China says no towards the second large-scale COVID-19 outbreak: voices from the online public

Xiaona Zhou, Junlan Liu, Wei Wang, Chunlei Jiang

With its fast and wide spread, coronavirus disease 2019 (COVID-19) caused by a novel coronavirus broke out suddenly in Wuhan, China at the end of 2019. It posed a grave threat to human life and health, and brought massive challenges to global health. On 30 January 2020, the World Health Organization (WHO) declared the novel coronavirus constituted a ‘public health emergency of international concern’.1 Due to its rapid transmission, it drew attention from more than 200 countries and areas worldwide. To prevent its spread, the WHO declared the novel coronavirus outbreak was a global pandemic on 11 March 2020. Meanwhile, it called for a global effort to combat the disease.2 China was the first country hit hardest by the disease. Facing this unknown, unexpected and devastating disease, the Chinese government rapidly took decisive and strong measures, for instance, complete lockdown, strict movement control on residents and closing public spaces.3 The epidemic in China was effectively controlled by the end of April 2020 with the support and assistance provided by the international community. Since then, China’s epidemic prevention and control has entered normalisation. But the battle against the epidemic is still ongoing in China.

Currently, a year has passed since the first cluster of COVID-19 cases was reported.4 The coronavirus is raging all over the world and has affected more than 200 countries and territories, which resulted in widespread medical complications and loss of life, and impacted global economies and people’s daily lives.5 For example, the pandemic has impeded the flow of people, cross-border trade and other economic activities, triggered fluctuations in financial markets, and delivered a blow to both global industry and supply chains.

More than 210 million people were infected during the pandemic, of whom over 4.5 million people lost their lives as of 30 August 2021. Strict control and quarantine measures have been taken around the world and the rate of new confirmed cases has declined, but the situation has not been effectively controlled—the global cumulative confirmed cases continue to increase. Due to the high infectivity and continuous variability of the virus, the large number of asymptomatic carriers and the lack of effective antiviral drugs, the prevention and control of COVID-19 is still extremely difficult.6

In the past several months, sporadic cases have been reported on the mainland, resulting in case clusters in some locations (eg, Xinjiang, Beijing, Qingdao, Hebei, Jilin and Shanghai). It was reported that many cases were from outside travellers coming into the country, imported cold-chain food was frequently tested positive for COVID-19 nucleic acid and asymptomatic carrier also appeared occasionally. As we all know, China is a country with a large, highly mobile population, which makes prevention and control of COVID-19 quite challenging.

With full consideration of the current status of the pandemic, both domestically and abroad, we wonder if there will be a second large-scale outbreak in China. How does the Chinese public perceive this issue? How much confidence does the Chinese public have in the government and their own ability to cope with a possible second outbreak? To answer these questions, we conducted an online survey. It has shown that understanding the knowledge, attitudes and behaviour of the general public regarding COVID-19 plays an integral role in the prevention and control of the pandemic.7 8 Therefore, it is essential to clarify the attitudes and behaviour of the public towards COVID-19.

Then, we conducted a cross-sectional online survey by sharing web links through WeChat Snowball, which linked to a questionnaire containing 24 questions (see online
supplemental file 1 for more details). Participants were invited to fill out their demographic information (such as gender, age, education level and occupation), individual status and their views related to the COVID-19 pandemic. For most items, respondents only needed to answer yes or no, or answer questions using a 5-point Likert scale from 1 (not at all) to 5 (extremely). Data were collected through a professional online questionnaire platform.

In less than 2 days, 2399 participants aged 15–90 years who answered the questions completely in less than 5 min were included. The average age was 33.07 (12.77), among which 1413 (58.9%) were females. Thirty-nine (1.63%) participants lived in Hubei which was the hardest hit province during COVID-19 pandemic in China. Five hundred and eighty-nine respondents were involved in efforts to combat the pandemic, 42.95% of them were mainly engaged in healthcare security and 37.55% of them participated in the fight against COVID-19 as a volunteer (see online supplemental file 2 for more details).

The survey showed that 17.92% of the respondents held the view that there would be no second large-scale outbreak in China, while 55.98% believed that the possibility of a second outbreak was slight. This demonstrated that the vast majority of the participants held an optimistic attitude towards the pandemic, and reflected the effectiveness of China’s current prevention and control measures. Meanwhile, 66% considered it is necessary to adhere to the existing standard public health measures based on mass vaccination if COVID-19 did have a large second outbreak. 45.18% of the respondents still regularly followed news reports about the pandemic (above moderate). In places or occasions where masks were not required, 48.60% of people insisted on wearing a mask. This ongoing concern seemed to suggest that many
people were cautious about a second wave of COVID-19\(^9\)
(see online supplemental file 3 for more details).

More than 90\% of the respondents chose ‘largely’ or
‘entirely’ in the question about the confidence in Chinese
government’s ability to deal with the subsequent outbreak
(see online supplemental file 3 for more details). This is
basically consistent with the level of public confidence
in the government’s coping ability during the rapid rise
period (97.1\%).\(^{10}\) The public’s strong confidence in
the government could be related to the interventions imple-
mented in China which successfully mitigated the spread
and reduced overall transmission.\(^{11, 12}\) Moreover, the
efforts of the Chinese public along with support from the
international community during the rise of COVID-19
further increased public confidence.

By contrast, only 54.15\% of the participants exhib-
ited ‘large’ or ‘entire’ confidence in their ability to
confront the economic, work and life stresses that would
be caused by a second large-scale outbreak (see online
supplemental file 3 for more details). It can be seen intu-
itively from this question that participants have more
confidence in the government’s ability to respond to the
outbreak vs consequences from a second outbreak (the
mean value is around 4.50 vs the mean value is around
3.50). First of all, it is possible that the power of the indi-
viduals is relatively small in the face of such a pandemic,
so the strength of the community and assistance from the
outside are particularly important at this time. During
the most serious period of the pandemic in Wuhan, thou-
sands of medical workers were dispatched and numerous
medical resources were provided by other provinces.
Second, individuals need to consider numerous factors,
such as physical health, financial capacity and work
conditions. The prevention and control policies for the
pandemic can hinder the normal work, which may lead
to a decrease in income and weaken the individual’s
coping ability.

Stress during the initial COVID-19 outbreak came
from three main areas: work (46.68\%), social interaction
(37.97\%) and economy (33.39\%). Meanwhile, people who
perceived increased economic pressure obviously lacked
confidence in the government (p<0.05) and individuals
(p<0.05). The reason for this may be that perceptions of
economic stress affect individuals’ attitudes (especially
diminishing generalised trust) and behaviours.\(^{13}\) Interest-
ingly, people of different age groups, educational levels
and occupations had different views on the possibility of a
second outbreak in China. Similarly, there was variability
in their confidence in the government’s ability to respond
to the possible outbreak (figure 1). The reasons for the
discrepancies need to be explored in depth with a large
number of detailed studies. Additionally, participants
with low educational level and less stable occupations
had lower confidence in themselves. People with low educa-
tional level usually work in less stable jobs, and may face
more uncertainties in their work and life. A previous study
had also shown that people with a lower educational level
experienced more distress during the pandemic.\(^{14}\)

Males had more confidence in their ability to cope with
a possible second wave than females (p=0.018). Particip-
ants who took part in efforts to combat the pandemic
had more confidence in their ability to deal with the stress
cased by a possible second wave (p<0.001). Those who
took part in efforts to fight COVID-19 may have a better
understanding of protective measures and information
related to the virus. This higher level of knowledge may be
associated with higher confidence.\(^{15, 16}\) Furthermore, they
had accumulated lots of experience in fighting against
the virus during the previous wave, which also gave them
more confidence.

The public had many psychological issues during the
previous outbreak, such as anxiety, depression, stress
and insomnia.\(^{17}\) When we conducted this investigation,
most of them were not as anxious, nervous, worried,
scared or fearful as they were during the period of
rapid outbreak. If there is a confirmed case in the city
where they live, 58.15\% of them will not feel anxious,
nervous, worried or fearful. Wearing masks, strictly
preventing and controlling inbound cases and vaccina-
tion were considered to be the most effectual measures
to fight against COVID-19.

Our purpose for this survey was to gauge the public’s
attitude towards a possible second wave of COVID-19 in
China using a relatively well controlled questionnaire.
Although there were slight differences among partici-
ants of different ages, educational backgrounds and
occupations, they generally held an optimistic attitude
towards a possible second wave of COVID-19 in China.
Not only that, most of the participants had high confi-
dence in the Chinese government and their capacity to
deal with another outbreak. Even if a second outbreak
does not occur, we should continue to take preventive
measures. The recent situation reminds us not to relax
our vigilance against the pandemic. Hopefully, this
virus can be defeated in the near future.

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led the whole study, including putting forward and carrying out the study, and was
the corresponding author. JL contributed to revision of this article. WW contributed
to performing the questionnaire and data collection. All authors read and approved
the final version of the manuscript.

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REFERENCES


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General information:

1. Gender
2. Age
3. City of employment
4. Educational level
5. Occupation

In the past phases of the epidemic:

6. Have you ever been diagnosed with COVID-19?
7. Have you ever been asymptomatic infected with COVID-19?
8. Do you have relatives or friends who have been diagnosed with COVID-19 (or asymptomatic infection)?
9. Is there any confirmed case (or asymptomatic infected person) in your neighborhoods (or community, village)?
10. Have you ever lived in Hubei during the COVID-19 outbreak?
11. Have you ever taken part in any action against the epidemic?
12. What’s your role in the fight against the epidemic?
13. What were your sources of stress during the epidemic?
14. The extent to which your mental state was affected by the past COVID-19 epidemic?
15. The extent to which your work and life were affected by the past COVID-19 epidemic?

Over the past half month:

16. How often you still following the reports related to the epidemic?
17. How often you insist on wearing a mask seriously except the places or occasions where it is required?
18. If there is a confirmed COVID-19 case in your city, the degree to which you feel anxious, nervous, worried, or afraid?
19. What do you think is the likelihood of a secondary large-scale outbreak in China?
20. If COVID-19 second outbreak, how much confidence do you have in government’s ability to deal with the epidemic?
21. The following are the effective measures to deal with the epidemic. Please rank them in order of importance (wearing a mask; strictly prevent and control imported
cases from abroad; vaccinating; home quarantine; managing the safety of imported cold-chain food)

22. If COVID-19 second outbreak, and based on mass vaccination, do you think it’s necessary to follow the existing, standard public health measures?

23. If COVID-19 second outbreak, will you be as anxious, nervous, worried, scared, and fearful as you were before?

24. If COVID-19 second outbreak, how much confidence do you have in your ability to deal with the economic, work and life stress caused by the outbreak?
Table 1. Demographic information, group differences of public’s perceptions on the three most critical questions (n=2399)

<table>
<thead>
<tr>
<th>variables</th>
<th>Category</th>
<th>N/%</th>
<th>Question 1</th>
<th></th>
<th>Question 2</th>
<th></th>
<th>Question 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>x²/Z</td>
<td>P</td>
<td>Mean</td>
<td>SD</td>
<td>x²/Z</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>986/41.10%</td>
<td>2.17</td>
<td>0.90</td>
<td>-0.815</td>
<td>0.415</td>
<td>4.60</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1413/58.90%</td>
<td>2.18</td>
<td>0.81</td>
<td>4.58</td>
<td>0.71</td>
<td>3.49</td>
<td>1.15</td>
</tr>
<tr>
<td>Age</td>
<td>15-25</td>
<td>1413/58.90%</td>
<td>2.30</td>
<td>0.86</td>
<td>48.187</td>
<td>0.000</td>
<td>4.65</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td>26-30</td>
<td>368/15.34%</td>
<td>2.12</td>
<td>0.80</td>
<td>4.60</td>
<td>0.71</td>
<td>3.38</td>
<td>1.22</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>561/23.38%</td>
<td>2.14</td>
<td>0.87</td>
<td>4.58</td>
<td>0.67</td>
<td>3.53</td>
<td>1.21</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>289/12.05%</td>
<td>2.06</td>
<td>0.80</td>
<td>4.54</td>
<td>0.73</td>
<td>3.62</td>
<td>1.11</td>
</tr>
<tr>
<td></td>
<td>51-60</td>
<td>230/9.59%</td>
<td>1.96</td>
<td>0.83</td>
<td>4.45</td>
<td>0.82</td>
<td>3.73</td>
<td>1.06</td>
</tr>
<tr>
<td></td>
<td>≥61</td>
<td>66/2.75%</td>
<td>2.20</td>
<td>0.88</td>
<td>4.44</td>
<td>0.88</td>
<td>3.77</td>
<td>1.08</td>
</tr>
<tr>
<td>Educational level</td>
<td>High school or below</td>
<td>168/7.00%</td>
<td>1.98</td>
<td>0.82</td>
<td>20.320</td>
<td>0.000</td>
<td>4.59</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>University or college</td>
<td>1644/68.53%</td>
<td>2.21</td>
<td>0.84</td>
<td>4.62</td>
<td>0.70</td>
<td>3.55</td>
<td>1.55</td>
</tr>
<tr>
<td></td>
<td>Postgraduate or above</td>
<td>587/24.47%</td>
<td>2.12</td>
<td>0.86</td>
<td>4.51</td>
<td>0.74</td>
<td>3.62</td>
<td>1.13</td>
</tr>
<tr>
<td>Occupation</td>
<td>Current student</td>
<td>776/32.35%</td>
<td>2.30</td>
<td>0.87</td>
<td>30.399</td>
<td>0.000</td>
<td>4.66</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Government functionary</td>
<td>399/16.63%</td>
<td>2.08</td>
<td>0.79</td>
<td>4.66</td>
<td>0.62</td>
<td>3.82</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td>Professional staff b</td>
<td>660/27.51%</td>
<td>2.11</td>
<td>0.85</td>
<td>4.55</td>
<td>0.70</td>
<td>3.64</td>
<td>1.11</td>
</tr>
<tr>
<td></td>
<td>Other industries c</td>
<td>564/23.51%</td>
<td>2.13</td>
<td>0.84</td>
<td>4.48</td>
<td>0.82</td>
<td>3.26</td>
<td>1.22</td>
</tr>
<tr>
<td>Lived in Hubei</td>
<td>Yes</td>
<td>39/1.63%</td>
<td>2.18</td>
<td>0.79</td>
<td>-0.180</td>
<td>0.857</td>
<td>4.51</td>
<td>0.85</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2360/98.37%</td>
<td>2.17</td>
<td>0.85</td>
<td>4.59</td>
<td>0.71</td>
<td>3.54</td>
<td>1.17</td>
</tr>
<tr>
<td>high-risk group</td>
<td>Yes</td>
<td>106/4.42%</td>
<td>2.25</td>
<td>0.87</td>
<td>-0.924</td>
<td>0.355</td>
<td>4.47</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2293/95.58%</td>
<td>2.17</td>
<td>0.85</td>
<td>4.59</td>
<td>0.71</td>
<td>3.53</td>
<td>1.17</td>
</tr>
<tr>
<td>Anti-epidemic actions</td>
<td>Yes</td>
<td>589/24.55%</td>
<td>2.17</td>
<td>0.86</td>
<td>-0.073</td>
<td>0.941</td>
<td>4.62</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1810/75.45%</td>
<td>2.17</td>
<td>0.84</td>
<td>4.58</td>
<td>0.72</td>
<td>3.46</td>
<td>1.17</td>
</tr>
<tr>
<td>Work stress</td>
<td>Yes</td>
<td>1115/46.48%</td>
<td>2.20</td>
<td>0.88</td>
<td>-1.348</td>
<td>0.178</td>
<td>4.56</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1284/53.52%</td>
<td>2.15</td>
<td>0.82</td>
<td>4.61</td>
<td>0.69</td>
<td>3.57</td>
<td>1.18</td>
</tr>
<tr>
<td>Economic pressure</td>
<td>Yes</td>
<td>801/33.39%</td>
<td>2.27</td>
<td>0.91</td>
<td>-3.441</td>
<td>0.001</td>
<td>4.54</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1598/66.61%</td>
<td>2.14</td>
<td>0.81</td>
<td>4.61</td>
<td>0.69</td>
<td>3.73</td>
<td>1.11</td>
</tr>
<tr>
<td>Family-relation stress</td>
<td>Yes</td>
<td>557/23.22%</td>
<td>2.32</td>
<td>0.91</td>
<td>-4.375</td>
<td>0.000</td>
<td>4.56</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1842/76.78%</td>
<td>2.13</td>
<td>0.82</td>
<td>4.60</td>
<td>0.70</td>
<td>3.58</td>
<td>1.17</td>
</tr>
<tr>
<td>Children education stress</td>
<td>Yes</td>
<td>393/16.38%</td>
<td>2.18</td>
<td>0.90</td>
<td>-0.173</td>
<td>0.862</td>
<td>4.57</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2006/83.62%</td>
<td>2.17</td>
<td>0.84</td>
<td>4.59</td>
<td>0.72</td>
<td>3.54</td>
<td>1.16</td>
</tr>
<tr>
<td>Social stress</td>
<td>Yes</td>
<td>911/37.97%</td>
<td>2.21</td>
<td>0.86</td>
<td>-1.756</td>
<td>0.079</td>
<td>4.55</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1488/62.03%</td>
<td>2.15</td>
<td>0.84</td>
<td>4.61</td>
<td>0.70</td>
<td>3.53</td>
<td>1.18</td>
</tr>
</tbody>
</table>
**Table 2. Statistical description of the public’s states and perceptions related to the COVID-19 pandemic.**

<table>
<thead>
<tr>
<th>Question</th>
<th>severity / Frequency (n/%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The extent to which your mental state was affected by the past COVID-19 epidemic?</td>
<td>Not at all (value=1)  a little (value=2) Moderate (value=3) largely (value=4) entirely (value=5)</td>
</tr>
<tr>
<td></td>
<td>376/15.67%  1147/47.81%  578/24.09%  251/10.46%  47/1.96%</td>
</tr>
<tr>
<td>The extent to which your work and life were affected by the past COVID-19 epidemic?</td>
<td>304/12.67%  922/38.43%  712/29.68%  378/15.76%  83/3.46%</td>
</tr>
<tr>
<td>How often you still following the reports related to the epidemic?</td>
<td>72/3%  783/32.64%  460/19.17%  750/31.26%  334/13.92%</td>
</tr>
<tr>
<td>How often you insist on wearing a mask seriously except the places or occasions where it is required?</td>
<td>284/11.84%  535/22.30%  414/17.26%  594/24.76%  572/23.84%</td>
</tr>
<tr>
<td>What do you think is the likelihood of a secondary large-scale outbreak in China? (Question 1)</td>
<td>430/17.92%  1343/55.98%  449/18.72%  135/5.63%  42/1.75%</td>
</tr>
<tr>
<td>If COVID-19 second outbreak, how much confidence do you have in government’s ability to deal with the epidemic? (Question 2)</td>
<td>8/0.33%  58/2.42%  98/4.09%  588/24.51%  1647/68.65%</td>
</tr>
<tr>
<td>If COVID-19 second outbreak, how much confidence do you have in your ability to deal with the economic, work and life stress caused by the outbreak?</td>
<td>91/3.79%  434/18.09%  599/24.97%  651/27.14%  624/26.01%</td>
</tr>
<tr>
<td>If COVID-19 second outbreak, and based on mass vaccination, do you think it’s necessary to follow the existing, standard public health measures?</td>
<td>87/3.63%  310/12.92%  476/19.84%  722/30.10%  804/33.51%</td>
</tr>
<tr>
<td>If there is a confirmed COVID-19 case in your city, the degree to which you feel anxious, nervous, worried, or afraid?</td>
<td>426/17.76%  969/40.39%  756/31.51%  185/7.71%  63/2.63%</td>
</tr>
<tr>
<td>If COVID-19 second outbreak, will you be as anxious, nervous, worried, scared, and fearful as you were before?</td>
<td>658/27.43%  1105/46.06%  443/18.47%  143/5.96%  50/2.08%</td>
</tr>
</tbody>
</table>