

# Emerging and re-emerging infectious diseases as public health challenges of the 21<sup>st</sup> century

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Infectious and communicable diseases have remained major public health challenges to humankind throughout history (1). These diseases marked epidemiological series of transitions where the first transition has to do with the rise in infectious diseases; the second transition accompanies a shift from infectious to chronic disease mortality and the third transition is marked by recent resurgence of infectious disease mortality. The emergence and re-emergence of these infectious diseases follow different socio-historical and ecological characteristics (2).

To date, advances in science and technology have managed to treat, prevent and control infections. Yet, infectious disease has continued to alter societal infrastructure on the one hand, and resulted unprecedented cost to the life of humankind (3). The extent to which global burden of infectious diseases becomes apparent depends on the incidence and prevalence of already known infections and the constant but unpredicted emergence of new infections (3-7). According to the WHO's estimate in 2050, 13 million deaths would be attributed to infectious disease (8).

Although there is no overarching framework to determine emergence of infectious diseases, it is suggested that changes in the pattern of the pathogen–host–environment play critical role (9). Such pathogens spread faster and often become difficult to control among others due to increasing global interdependence in connection to demographic, environmental, economic, social, and technological changes, bioterrorism, anti-biotic resistance and mutation. All these have added to layers of complexity in the pace at which these diseases emerge and spread (1, 10).

Currently emergence and re-emergence of infectious diseases poses critical challenge to public health research, health service planning

and management. The fact that such infectious diseases suddenly emerge and re-emerge suggests knowledge gap on how to respond against them. According to a publication in 2005, understanding of emergence and drivers of infections has remained so linear that broader social and ecological contexts were not given as much attention in charting response (10). Consequently the last decade alone has witnessed widespread emergence of virulent infections such as *severe acute respiratory syndrome* (SARS), Swine flu (H1N1), Swine flu, Ebola and now Zika virus. As always, these infections have considerable costs in terms of human life; compromised development processes, depleted resources, and more importantly left the countries in disarray on what would come next. The problem becomes more frustrating when, among others, prepositioning for the emergence and re-emergence of such infectious diseases is not in place.

Ethiopia, as a country on economic and social transition, is believed to be under threats of double burden of the long recognized infectious and communicable diseases and fast spreading non-communicable disease. This is getting some level of attention in the rhetoric in public health research and education in Ethiopia. Nonetheless, as part of the global entity, Ethiopia cannot be immune to what is merging or re-emerging in the rest of the world. For instance, in 2013, the major infectious diseases in Ethiopia were identified to include lower respiratory infections, diarrheal diseases, HIV, Tuberculosis, and malaria (11-13). These are long known infectious diseases for which there are relative knowledge and mechanisms to deal with. Nonetheless, it is critical here to challenge researchers, public health planners and programmers, policy makers to stand by and develop a responsive health system against emerging and re-emerging infectious diseases across the world.

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**References**

1. Morens DM, Fauci AS. Emerging Infectious Diseases: Threats to Human Health and Global Stability. *PLoS Pathog.* 2013; 9(7): e1003467. doi:10.1371/journal.ppat.1003467
2. Ronald Barrett, Christopher W. Kuzawa, Thomas McDade, and George J. Armelagos. Emerging and re-emerging infectious diseases: The Third Epidemiologic Transition. *Annu. Rev. Anthropol.* 1998; 27: 247-71.
3. Kass EH. History of the specialty of infectious diseases in the United States. *Ann Intern Med.* 1987; 106:745–56.
4. Anthony S. Fauci. Infectious Diseases: Considerations for the 21st Century. *Clinical Infectious Diseases.* 2001; 32:675–85
5. Krause RM. *The restless tide: the persistent challenge of the microbial world.* Washington, DC: National Foundation for Infectious Diseases; 1981.
6. Joint United Nations Programme on HIV/AIDS (UNAIDS). *AIDS epidemic update: December 2000.* Geneva: World Health Organization; 2000.
7. Lederberg J. Infectious disease as an evolutionary paradigm. *Emerg Infect Dis.* 1997; 3:417–23.
8. Cohen ML. Changing patterns of infectious disease. *Nature,* 2000; 406: 762–7.
9. Anneke Engering, Lenny Hogerwerf and Jan Slingenbergh. Pathogen–host–environment interplay and disease emergence. *Emerging Microbes and Infections.* 2013; 2, e5; doi:10.1038/emi.2013.5
10. Bruce A. Wilcox and Rita R. Colwell. Emerging and Reemerging Infectious Diseases: Bio-complexity as an Interdisciplinary Paradigm. *EcoHealth.* 2005; 2: 244–257 DOI: 10.1007/s10393-005-8961-3
11. World Health Organization. *Mortality and global health estimates.* Geneva, Switzerland: World Health Organization; 2013.
12. GBD Compare; 2013. (<http://viz.healthmetricsandevaluation.org/gbd-compare/>;
13. Africa Check. *Fact sheet: The leading causes of death in Africa;* 2014.