Public Health 179 (2020) A1–A2

Contents lists available at ScienceDirect

Public Health

journal homepage: www.elsevier.com/locate/puhe

Editorial

Wuhan novel coronavirus (COVID-19): why global control is challenging?

On 31 December 2019, the World Health Organization (WHO) was alerted to the emergence of cases of pneumonia of unknown etiology detected in Wuhan city, China. Within days, Chinese health authorities identified 44 more cases. A novel coronavirus (COVID-19) was subsequently isolated from patients. A putative epidemiological link was made with exposures in a seafood market in Wuhan city.[1] By the end of January 2020, 9720 cases of 2019-nCoV were confirmed throughout China, with further 15,238 suspected cases and 213 deaths.[2] More worryingly, 106 cases were also confirmed abroad in 19 countries, from neighboring countries such as Japan and Vietnam to more distant countries such as Finland, Canada, and Australia. On 30 January 2020, the Emergency Committee of the WHO, under the 2005 International Health Regulations, declared COVID-19 acute respiratory disease a public health emergency of international concern.

At this stage, the global spread of COVID-19 acute respiratory disease continues to grow, and the full extent and severity of this outbreak remains to be seen. That said, global disease control of COVID-19 is likely to be challenging. Experience from the 2003 severe acute respiratory syndrome (SARS) and 2015 Middle East respiratory syndrome (MERS) outbreaks, both also caused by emerging novel coronaviruses, may be informative. Firstly, the rapid spread of COVID-19 is likely to be driven by the phenomenon of 'superspreading'. Superspreading describes heightened transmission of the disease to at least eight contacts and has been observed for several infectious diseases including SARS, MERS, and influenza.[3,4] Any delay in recognition of the disease and implementation of effective control measures increases the likelihood of greater spread of the pathogen.

Another feature of COVID-19 common to SARS and MERS is the rapidity of global spread due to commercial air travel. The 1918 Spanish influenza pandemic took months to spread from Europe to Australia or South America as ship-borne travel took time. Modern air travel allows passengers to traverse the globe in less than a day. This allows the viruses to rapidly spread across continents, and efforts at airport screening to halt them have been fairly ineffective and costly.[5,6] This is in addition to the potential for in-flight transmission of the virus among passengers that was observed with SARS.[7]

Once the pathogen has landed in a new country, the likelihood of contagion and spread is dependent on local transmission pathways and the strength of local health protection systems. Experience from MERS suggests the transmissibility of the virus is not just due to its inherent infectivity but also due to influence by local contextual variables such as hygiene practices, crowding, and infection control standards.[8] High-income countries such as the United States and United Kingdom have well-developed health protection systems to detect and respond to communicable disease threats. They have the ability to robustly trace contacts, assess suspected cases, and have them tested rapidly to get timely laboratory confirmation of infectious status to guide the management of these individuals. Infected individuals identified can then be isolated until the risk of disease transmission has abated. This containment strategy, however, is resource intensive and may be more difficult to enforce in liberal democracies.

The other component of well-developed health protection systems are strong infectious disease surveillance systems. Surveillance enables the disease to be detected, outbreaks to be tracked, and the efficacy of interventions to be monitored. It also can provide vital information on the characteristics of the pathogen and help identify vulnerable population groups. During an outbreak of this significance, active surveillance is likely to be instituted, often with daily monitoring of disease trends demanded by health authorities. Once again, this is laborious and resource intensive.

The current concerns then regarding the 2019-nCoV outbreak must be for low- and middle-income countries where health protection systems tend to be weaker. In these settings, laboratory resources may be lacking, notification of infectious diseases are often not timely or complete, and their public health infrastructure is often weak.[9] Their surveillance systems may be more rudimentary, lacking in coverage and analytical strength.[10,11] Surveillance systems are the eyes of the health system – without them the health system would be blind. You cannot tackle what you cannot see.

Unfortunately, in resource-constrained settings, investment in this critical health protection infrastructure is a low priority compared with other health priorities. Health protection investment is analogous to an insurance policy – in good times when it is infrequently called upon it may be deemed unnecessary by policymakers. But this is a dangerous misperception. Furthermore, compared with other public health interventions, health protection interventions are highly cost-effective.[12] Disinvestment in health protection is risky as it is not easy to build up health protection infrastructure, skills, and workforce rapidly. Consequently, the risk of COVID-19 is most likely to be greatest in developing countries that are most likely to lack the means and health protection systems to protect themselves. The burden of infection may, therefore, be heaviest in these countries.

Undoubtedly, most developed countries would be focused on preparing their health systems to protect their own health security. However, without adequate intervention in the developing countries, COVID-19 could take root and become endemic in these countries, in effect becoming human population reservoirs for the virus that can and will reinfect other populations worldwide. There is therefore both a self-preservation and a moral imperative for richer countries to offer and provide assistance to developing countries to help them bolster their defenses against this global threat. What is clear is that global health threats such as COVID-19 will require collaborative solutions by the international community.

The global COVID-19 outbreak story could have several different endings. With a degree of luck, the best-case scenario may be COVID-19 spontaneously petering out as was the case with SARS in 2003. Or it may continue to sporadically pop up over many years with the occasional outbreak as MERS has done. Or, more worryingly, it may follow a more sinister path such as the 1918 Spanish influenza and take root in populations worldwide, exacting a heavy toll in morbidity and mortality over decades to come. The initial signs are worrying – early estimates put its reproductive number at 3.11 with a case fatality rate around 3%, [13,14] not too dissimilar to the 1918 pandemic flu strain.[15] Only time will tell.

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https://doi.org/10.1016/j.puhe.2020.02.001
0033-3506/