



EDITORIAL

The 2019/2020 Novel Corona Virus Outbreak: An International Health Management Perspective

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1. INTRODUCTION

On December 31, 2019 Chinese health authorities reported an outbreak of atypical pneumonia in Wuhan, the 12 million person capital of Hubei province [1]. On January 7, 2020 this outbreak was linked to a novel coronavirus epidemic known as Covid-19 (or 2019-nCoV caused by the virus SARS-CoV-2) [2]. The WHO declared the outbreak a Public Health Emergency of International Concern on January 30, 2020 [3, 4].

Covid-19 is one of several zoonotic coronaviruses known to affect humans. Others include severe acute respiratory syndrome (SARS-CoV) which was first reported in South China in 2002, infected over 8,000 and killed an estimated 747 individuals [1, 5]. Middle East respiratory syndrome (MERS-CoV) was first reported in Saudi Arabia in 2012, infected 2,494 and killed 858 individuals worldwide [1]. Data published by the German Health Ministry indicate that as of February 18, 2020 a total of 73,335 had been diagnosed with Covid-19 and 1,873 have died from the disease [2]; albeit that it is likely that these figures underestimate the true extent of the epidemic on account of undiagnosed cases or cases not being attended to at hospitals (Table 1).

2. MEASURES

Covid-19 is said to have emerged from Wuhan's Huanan seafood (and wildlife) market which was closed on January 1, 2020 as part of the government's crisis response. Officials also responded by depositing the genome sequence of the virus on Genbank and with the Global Initiative on Sharing All Influenza Data [3, 6, 7] which is likely to facilitate developments of diagnostic kits and potentially also of vaccines [3]. Analyses of the genome sequence have led researchers to suggest that the virus originated from snakes, but

this has been disputed by other scientists who propose that it derived from bats [8]. Other government measures include the creation of a case definition system for the classification of patients [1], the provisions of test-kits, and the accelerated construction of hospitals in Wuhan, which still seems to be overwhelmed by the epidemic [9]. The most notable measure taken by the government obviously concerns the imposition of quarantine on Wuhan and some nearby cities which took place from January 23 [1].

As the major measure employed to combat the spread of the epidemic, this quarantine has attracted both approval and criticism, with some commentators arguing that it deprived the local population of their liberty [10]. Others, meanwhile, are concerned that measures taken locally to contain the Covid-19 threat have not gone far enough or were not taken early enough. Accordingly, some of the first patients admitted to hospital did not have any connections to the seafood market [3, 11] which, given an incubation period of 2 to 14 days, suggests that several other clusters may have already existed which may have involved superspreading events [1, 12].

Researchers working in Hong Kong have suggested that "substantial, even draconian measures that limit population mobility should be seriously and immediately considered in affected areas, as should strategies to drastically reduce within-population contact rates through cancellation of mass gatherings, school closures, and instituting work-from-home arrangements" [1]. The same team suggests that there is an urgent need to compile a "list of suspected, possible, probable, and confirmed cases and close contacts that is updated daily and linked to clinical outcomes and laboratory test results" as well as a need to identify the zoonotic source and to accelerate vaccine platforms [1]. In this sense it is remarkable to note that in Germany, a country which by mid-February reported only 16 cases of Covid-19, the Health Ministry already advised individuals suffering from acute respiratory conditions to stay at home as a precaution [2].

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Table 1. Health threat from past and present coronavirus outbreaks.

-	SARS-CoV [1, 5]	MERS-CoV [1]	-	-	Covid-19 [2]	-	-
-	-	-	14 Feb 2020	15 Feb 2020	16 Feb 2020	17 Feb 2020	18 Feb 2020
Outbreak	2002/2003	2012	2019	2019	2019	2019	2019
Origin	South China	Saudi Arabia	Central China				
Countrs. Affected	37	27	26	27	27	27	27
Infected	8,000+	2,495	64,460	67,091	69,267	71,710	73,335
Deaths	747	858	1,526	1,526	1,670	1,775	1,873
Crude Mortality	~10%	~35%	~2.4%	~2.3%	~2.4%	~2.5%	~2.6%

3. DISRUPTION

While the relative success of triage measures in controlling the outbreak of SARS and the institutional legacy of the partially reformed *Hukuo* (Household Registration System) on population movement should make more draconian restrictions on movement feasible in China, such controls will have a wider disruptive impact on China's health system, its ability to supply and access pharmaceutical products and mobility in the economy more generally. The virus has already challenged capacity within China's health system. The sudden influx of a large number of patients presenting at clinics in Wuhan overstretched the number of physicians and increased the risks from potential cross-infection [13]. This put pressure on China's traditional approach to the management of such outbreaks through specialized clinics. The numbers of these specialized clinics grew rapidly in the 1990s, allowing for the triaging of patients during the SARS outbreak. However, constraints on health spending have seen their numbers plateau. In 2002, just before the outbreak of SARS China had 3,580 specialized epidemic centers; in 2017 their numbers stood at 3,456 [14]. The pressures on these clinics have been amplified by imbalances between urban and rural healthcare provision. In Hubei, there is a major imbalance between the number of healthcare workers per head of population employed in urban facilities (10.09/1,000) and rural facilities (4.83/1000) [14].

China's increasing pharmaceutical exports alongside dependence on imports make the country a source of vulnerability and make it susceptible to transportation disruptions. Chinese exports of pharmaceutical products have grown rapidly from US\$6,592 million in 2014 to US\$ 15,077 million in 2017, while imports in 2017 stood at US\$26,796 million, up from US\$17,752 million in 2014 [14]. This growth has come from targeted policy efforts. In 2014, China significantly reduced the time-to-market for innovative pharmaceutical products and in 2015 the State Council expedited the regulatory approval process for new drugs "where the applicant's manufacturing capacity had been shifted to China" [15]. China's approach has attracted criticism from the US on the grounds that it has linked price concessions to marketing approval, departing from international best practice on safety, efficacy and quality [15]. These measures were perceived by US trade officials as giving an advantage to pharmaceutical firms that had located their operations in China. Recent media coverage suggests that the risks associated with supply chain concentration are likely to become of greater political concern [16].

4. SOCIAL AND ECONOMIC IMPACT

Efforts to stem within population transmission rates will also have specific economic impacts. Of concern to China will be the threat that restrictions on movement will have on food supply chains, especially in terms of the transport of live poultry and animals [17]. Many farmers had turned to poultry production following the outbreak of African Swine Flu in August 2018 which resulted in the loss of approximately 40% of the country's swine population through culling and disease. These losses saw a rise in the price of other protein sources, but inventories of these products are now reported to be stockpiled at ports, distribution centers and on farms due to restrictions on movement [17]. Even before the Covid-19 outbreak China's food security has been thought of as finely balanced, with some 122.4 million people (8.4% of population) categorized as undernourished in 2018 [18]. Many of these reside in rural areas and are dependent on agriculture and migrant work.

OUTLOOK

Several organisations, including publishers such as Elsevier currently maintain open access online information centres which, among other issues, discuss clinical approaches and solutions [19]. Similarly academics have begun reporting successful clinical interventions across the globe [3]. It is to be hoped that swift exchange of information will help reduce the impact of this epidemic, while close collaboration of public sector bodies with voluntary and private sector organisations will help address or ameliorate the collateral damage caused by this health crisis.

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