

Editorial

Double threats: Climate change and Zoonotic Disease

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“Zoonoses” the term obtains from an ancient Greek word (zoon means animals, and noon means disease). According to WHO, Zoonosis points out to “diseases and infections that are naturally transmitted between vertebrate animals and man”.¹ The Expert Committee on Zoonoses in 1951 defined Zoonotic diseases as “diseases and infections that are naturally transmitted between vertebrate animals and man”.² Nevertheless, at the end of the 19th century the German physician and pathologist Rudolf Virchow established the term “zoonoses” is to describe human diseases shared with animals,³ which make global threat because they can become a pandemic status, with high mortality such as in 2005 H₅N₁ avian influenza outbreak, in 2009 “swine flu” H1N1 influenza pandemic, and in 2013–2016 West African Ebola outbreak and the more recent pandemic of COVID-19.⁴ There are different types of factors such as globalization, international trade, land-use changes, and, increasingly, climate change associated with the emergence of zoonoses. Furthermore, the catastrophe of global climate control the transmission of diseases among the world's population.⁵

The frequency, way of transmission, and spreading of zoonotic diseases represent a major threat in the world due to the impact of climate change.⁶ The world has already noticed the out-turn of man-made climate change, including high rise temperatures, rising sea levels, and recurrent and drastic forms of disaster.⁷

The threat from pathogen spillover provides a role due to climate change. Convert in species' range and density are ended by changing environmental situations which fabricate to novel interactions between species, thereby risk of zoonotic emergencies such as dengue, Zika virus disease, and chikungunya. Demographic change, including trends such as urbanization (in low and middle-income countries), population growth, land-use change, migration, aging, and changing birth rates have designed new scope for the emergence of infectious diseases.⁸

According to the authoritative Intergovernmental Panel on Climate Change (IPCC), “Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems”⁹ Emission of anthropogenic greenhouse gas have caused the mean global temperature to increase by 1°C above preindustrial levels.⁶ Changes in climate allow zoonotic pathogens and related vectors to be prevalent; deteriorates people's health such as the Zika and dengue viruses.⁵ In developing areas, there is no availability of fresh water due to an increase in droughts and flooding which causes humans zoonotic waterborne diseases, such as schistosomiasis.¹⁰

Two hundred types of zoonotic diseases are picked out, which focus on a considerable proportion of novel and current human health hazards.¹¹ Moreover, around 60% of all human pathogens and 75% of emerging infectious diseases emerge from animals is established.¹² Globally, the 13 most widespread zoonoses had a significant impact on developing countries by causing 2.4 billion morbidities and 2.7 million mortality per annum in humans.¹³ According to the CDC at Atlanta, Georgia, USA through animals, almost six out of every ten infectious diseases and three out of every four emerging infectious diseases can be spread. Their spreading is influenced by the environment, food, contact, or vectors.¹⁴

From the mid-20th century to till now climate change denotes increasing global temperatures. We have to come to an end to liberate heat-tapering greenhouse gasses, as well as pull out existing emissions from the atmosphere to avert the world's rising temperature. We need to step in at multiple levels, including the burning of fossil fuels, and serve that as an urgent health demand.

References:

1. Chomel B. Zoonoses. In *Encyclopedia of Microbiology*; Academic: San Diego, CA, USA, 2009; 820–829.
2. Joint FAO/WHO Expert Committee on Zoonoses; World Health Organization; Food and Agriculture Organization of the United Nations. Second Report. WHO IRIS. In *Proceedings of the Joint WHO/FAO Expert Committee on Zoonoses*, Stockholm, Sweden, 11–16 August 1958; Available online: <https://apps.who.int/iris/handle/10665/40435> (accessed on 14 July 2021).
3. De Giusti M, Barbato D, Lia L, Colamesta V, Lombardi A.M, Cacchio D, Villari P et al. Collaboration between human and veterinary medicine as a tool to solve public health problems. *Lancet Planet. Health* 2019; 3: 64–65.
4. Cross AR, Baldwin VM, Roy S, Essex-Lopresti AE, Prior JL, Harmer NJ. Zoonoses under our noses. *Microbes Infect.* 2019; 21:10–19.
5. Leal F W, Ternova L, Parasnis SA, Kovaleva M, NagyGJ. *Climate Change and Zoonoses*:
6. A Review of Concepts, Definitions, and Bibliometrics. *Int. J. Environ. Res. Public Health* 2022;19:893. <https://doi.org/10.3390/ijerph19020893>

7. Rocklöv J and Dubrow R. Climate change: an enduring challenge for vector-borne disease prevention and control. *Nature Immunology*, May 2020; 21:479–483. Available from: URL: www.nature.com/natureimmunology
8. C Klobucista C and L Maizland L. Perilous Pathogens: How Climate Change Is Increasing the Threat of Diseases. November 4, 2022; 4:12
9. Baker RE, Mahmud A S, Miller I F, Rajeev M, Rasambainarivo F, Rice BL, Takahashi S, et al. Infectious disease in an era of global Change. *Nature Reviews | Microbiology*. volume 20 | April 2022. Available from: <https://doi.org/10.1038/s41579-021-00639-z> IPCC. Climate Change 2014: Synthesis Report (eds Core Writing Team, Pachauri, R. K. and Meyer, L. A.) (IPCC, 2014).
10. De Leo G.A, Stensgaard, A.S, Sokolow, S.H N'Goran, E.K.; Chamberlin, A.J, Yang, G.J Utzinger, J. Schistosomiasis and climate change. *BMJ* 2020;371:4324.
11. World Health Organization. Zoonoses. Available online: <https://www.who.int/news-room/fact-sheets/detail/zoonoses> (accessed on 29 July 2020).
12. Mohammadpour R, Champour M, Tuteja F, Mostafavi E. Zoonotic implications of camel diseases in Iran. *Vet. Med. Sci.* 2020; 6:359–381[PubMed]
13. Rahman M.T, Sobur M.A, Islam M.S, Ievy S, Hossain, M.J, El Zowalaty, et al. Zoonotic Diseases: Etiology, Impact, and Control. *Microorganisms* 2020;8:1405.
14. N.C.Centers for Disease Control and Prevention. Zoonotic Diseases. Retrieved from [cdc.gov](https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html). Available online: <https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html> (accessed on 14 July 2017).

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