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Public health emergencies of international concernin the 21st century

To The Editor

Since 2007, the International Health Regulations (IHR) formulated the framework of global health security [1]. It is one of the World Health Organization's (WHO) priorities, primarily promoting health and well-being. One of the main roles of the IHR is to declare certain diseases as public health emergencies of international concern (PHEIC) [2]. This declaration is publicized by the IHR Emergency Committee (EC) of international experts which was developed following the SARS outbreak in 2004 [3]. A PHEIC is defined as an extraordinary event which is determined to constitute a public health risk to other states through the international spread of disease and potentially requiring an international coordinated response [4]. This is mainly seen as an alarm system or a call for action for a preceding pandemic. With the declaration, the WHO states have 24 hours within which to report any potential PHEIC events to the WHO. It can also be received by non-governmental sources.

With escalating globalization and a sudden increase in the emergence of infectious diseases, pathogens of concern are increasingly mobile worldwide. Such pathogens are causing severe outbreaks and loss of life. A disease is said to be PHEIC if it has a serious public health impact, is unexpected in nature and is likely to affect travel and trade worldwide. PHEIC are not only confined to infectious diseases but also include events caused by chemical agents or radioactive materials. The IHR decision algorithm assists the WHO member states to decide whether a potential PHEIC exists and if it is required to notify the WHO. The PHEIC list already includes a list of diseases that are always notifiable and do not require any IHR decision to declare them as such. This list includes SARS, smallpox, wild type poliomyelitis and any new subset of human influenza [5].

To date, all PHEIC declarations have been done for viral emerging infectious diseases and none of bacterial illnesses. Most of these viral diseases are zoonotic in nature. This declaration by the WHO is made whenever a disease constitutes public health risk to other countries. The responsibility of determining whether a disease can be classified as a PHIEC lies with the WHO General Director and is based on the advice of the IHR emergency committee. This committee also sets out temporary recommendations which have to be implemented by the states experiencing the PHIEC. Since the IHR became functional in 2007, six diseases have been declared as PHIEC, starting with the H1N1 pandemic in 2009 to the COVID-19 pandemic in 2020 [6]. The most recent one to join this list is the Monkeypox outbreak in 2022. Among all of these, Ebola was declared a PHIEC twice, once in 2014 and then again in 2016. Poliomyelitis was the longest PHIEC and continues to be one.

The first PHIEC was declared on April 25, 2009, when H1N1 was identified to be the cause of a febrile respiratory infection in Mexico and the USA. At the time of declaration, a total of 42 cases had already been reported (USA: 20, Mexico: 22), with three confirmed deaths from Mexico. In nine weeks, the disease had spread to all WHO regions, with a total of 429 deaths reported from 135 countries [7]. All countries were asked to intensify surveillance for unusual outbreaks of influenza-like illness and severe pneumonia. No restrictions were recommended on international travels, and borders remained open. Finally, on August 10, 2010, it was declared non-PHIEC.

Poliovirus was the second PHEIC to be declared on May 5, 2014, and remains a PHIEC as decided by the IHR committee meeting in January 2020 [8]. During the declaration, the countries affected were Afghanistan, Cameroon, Equatorial Guinea, Ethiopia, Israel, Nigeria, Pakistan, Somalia, and the Syrian Arab Republic. A total of 74 cases were reported, with 59 of them from Pakistan.

Third on the list is Ebola, the only disease to be declared twice as a PHIEC. Firstly, it was announced on August 8, 2014, when about 1711 cases were reported from West African countries (Guinea, Liberia, Nigeria, and Sierra Leone). It was one of the worst outbreaks to affect the human race, with 932 deaths reported in these countries. Given the high virulence of the virus and the intensive community and health facility transmission pattern, states were asked to declare it a national emergency. It took two years for the WHO to call the end of the pandemic on March 29, 2016. Three years later, on July 17, 2019, it was again declared a PHIEC. The second pandemic was even worse, mainly confined to the Democratic Republic of Congo, specifically in North Kivu and Goma region. A high case-fatality ratio (67%) was seen, with 1698 deaths reported in 2522 cases.

In between these outbreaks, Zika was declared a PHIEC on February 1, 2016, and affected mainly Brazil, the USA, France, and El Salvador. Most cases presented with microcephaly, and out of a total of 39 cases, including 30 reported from Brazil. The beginning of 2020 marked the start of the worst pandemic, COVID-19, reported on January 30, 2020, as a PHIEC [9]. It affected almost every country, and China was the worst affected by its declaration, with about 8000 cases and 170 deaths. It continues to be a PHIEC, with more than 63, 78,748 deaths reported worldwide in the last two years.

On July 23, 2022, following an urgent meeting of the IHR Emergency Committee, the WHO declared the multi-country MPX outbreak a PHEIC, one step below that of a pandemic [10]. The WHO has declared a global public health emergency for the second time in two years. Despite the committee's failure to reach a consensus on whether the outbreak was a PHEIC, the decision was made to raise awareness to the highest level possible with strong political commitment and to reduce discrimination.

Overall, it has been observed that the WHO is robust and effective in responding to these international health emergencies but some studies have postulated that the responses were quicker and more prompt when American citizens were infected and these emergencies did not coincide with holidays [11,12]. The main aim of the declaration of PHEIC to prepare the world to deal with the causative agents in every aspect

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possible by all countries of the world irrespective of their economic status. It should be noted that most PHEIC owe to zoonotic infections from low-to-middle income countries. The IHR declaration covers all zoonotic aspects of these diseases and also how to limit animal-human interaction. The one health strategy can be covered in order to mitigate, prevent and control these diseases. For this, resources should be allocated for research and infrastructure development for testing/diagnostic, prevention and treatment of the causative agents in every country of the world. Although high-income countries seem to be well-equipped to face such pandemics, the past ones (like COVID-19) have proven that serious efforts should still be conducted to reduce the burdens of these emergencies. We think paying more attention to countries where outbreaks of infectious diseases are reported should be prioritized. Equipping these countries should be sought by the global community to control the local outbreaks and prevent their global spread. Global healthcare authorities should also seek to provide adequate efficacious prevention and treatment approaches. Another recommendation would be not to stigmatize and isolate countries where an outbreak was first reported, similar to what occurred with the so-called Spanish influenza before it was realized that the infection did not originate from Spain.

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Conflicts of interest

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