Broadening the Tent: A One-Health Approach to Global Health Diplomacy
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SESSION ORGANIZER & MODERATOR
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PANELISTS
Dennis Carroll, Director, Emerging Threats Programs, USAID
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Catherine Machalaba, Health and Policy Program Coordinator, EcoHealth Alliance

Estimates indicate that approximately 75% of emerging or reemerging infections are vector-borne or zoonotic. Within the last 20 years, there have been several instances of cross-species transmission that have caused severe public health, economic, social, and political consequences, underscoring how devastating zoonotic diseases can be, even if rapidly detected and geographically contained.

The American Veterinary Medical Association defines One Health as: the collaborative effort of multiple disciplines – working locally, nationally, and globally – to attain optimal health for people, animals and the environment. Achieving this goal has been articulated by the One Health Initiative.

Dennis Carroll described how the rapidly increasing human population has exerted pressure on our environment and animal populations, which has exacerbated the emergence of infectious diseases. Emerging infectious diseases outpace our global ability to respond effectively. To face this challenge, Carroll underscored that the global community must embrace a paradigm shift from a reactive response to infectious disease once reported in humans to a proactive preparedness culture that utilizes surveillance efforts to detect infectious disease in wildlife before they significantly impact human health. The “invisible value of prevention” is a major challenge to this effort: we do not know what is out there, so we fail to see what to prevent.

The Global Virome Project (GVP) is a global initiative intended to transition the science of emerging viral diseases into a Big Data science, allowing new ways to evaluate problems and solutions. The GVP is a global venture to document and characterize within ten years virtually all of the planet’s viruses in wildlife. The GVP is focused on the economic benefits of investing in global health. Analysis by the World Bank suggests that incrementally investing in the 129 World Bank client countries to bring prevention and control of zoonotic diseases up to OIE and WHO standards in the human and animal health sectors would require approximately $1.8 to $3.4 billion per year, but would yield an expected benefit of pandemic prevention of more than $30 billion per year. Of particular relevance are the outbreaks with low public health impact, but high economic costs, such as the MERS outbreak in the Republic of Korea that resulted in only 186 cases, but had an estimated impact of $700 million in economic losses.

Also relevant to One Health discussions are non-zoonotic diseases and their effect on agriculture, animal, and economic sectors. Two significant examples are the H5N2 outbreak in U.S. poultry and the white nose syndrome in North American bats. The H5N2 outbreak in poultry resulted in the culling of approximately 48 million birds and 80% egg product price increase. Perhaps one of the most underappreciated species of our global ecosystem is bats, which are not only one of the best natural indicators of the health of the environment, but also provide a tremendous food service at no cost that includes pest control, pollination, seed dispersion, and fertilization. It is estimated that the loss of bat populations in North America could lead to agricultural losses of $3.7 to $53 billion per year. To mitigate the deleterious effects to health caused by the pressures of rapid population increases on the environment and biodiversity, sectors should embrace non-conventional partnerships, multi-disciplinary risk assessments that address health, environment, and social impacts; cost-benefit analysis of investing in development, including disease risk as a financial outcome; considering food provision for workers at excavation sites to relieve wildlife hunting pressure; judicious use of antimicrobials; and reducing drivers of emerging infectious diseases to relieve pressures on biodiversity.

SESSION KEY POINTS
• Rapid human population growth is placing increased demands on the global ecosystem.
• To increase our preparedness to respond to emerging infectious diseases, we must better understand the transmission dynamics of pathogens, considering humans, animals, and the environment.
• Current reactive response measures need to be replaced by proactive preparedness measures that utilize Big Data.
• The global community should seek to capture the socio-economic impacts of health disasters and expand multi-sectoral partnerships for policy change at all levels to better understand and effectively communicate the total burden of diseases, both zoonotic and non-zoonotic.

The ongoing outbreak of influenza A(H7N9) in humans in China is a prime example of this complexity. Until recently, the majority of influenza viruses circulating in poultry that have caused disease in humans did not cause clinical symptoms in birds, making surveillance control measures difficult within bird populations.

Berthe also noted that the traditional Venn diagram representing One Health—which portrays the relationship between humans, animals, and the environment—should not be considered static but rather dynamic and varying across different infectious diseases. When considering pathogens such as Ebola virus, Rift Valley fever, and Brucellosis, all sectors—humans, animals, and the environment—play a role in transmission, but the weight given to a particular sector varies based on the pathogen and the nature of its transmission cycle. The notion of varied contributions from each sector then serves as the foundation for understanding the “drivers” of emerging infectious diseases and hence can shape the agenda for researchers, public health workers and others as they act to understand and mitigate emerging risks. Specific drivers include land-use changes, food and agricultural industry changes, international travel and commerce, war and famine, climate and weather, breakdown of public health measures, and human demographics and behavior.

Catherine Machalaba focused on the economic benefits of investing in global health. Analysis by the World Bank suggests that incrementally investing in the 129 World Bank client countries to bring prevention and control of zoonotic diseases up to OIE and WHO standards in the human and animal health sectors would require approximately $1.8 to $3.4 billion per year, but would yield an expected benefit of pandemic prevention of more than $30 billion per year. Of particular relevance are the outbreaks with low public health impact, but high economic costs, such as the MERS outbreak in the Republic of Korea that resulted in only 186 cases, but had an estimated impact of $700 million in economic losses.

Also relevant to One Health discussions are non-zoonotic diseases and their effect on agriculture, animal, and economic sectors. Two significant examples are the H5N2 outbreak in U.S. poultry and the white nose syndrome in North American bats. The H5N2 outbreak in poultry resulted in the culling of approximately 48 million birds and 80% egg product price increase. Perhaps one of the most underappreciated species of our global ecosystem is bats, which are not only one of the best natural indicators of the health of the environment, but also provide a tremendous food service at no cost that includes pest control, pollination, seed dispersion, and fertilization. It is estimated that the loss of bat populations in North America could lead to agricultural losses of $3.7 to $53 billion per year. To mitigate the deleterious effects to health caused by the pressures of rapid population increases on the environment and biodiversity, sectors should embrace non-conventional partnerships, multi-disciplinary risk assessments that address health, environment, and social impacts; cost-benefit analysis of investing in development, including disease risk as a financial outcome; considering food provision for workers at excavation sites to relieve wildlife hunting pressure; judicious use of antimicrobials; and reducing drivers of emerging infectious diseases to relieve pressures on biodiversity.

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