The re-emergence from the COVID-19 epidemic of Beijing Xinfadi Market

Haiqian Chen, MD\textsuperscript{a}, Leiyu Shi, PhD\textsuperscript{b}, Yuyao Zhang, MD\textsuperscript{a}, Xiaohan Wang, MD\textsuperscript{a}, Gang Sun, PhD\textsuperscript{a,b,∗}  

Abstract  
To provide references for global pandemic prevention and control, this study aimed to analyze the epidemiological characteristics and clinical manifestations of 103 new confirmed cases between June 12 and June 15, 2020, in Beijing. All confirmed cases in this study were tested with a positive SARS-CoV-2 reverse transcriptase-polymerase chain reaction and extracting data from the Beijing Municipal Health Commission (June 11 to July 6, 2020). We selected the 103 typical confirmed cases (excluding imported cases) between June 12 and June 15 for statistical analysis and explored differences among different clinical cases. A cluster of COVID-19 was reported in Beijing between June 12 and June 15, 2020, involving 103 confirmed cases. Patients aged 21 to 65 years old and the mean age was 42.38 ± 11.507, the male-to-female sex ratio was 1.40:1. All confirmed cases had a direct or indirect exposure history in the Beijing Xinfadi Market (BXM), and the clinical manifestations of 97% confirmed cases was diagnosed as mild or moderate. Different clinical classification in age (P = .041), exposure history (P = .025), fever (P = .020), and cough (P = .000) were the statistically significant difference, but there was no statistically significant difference in gender (P = .501), the type of diagnosis (P = .478), expectoration (P = .979), fatigue (P = .906), dizziness or headache (P = .848), muscle pain (P = .825), sore throat or throat discomfort (P = .852), chills (P = .933), diarrhea (P = .431) and runny nose or nasal congestion (P = .898). This study shows that Beijing’s epidemic scope was mainly concentrated in the Xinfadi Market. The initial cases were epidemiologically related to the BXM, the clinical classification of most cases was mild and moderate, and the differences in age, exposure history, fever, and cough among different clinical cases were statistically significant.

Abbreviations: BXM = Beijing Xinfadi Market, COVID-19 = SARS-Coronavirus-2, XM = Xinfadi Market.

Keywords: BXM, COVID-19, locally transmitted confirmed cases

1. Introduction
SARS-Coronavirus-2 (COVID-19) is an acute respiratory infectious disease caused by a novel coronavirus infection and has been classified as a category B infectious disease.\textsuperscript{[1]} It has been one of the most dreaded, recent pandemics impacting multifarious global sectors, including education.\textsuperscript{[2–4]} In early December 2019, the COVID-19 pandemic emerged in Wuhan city, Hubei province, China.\textsuperscript{[5]} After the COVID-19 pandemic outbreak, China met the challenge of COVID-19 by essentially mobilizing “everything.” Taking what has been described as a whole-of-government, whole-of-society approach,\textsuperscript{[6]} such as locking down Wuhan city, establishing a Leading Group by the central government, raising the public health emergency response to the highest level in all localities, classifying management of “four categories of personnel”, makeshift hospitals in operation, pairing assistance, and launching massive community screening. China has achieved remarkable results in the fight against COVID-19 through the concerted efforts of all its people. On April 8, 2020, Wuhan lifted the 76-day control measures on the passageways between China and Hubei. Since April 29, 2020, the epidemic situation in China has been sporadic on the whole, with sporadic cases causing clusters in some areas. Imported cases from abroad have been basically brought under control, the positive momentum of the epidemic situation has been consolidated, and epidemic prevention and control across China has become normal.\textsuperscript{[7]}

As of June 10 at 0:00, 2020, Beijing, the capital of China, has also reported no new confirmed cases for 56 consecutive days.\textsuperscript{[8]} But on June 11, locally transmitted cases have suddenly appeared in Beijing, this new infection cluster lasted 26 days and had a direct or indirect connection with the BXM (Beijing Xinfadi Market, which sells a wide range of agricultural, meat and seafood products has extensive logistics and intensive personnel). After the new infection cluster outbreak, Beijing has adopted a series of measures to control the pandemic and achieved zero
reported on July 6, 2020. Between June 11 and July 6, 2020, a total of 333 new confirmed cases were reported in Beijing. At present, the COVID-19 pandemic is spreading worldwide, which posed a huge impact on global economic, political, and cultural life. This study selected the 103 typical confirmed cases between June 12 and June 15, 2020, which aimed to analyze the demographic and clinical characteristics of new confirmed cases in Beijing. We hope these findings could provide a scientific basis for diagnosis and treatment in the struggle against the COVID-19.

2. Materials and methods

2.1. Data sources

The data of cluster cases were obtained from the Beijing Municipal Health Commission (June 11 to July 6, 2020). The criteria was as follows. All confirmed cases were tested by nucleic acid and defined by positive respiratory specimens and clinical symptoms. All epidemiologic information collected, including demographics and epidemiological information, exposure history, time-lines of events, close contact identification, and so on.

2.2. Statistical analysis

This study selected the 103 typical confirmed cases between June 12 and June 15 for statistical analysis. The data were sorted out by Excel, statistical analysis was performed by SPSS20.0. Descriptive analysis was used to describe the demographic characteristics of new confirmed cases. The measurement data between different groups were analyzed by the Mann–Whitney U test and Kruskal–Wallis H test, and the count data between different groups were analyzed by the χ² test.

3. Results

3.1. The overall situation of new confirmed cases in Beijing

On June 11, 2020, a confirmed case was detected in Xicheng District, Beijing, without contact with foreign personnel or personnel from Hubei Province. He reported that he had visited the Xinfadi Market (XM) before the onset of the disease. Since that, a new infection cluster emerged in BXM and as of July 6, a total of 333 locally transmitted COVID-19 confirmed cases were reported.[9] We selected 103 locally transmitted COVID-19 confirmed cases between June 12 and June 15 in Beijing for analysis (see Table S1, Supplemental Content, http://links.lww.com/MD/G327, which illustrates the specific information of 103 locally transmitted COVID-19 confirmed cases). Among 103 locally transmitted COVID-19 confirmed cases, there were 14 cases of household registration in Beijing and 89 cases in other provinces, and including 60 males and 43 females. All of them were directly or indirectly exposed to the BXM.[10–13]

Figure 1 showed the trend of new confirmed cases between June 11 and July 6, 2020, in Beijing. During the early new infection cluster outbreak, new confirmed cases increased rapidly and reached the peak on June 14. After June 14, new confirmed cases decreased fluctuate and had achieved zero reported on July 6 in Beijing.

3.2. The demographic characteristics and clinical symptoms of 103 cases in Beijing

Table 1 showed that among Beijing’s 103 new confirmed cases, 60 were males (58.3%) and 43 were females (41.7%). The mean age was 42.38 ± 11.507 years old (range, from 21 to 65). The cases were mainly confirmed through seeking medical advice actively (41) and traceability screening (60). All the new confirmed cases had a direct or indirect exposure history in the BXM, and mainly working (69) and purchasing (28) in BXM. The clinical classification of cases was mild or moderate, accounting for 97%. Mild cases were 38 (36.9%) with the age range from 25 to 58, and moderate cases were 62 (60.2%) with the age range from 21 to 65. Different clinical classification in age (P = .041) and exposure history (P = .025) were statistically significant differences, while there were no statistically significant differences in gender (P = .501) and diagnosis way (P = .478).
### 3.3. The main symptoms of 103 COVID-19 patients with different clinical classification in Beijing

Table 2 showed that 103 patients had obvious COVID-19 clinical symptoms, mainly including fever, sore throat or throat discomfort, fatigue, cough, and other symptoms. The symptom of fever were 34 cases (33%), sore throat or throat discomfort were 20 cases (19.4%), fatigue was 15 cases (14.6%), and sputum cough (2 cases), chills (4 cases), and diarrhea (4 cases). A different classification in fever ($P = .020$) and cough ($P = .000$) had a statistically significant difference.

### 4. Discussion

During the COVID-19 pandemic, China adopted the most thorough, rigorous, and comprehensive prevention and control measures, unprecedentedly enforced quarantine and isolation, and mobilized medical resources across China, which has ensured that all those in need have been tested, quarantined, hospitalized, or treated. With these measures in place, China has prevented a wider spread and further development of the virus. Since April 29, 2020, China’s epidemic prevention and control have been entered normalize stage.

On June 5, Beijing announced that from 0:00 on June 6, the level of public health emergency response adjusted to level 3 (Public health emergency response are classified into 4 levels, with the intensity decreasing from 1 level to 4).

### Table 2

| Variable | Total (n = 103) | Mild (n = 38) | Moderate (n = 62) | Severe (n = 2) | Asymptomatic infection (n = 1) | Statistics | $P$ |
|----------|----------------|--------------|------------------|---------------|-------------------------------|------------|-----|
| Gender (male/female) | 60/43 | 24/14 | 34/28 | 2/0 | 0/1 | Z = -0.672 | .501 |
| Age (x ± s) | 42.38 ± 11.507 | 38.63 ± 9.680 | 44.40 ± 12.247 | 49.00 ± 1.414 | 46.00 ± 0.000 | H = 9.252 | .041 |
| Diagnosis way | Seek medical advice actively 41 (39.8) | 18 (47.4) | 22 (35.5) | 1 (50.0) | 0 (0) | H = 1.477 | .478 |
| Traceability screening | 60 (58.3) | 20 (52.6) | 38 (61.3) | 1 (50.0) | 1 (100.0) | H = 7.389 | .025 |
| Close contact screening | 2 (15.4) | 0 (0) | 2 (3.2) | 0 (0) | 0 (0) | H = 1.100 | .293 |
| Exposure history | Working in Xinfadi Market 69 (67.0) | 24 (63.2) | 41 (66.2) | 2 (100.0) | 0 (0) | H = 1.477 | .478 |
| Xinfadi Market bought food or purchased | 28 (27.3) | 12 (31.6) | 16 (25.8) | 0 (0) | 0 (0) | H = 1.477 | .478 |
| Close contact | 8 (7.8) | 2 (5.3) | 5 (8.1) | 0 (0) | 1 (100.0) | H = 1.477 | .478 |

$P$ value is the result representation symbol of the test of Kruskal-Wallis $H$; $Z$ value is the result representation symbol of the test of Mann-Whitney U.

### Table 1

The general situation of 103 COVID-19 patients with different clinical classification case (%).

| Items | Total (n = 103) | Mild (n = 38) | Moderate (n = 62) | Severe (n = 2) | Asymptomatic infection (n = 1) | χ² | $P$ |
|-------|----------------|--------------|------------------|---------------|-------------------------------|-----|-----|
| Fever | 34 (33.0) | 0 (0) | 6 (15.8) | 28 (45.2) | 1 (50.0) | 21.425 | .000 |
| Cough | 9 (8.7) | 0 (0) | 3 (7.9) | 4 (6.5) | 2 (100.0) | 0.478 | .481 |
| Expectoration | 2 (1.9) | 0 (0) | 1 (2.6) | 1 (1.6) | 0 (0) | 0.190 | .979 |
| Fatigue | 15 (14.6) | 0 (0) | 6 (15.8) | 9 (14.5) | 0 (0) | 0.557 | .906 |
| Dizziness or headache | 8 (7.8) | 0 (0) | 4 (10.5) | 4 (6.5) | 0 (0) | 0.806 | .488 |
| Muscle pain | 8 (7.8) | 0 (0) | 2 (5.3) | 6 (9.7) | 0 (0) | 0.901 | .025 |
| Sore throat or throat discomfort | 20 (19.4) | 0 (0) | 8 (21.1) | 12 (19.4) | 0 (0) | 0.788 | .852 |
| Chills | 4 (3.9) | 0 (0) | 1 (2.6) | 3 (4.8) | 0 (0) | 0.432 | .933 |
| Diarrhea | 4 (3.9) | 0 (0) | 0 (0) | 4 (6.5) | 0 (0) | 2.752 | .431 |
| Runny nose or nasal congestion | 6 (5.8) | 0 (0) | 3 (7.9) | 3 (4.8) | 0 (0) | 0.592 | .898 |

χ² value is the result representation symbol of the test of χ² test.
tion measures in farmers’ markets, restaurants, canteens and strengthened monitoring, shut down all underground cold and wet business places, strictly controlled the inspection and quarantine of port food, improved the quarantine standards of imported food, and strengthened traceability management. Second, residents of Beijing’s medium and high-risk areas, as well as those related to the XM, should not leave Beijing, and other residents should not leave the city if the trip was not necessary. Those who have to leave the city should first have negative nucleic acid test results within 7 days.

The study found that 103 new confirmed cases were mainly mild and moderate clinical classification, and there were statistically significant differences in age and exposure history of different clinical classification. Therefore, first, strict closed management should be applied to the place such as supervision, old-age care, welfare, and mental health in Beijing, especially for the elderly, focusing on the prevention and control of imported COVID-19 and internal disease transmission. Second, wearing masks when in close contact with people <1 m away, also in closed and crowded places. Especially it was important for those working in medical and health institutions and public service workers. Third, strengthening ventilation in crowded places. When it is not necessary, parties and gatherings should be avoided, and people should be strictly prevented from gathering. When carrying out activities, people should keep their social distance at least 1 meter.

This study also found that there were statistically significant differences in fever (P = .020) and cough (P = .000) among patients with different clinical classification. The main symptoms of 103 COVID-19 cases were fever, cough, fatigue, and so forth, but some patients had no obvious clinical symptoms in the past 14 days. So in order to control the epidemic, the following steps can be implemented. First, strengthening the body temperature detection of people in public places, adjusting the proportion of traffic restriction and controlling the full load rate. Doing well in disinfection, ventilation, temperature detection, wearing masks, setting up observation areas, handing over of passengers with fever and information registration. Second, under level 2 response, requiring people to check their body temperature detection of people in public places, adjusting the proportion of traffic restriction and controlling the full load rate. Doing well in disinfection, ventilation, temperature detection, wearing masks, setting up observation areas, handing over of passengers with fever and information registration. Second, under level 2 response, requiring people to check their body temperature detection of people in public places, adjusting the proportion of traffic restriction and controlling the full load rate.

5. Conclusion

This study showed that Beijing’s epidemic scope was mainly concentrated on the XM. The initial cases were epidemiologically related to the XM, and the clinical classification of 97% cases was mild and moderate. The differences in age, exposure history, fever, and cough among different clinical cases were statistically significant. We hope these findings could provide references for countries experiencing the COVID-19 outbreak.

Acknowledgments

The authors thank all study participants who have been involved and contributed to the procedure of data collection.

Author contributions

Gang Sun conducted the analyses and supervised the study. Leiyu Shi contributed conceptual guidance. Haiqian Chen contributed to the statistical analysis and execution of the study. Xiaohao Wang and Yuyao Zhang collected the official data and made revisions for the study. All authors contributed to the writing.

Conceptualization: Leiyu Shi.

Data curation: Xiaohan Wang, Yuyao Zhang.

Supervision: Gang Sun.

Writing – original draft: Haiqian Chen.

References

[1] GooNHaH.C. Covid-19 diagnosis and treatment protocol (trial version 7). J Cardiovasc Pulmonary Dis 2020;39:103–7.

[2] De S. Impacts of the COVID-19 Pandemic on Global Education. In: Impacts of the COVID-19 Pandemic on Global Education: Royal Book Publishing, 2020. doi:10.26524/royal.37.6.

[3] Education, research, and management in STEM and healthcare: global impacts of COVID-19; 2021. Available at: https://nusworks.nova.edu/cnso_bio_facpres/432/. Accessed June 26, 2021.

[4] Hallert J, De S. Effects of COVID-19 on education in healthcare and STEM. AJIR Preprints, 275, Version 1, 2020. [Preprint]. Available at: https://preprints.aijr.org/index.php/ap/preprint/view/275.

[5] Guan WJ, Ni ZY, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med 2020;382:1708–20.

[6] Zhou L, Wu Z, Li Z, et al. One hundred days of coronavirus disease 2019 prevention and control in China. Clin Infect Dis 2021;72:332–9.

[7] China’s State Council Information Office on Sunday published a white paper titled “Fighting COVID-19: China in Action.” Available at: http://english.scio.gov.cn/whiterapapers/2020-06/07/content_76135269_3.htm. Accessed June 27, 2020.

[8] No new confirmed cases of COVID-19 were reported in Beijing yesterday. Available at: http://wjw.beijing.gov.cn/wjwh/xzjx/xzgzbw/t202006x20200611_1922160.html. Accessed June 27, 2020.

[9] Information related to the new confirmed cases on June 15. Available at: http://wjw.beijing.gov.cn/wjwh/xzjx/xzgzbw/t202006x20200616_1926318.html. Accessed June 27, 2020.

[10] Beijing has released details of new COVID-19 cases. Available at: http://wjw.beijing.gov.cn/wjwh/xzjx/xzgzbw/t202006x20200616_1924474.html. Accessed June 27, 2020.

[11] Beijing has reported 36 new cases, all related to the Beijing Xinfadi Market. Available at: http://www.beijing.gov.cn/wydt/gzdt/202006/t20200614_1924597.html. Accessed June 27, 2020.

[12] Notification of confirmed cases in Beijing between 0:00 and 7:00 on June 14. Available at: http://www.beijing.gov.cn/wydt/gzdt/202006/t20200614_1924621.html. Accessed June 27, 2020.

[13] Information related to the new confirmed cases on June 14. Available at: http://wjw.beijing.gov.cn/swzx_20031/swxw/202006/t20200615_1925189.html. Accessed June 27, 2020.

[14] The level of public health emergency response in Beijing has been adjusted to level 3 since 0:00 on June 6. Available at: http://www.beijing.gov.cn/wydt/gzdt/202006/t20200605_1917879.html. Accessed June 27, 2020.

There are some limitations in the present study that clinical symptom indicators may be further improved, some deterioration in clinical signs, and symptoms of patients and genetic characteristics of SARS-CoV-2 in the new epidemic should be further explored. Nevertheless, our study timely demonstrated the specific information of 103 confirmed cases between June 12 and June 15 in BXM and the materials of this study were a novelty. When the first confirmed case was reported in Beijing on June 11, 2020, the number of confirmed cases has been increasing at a double-digit rate for 8 consecutive days.
The level of emergency response to public health emergencies in Beijing has been raised to level two. Available at: http://www.beijing.gov.cn/ywdt/gzdt/202006/t20200616_1926324.html. Accessed June 27, 2020.

Wei W, Hesong H, Mengyun Z, et al. Clinical features of COVID-19 patients: a 102 case study. J Pract Med 2020;36:1569–73.

Fei T, Fei Y, Xixiang R, Dezhi X, Jiasheng L, Xiang W. Clinical characteristics of 382 hospitalized patients with COVID-19. J Pract Med 2020;36:1705–9.

COVID-19-based Challenges and Countermeasures in Education, Research, and Management in Healthcare and STEM; 2021. Available at: https://nsuworks.nova.edu/cnso_bio_facpres/431/. Accessed June 26, 2021.

Impact of COVID-19 on Global Education and Research in Healthcare and STEM; 2020. Available at: https://nsuworks.nova.edu/trick/2020/events/8/. Accessed June 26, 2021.

Navigating COVID-19-based Challenges to Global Education, Research, and Management in Healthcare and STEM; 2021. Available at: https://nsuworks.nova.edu/cnso_bio_facpres/430/. Accessed June 26, 2021.

Assessment of Student Mastery of Anticipated Learning Outcomes During a BlendFlex STEM CURE Using a Combination of Self-reported and Empirical Analysis; 2021. Available at: https://nsuworks.nova.edu/cnso_bio_facpres/429/. Accessed June 26, 2021.