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COVID-19: a fast evolving pandemic

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On 31 December 2019, the World Health Organization (WHO) office in China received a report of 29 pneumonia cases of unknown aetiology in Wuhan city in Hubei province, central China. Within 1 week it became clear that the initial cases were associated with a seafood market where live poultry and wild animals were also sold. The virus was quickly identified as a novel beta-coronavirus and the genetic sequence was shared on 12 January 2020. The infection is now officially termed COVID-19 and the virus SARS-CoV-2. News of this outbreak gave many public health officials an involuntary shudder as they recalled the parallels with the severe acute respiratory syndrome (SARS) outbreak that arose in China in November 2002. That outbreak was also caused by a novel coronavirus spilling over from an animal reservoir and transmitted by respiratory droplets. SARS spread to many parts of the world through international air travel, caused more than 8000 cases and 774 deaths and cost in the region US$20 billion to control.

Within less than a month COVID-19 had spread throughout China and to neighbouring countries, even to the USA and Europe. It became clear that the new virus was highly transmissible from person to person but was considerably less virulent, with less than 20% of cases being classified as severe. It has the clinical features of an atypical pneumonia with fever, dry cough, fatigue, dyspnoea and myalgia and is more often severe in those with comorbidities and the elderly. Since there are no specific therapies or vaccines available, standard public health measures appropriate for a virus spread by droplets, close contact and on environmental surfaces were instituted. The Chinese authorities conducted active case finding and testing, contact tracing and quarantining of cases and contacts. The public was advised to stay at home if sick, in an effort to control the spread of the virus. On 30 January 2020 the WHO declared the outbreak a public health emergency of international concern, their highest level of severity, at a time when there were almost 10 000 confirmed cases, more than 200 deaths and it had spread to 20 countries.

The Chinese authorities had by then instituted highly stringent control measures, including stopping flights and public transport in Wuhan and other major cities, closing animal wet markets, extending the New Year holiday period in an effort to prevent mass travel, reducing movements within cities, minimizing mass gatherings, keeping schools closed, staggering office and factory working hours and restricting movement on the streets. The wearing of face masks became compulsory and, in effect, the population of Hubei province, more than 50 million people, were in quarantine. The authorities also built two new hospitals with more than 2500 beds within 2 weeks to cope with the surge in demand for medical care.

By the middle of March, less than 3 months into the epidemic, there had been more than 200 000 cases confirmed worldwide with more than 8000 deaths, vastly surpassing the SARS epidemic. The number of cases reported has been highest in China, although cases have now been reported in 159 countries and territories on six continents. Over 70 countries have instituted travel restrictions. The main initial battle to control this epidemic has been in China, where heroic public health measures have bought the rest of the world time and may have reduced the effective reproduction number to close to 1, thereby bringing the epidemic under control. However, the rest of the world needs to maintain high vigilance, as this virus is highly transmissible and can cause severe disease and death, as has been seen in countries such as South Korea, Iran and Italy. Indeed, the number of new cases is now highest in Europe. Containment through case finding and isolation and contact tracing and social distancing remain the key public health approaches to controlling the epidemic in all parts of the world. This is particularly important for countries in sub-Saharan Africa and also those parts of South and Central America and Asia that are not well-prepared for outbreaks. Global solidarity and support are essential, as infectious diseases can easily cross borders, and as John Nkengasong, from the Africa Centres for Disease Control and Prevention (Africa CDC) has said, 'The global health chain is only as strong as its weakest link, so a disease threat anywhere can quickly become a threat everywhere'.

Preparedness to respond to outbreaks is weak in many countries. Of the 45 low-income countries that have undertaken a national preparedness assessment, none have been deemed ready to respond, making them particularly vulnerable to outbreaks. There are many reasons for this, including poor health and nutrition, exacerbated by high rates of concomitant human immunodeficiency virus and tuberculosis, and low influenza vaccination rates; poor quality of healthcare and resource constraints, as low- and middle-income countries (LMICs) spend on average only $267 annually per person on health; and vulnerable supply chains and weak medicine procurement, and up to 30% of medicines are substandard or falsified.

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In response to the outbreak, the African Union Commission is strengthening partnerships and coordination across the continent, including a common approach for monitoring and movement restriction of people at risk for COVID-19 and for information sharing. The WHO has found the regional readiness level to be only 66%, with critical gaps and a need to strengthen the capacities for countries to investigate alerts, treat patients in isolation facilities and improve infection, prevention and control (IPC) in health facilities and communities. More than 40 experts have deployed to 10 countries to support preparedness activities and the diagnostic capacity for COVID-19 has been strengthened, with 17 countries now having at least some capacity for laboratory testing.

The WHO regional office for Africa, in partnership with Africa CDC and others, is working hard to prepare African countries for the potential spread of the virus through the Africa Taskforce for Coronavirus (AFCOR). This includes developing and implementing national preparedness plans, event- and case-based surveillance systems, point-of-entry controls, traveller screening and contact tracing, developing policies for mass gatherings, risk communication and the handling and management of suspect cases. Plans are being developed for the sourcing and stockpiling of personal protective equipment (PPE) and quality-assured diagnostics.

There is still a need to scale up support to frontline health workers, ensure additional manufacturing capability and reinforce the existing supply chain for PPE and other critical medical supplies. Regular communication with the public through trusted experts is a high priority. This includes providing advice on what individuals can do to protect themselves, including avoiding close contact with people with acute respiratory infections and with farm and wild animals and the promotion of cough etiquette and regular hand washing.

Research priorities include the development of point-of-care diagnostics, optimizing PPE and determining the utility of facemasks; identification of the animal reservoir to prevent further spillover; accelerating the evaluation of therapeutics, especially of remdesivir and Kaletra, for which trials are currently under way in China; and vaccines, which may prove vital in the longer term. All of this requires commitments of increased funding for both the outbreak response and research. Other priorities include the promotion of the rapid sharing of information, clinical samples and genetic sequences; social science research to ensure communities engage and support proposed interventions; working to counter misinformation, rumour and myth; natural history studies, including the documentation of virus shedding; and working to close or make safe animal wet markets.

The threat posed by COVID-19 has cast a spotlight on the shortcomings of health systems in LMICs. Countries must invest in emergency preparedness. This is worthwhile considering the cost of responding to outbreaks, which for the 2014–16 West Africa Ebola outbreak was estimated at close to US$3 billion. One longer-term solution might be to establish a Global Health Security Fund that provides incentives for countries to make capital investments to close their preparedness gap. There are already some preparedness efforts in place that are paying off with COVID-19. For instance, investments in Ebola preparedness for the nine countries neighbouring the Democratic Republic of the Congo have ensured partner coordination structures are in place, points-of-entry screening has been strengthened (particularly at major airports) and isolation units have been upgraded to manage suspect cases. Over the years, the WHO has developed a national influenza network of laboratories and health facilities, which have been able to scale up their diagnostic capacity quickly in order to monitor for severe acute respiratory infections and influenza-like illnesses. This has provided a useful interim surveillance mechanism while awaiting the scaling up of specific diagnostic tests.

Ministries of health, national public health institutes, universities and other public health agencies are working in many ways to fight this new public health threat across the globe. But this pandemic is not only a medical emergency and human tragedy, it is starting to affect economic activities, and without urgent action, the socio-economic effects could have wide implications for trade, travel, provision of aid, economic markets, supply chains and the daily lives of people living around the world.

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