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# The Role of Institutional Trust in Medical Care Seeking during the COVID-19

## Pandemic\*

Li Ping Wong, Qunhong Wu, Yanhua Hao, Xi Chen, Zhuo Chen, Haridah Alias, Mingwang Shen, Jingcen Hu, Shiwei Duan, Jinjie Zhang, Liyuan Han

## Abstract

This paper investigates the associations between institution trust and public response to the COVID-19 outbreak. An Internet-based, cross-sectional survey was administered on January 29, 2020 to the epicenter Hubei province, China. A total of 4,393 adults who  $\geq 18$  years of age and residing or working in the province of Hubei were included in the study. The majority of the participants expressed a higher level of trust in the information and preventive instructions provided by the central government than by the local government. Being under quarantine (adjusted odds ratio (OR) = 2.35, 95% confidence interval (CI) 1.80–3.08) and having a high institutional trust score (OR = 2.23, 95% CI 1.96–2.53) were both strong and significant determinants of higher preventive behavior scores. The majority of study participants (85.7%,  $n = 3,640$ ) reported that they would seek hospital treatment if they suspected themselves to have been infected with COVID-19. Few of the participants from Wuhan (16.6%,  $n = 475$ ) and those participants who were under quarantine (13.8%,  $n = 550$ ) expressed an unwillingness to seek hospital treatment. Institutional trust is an important factor influencing adequate preventive behavior and seeking formal medical care during an outbreak.

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## 1. INTRODUCTION

Starting on December 8, 2019, several cases of pneumonia were reported in Wuhan, Hubei province, China.<sup>1,2</sup> Subsequently, on January 7, 2020 the Chinese Center for Disease Control and Prevention (CDC) identified a novel coronavirus linked to the outbreak, which was subsequently named the 2019 novel coronavirus (2019-nCoV) by the World Health Organization (WHO).<sup>3</sup> On January 23, 2020, the central government of the People's Republic of China imposed a lockdown in Wuhan in an effort to quarantine the epicenter of the outbreak to prevent an epidemic. On February 11, 2020, the WHO declared an official name for the new coronavirus disease as Coronavirus disease 2019 (COVID-19). In this ongoing severe case of escalating infections and deaths, healthcare providers in China are working around the clock treating patients and preventing casualties, while scientists in China and around the globe are racing to find out more about the coronavirus to prevent it becoming a worldwide pandemic. Studies published in the past weeks have led to a better worldwide understanding of the epidemiology, clinical and genomic characteristics of the COVID-19.<sup>4,5</sup> However, counteracting the newly discovered COVID-19 will entail multifaceted control strategies. Global outbreaks like the severe acute respiratory syndrome (SARS) epidemic and the 2009 pandemic influenza A (H1N1) have brought attention to the importance of understanding community responses in outbreak control.<sup>6</sup> Understanding local community responses is vital to provide insights into the development of risk communication messages to the general public for outbreak prevention and control.<sup>6,7</sup> Therefore, investigating the public response to the outbreak is as important as epidemiological, clinical, and genomic research.

The lesson learned from the recent 2018-2019 Ebola outbreak suggests that institutional trust is of central importance in effective public health intervention.<sup>8</sup> Lack of institutional trust may lead to refusal to comply with a preventive or curative intervention which may result in an increased risk of both acquiring and spreading the disease.<sup>8</sup> As noted in the statement from the second meeting of the Emergency Committee regarding the outbreak of COVID-19 on January 30, the implementation of comprehensive risk communication strategies to enhance public health measures for containment of the outbreak is vital.<sup>9</sup> Therefore, it is of utmost importance that people in the epicenter, particularly in the quarantine area, have full trust in the government institutions to enable successful delivery of risk communication and practice of health protection behaviors.

Currently, over a month since the onset of the COVID-19, the epidemic is still spreading rapidly with escalating confirmed cases and deaths. In consideration of the importance of

understanding the community responses, this study aimed to investigate the role of institutional trust in individual preventive and treatment-seeking behaviors during the COVID-19 outbreak, which as of February 23, the confirmed cases has reached over 70,000 and more than 2000 deaths have been reported in China.

## **2. METHODS**

### **Study design and participants**

An anonymous Internet-based, cross-sectional survey commenced on January 29, 2020. The study population comprised adults  $\geq 18$  years of age and residing or working in the province of Hubei, where Wuhan is the capital city. This cross-sectional study was performed in accordance with the STROBE (Strengthening the Reporting of Observational studies in Epidemiology) guidelines.

### **Procedures**

A snowballing sampling technique was used to recruit the participants. The weblink to the survey was first circulated to the academic staff and students at the Ningbo Medical University, who are from diverse geographical locations of origin. They were instructed to employ their social networks to circulate the link to people residing or working in the province of Hubei. Upon completing the survey, a note to encourage participants to disseminate the survey link to all known contacts in Hubei province was included. Participants were remunerated CNY 5 for each complete response.

The questionnaire was developed in English and translated into Chinese. Independent experts reviewed and validated the translation. The questionnaire was also face validated by local experts and pilot tested. The survey consisted of sections that assessed demographic background, institutional trust, and COVID-19-related preventive and health-seeking behaviors.

Institutional trust was assessed using a series of questions (eight items) that assessed participants' trust in COVID-19-related information (i.e. the reported number of confirmed cases, deaths, etc.) and preventive instructions (i.e. self-quarantine, provincial quarantine, extended time off, etc.) given by the local, provincial, and central governments. They were also queried about their trust in the information provision and the preventive instructions from healthcare providers. The response options were recorded on a 4-point Likert scale with items

scored as either 0 (not at all), 1 (a small extent), 2 (moderate), or 3 (a great extent). The possible score ranged from 0 to 24, with higher scores indicating higher levels of trust.

The section on preventive behaviors consisted of five parts (14-items), namely: (1) direct avoidance, (2) social interaction avoidance, (3) physical contact avoidance, (4) public space avoidance, and (5) personal protection. The response options were recorded on a 3-point Likert scale with items scored as either 0 (never), 1 (occasionally), or 2 (frequently). The possible score ranged from 0 to 28, with higher scores indicating higher levels of preventive behaviors.

The section on health-seeking behaviors asked participants about the health-seeking behaviors that they would adopt if they suspected themselves to have been infected with 2019-nCoV. The health-seeking behaviors queried were 1) seeking treatment in the hospital, 2) traditional healing, and 3) self-healing (i.e. exercise, high dose of vitamins, plenty of fresh fruit and vegetables). The answers included two options, “yes” and “no”.

### **Statistical analyses**

Normality testing was performed using the Kolmogorov-Smirnov test. The scores of institutional trust and preventive behaviors were not normally distributed, therefore all results were expressed as the median and interquartile range (IQR). Other descriptive statistics, such as frequency tables, charts, and proportions were used for data summarization. The reliability of the institutional trust and preventive behavior items was evaluated by assessing the internal consistency of the items representing the scores. The 8-item institutional trust and the 14-item preventive behaviors had a reliability (Cronbach’s  $\alpha$ ) of 0.944 and 0.653, respectively. Multivariable logistic regression was used to determine factors influencing preventive behavior scores and conventional treatment-seeking. Variables that were significant on a chi-square ( $\chi^2$ ) test were selected for multivariable logistic regression analysis and included in the model using a simultaneous forced-entry method. Odds ratios (OR), 95% confidence intervals (95% CI), and  $p$  values were calculated for each independent variable. The model fit was assessed using the Hosmer–Lemeshow goodness-of-fit test.<sup>10</sup> All statistical analyses were performed using the Statistical Package for the Social Sciences, version 20.0 (IBM Corp., Armonk, NY, USA). A  $p$ -value of less than 0.05 was considered statistically significant.

## **3. RESULTS**

Fig. 1 showed the number of confirmed cases in China was 1,737 on the date of the onset of data collection. The survey link was disseminated on January 29, 2020, and by January 30 a

total of 4,393 responses were received. The final number of responses included in data analyses was 4,245, after data cleaning to remove invalid responses. The demographic characteristics of the participants are shown in the first column of Table 1. Most of the participants were from the city of Wuhan (67.3%) and most (93.6%) reported that they were currently under quarantine.

Fig. 2 shows the results of institutional trust for both information provision and preventive instruction. The majority of the participants expressed a great extent of trust in the information provision (72.4%) and preventive instructions (78.5%) from the central government authority. The level of trust in the information provision (68.4%) and preventive instruction (72.1%) from healthcare providers were lower than that of the central government authority. An even lower proportion expressed a great extent of trust in information provision (48.0%) and preventive instructions (59.7%) given by the local authority. There were no significant association between score differences in information provision and preventive measures. The total scores of institutional trust for information provision and preventive instruction ranged from 0 to 24. The median score was 22 (IQR 18 to 24). The total scores was categorized into two groups, namely 22-24 or 0-21, based on the median split; as such, a total of 2,208 (52.0%) were categorized as having a score of 22-24 and 2,037 (48.0%) had a score of 0-21.

Fig. 3 shows the distribution of self-reported preventive behaviors. The uptake of preventive behaviors was high in the study population. However, only 40% reported wearing a face mask at home when they were with other household members. The scores of preventive behaviors in the study population ranged from 7 to 28. The median score was 27 (IQR 26-28). The preventive behaviors scores were categorized as a score of 27 to 28 or 7 to 26 based on the median split; as such, a total of 2321 (54.7%) were categorized as having a score of 27 to 28 and 1924 (45.3%) had a score of 7 to 26. Table 1 shows the univariate and multivariable analyses of factors associated with preventive behavior scores. In the univariate analysis, there were significant associations between the preventive behavior scores and age group, highest educational attainment, occupational types, quarantine status, and the total score of institutional trust. In the multivariate analysis, under quarantine (adjusted odds ratio (OR) = 2.35, 95% confidence interval (CI) 1.80 - 3.08) and having high institutional trust score (OR=2.23, 95% CI 1.96 -2.53) were two strong significant determinants of higher preventive behavior scores. Participants of age group 26-35 years (OR=1.54, 95% CI 1.29 -1.83) and 36-45 years (OR=1.22, 95% CI 1.01 - 1.48) had significantly higher preventive behaviour scores than those >45 years old.

Fig. 4 shows the treatment-seeking behaviours of the study population. Most participants (85.7%, n = 3,640) reported that they would seek treatment at the hospital, whereas 42% (n = 1,782) reported that they would seek traditional healing, and 62.4% (n = 2,651) reported a preference for self-treatment. A total of 462 (46.3%) participants aged >45 years reported a preference for using traditional healing ( $\chi^2 = 13.649$ , degrees of freedom = 3, p = 0.011). There was no significant difference in the use of self-healing by participants' age. Table 2 shows the univariate and multivariable analyses of factors associated with treatment-seeking in the hospital. In the univariate analysis all of the factors studied, except for the age group, were significantly associated with treatment-seeking in the hospital. Of note, 16.6% (n = 475) of the participants from the city of Wuhan reported no intention of seeking treatment in the hospital, whereas 13.8% (n = 550) of participants who were in the quarantine area reported no intention of seeking treatment in the hospital. In the multivariable analysis, similarly, being quarantined (OR = 2.36, 95% CI 1.80–3.09) and having a high institutional trust score (OR = 2.20, 95% CI 1.96–2.49) were two strong significant determinants of treatment-seeking in the hospital.

#### **4. DISCUSSION**

This is first and earliest study conducted during the COVID-19 outbreak in China. With the aim of understanding the public behaviour in prevention measures in this crisis that has now become a worldwide concern, this study collected data at the COVID-19 outbreak epicenters during a period of exponential growth of the epidemic. This study found a considerably high level of institutional trust in both information provision and recommendation among the public in the epicenters. However, trust (both information provision and recommendation) in the local authority was lower than that in the provincial and central government. This finding is in contrast to the study on the Ebola outbreak in Congo, where their public expressed higher trust in their local authorities.<sup>8</sup> There is a need to enhance trust in the local authority, as they are the frontline in service delivery during the outbreak. Lack of trust in the local authority results in poor cooperation, thus undermining contact tracing and adherence to recommended public health interventions.<sup>11,12</sup> Healthcare providers can be strong advocates for outbreak prevention efforts in these communities, considering that many expressed a high level of trust in them. It is noteworthy to highlight that further investigation is warranted to explore whether the differences in institutional trust during the COVID-19 outbreak in our country and in the Ebola outbreak in Congo were due to cultural or other reasons. On a positive note, this study revealed that the people in the epicenters adopted a high level of prevention measures. As noted,

however, a relatively small proportion reported using face masks at home when they were around household members. Wearing a face mask in public places and at home when around other household members is advisable based on CDC recommendation and the Australian Government Department of Health.<sup>13,14</sup> In consideration that human-to-human transmission among close family members has been reported in overseas countries such as Germany, Japan, and Vietnam, the community in Hubei province and the epicenters should be made aware of the essential importance of wearing face masks when they are around other household members.

The main strength of this study is the finding of the strong influence of institutional trust on overall preventive behaviors, in good agreement with previous studies.<sup>8,11</sup> As the COVID-19 epidemic is still growing exponentially, continued strengthening of institutional trust, and in particular, increasing the trust in the local authority, is essential for emergency management outbreak control.

The study also found that uptake of prevention practices was poorer among older members of the public, which warrants serious attention. It has been found that older adults affected by COVID-19 are likely to have a higher risk of complications and mortality.<sup>4</sup> There is a need to find out whether a lack of appropriate prevention practices among people of older age is due to knowledge deficiency or to their being out-of-reach of current public health intervention.

The finding that nearly 15% of people would be reluctant to seek treatment in the hospital if they were suspected to have been infected with COVID-19 is clinically important and worrisome. Of utmost importance, a proportion of those participants are in the city of Wuhan and currently under quarantine. The preference for using traditional healing among a minority of the older respondents is also of concern. Refusal to seek hospital treatment not only leads to progress to serious respiratory distress and can be life-threatening, but also increases the chances of spreading the disease. People who favor traditional healing should be made aware that seeking conventional treatment in the hospital and obeying the quarantine order are the most appropriate actions in containing this outbreak. Finally, the finding of the strong influence of institutional trust on seeking conventional treatment again amplifies the immense importance of building trust between the public and the government authorities.

This current study has several limitations that should be considered. The first pertains to the cross-sectional nature of the study. Thus, it cannot be used to infer causality. Second, the responses were based on self-report and may be subject to self-reporting bias and a tendency to report socially desirable responses. Therefore, the results should be interpreted with caution. Third, the snowballing method used in this study can lead to selection bias. Nevertheless, the



demographic distributions of our study population resembles of the general population in Hubei province, where the majority of the population were between the reproductive age of 25 to 45 years old. The majority of the people in Hubei province are working class, as depicted in the demographics of our study participants. The Hubei province is one of the most populous city in China, with an estimated of over 60 million population. The vast population and in addition to high use of smartphones among the people enable rapid collection of the data. Despite these limitations, the study data contributes tremendously to understanding of public responses, especially now that the epidemic is growing exponentially.

In conclusion, bridging the trust gaps between the public and local authorities in the epicenters is crucial. It is of utmost urgency to carry out public health interventions to reach out to individuals with poor adherence to preventive measures and who are reluctant to seek conventional medical care. Considering the extremely contagious nature of the COVID-19, a slight in compliance by even a small portion of the population may have grave consequences and contribute to the continued exponential increase of the outbreak cases.

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**Contributors** QW, XC, ZC, HA, MS, JH, SD, JZ and LYH conceived the study and designed the study in collaboration. LPW and HA analyzed the data. LPW wrote the first draft of the manuscript. All authors interpreted the data and contributed to subsequent drafts of the manuscript, and all authors have seen and approved the final version.

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**Competing interests** None declared.

**Patient consent** Not required.

**Ethics Approval** This survey was part of a continuing public health outbreak investigation and thus considered exempt from institutional review board approval.

**Data sharing statement** Data are available from the corresponding author upon request.

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Tables

**Table 1**

Demographic characteristics and factors associated with preventive behaviors (N=4245).

Covariates	Frequency (%)	Univariate analysis			Multivariable analysis <sup>a</sup>
		Preventive behavior score		<i>P</i>	Preventive behavior score
		Score 27-28 (n=2321)	Score 7-26 (n=1924)		27-28 vs 7-26
					OR (95% CI)
<b>Demographic characteristics</b>					
Age group (years)					
18-25	782 (18.4)	380 (48.6)	402 (51.4)		1.17 (0.93-1.48)
26-35	1515 (35.7)	893 (58.9)	622 (41.1)	p<0.001	1.54 (1.29-1.83)***
36-45	953 (22.4)	532 (55.8)	421 (44.2)		1.22 (1.01-1.48)*
>45	995 (23.4)	516 (51.9)	479 (48.1)		Reference
Gender					
Male	1754 (41.3)	975 (55.6)	779 (44.4)	0.332	
Female	2491 (58.7)	1346 (54.0)	1145 (46.0)		
Highest education level					
Middle school and below	380 (9.0)	215 (56.6)	165 (43.4)		Reference
High school/Technical secondary school	783 (18.4)	472 (60.3)	311 (39.7)	p<0.001	1.21 (0.94-1.57)
Junior college/vocational college	1117 (26.3)	626 (56.0)	491 (44.0)		1.05 (0.82-1.35)
Bachelor/master degree and above	1965 (46.3)	1008 (51.3)	957 (48.7)		0.94 (0.74-1.21)
Occupation					
Government staff/civil servants	1324 (31.2)	681 (51.4)	643 (48.6)		1.12 (0.84-1.51)
Ordinary worker	1260 (29.7)	768 (61.0)	492 (39.0)		1.54 (1.13-2.09)**
Business/ Service personnel	823 (19.4)	455 (55.3)	368 (44.7)	p<0.001	1.24 (0.91-1.69)

Housewife/ Retiree	504 (11.9)	266 (52.8)	238 (47.2)		1.18 (0.84-1.67)
Student.	334 (7.9)	151 (45.2)	183 (54.8)		Reference
Current location					
Wuhan	2855 (67.3)	1562 (54.7)	1293 (45.3)	0.948	
Others	1390 (32.7)	759 (54.6)	631 (45.4)		
Quarantine status					
Yes	3974 (93.6)	2233 (56.2)	1741 (43.8)	p<0.001	2.35 (1.80-3.08)***
No	271 (6.4)	88 (32.5)	183 (67.5)		Reference
Institutional trust					
Total score of institutional trust in information provision and preventive behaviors					
Score 0-21	2037 (48.0)	895 (43.9)	1142 (56.1)	p<0.001	Reference
Score 21-24	2208 (52.0)	1426 (64.6)	782 (35.4)		2.23 (1.96-2.53)***

OR: Odds ratio; CI: Confidence interval

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

<sup>a</sup>Hosmer & Lemeshow test, chi-square:11.999, p-value: 0.151; Nagelkerke R<sup>2</sup> : 0.086

**Table 2**

Factors associated with treatment-seeking in the hospital (N=4245).

Covariates	Frequency (%)	Univariate analysis			Multivariable analysis <sup>a</sup>
		Treatment-seeking in hospital			Treatment seeking in hospital Yes vs No
		Yes (n=3640)	No (n=605)	<i>P</i>	OR (95% CI)
<b>Demographic characteristics</b>					
Age group (years)					
18-25	782 (18.4)	655 (83.8)	127 (16.2)	0.271	
26-35	1515 (35.7)	1297 (85.6)	218 (14.4)		
36-45	953 (22.4)	824 (86.5)	129 (13.5)		
>45	995 (23.4)	864 (86.8)	131 (13.2)		
Gender					
Male	1754 (41.3)	1549 (88.3)	205 (11.7)	p<0.001	1.01 (0.89-1.15)
Female	2491 (58.7)	2091 (83.9)	400 (16.1)		Reference
Highest education level					
Middle school and below	380 (9.0)	340 (89.5)	40 (10.5)	p<0.001	Reference
High school/Technical secondary school	783 (18.4)	709 (90.5)	74 (9.5)		1.22 (0.94-1.58)
Junior college/vocational college	1117 (26.3)	977 (87.5)	140 (12.5)		1.12 (0.87-1.43)
Bachelor/master degree and above	1965 (46.3)	1614 (82.1)	351 (17.9)		1.04 (0.81-1.32)
Occupation					
Government staff/civil servants	1324 (31.2)	1105 (83.5)	219 (16.5)	0.002	1.18 (0.92-1.52)
Ordinary worker	1260 (29.7)	1110 (88.1)	150 (11.9)		1.66 (1.28-2.16)***
Business/ Service personnel	823 (19.4)	718 (87.2)	105 (12.8)		1.38 (1.06-1.81)*
Housewife/ Retiree	504 (11.9)	434 (86.1)	70 (13.9)		1.19 (0.88-1.61)
Student	334 (7.9)	273 (81.7)	61 (18.3)		Reference
Current location					
Wuhan	2855 (67.3)	2380 (83.4)	475 (16.6)	p<0.001	Reference

Others	1390 (32.7)	1260 (90.6)	130 (9.4)		0.94 (0.82-1.08)
Quarantine status					
Yes	3974 (93.6)	3424 (86.2)	550 (13.8)	0.005	2.36 (1.80-3.09)***
No	271 (6.4)	216 (79.7)	55 (20.3)		Reference
<b>Institutional trust</b>					
Total score of institutional trust in information provision and preventive behaviors					
Score 0-21	2037 (48.0)	1604 (78.7)	433 (21.3)	p<0.001	Reference
Score 21-24	2208 (52.0)	2036 (92.2)	172 (7.8)		2.20 (1.94-2.49)***

OR: Odds ratio; CI: Confidence interval

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

<sup>a</sup>Hosmer & Lemeshow test, chi-square:2.231, p-value: 0.973; Nagelkerke R<sup>2</sup> : 0.079



**Figure legends:**

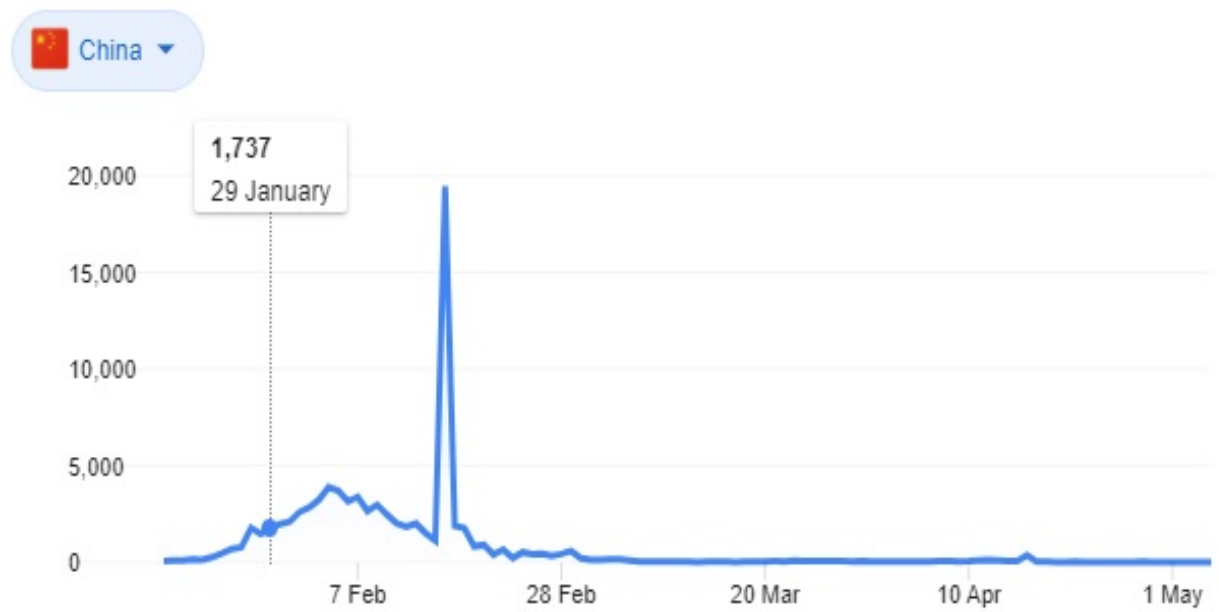
Figure 1 The number of confirmed COVID-19 cases in China and the date of data collection.

Figure 2 Figure 1 Institutional trust for information provision and preventive instruction (N=4245)

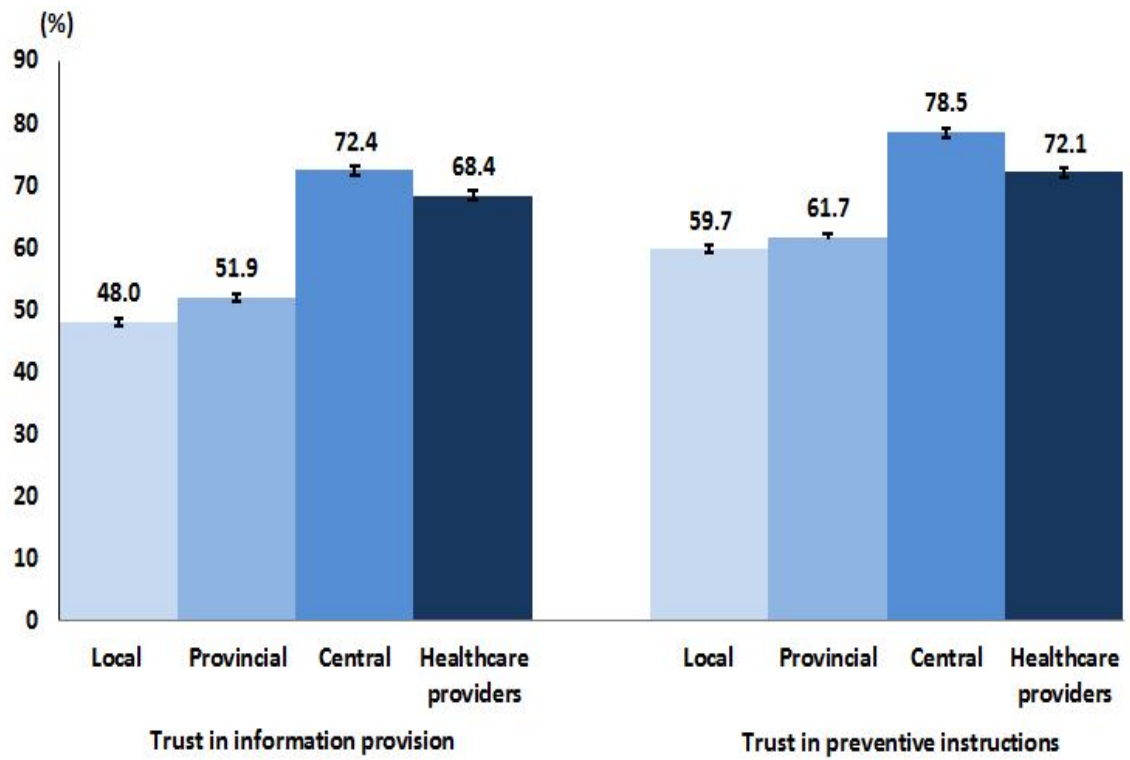
Figure 3 Proportion of Frequent responses for preventive behaviours (N=4245)

Figure 4 Treatment-seeking behaviours (N=4245)

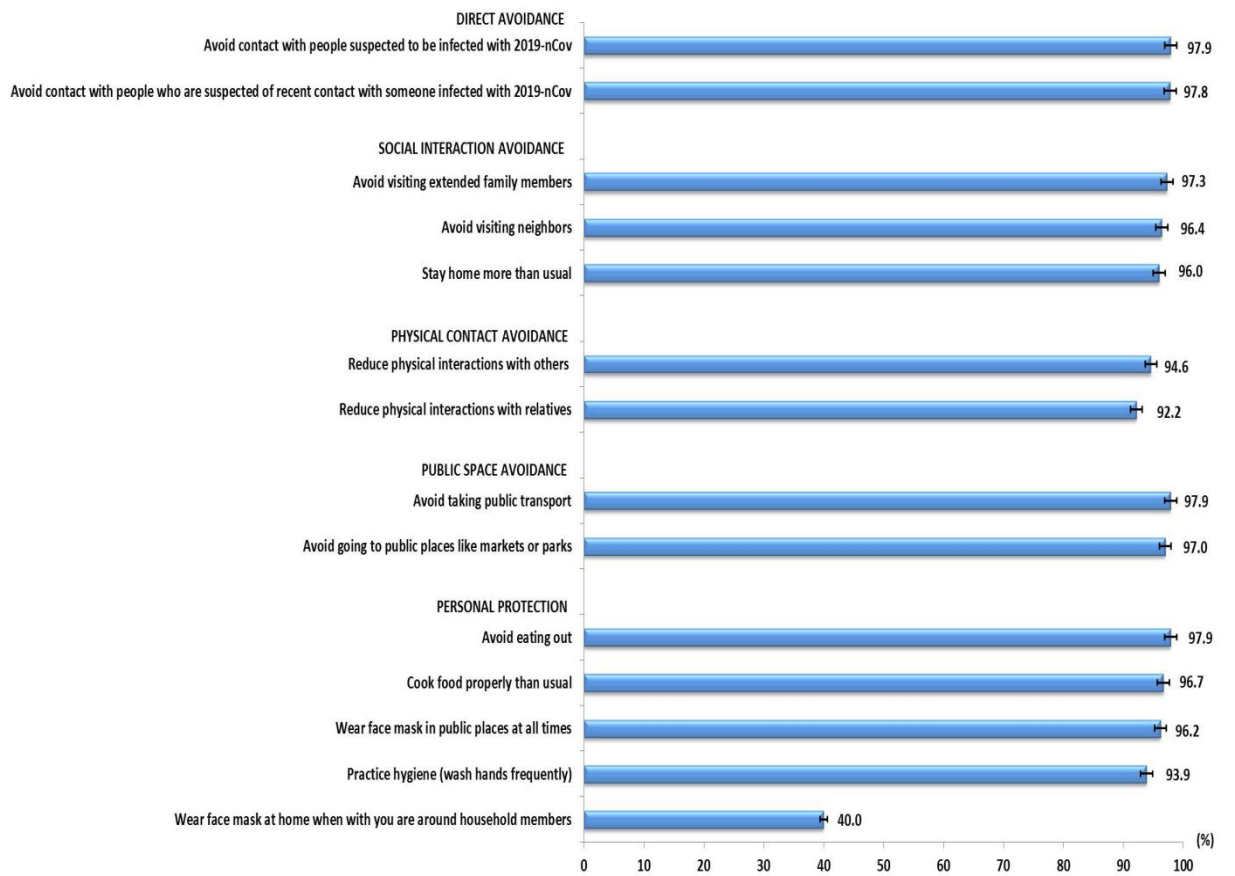
## New cases



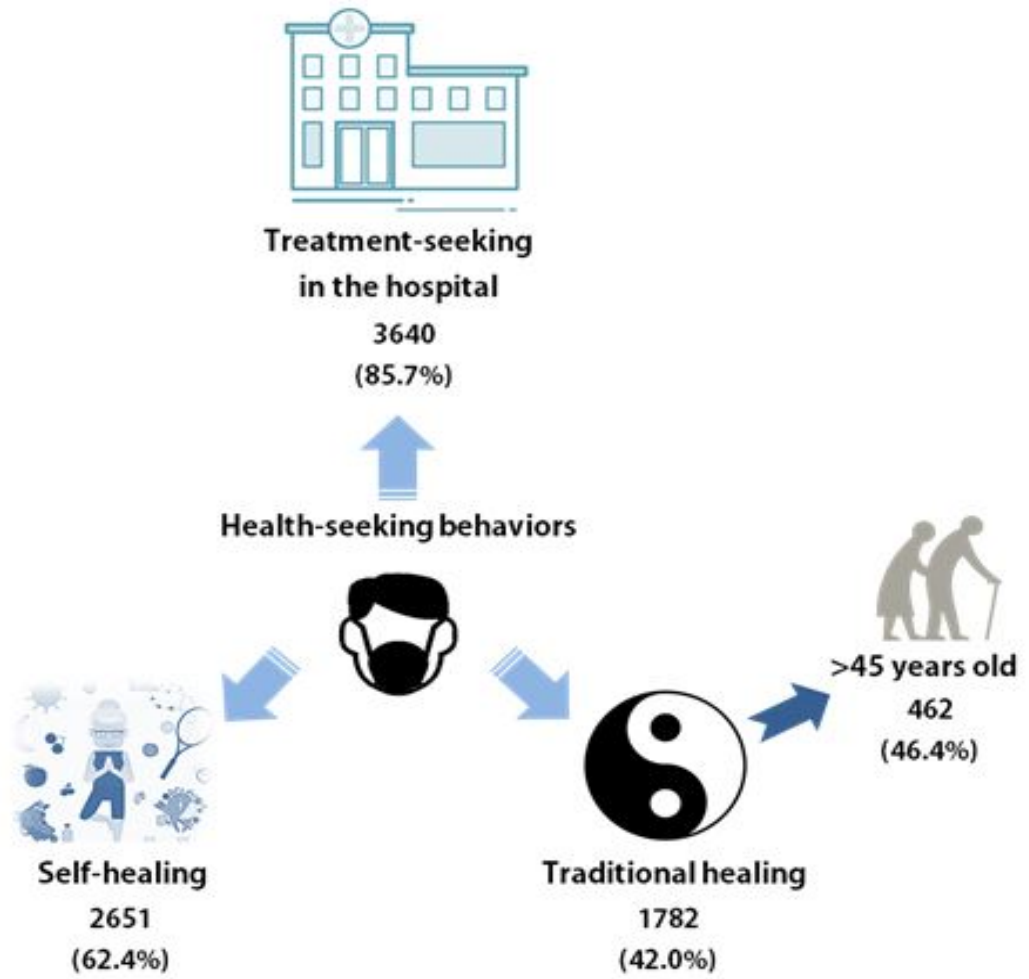
**Fig. 1.** The number of confirmed cases in China during the onset.



**Fig. 2.** Institutional trust for information provision and preventive instruction (N=4245).



**Fig. 3.** Proportion of Frequent responses for preventive behaviours (N=4245).



**Fig. 4.** Treatment-seeking behaviors (N=4245)