

Notes from the Field

An Outbreak of the SARS-CoV-2 Omicron Variant BA.1 — Zhuhai City, Guangdong Province, China, January 13, 2022

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On January 13, 2022, Zhuhai CDC received a notification that a coronavirus disease 2019 (COVID-19) case was found in the fever clinic in nearby Zhongshan City. Zhuhai CDC promptly carried out large-scale population screening in three nearby counties. A total of 4 COVID-19 cases were found in Nanping County. 34 cases were screened from close contacts, and 2 cases were reported from close contacts in other cities of Guangdong Province. The 20 cases were sequenced by Guangdong CDC and identified as the variant of concern (VOC)/Omicron variant BA.1. Since January 14, Zhuhai has carried out 8 rounds of nucleic acid screening for COVID-19 in the county where the cases occurred. Four large-scale nucleic acid screening tests for COVID-19 were conducted across the city, and no new community cases were reported after January 15.

In a total of 38 Omicron cases, 76% were mild (26/38) or asymptomatic (3/38) cases and 24% were moderate (9/38) cases; 79% of the mild or asymptomatic (23/29) cases completed more than 2 doses of inactivated COVID-19 vaccine; 83% of cases under the age of 15 were mild (15/18) and 70% of adult cases were mild or asymptomatic (14/20). There was no significant difference between the 2 age groups ($P>0.05$). The main symptoms were cough (49%, 17/35), fever (29%, 10/35), and dry pharynx (23%, 8/35). Pulmonary inflammation was found on computed tomography in 16% (6/38) of cases, 17% (3/18) in children and 15% (3/20) in adults.

The outbreak occurred in a cluster of work and study places and families (Figure 1A). The first case (a 34-years-old female) who worked in Company C developed symptoms on January 8, 2022. Her husband was a yacht harbor driver, her daughter was studying in Primary School B, and her son attended Kindergarten A, all of whom developed symptoms on January 11, 2022.

We identified the outbreak was caused by family cluster cases spreading to kindergartens, elementary

schools, and companies, then successively causing 7 families to have cluster cases (Figure 1B). The family secondary attack rate is 15.8%.

This outbreak has produced five generations of cases. The intergenerational time interval was calculated using the time interval of case onset, mean=3.37 days, standard deviations=1.70 days. The basic reproduction number (R_0) from January 8 to 21 was calculated (maximum likelihood method) as 1.3 (95% confidence interval: 0.8, 2.0). On January 13, the effective reproduction number was (R_t)=5.5 at the highest, then decreased rapidly to $R_t<1$ after January 19 (Figure 1C).

In the mainland of China, the first imported Omicron cases were found in Tianjin in December 2021 (1). Zhuhai had had no local COVID-19 cases since February 4, 2020. The first infected case had never left Zhuhai within one month before onset.

Company C mainly undertakes the customized production of foreign dentures and dental membranes. The goods were imported by express delivery from Europe and America. The first case occurred in a customer service employee. She occasionally helped pick up goods in the receiving area without protection (without masks and gloves) from January 1 to 11, 2022.

On January 16, 670 environmental samples were collected from Company C, and 6 single gene positive samples were detected, of which 5 positive samples were from the working area of cases as well as their colleagues without disease, and 1 positive sample was from the inner packaging of imported molds on the first floor.

After cases were found in adjacent cities, Zhuhai rapidly carried out large-scale population screening in three nearby counties. Early detection and isolation has played a key role in containing this Omicron outbreak (2). If the outbreak in kindergartens and primary schools had not been blocked in time, it could easily have spread through the community and caused an epidemic.

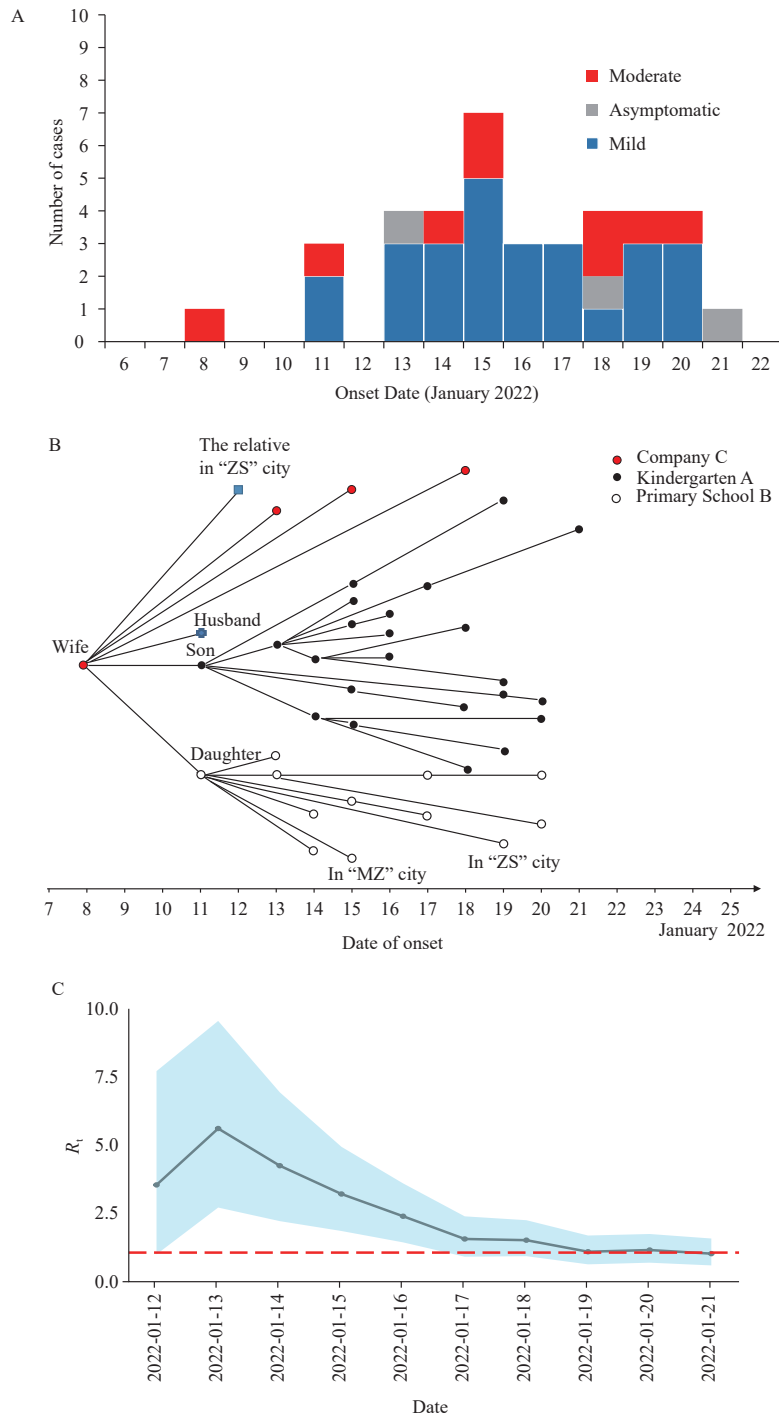


FIGURE 1. The transmission characteristics and transmission chain of an outbreak of the COVID-19 Omicron variant in Zhuhai City, Guangdong Province, China, 2022. (A) The epidemic curve of 38 COVID-19 cases; (B) The transmission chain of 38 COVID-19 cases; (C) The R_t of the ongoing COVID-19 epidemic in Zhuhai City from January 12 to January 21, 2022. Note: In Figure 1B, each dot represents an infection case, and the connecting line between them represents the transmission relationship. “ZS” City is Zhongshan City of Guangdong Province, “MZ” City is Meizhou City of Guangdong Province. In Figure 1C, the red dotted line indicated $R_t=1$, below which sustained transmission was unlikely so long as intervention measures were sustained, indicating that the outbreak was under control. The “R0” package of R software (version 3.6.0, R Core Team, Vienna, Austria) was used for the data analysis. Through gamma distribution fitting, the “EpiEstim” package was used to estimate the R_t since January 12. R_0 represents the basic reproduction number; R_t represents the effective reproduction number. Abbreviation: COVID-19=coronavirus disease 2019.

There was no strong evidence to show that materials other than cold chain food were the infection source (3). We suspected foreign dentures and dental membranes were possible sources of infection by epidemiological investigation, and more studies will be conducted in the future.

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