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Perspective

# Disease X-An inevitable threat to mankind

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The world has seen some recent outbreaks like H1N1 in the year 2009, the Middle East respiratory syndrome (MERS) in 2012, the West African Ebola outbreak in 2014–2016, and Zika in 2015–2017.[1] As per an estimate, of the twenty-five families of viruses, there are 1.67 million unknown viruses, of which around 631,000 to 827,000 have the potential to infect humans.[2,3] The sudden appearance of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), resulting in coronavirus disease 2019 (COVID-19) leading to a great loss of lives has surprised the healthcare systems and the policymakers.[4] The disease that started in a local animal market devastated the world sparing no race or ethnicity.[4] The direct effect of this disease was the high number of deaths and morbidity.[4] But the disease indirectly affected humans in every possible way economically, psychologically, socially, etc.[5] This became possible due to the sudden onset and rapid spread of the SARS-CoV-2 virus.[5] That gave no time to the health workers and the national agencies to draft a proactive policy to keep this in check, ultimately the novel infection burgeoned into a pandemic and directly or indirectly affected every single human being on this planet. This could well be a 'Disease X' which is defined by the WHO as "Disease X represents the knowledge that a serious international epidemic could be caused by a pathogen currently unknown to cause human disease".[6] The word Disease X was announced in the year 2018 by the WHO.[6] In this paper, the author highlights the potential threats to mankind i.e., Disease X which could grow up into a novel pandemic or an epidemic in an already devastated world from an unknown pathogen.

WHO has proposed a number of diseases with a potential to be the next Disease X, this includes Crimean-Congo hemorrhagic fever, Ebola virus disease, Marburg virus disease, Lassa fever, Middle East respiratory syndrome coronavirus (MERS-CoV), severe acute respiratory syndrome (SARS), Nipah and henipavirus diseases, Rift Valley fever, and Zika.[6,7] Some have postulated that the Zika virus was the recent Disease X while some call COVID-19 to be the one.[8] The disease is called Disease X when there is no preparedness against a potential pandemic of the disease and there is no definitive treatment due to a lack of research.[7] The problem is looming large on the world as due to COVID-19, economies around the globe are weak, and once COVID-19 is controlled the efforts would be at bolstering these fragile economies.[7] And the budget for research would be very less thereby again putting mankind at risk against a potential Disease X with an ability to wreak havoc which could be even graver than in the past.[7] The situation in low- to middle-income countries is even graver due to a very weak healthcare budget associated with rampant corruption and politics.[9]

Furthermore, not only the lack of preparedness could be a potential threat for a lurking Disease X but delay in declaring a never seen before infection or a novel presentation early could also be the cause of widespread morbidity and mortality.[10] The same is backed by the fact

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that diseases like the 2014 pandemic of the Ebola virus caused so much loss of life due to delayed declaration as a pandemic.[10] Thus the infection continued to spread and by the time it was taken care of it had already resulted in mass-scale devastation.[10] The role of international agencies like the WHO is thus very important as not only being a proactive organization with a presence in almost all the countries it can notify and alarm everyone about any unprecedented presentation of any pathogen or any potential Disease X but could also presciently increase the reporting and surveillance of any such infections.

Again, the threat of any Disease X could be higher in the population with co-morbidities and thus lack of timely development of management strategies which were stark during the ongoing COVID-19 pandemic should be taken care of.[9] It has been widely reported that there are higher odds of intensive care unit (ICU) admissions in cases having diabetes, hypertension, immunocom promised state, etc.[9] There is a dire need to develop policies for these at-risk groups.

Also, the development of the synthetic viruses and their potential use as bioweapon may well end up as a potential Disease X.[11,12] There are reports of viruses synthesized in labs and this could be disastrous for humanity.[12] The current geo-political tensions and ongoing war between some countries could lead to this situation where the survival of mankind would be tough due to this bioterrorism.

In short, the next unknown pandemic i.e., Disease X could appear at any time and the policymakers should learn a lesson from the past and the present to make efforts for the timely management of this unknown pandemic. Any unknown case identified from any part of the world should be reported immediately and surveillance with strict regulations on travel, not affected by politics is the need of the hour. Health expenditure must increase for timely and effective research to find management of any such Disease X in the future. Efforts should be aimed at preparedness against any such infections including zoonotic spillovers which could be a threat to mankind. And international regulations for monitoring bioweapons and synthetic pathogens are imperative. Data sharing, capacity building, and scientific collaborations are important domains for a rapid and positive response against any such Disease X. Nevertheless, this pandemic of SARS-CoV-2 has just given a glimpse of what could happen if complacency prevails in the research and policy-making.

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## Conflicts of Interest

None.

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