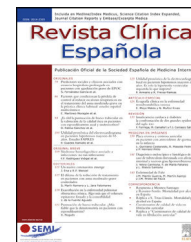




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ORIGINAL ARTICLE

Distributions of time, place, and population of novel coronavirus disease 2019 (COVID-19) from January 20 to February 10, 2020, in China[☆]



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KEYWORDS

Novel coronavirus;
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Abstract

Background and objective: Since December 2019, increasing cases of novel coronavirus disease 2019 (COVID-19) are being detected worldwide. The purpose of this paper is to provide a scientific reference for the global prevention and control of COVID-19.

Methods: General demographic characteristics, epidemiological history, and clinical symptoms of COVID-19 were collected that had been reported on the websites of multiple Municipal Health Commissions in China. We herein describe distributions in time, place, and population of COVID-19.

Results: As of midnight on February 10, 2020, the number of confirmed cases of COVID-19 in China was 42,638, and the province with the largest number of confirmed cases was Hubei (31,728), followed by Guangdong (1177), Zhejiang (1117), and Henan (1105) province. The number of cases and the speed of confirmed cases in provinces other than Hubei were more moderate than those of the Hubei province. The median (interquartile range) age of 1740 patients with COVID-19 was 44 (33, 54) years, with a range of 10 months to 89 years.

Conclusions: The COVID-19 epidemic should be considered a global threat and the steps for control include early diagnosis and treatment, as well as isolation.

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PALABRAS CLAVE

Nuevo coronavirus;
Enfermedades
infecciosas;
Brote;
Neumonía

Distribución temporal, geográfica y por población de la nueva enfermedad por coronavirus (COVID-19) desde el 20 de enero hasta el 10 de febrero del 2020, en China

Resumen

Antecedentes y objetivo: Desde diciembre del 2019, se está detectando en el mundo un incremento de casos de una nueva enfermedad causada por el coronavirus 2019 (COVID-19). El objetivo de este artículo es proporcionar recomendaciones científicas para la prevención y el control de la COVID-19 en todo el mundo.

Métodos: Se han recopilado características demográficas generales, antecedentes epidemiológicos y síntomas clínicos de la COVID-19 recogidos en los sitios web de múltiples Comisiones Municipales de Salud en China. Aquí describimos las distribuciones temporales, geográficas y de población de la COVID-19.

Resultados: Hasta la medianoche del 10 de febrero del 2020, el número de casos confirmados de COVID-19 en China fue de 42.638, siendo Hubei la provincia con un mayor número de casos confirmados (31.728), seguida por Guangdong (1.177), Zhejiang (1.117) y la provincia de Henan (1.105), en China. El número de casos y la velocidad de confirmación en otras provincias fue más moderada que en la provincia de Hubei. La mediana (rango intercuartílico) de edad de 1.740 pacientes de COVID-19 fue de 44 años (33, 54), con un rango desde los 10 meses hasta los 89 años.

Conclusiones: La epidemia de COVID-19 se ha de considerar como una amenaza mundial y los pasos encaminados para su control incluyen el diagnóstico temprano y su tratamiento, así como el aislamiento.

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Introduction

Since December 2019, increasing cases of a novel coronavirus disease (COVID-19) are being detected in Wuhan, Hubei Province, China.¹ The COVID-19 recently discovered is caused by a new coronavirus that has not previously been found in humans (SARS-CoV-2). With the spread of the epidemic, such cases have been found in other parts of China and throughout the world.² The number of confirmed cases and deaths in recent days is still increasing. As of midnight on March 11, 2020, the National Health Commission (NHC) had received reports of 80,793 confirmed cases and 3169 deaths on the Chinese mainland.³

This study provides a data analysis of the confirmed cases of COVID-19 in China as of midnight on February 10, 2020, to describe the disease distribution and development dynamics of COVID-19.

The epidemiological characteristics and clinical symptoms of 1740 confirmed cases are also described in this paper to provide scientific evidence for the prevention and control of pneumonia in China and other countries around the world.

Methods**Data sources**

We collected the number of confirmed cases, deaths, and cured cases of COVID-19 from January 20, 2020 to February 10, 2020, using the official website of the NHC

of the People's Republic of China. General demographic characteristics, epidemiological history, and clinical symptoms of 1740 patients with COVID-19 were collected that had been reported on the websites of multiple Municipal Health Commissions in all Chinese provinces and cities, including Jiangsu, Fujian, Gansu, Guangdong, Guizhou, Hainan, Hebei, Henan, Beijing, and Zhejiang by January 31, 2020.

Statistical analysis

Medians and interquartile ranges (IQR) were computed for describing data not conforming to normal distributions. The statistical map was used to describe the distribution of variables in geographical space. Line charts were used to describe the trend of data over time. Semi-logarithmic line charts were used to describe the speed of increase in the number of confirmed cases. Pie charts and doughnut charts were used to describe proportions. Histogram was used to describe the distribution of qualitative variables. The bar chart was used to describe the frequency distribution of qualitative variables. SPSS software 18.0 version was used for the analysis of data. Arc Gis software version 10.5 and Excel software were used to draw statistical graphics.

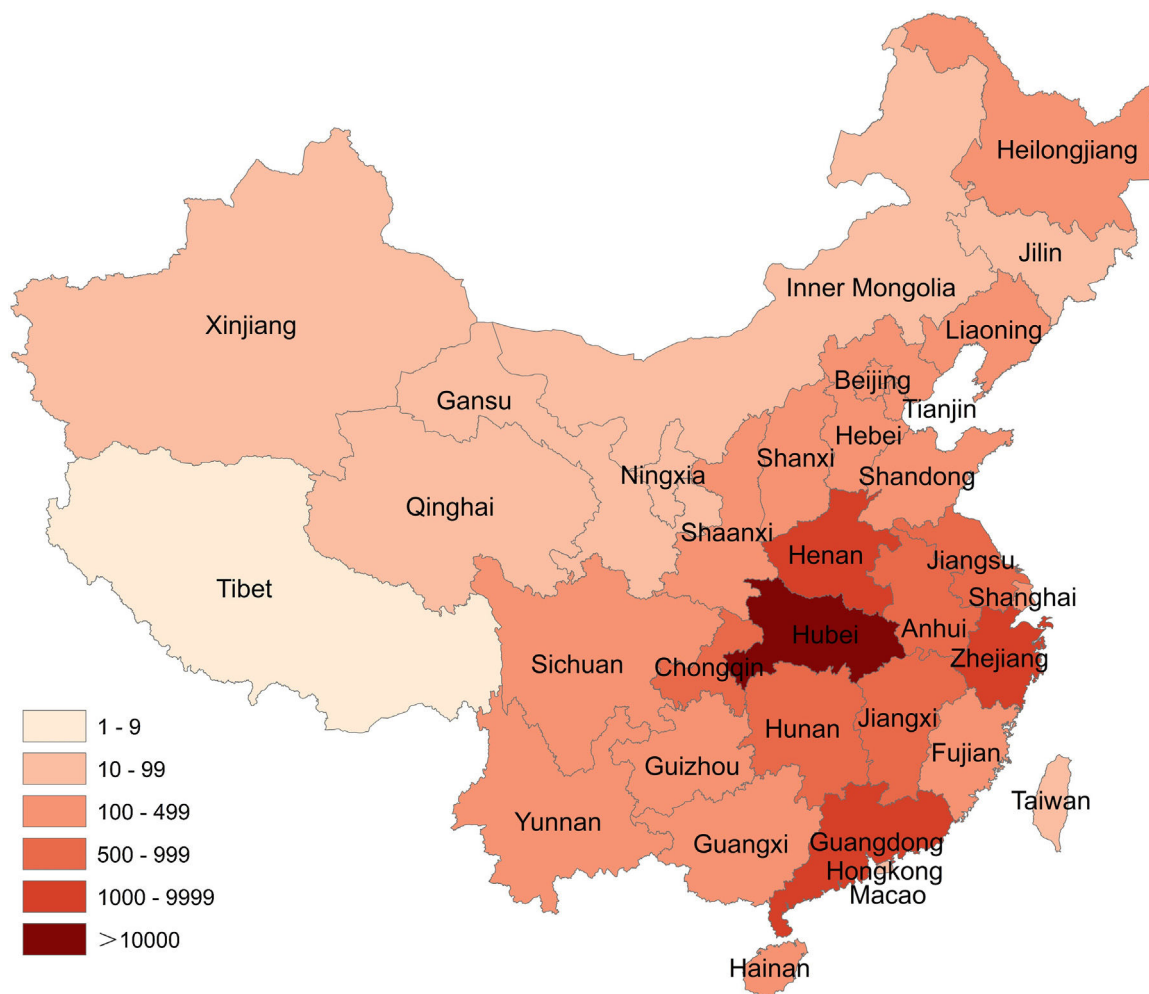


Figure 1 The distribution in place of confirmed cases of COVID-19 in 34 provinces/cities in China on February 10, 2020.

Results

Regional distribution of confirmed cases of COVID-19

A total of 42,638 cases of COVID-19 were confirmed, including 31,728 cases in Hubei province and 10,910 cases in other Chinese provinces or cities at midnight on January 31, 2020. [Fig. 1](#) shows the distribution of confirmed cases of COVID-19 in 34 provinces/cities (including Hong Kong, Macao, and Taiwan) at that moment. The largest number of confirmed cases occurred in Hubei, followed by Guangdong, Zhejiang, and Henan provinces.

Time distribution of confirmed cases of COVID-19

[Fig. 2\(a\)–\(c\)](#) shows the growth trends of COVID-19 cases in China, Hubei, and non-Hubei provinces from January 20, 2020, to February 10, 2020, respectively. [Fig. 2\(d\)–\(f\)](#) shows the growth speeds of COVID-19 cases in China, Hubei, and non-Hubei provinces during the same period, respectively. The growth quantity and speed of confirmed cases in non-Hubei provinces are more moderate than those in the Hubei province.

Population distribution of confirmed cases of COVID-19

Sex

There were 966 (55.52%) men and 774 (44.48%) women in the 1740 confirmed cases of COVID-19 ([Fig. 3](#)).

Age

The median (IQR) age of the 1740 patients with COVID-19 was 44 (33, 54) years, with a range of 10 months to 89 years. [Fig. 4](#) shows the age distribution of cases by sex.

Clinical symptoms

[Fig. 5](#) shows the frequency distribution of clinical symptoms in 1247 of 1740 patients, from highest to lowest: fever (47.39%), cough (25.26%), fatigue (8.02%), sore throat (6.34%), muscle soreness (4.89%), chills (3.61%), chest tightness (1.52%), diarrhea/abdominal pain (1.36%), runny nose (1.20%), and poor appetite (0.40%). Symptoms in 493 of 1740 cases were unknown because the information was not available on the website.

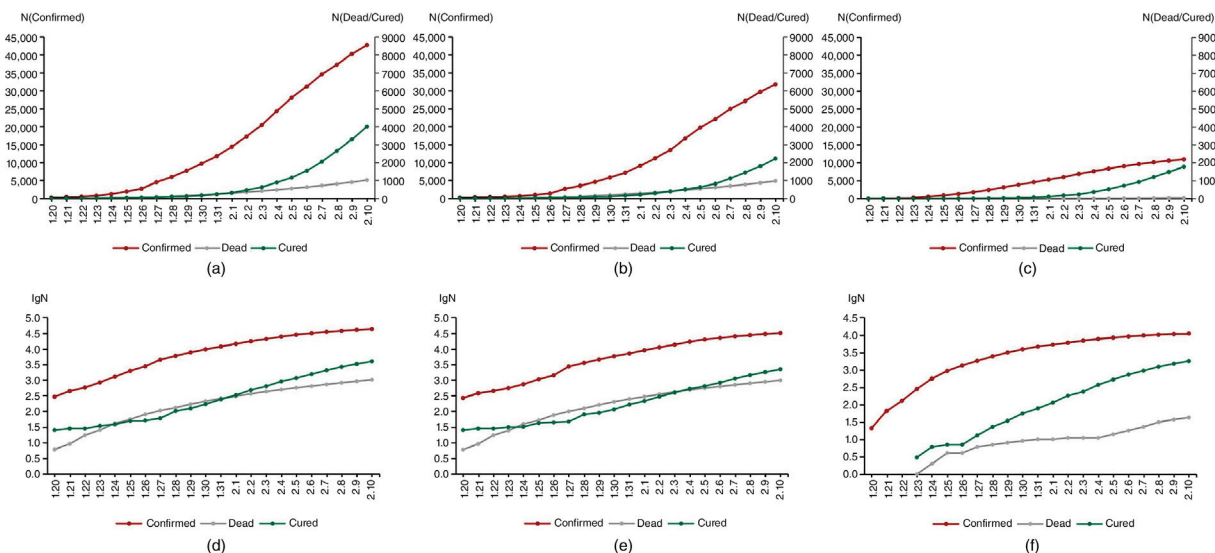


Figure 2 The growth trend of confirmed cases of COVID-19 in China (a), Hubei province (b), and non-Hubei province (c) from January 20, 2020, to February 10, 2020. And the growth speed of confirmed cases of COVID-19 in China (d), Hubei province (e), and non-Hubei province (f) from January 20, 2020, to February 10, 2020.

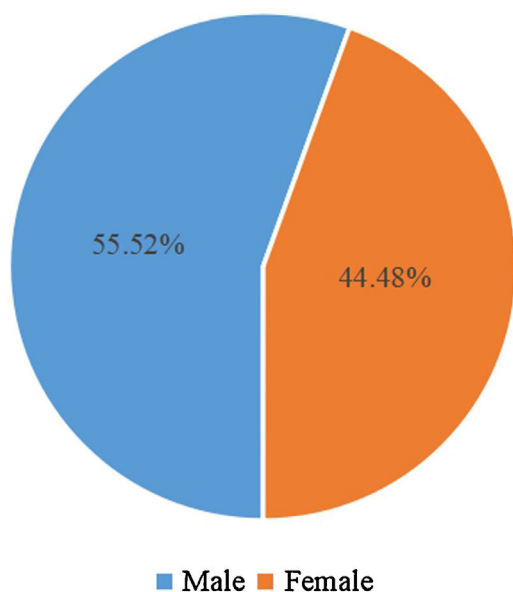


Figure 3 The percentage and distribution by sex.

Epidemiological history

Fig. 6 shows the distribution of the epidemiological history of COVID-19.

There were 996 (57.24%) patients with a Wuhan contact history, 248 (14.25%) patients with a confirmed case contact history, 20 (1.15%) patients with Wuhan and confirmed case contact history, and 476 (27.36%) patients whose epidemiological history was not found on the official website of the Municipal Health Commission.

Discussion

The outbreak of COVID-19 in Wuhan, China, has aroused attention around the world.⁴ We collected and analyzed

the data from the official websites of Municipal Health Commissions to provide information about the epidemic characteristics in China.

The results of this study indicated that Hubei province suffered the most severe COVID-19 epidemic, followed by Guangdong, Zhejiang, and Henan provinces. The explanation for these findings could lie in a greater frequency of travel to these provinces among the population of Wuhan. Therefore, the current epidemic in Hubei province needs more medical attention, and the epidemic in Zhejiang province and Guangdong province should not be underestimated.

Our data show that the age of the patients was mainly concentrated between 33 and 54 years, with the youngest patient aged 10 months. Deaths in the confirmed cases were mainly in the elderly population, whose disease could have a more accelerated course.⁵

The frequency of clinical symptoms from highest to lowest was fever, cough, fatigue, sore throat, muscle soreness, chills, chest tightness, diarrhea/abdominal pain, runny nose, and poor appetite; these could provide a reference for the clinical diagnosis of COVID-19.

Human-to-human transmission has already taken place.⁶ Urgent next steps to control the extension of the outbreak include early detection and treatment of cases, and quarantine of the population to reduce the transmission of the infection within the community.⁷ Authorities in China have adopted rapid public health measures, including rapid identification and containment of COVID-19 in a short period of time, enhanced surveillance, epidemiological investigations, and sequencing of the COVID-19 genome, all of which have been recognized and praised by the WHO.⁸

China has severely restricted traffic in Hubei Province, prohibited outbound transportation (airplanes, trains, and long-distance buses), and vehicle traffic in Wuhan has been banned.⁹ Large quantities of medical supplies have arrived

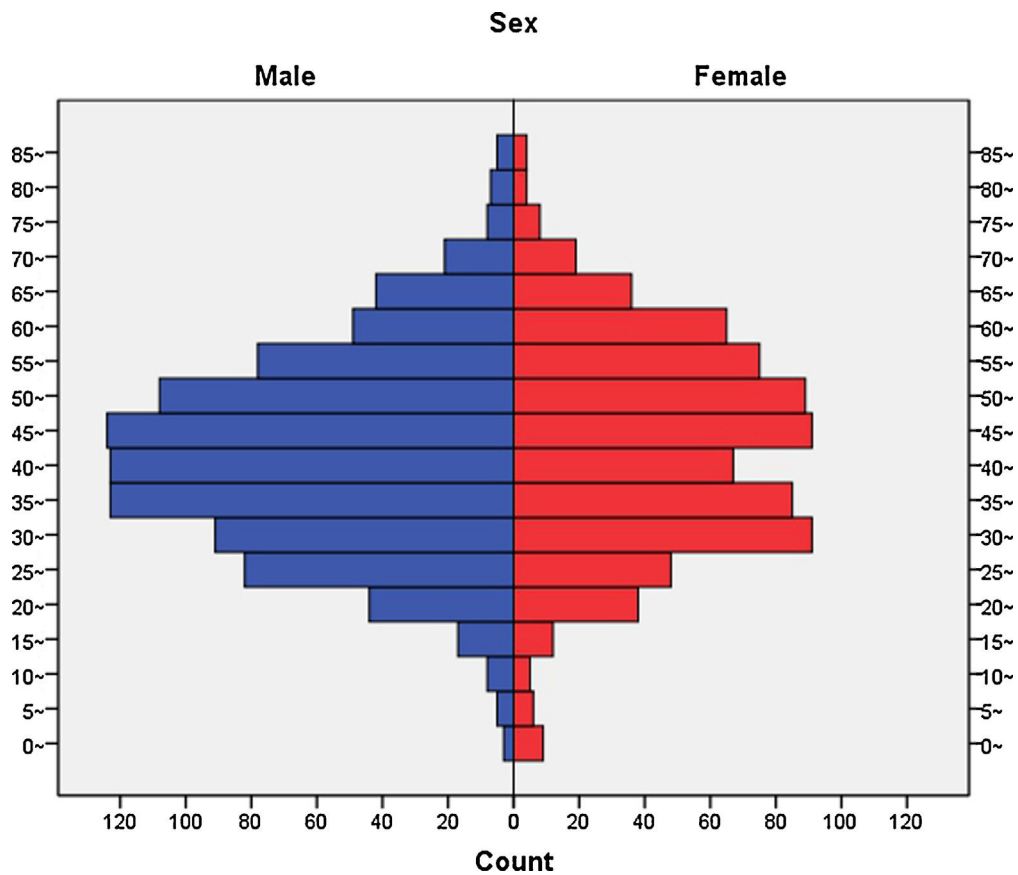


Figure 4 The age distribution in 1740 confirmed cases of COVID-19 in different genders in China on January 31, 2020.

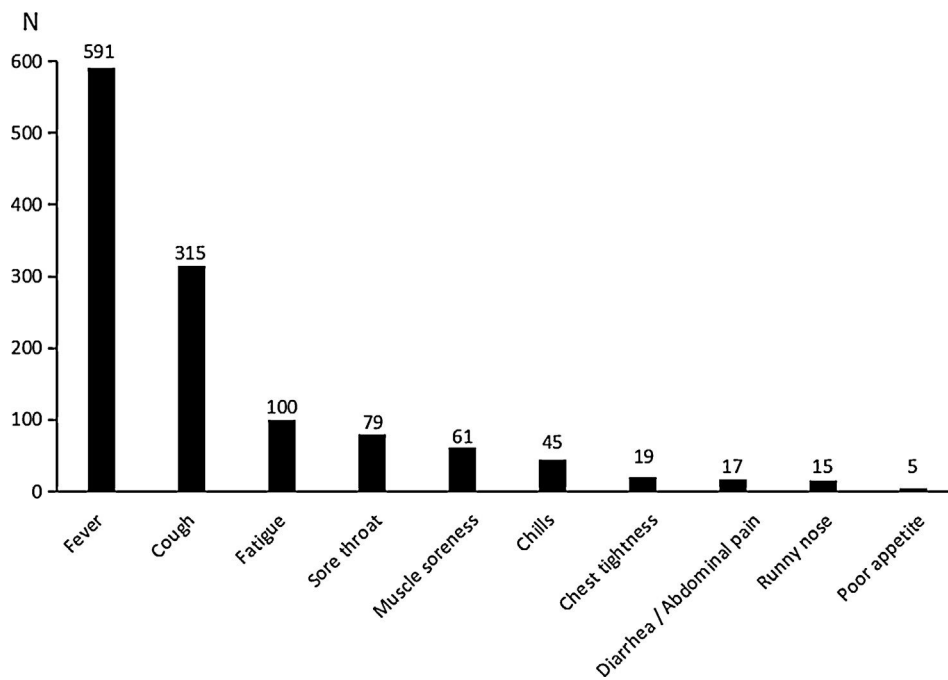


Figure 5 The frequency distribution of clinical symptoms in 1247 confirmed cases of COVID-19 in China on January 31, 2020.

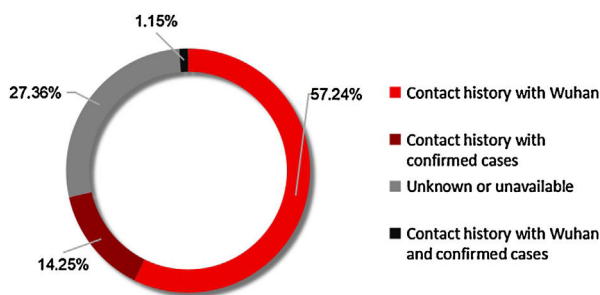


Figure 6 The epidemiological history distribution of 1740 confirmed cases of COVID-19 in China on January 31, 2020.

in Wuhan city,¹⁰ which is worth emulating in other countries in order to ameliorate the effects of the epidemic. All of us, including health care workers, must take precautions and use qualified N95 masks and other personal protective equipment when necessary.¹¹

This article has some limitations. There was a proportion of cases with no information about the infection's origin of transmission (27% missing data) or information about the symptoms (28% missing data). However, this paper provided information about the distribution in time, place, and population of COVID-19 that could be useful for preparing for and controlling COVID-19 worldwide.

Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgment

All authors thank multiple Municipal Health Commissions in China for publishing the data on the official website. Fight the epidemic! Come on.

References

1. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med.* 2020;382:727–33, doi:10.1056/NEJMoa2001017.
2. Bogoch II, Watts A, Thomas-Bachli A, Kraemer MUG, Khan K. Potential for global spread of a novel coronavirus from China. *J Travel Med.* 2020;27:taaa011, doi:10.1093/jtm/taaa011.
3. Huang Z, Zhao S, Li Z, Chen W, Zhao L, Deng L, et al. The battle against Coronavirus Disease 2019 (COVID-19): emergency management and infection control in a radiology department. *J Am Coll Radiol.* 2020, doi:10.1016/j.jacr.2020.03.011. S1546-1440(20)30285-4 [online ahead of print].
4. Chan JF, Yuan S, Kok KH, To KK, Chu H, Jang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet.* 2020;395:514–23, doi:10.1016/S0140-6736(20)30154-9 [Epub 24.01.20].
5. Wang W, Tang J, Wei F. Updated understanding of the outbreak of 2019 novel coronavirus (COVID-19) in Wuhan, China. *J Med Virol.* 2020;92:441–7, doi:10.1002/jmv.25689.
6. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *Lancet.* 2020;395:565–74, doi:10.1016/S0140-6736(20)30251-8.
7. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in wuhan china, of novel coronavirus-infected pneumonia. *N Engl J Med.* 2020;382:1199–207, doi:10.1056/NEJMoa2001316.
8. Hui DS, Azhar I, Madani E, Ntoumi TA, Kock F, Dar R, et al. The continuing COVID-19 epidemic threat of novel coronaviruses to global health – the latest 2019 novel coronavirus outbreak in Wuhan, China. *Int J Infect Dis.* 2020;91:264–6, doi:10.1016/j.ijid.2020.01.009.
9. Phelan AL, Katz R, Gostin LO. The novel coronavirus originating in Wuhan, China: challenges for global health governance. *JAMA.* 2020, doi:10.1001/jama.2020.1097 [online ahead of print].
10. Zhao S, Lin Q, Ran J, Musa SS, Yang G, Wang W, et al. Preliminary estimation of the basic reproduction number of novel coronavirus (COVID-19) in China, from 2019 to 2020: a data-driven analysis in the early phase of the outbreak. *Int J Infect Dis.* 2020;92:214–7, doi:10.1016/j.ijid.2020.01.050.
11. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet.* 2020;395:497–506, doi:10.1016/S0140-6736(20)30183-5.