
Epidemiological Investigation and Analysis of a COVID-19 Cluster in Jingxi, Guangxi

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Abstract: Since December 2019, it has been 3 years since the global outbreak of new coronavirus pneumonia. New coronaviruses have been constantly changing. The Omicron variant has become the global epidemic of now coronavirus pneumonia has not been effectively controlled. Since the beginning of this year, China has witnessed the outbreak of omicron subtype BA.1 and BA.2 mutants. *Objective* To analyze the characteristics of a COVID-19 outbreak in Jingxi City from February 5 to 11, 2022, to provide a reference for the formulation of epidemic prevention and control measures in the future. *Methods* Apply descriptive epidemiological methods to analyze the characteristics of the epidemic and the investigation and disposal work. *Results* From February 5 to 11, 2022, Jingxi City reported a total of 32 confirmed cases of COVID-19, including 12 mild cases (37.50%), 19 ordinary cases (59.38%), 1 severe case (3.12%), and no deaths. case occurred. The type of transmission was 21 cases (65.62%) of family members gathering at the same meal, and 11 cases (34.38%) of daily contact transmission. The source of infection of most cases was related to the transmission chain of gathering meals, and then spread through family and community transmission. *Conclusion* The original outbreak in Jingxi City was a secondary local outbreak of imported cases of Omicron subtype BA.1 variant strains imported from Debao county, Baise City, Guangxi. Jingxi City took timely and decisive measures to close the whole region, and strictly controlled the closed and controlled areas, control areas and prevention areas, and the epidemic was quickly and effectively controlled.

Keywords: COVID-19, Epidemiology, Clusters, Chains of Transmission

1. Introduction

Since Decembr 2019, 2019 cornona virus disease and COVID-19 outbreak have been prevalent for three years [1], 2019-ncov continues to mutate around the world [2], and omicron mutant has replaced delta strain as the main epidemic strain. Due to the impact of the fourth wave of global epidemic, Omicron subtype Ba has occurred in China 1 and ba 2. Epidemic Situation of mutant strain. COVID-19 patients and asymptomatic infected persons are the sour of infection [3]. Family community transmission are the epidemic characteristics of COVID-19. The Omicron mutant is highly infectious and spreads rapidly. Improper response and handling of the epidemic is easy to cause widespread community transmission. In order to better cope with and deal with COVID-19 epidemic and do a good job in normalized

epidemic prevention and control, the epidemic characteristics and disposal of COVID-19 epidemic in Jingxi from February 5 to 11, 2022 are reported as follows.

2. Materials and Methods

2.1. Data Source

According to the COVID-19 epidemic data reported by China's disease prevention and control information system, the 2019-ncov nucleic acid monitoring report of Jingxi CDC, epidemiological case questionnaire and epidemiological investigation report. According to the COVID-19 prevention and control plan (Eighth Edition) of the National Health Commission, carry out case epidemiological case investigation registration and close contact tracking investigation management [4].

2.2. Diagnostic Criteria and Related Definitions

Suspected cases, confirmed cases and clinical typing of COVID-19 were diagnosed according to the diagnostic criteria of COVID-19 diagnosis and treatment plan (trial version 8, revised version) of the National Health Commission, and those with positive laboratory 2019-ncov were divided into confirmed cases and asymptomatic infections.

2.2.1. Suspected Case

Have any one of the following epidemiological history and meet any two of the clinical manifestations; or there is no clear epidemiological history, which is in line with 3 of the clinical manifestations; Or meet any two of the clinical manifestations, and 2019-ncov specific IgM antibody is positive (those who have recently been vaccinated with COVID-19 vaccine are not used as the reference index) can be diagnosed as suspected cases.

- 1) Epidemiological history:
 - a) travel history or residence history of the community with case reports within 14 days before the onset;
 - b) Have contact history with 2019-ncov infected patients and asymptomatic infected persons within 14 days before onset;
 - c) Patients with fever or respiratory symptoms who came into contact with their own case reporting community within 14 days before the onset of the disease;
 - d) Aggregation onset (2 or more cases of fever and/or respiratory symptoms in a small range within 14 days, such as family, office, school class, etc).
- 2) Clinical manifestations:
 - a) COVID-19 related clinical manifestations such as fever and/or respiratory symptoms;
 - b) It has multiple small patch shadows and interstitial changes in the early stage, especially in the extrapulmonary zone. Then it develops into multiple ground glass shadow and infiltration shadow of both lungs. In severe cases, lung consolidation can occur, and pleural effusion is rare. In children with multisystem inflammatory syndrome, patients with cardiac insufficiency can see COVID-19 imaging features such as enlargement of heart shadow and pulmonary edema.
 - c) In the early stage of onset, the total number of leukocytes was normal or decreased, and the lymphocyte count was normal or decreased.

2.2.2. Confirmed Cases

Suspected cases with one of the following etiological or serological evidence can be diagnosed as confirmed cases: (1) 2019-ncov nucleic acid test is positive; (2) 2019-ncov specific IgM antibody and IgG antibody were positive in those who were not vaccinated with COVID-19 vaccine.

2.2.3. Clinical Classification of Cases

(i). Mild Cases

The clinical symptoms were mild, and there was no

pneumonia in imaging.

(ii). Common Cases

Fever, pneumonia and other imaging symptoms can be seen.

(iii). Severe Cases

- 1) Adult severe cases. Adults who meet any of the following conditions can be diagnosed as adult severe cases:
 - a) Shortness of breath, RR \geq 30 times/minute;
 - b) In the resting state, when sucking air, it means that the oxygen saturation is \leq 93%;
 - c) Arterial partial pressure of oxygen (pao₂) / oxygen uptake concentration (Fio₂) \leq 300mmHg (1mmHg = 0.133kpa);
 - d) Progressive aggravation of clinical symptoms and significant progress of lesions within 24-48 hours in pulmonary imaging $>$ 50%.
- 2) Severe cases in children. Children who meet any of the following conditions can be diagnosed as severe cases of children:
 - a) Persistent high fever for more than 3 days;
 - b) Shortness of breath (<2 months old, RR \geq 60 times/minute; 2-12 months old, RR \geq 50 times/minute; 1-5 years old, RR \geq 40 times/minute; >5 years old, RR \geq 30 times/minute), excluding the effects of fever and crying;
 - c) In the resting state, when sucking air, it means that the oxygen saturation is \leq 93%;
 - d) Auxiliary breathing (nasal flap, three concave sign);
 - e) Drowsiness and convulsion;
 - f) Food refusal or feeding difficulty, dehydration sign.

(iv). Critical Cases

Those who meet one of the following conditions can be diagnosed as critical cases: (1) respiratory failure and need mechanical ventilation; (2) Shock; (3) Patients with other organ failure need ICU monitoring and treatment.

(v). Severe / High-Risk Groups

(1) Older than 65 years old; (2) Have cardiovascular and cerebrovascular diseases (including hypertension), chronic lung diseases (chronic obstructive pulmonary disease, moderate to severe asthma), diabetes, chronic liver, kidney diseases, tumors and other basic diseases; (3) Deficiency of immune function (e.g. patients with AIDS, long-term use of corticosteroids or other immunosuppressive drugs leading to hypimmunity); (4) Obesity (body mass index \geq 30); (5) Late pregnancy and perinatal women; (6) Heavy smokers.

2.2.4. Related Definitions

- (1) Definition of close contacts: close contacts refer to those who do not take effective protection and have close contact with them 4 days before the occurrence of case symptoms, 4 days before the collection of asymptomatic infected samples and at the time of isolation. The personnel who enter the case during the stay in the same closed place (toilet, small supermarket, elevator, etc.) and within 3 hours after leaving are

managed as close contacts [5].

- (2) Definition of incubation period incubation period refers to the time interval between the earliest exposure of a case to pathogens and the onset of the first symptoms [6].
- (3) Definition of aggregation epidemic situation aggregation epidemic situation refers to the discovery of ≥ 2 confirmed cases or asymptomatic infections in a small range (such as a family, construction site, unit, etc.) within 14 days, and there is the possibility of interpersonal transmission caused by close contact between patients or the possibility of infection due to joint exposure [7].
- (4) Definition of asymptomatic infected persons asymptomatic infected persons refer to those who are positive in 2019-ncov etiology test, but have no relevant clinical manifestations, such as fever, dry cough, fatigue, sore throat, hypoesthesia of smell (taste), diarrhea and other symptoms and signs that can be perceived or recognized clinically, and there are no COVID-19 imaging signs in CT imaging.

2.3. Laboratory Testing

The 2019-ncov nucleic acid was detected by real-time fluorescent RT-PCR in the whole staff nucleic acid screening test and throat swab samples of cases and close contacts. If the CT value is less than 40, it is positive, and if the CT value is ≥ 40 , it is negative [8].

2.4. Statistical Analysis

Application spss22.0 software carries out statistical analysis on the data, and χ^2 test is adopted for the comparison of rate, and the test level is improved $\alpha=0.05$.

3. Results

3.1. General Situation

From February 5 to 11, 2022, a total of 32 cases of COVID-19 confirmed cases were reported in Jingxi City. The period from the first case to the last case lasted 7 days, and the incubation period was 1-14 days, mostly 2-4 days (71.88%).

The clinical manifestations were mild in 12 cases (37.50%), common in 19 cases (59.38%), and severe in 1 case (3.12%).

3.2. Epidemic Characteristics

3.2.1. Time Distribution

Luo Jinshu, a 9-year-old student, is the first case in China. He lives in xincuntun, nongtie village, Wuping Town, Jingxi City. On February 5, 2022, he was diagnosed with 2019-ncov nucleic acid positive cases. Flow tracing investigation found that some villages in wuping town have reported new cases one after another. On February 10, the number of new cases (7 cases) reached a peak, accounting for 21.88% of the total number of confirmed cases reported. On February 11, the number of new cases decreased to 4, No new cases and asymptomatic infections were reported after February 12, as shown in Table 1.

Table 1. Time distribution of COVID-19 incidence in Jingxi City in February 2022.

Time	February 5th	6th	7th	8th	9th	10th	11th	Total
Number of cases	3	6	3	3	6	7	4	32
Constituent ratio (%)	9.38	18.75	9.38	9.38	18.75	21.88	12.50	100.00

3.2.2. Regional Distribution

Among the 19 townships in Jingxi City, 32 cases were reported in wuping Town, accounting for 100% of the total reported cases, and no cases were reported in other townships. The cases were distributed in 9 natural villages in 5 villages of

Wuping Town, including 17 cases in Maliang Village (53.12%), 8 cases in Dadao Village (25.00%), 3 cases in Nongtie Village (9.38%), 2 cases in AnBen Village (6.25%), 1 cases in Lilu Village (3.12%), and 1 case in Xinfu aluminum factory vegetable market in Dadao area (3.12%), as shown in Figure 1.

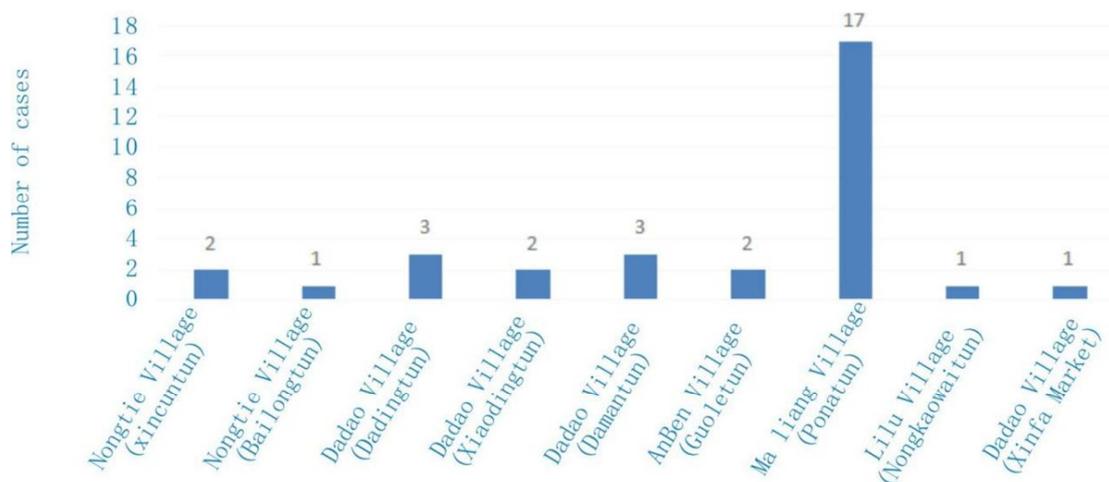


Figure 1. Distribution of COVID-19 incidence areas in Jingxi City in February 2022.

3.2.3. Population Distribution

There were 14 males and 18 females, with a gender ratio of 1:1.29. 23 cases (71.88%) were mainly farmers, 5 cases (15.62%) were students, 2 cases (6.25%) were nursery children, 1 case (3.12%) was workers and 1 case (3.12%) was

scattered children. The minimum age of onset was 1 year old, the maximum age was 76 years old, 7 cases (21.88%) aged 0-19 years, 11 cases (34.38%) aged 20-39 years, 10 cases (31.25%) aged 40-59 years and 4 cases (12.50%) aged 60-79 years are shown in Table 2.

Table 2. Age distribution of COVID-19 onset in Jingxi City in February 2022.

Age group (year)	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	Total
Number of cases	5	2	6	5	6	4	1	3	32
Constituent ratio (%)	15.62	6.25	18.75	15.62	18.75	12.50	3.12	9.38	100.00

3.3. COVID-19 Vaccine Immunization History

Among the 32 patients, 13 (40.62%) received COVID-19 vaccine three times, 15 (46.88%) received COVID-19 vaccine two times, 3 (9.38%) received COVID-19 vaccine zero times, and 1 (3.12%) was under the age of vaccination.

3.4. Transmission Chain and Source of Infection

Through epidemiological tracing and investigation and using the track of public security big data information, it was found that the source of infection was Jingxi City. Eight patients had been to longyi village, Fuji village, Du'an Township, Debao county, Guangxi within 14 days before the onset of the epidemic. They had dinner with relatives and contacted the confirmed case of COVID-19 in this village. After returning to Jingxi, they caused the secondary local COVID-19 epidemic. The main mode of transmission of the

epidemic was family dinner exposure. The incidence rate was 7.64% (21/275), and the incidence rate of community exposure was 0.95% (11/1158). The incidence rate difference between the two groups was statistically significant ($\chi^2=47.19$, $P<0.001$). The results of epidemiological investigation showed that the main way of case discovery was nucleic acid screening of close contacts, accounting for 78.12% (25/32), and active medical treatment accounted for 21.88% (7/32). There were 396 close contacts, accounting for 27.63%, and 1037 secondary close contacts, accounting for 72.37%. All cases were transferred to Jingxi public health treatment center by negative pressure ambulance in a closed loop. Close contacts and secondary close contacts were transferred to designated isolation hotels for isolation medical observation. The transmission chain of this aggregated epidemic has triggered six intergenerational transmission, as shown in Table 3 and Figure 2.

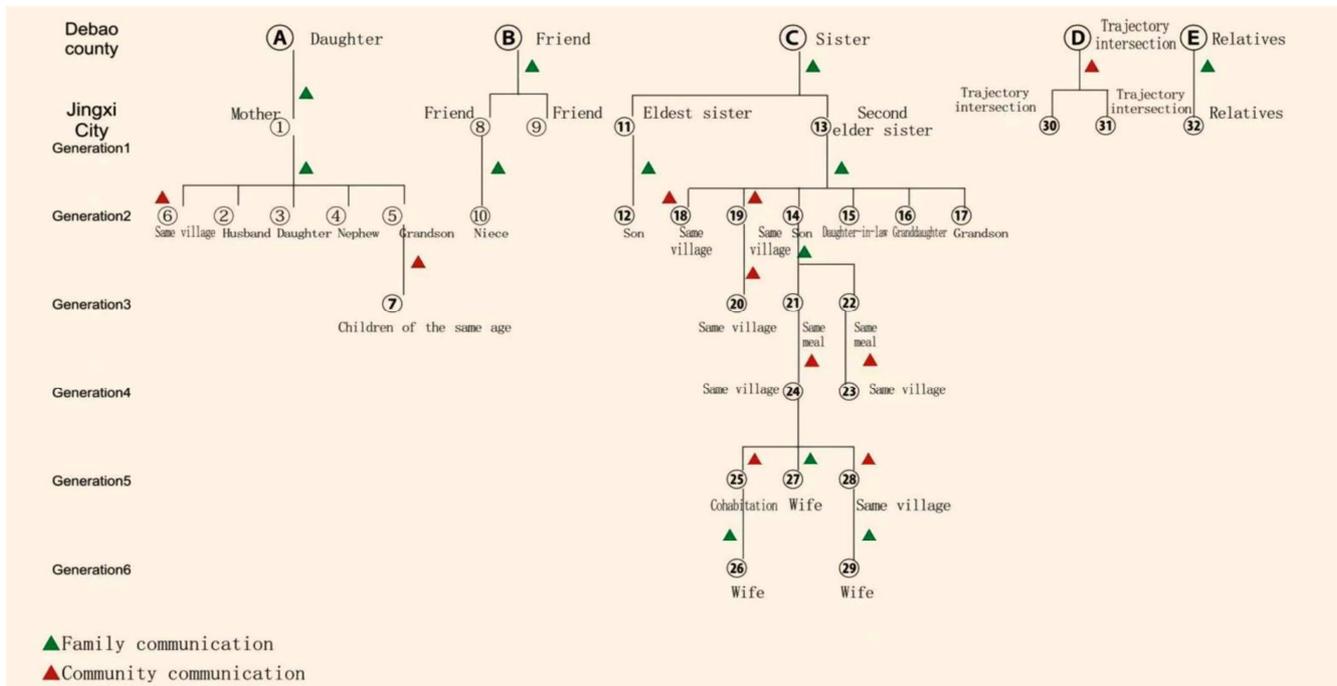


Figure 2. Schematic diagram of COVID-19 aggregated epidemic transmission chain in Jingxi City in February 2022.

Table 3. Basic information of COVID-19 cases in Jingxi City in February 2022.

Case	Number	Gender	Age (year)	Relationship	Exposure date	Exposure mode	Date of onset	Clinical classification
Debao County	A	Female	43	Relatives in the same village	February 2nd	Same meal	3nd	Ordinary type
	B	Male	44	Relatives in the same village	February 2nd	Same meal	4nd	light
	C	Female	44	Relatives in the same village	February 2nd	Same meal	3nd	Ordinary type
	D	Male	37	Relatives in the same village	February 2nd	Tight joint	7nd	light
	E	Female	34	Relatives in the same village	February 2nd	Same meal	6nd	light
Jingxi City	1	Female	76	Case A Mother	February 2nd	Same meal	7nd	Ordinary type
	2	Male	72	Case 1 Husband	February 3nd	Live with	7nd	light
	3	Female	44	Case 1 Daughter	February 3nd	Live with	7nd	Ordinary type
	4	Male	12	Case 1: nephew	February 3nd	Live with	5nd	Ordinary type
	5	Male	9	Case 1 grandchild	February 3nd	Live with	5nd	light
	6	Female	52	Case 1: same village	February 3nd	Tight joint	8nd	Ordinary type
	7	Male	9	Case 5 Play with	February 5nd	Tight joint	6nd	light
	8	Male	37	Case B Friend	February 3nd	Same meal	6nd	Heavy
	9	Male	36	Case B Friend	February 3nd	Same meal	6nd	Ordinary type
	10	Female	11	Case 8 niece	February 3nd	Live with	5nd	Ordinary type
	11	Female	61	Case C elder sister	February 3nd	Same meal	10nd	Ordinary type
	12	Male	35	Case D Son	February 5nd	Live with	6nd	Ordinary type
	13	Female	51	Case C Second sister	February 3nd	Same meal	9nd	Ordinary type
	14	Male	26	Case 13 Son	February 8nd	Tive with	9nd	light
	15	Female	27	Case 13 Daughter in law	February 8nd	Tive with	9nd	Ordinary type
	16	Female	3	Case 13 granddaughter	February 8nd	Tive with	9nd	light
	17	Male	1	Case 13 Sun Tzu	February 8nd	Tive with	9nd	Ordinary type
	18	Female	6	Case 13 Same village	February 8nd	Tight joint	8nd	light
	19	Female	36	Case 13 Same village	February 8nd	Tight joint	10nd	Ordinary type
	20	Female	72	Case 19 Same village	February 4nd	Tight joint	10nd	Ordinary type
	21	Male	25	Case 14 Same meal	February 8nd	Same meal	9nd	light
	22	Female	47	Case 14 Same meal	February 8nd	Same meal	11nd	light
	23	Female	20	Case 22 Same village	February 9nd	Tight joint	10nd	light
	24	Male	53	Case 21 Same village	February 9nd	Tight joint	11nd	Ordinary type
	25	Male	29	Case 24 Cohabitation	February 9nd	Tight joint	11nd	Ordinary type
	26	Female	29	Case 25 Wife	February 9nd	Tive with	11nd	light
	27	Female	50	Case 24 Wife	February 9nd	Tive with	11nd	Ordinary type
28	Male	44	Case 24 Same village	February 7nd	Tight joint	11nd	light	
29	Female	44	Case 28 Wife	February 9nd	Live with	11nd	light	
30	Female	47	Case D Trajectory Intersection	February 3nd	Tight joint	10nd	Ordinary type	
31	Male	40	Case D Trajectory Intersection	February 3nd	Tight joint	7nd	Ordinary type	
32	Female	40	Case E of relatives	February 3nd	Same meal	8nd	Ordinary type	

Note: The case number of Debao county is ABCDE, and the resl are cases imported into Jingxi City numbered 1-32.

3.5. Epidemic Situation Disposal Measures

Jingxi City launched the first level response to public health emergencies on February 5, 2022, established the joint headquarters for epidemic situation disposal of provinces, cities and counties (cities and districts), established a flat command and dispatching system mechanism, implemented unified leadership and coordinated action, formed a joint force for joint prevention and control, and implemented the epidemic situation disposal measures: (1) From 0:00 on February 7, 2022, Jingxi City strictly implemented the whole area closed control measures, and all employees were isolated at home for 14 days; (2) From February 7 to 11, nucleic acid detection and screening of all staff shall be conducted once a day. Once a case or infected person is found, it shall be “found, reported, isolated and treated in time”; (3) The close contacts and secondary close contacts of the cases were followed up for centralized isolation medical observation for 14 days and home health detection for 7 days; (4) Scientifically and accurately divide the sealing and control area, control area and prevention area, and implement hierarchical and classified

control measures, that is the sealing and control area implements the control measures of “regional closure, staying at home and providing door-to-door service”; The control area implements the control measures of “no people out of the area, no gathering”; The prevention zone implements the control of “strengthening social control and strictly restricting personnel gathering”. (5) Preventive disinfection and sterilization and terminal disinfection shall be carried out for the infectious source, the residence of close contacts and sub close contacts and their polluted environment; (6) Strengthen the guidance of public opinion, publicize the knowledge of epidemic prevention and control through multiple channels, develop good health habits such as wearing masks, washing hands frequently, regular ventilation and no gathering, maintain ventilation in home places, strictly wear masks in public places, actively scan codes and measure temperature, maintain a safe distance of one meter line, and do a good job in personal protection.

3.6. Epidemic Situation Disposal Effect

In combination with the investigation and treatment of the

epidemic situation in the villages and towns, we will strengthen the tracking and treatment of the epidemic situation in the villages and towns, and actively track and report the epidemic situation to the people from the villages and towns in combination with the medical track of the epidemic situation in the streets of Jingshi. We will strengthen the tracking and treatment of the epidemic situation in the villages and towns, and actively track and report the epidemic situation to the people from the villages and towns in time. At 0:00 on February 7, 2022, in the early dissemination stage of the epidemic, Jingxi City resolutely took the whole area closed control measures, isolated all staff at home, timely blocked the cross regional transmission of the epidemic, and effectively prevented the occurrence of case overflow. There were 9 cases in the whole village before the whole area closure on February 7, and the incidence rate was 0.06% (9/15757). After the whole area closure on February 7, there were 23 cases in the whole village, and the incidence rate was 0.15% (23/1548). The difference was statistically significant ($\chi^2=6.13$, $P<0.05$). After the implementation of global sealing and control, the new cases are nucleic acid detection reports of close contacts under centralized isolation medical observation. It can be seen that in case of aggregated epidemic spread, global sealing and control measures should be taken as soon as possible, which is of great significance to effectively cut off the transmission chain of the epidemic. There were no new confirmed cases and asymptomatic infections in the epidemic since February 12. The sealing and control measures were lifted at 0:00 on February 24, and the epidemic treatment effect was obvious.

4. Discussion

Jingxi City COVID-19 Omicron BA The transmission chain of subtype 1 mutant was clear. The first generation of cases distributed in the early stage of the epidemic are all related to the Longyitun case in Fuji village, Duan Township, Debao county. Because the epidemic occurred during the Spring Festival, family reunion, visiting relatives and friends, family dinner and other gathering activities caused close unprotected contact within a short period of time, causing local secondary epidemics, causing the spread of family and community infections. As shown in Table 3 and Figure 2, case A infects case 1, case 1 causes infection in family cases 2-5, case 6 in the same village, and case 5 causes infection in children of the same age in case 6; Case B is transmitted to case 8 and case 9, and case 8 causes the niece who lives with case 10 to become infected; Case C is transmitted to case 11 and case 13, and case 11 causes infection and morbidity of son case 12; case 13 caused the infection of granddaughter case 18 in the same village, friend case 19 and case 14-17, and caused the infection of cases 20-29 successively; Case D was transmitted to case 31 and case 32 through the intersection of shopping shop trajectories; Case E was transmitted to case 32 through the same meal of relatives. No secondary cases occurred in case 9 and case 30-32. Omicron is highly infectious, spreads rapidly, and its early symptoms are

atypical. It is difficult to find cases in time. Patients and asymptomatic infected persons are important sources of infection. Patients are infectious in the incubation period, and the infectivity is strongest within 5 days after the onset.

COVID-19 is an acute respiratory infectious disease, which was included in class B infectious diseases and frontier health quarantine infectious diseases stipulated in the law of the people's Republic of China on the prevention and control of infectious disease on January 20, 2020, and is managed as class A infectious diseases [9]. The disease is mainly transmitted through respiratory air droplets and close contact, and exposure to items contaminated by the virus also causes infection. Studies have shown that the aggregated outbreak of COVID-19 epidemic is related to frequent social activities, with the characteristics of early sporadic and late aggregated onset. The analysis of multiple data shows that family aggregation is [10]. The epidemic situation is mainly spread through family dinners and other aggregated exposures, followed by community contact. The rate of family dinner is higher than that of community co-workers, which is consistent with the research results of Chongqing Shunyi District of Beijing and Lu'an City of Anwei Province [11-12]. It is mainly during the Spring Festival that the outbreak of the epidemic is taking Place, and family gatherings, family visits, New Year greetings and other activities are frequent. In particular, the poor ventilation, dense personnel and weak personal protection awareness in family indoor dining make the communication mechanism easy to realize.

The susceptible population of the disease is generally susceptible, Infected people or COVID-19 vaccinators can obtain certain immunity, but the duration of immunity is not clear. The existing COVID-19 vaccine immunization Department significantly reduced the incidence of severe illness and death of Omicron mutant. The results of COVID-19 research show that the elderly over 65 years old are high-risk groups for severe or critical COVID-19. Patients over 60 years old have high risk of clinical severe cases and high mortality, which is mainly related to the low immune level and poor resistance of the elderly, who mostly suffer from chronic foundation [13]. The results of the retrospective survey on the history of COVID-19 vaccination against this epidemic in Jingxi City show that the coverage rate of two doses of vaccine is less than 90%, and that of those who have not been vaccinated due to chronic basic diseases and other reasons is as high as 12.5%. Therefore, we should strengthen the publicity of COVID-19 vaccination, take the form of combination of targeted vaccination and household vaccination, and increase the COVID-19 vaccination rate for the elderly over 60 years old, Except for contraindications, we should plant all kinds of COVID-19 vaccine, it is a fundamental measure to effectively reduce the severity rate and mortality of COVID-19 in the elderly over 60 years old.

Epidemiological research shows Omicron ba The incidence rate of familial aggregation of subtype 1 mutant is high which is mainly related to personal protective factors such as exposure time, ventilation, exposure degree, detoxification activities of infectious sources, wearing masks and so on [14,

15]. After the outbreak of the epidemic, Jingxi City set up a provincial, municipal, County (city, district) epidemic, Prevention and control joint headquarters implemented a flat upgrading command and scheduling system mechanism, quickly and decisively took measures to close the whole area, strictly implemented the isolation and treatment of infectious sources, isolated medical observation of close contacts, and isolated all vulnerable people at home, and cut off the route of transmission by wearing masks, ventilation, disinfection and other measures, strengthening COVID-19 vaccination among susceptible people, improving the immune level of susceptible people, and doing a good job in personal protection are effective prevention and control measures to block the epidemic transmission chain and curb the aggregated epidemic.

5. Conclusion

The analysis of the epidemic characteristics of this COVID-19 imported aggregation epidemic shows that the aggregation epidemic of Omicron BA-1 spreads rapidly and is highly infectious, mainly in family aggregation, followed by community transmission. Therefore, we will quickly and decisively adopt global closed management, scientifically and accurately divide closed control areas, control areas and prevention areas, and implement hierarchical and classified control measures. Through home isolation and nucleic acid screening of all staff, timely isolation and treatment should be carried out when infectious sources are found; all close and sub close contacts shall be isolated for medical observation; strengthen social publicity and education.

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