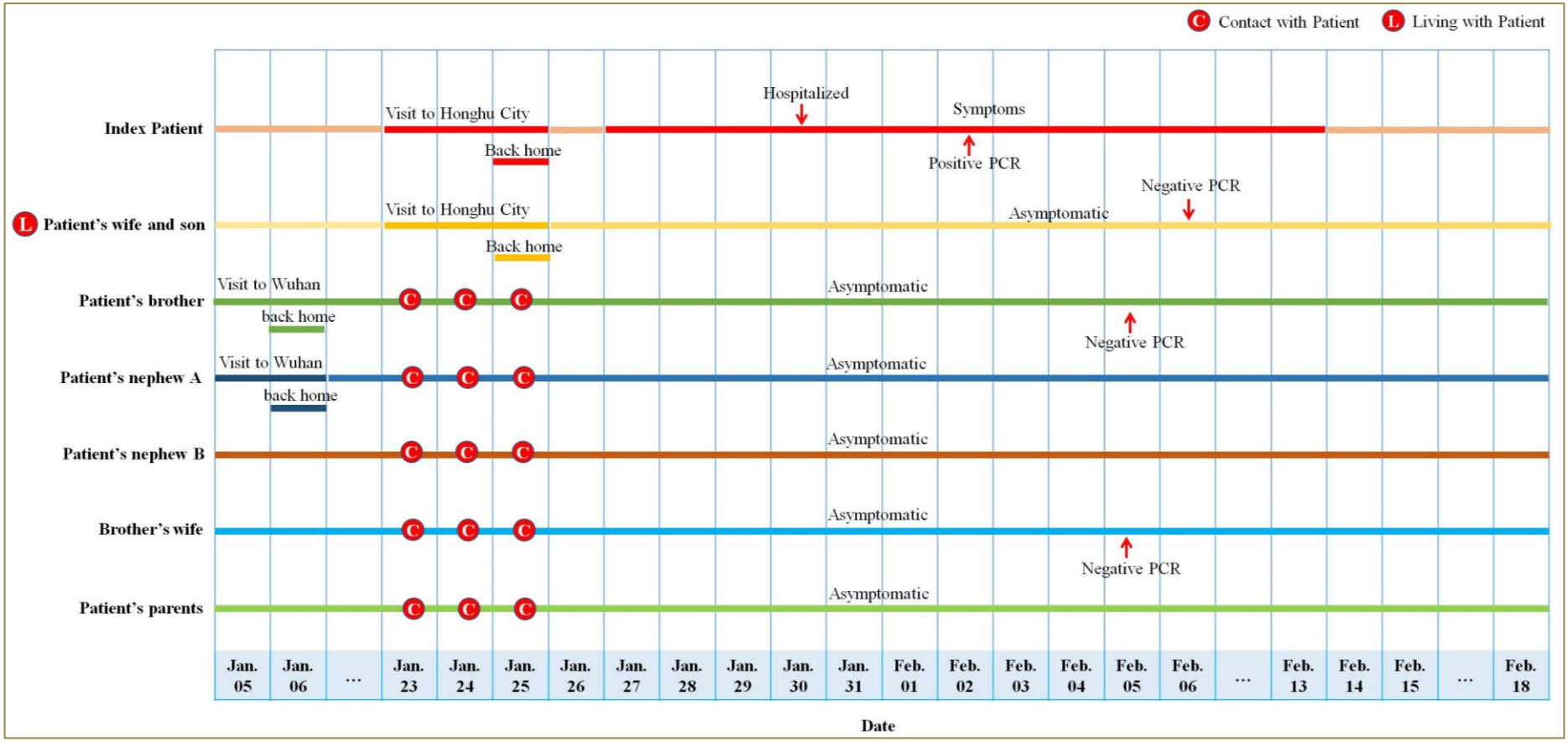

Figure 6. Timeline of Exposure to Index Patient with Asymptomatic 2019-CoV Infection in China.

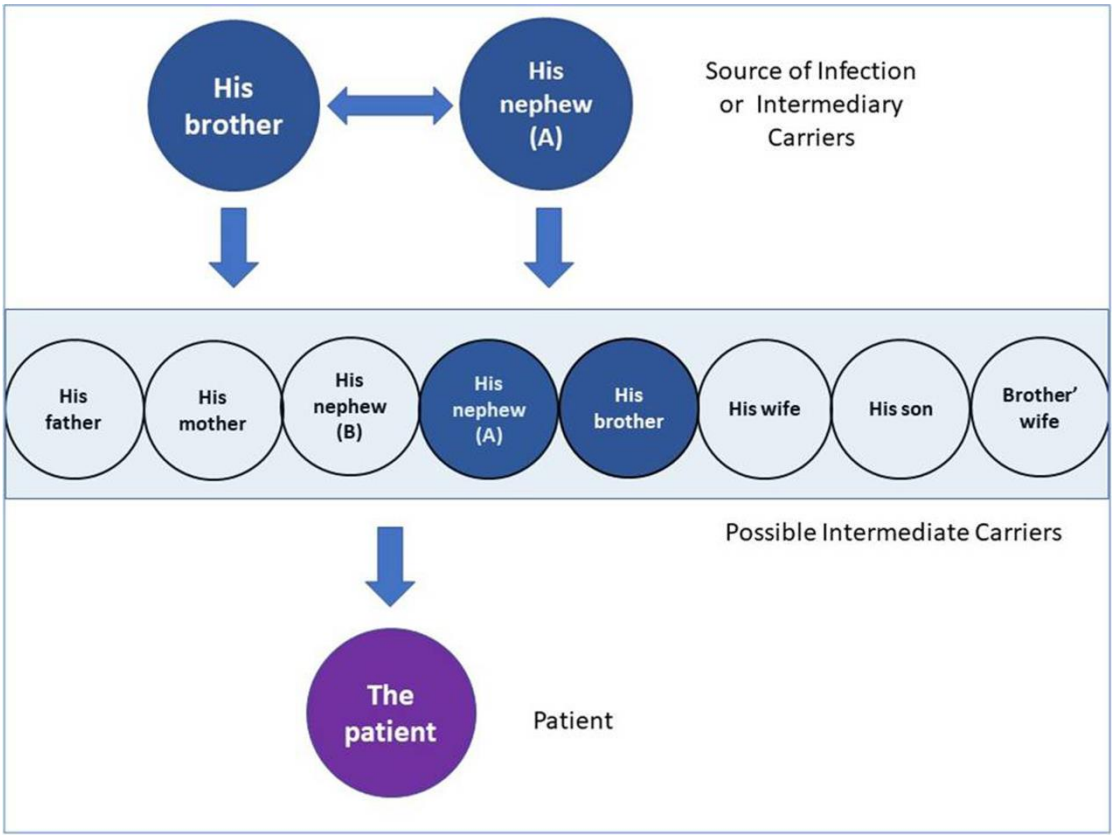

Figure 7. The possible transmission of virus among relatives.