

PRIORITIZATION: REDUCING THE THREAT POSED BY ZOOONOTIC DISEASES

Zoonotic diseases, which are transmitted between humans and animals, take an enormous toll on lives and economies. They account for nearly two-thirds of infectious diseases in humans and 60 percent of emerging threats (Karesh et al., 2012; Allen et al., 2014). Despite this, programs combating these diseases are often neglected and underfunded. Zoonotic diseases are commonly misdiagnosed and underreported, predominating among poor, marginalized people with limited access to health and other services (WHO, 2012). The Global Health Security Agenda, a partnership of more than 50 countries, calls for governments to prioritize zoonotic diseases for intensified action. This marks a critical opportunity to make strides against both endemic and emerging/re-emerging zoonoses.

THE POWER OF UNIFIED ACTION: MORE EFFECTIVE PREVENTION, DETECTION, AND RESPONSE

Effectively addressing zoonotic diseases requires collaboration between the human, animal, and environmental health sectors (WHO, 2012). Often, however, the sectors work in “silos,” even as coordinated action and information sharing could minimize outbreaks and save lives (Halliday et al., 2015; Pike et al., 2014). Using a One Health or multisectoral approach, disease prioritization can harmonize and focus efforts to strengthen laboratory capacity; human and animal disease surveillance; information sharing across sectors; and joint prevention, detection, and response activities. A One Health Zoonotic Disease Prioritization Tool, developed by the U.S. Centers

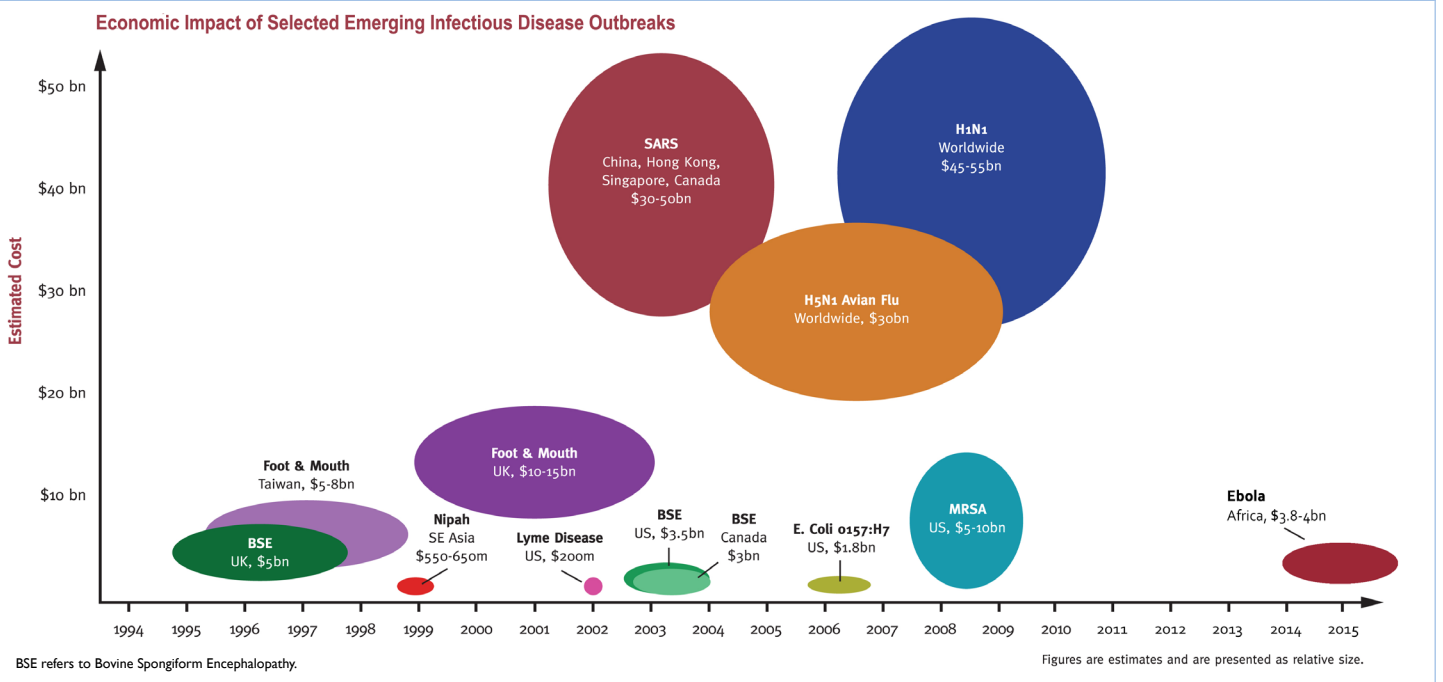
for Disease Control and Prevention, draws upon inputs from the human, animal (livestock and wildlife), and environmental health sectors (Rist et al., 2014). Multisectoral One Health “platforms,” which exist or are being established in many countries, can foster a coordinated, collaborative approach for using this tool and taking action on prioritized diseases.

THE IMPORTANCE OF PRIORITIZING BOTH ENDEMIC AND EMERGING/ RE-EMERGING DISEASES

It is critical that countries consider both known and potential threats for prioritization. Endemic zoonoses such as brucellosis, rabies, plague, and anthrax account for an estimated 20 percent of human illness and death in the world’s poorest countries (Rist et al., 2014). Many people face serious health and economic risks from close, daily contact with animals (WHO, 2012). Nearly one-tenth of the global population depend directly on livestock for survival and income. One study, examining the top 13 zoonoses affecting poor livestock keepers in lower-income countries, found these diseases caused about 2.7 million deaths and 2.4 billion cases of human illness per year (Grace et al., 2015; Halliday et al., 2015). These illnesses also cause losses in livestock production, which negatively affect livelihoods and food security (Halliday et al., 2015).

Countries also need to consider emerging/re-emerging zoonotic diseases, which are responsible for the deadliest pandemics in human history (Morens and Fauci, 2013). Outbreaks of novel diseases are costly (see Figure 1), and the threat posed by them is growing. In the past thirty years, new diseases affecting

FIGURE 1: ESTIMATED COSTS OF SELECTED OUTBREAKS, 1994-2015 (USD)



Source: Adapted from Newcomb, J. 2011. *Economic Impact of Selected Infectious Diseases*. Cambridge, MA: Bio Economic Research Associates.

humans have emerged at a rate of more than one per year (Institute of Medicine Forum on Microbial Threats, 2009). The majority are zoonotic and, among these, about 72 percent have wildlife origins (Allen et al., 2014). Risk factors include increasing contact between animals and humans, mostly driven by population growth and habitat encroachment; livestock intensification; wildlife trade; and the conversion of land for agriculture, logging, mining, and oil extraction (Loh et al., 2015; Allen et al., 2014; World Bank, 2012).

Prioritization can spur needed investments against endemic, emerging, regional, and unexpected threats. The recent Ebola outbreak underscores the

importance of early action. The first known human case appeared in Guinea in December 2013, but national health authorities did not receive reports until March 2014, and the scale of the outbreak was not realized until a few months later (PREDICT Consortium, 2016).

MAKING PRIORITIZATION “PAY OFF”

The vision of the Global Health Security Agenda is “a world safe and secure from infectious disease threats.” Joint multisectoral prioritization is an opportunity to realize this vision and make wise investments where they are needed most. Prioritizing both endemic and emerging diseases will help countries better address these serious threats to health and prosperity.

REFERENCES

- Allen, A., K. Murray, K. Olival, and P. Daszak. 2014. “Eight Critical Questions for Pandemic Prediction.” Pp. 182-193 in *The Influence of Global Environmental Change on Infectious Disease Dynamics: Workshop Summary*. Washington, DC: National Academies Press.
- Grace, D., J. Gilbert, T. Randolph, and E. Kang’ethe. 2012. “The Multiple Burdens of Zoonotic Disease and an Ecohealth Approach to Their Assessment.” *Tropical Animal Health and Production* 44, 567-73.
- Halliday, J., K. Allen, D. Ekwem, S. Cleaveland, R. Kazwala, and J. Crump. 2015. “Endemic Zoonoses in the Tropics: A Public Health Problem Hiding in Plain Sight.” *Veterinary Record*, 176: 220-225. DOI: 10.1136/vr.h798.
- Institute of Medicine Forum on Microbial Threats. 2009. *Microbial Evolution and Co-Adaptation: A Tribute to the Life and Scientific Legacies of Joshua Lederberg: Workshop Summary*. Washington, DC: National Academies Press.
- Karesh, W., A. Dobson, J. Lloyd-Smith, J. Lubroth, M. Dixon, et al. 2012. *Ecology of Zoonoses: Natural and Unnatural Histories*. Lancet 380:1936-1945.
- Loh, E., C. Zambrana-Torrel, K. Olival, T. Bogich, C. Johnson, J. Mazet, W. Karesh, and P. Daszak. 2015. “Targeting transmission pathways for emerging zoonotic disease surveillance and control.” *Vector Borne and Zoonotic Diseases* 15(7):432-7, doi: 10.1089/vbz.2013.1563.
- Morens, D., and A. Fauci. 2013. “Emerging Infectious Diseases: Threats to Human Health and Global Stability.” *PLOS Pathogens*, Volume 9, Issue 7: 1-3.
- PREDICT Consortium. 2016. *One Health in Action*. New York: EcoHealth Alliance.
- Rist, C., C. Arriola, and C. Rubin. 2014. “Prioritizing Zoonoses: A Proposed One Health Tool for Collaborative Decision-Making.” *PLOS One* 9(10): e109986, doi:10.1371/journal.pone.0109986.
- World Bank, 2012, *People, Pathogens, and Our Planet*, Volume 2, p. ix.
- WHO, 2012. *Research Priorities for Zoonoses and Marginalized Infections*. Available at: http://apps.who.int/iris/bitstream/10665/75350/1/WHO_TRS_971_eng.pdf?ua=1