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ADVANCING HUMAN, ANIMAL, ENVIRONMENTAL HEALTH AND SUSTAINABLE DEVELOPMENT THROUGH A ONE HEALTH APPROACH IN SIERRA LEONE

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ABSTRACT

In the context of population growth, poverty, increased mobility and travel, urbanization, expanding human-animal contact, deforestation, climate change, weak public health systems, armed conflicts, and its geographical location, Sierra Leone is prone to emerging and re-emerging infectious diseases and non-infectious diseases. The effects of the 1990 to 2001 civil war and Ebola severely weakened the country's fragile healthcare system, which has further been threatened with various outbreaks of highly infectious diseases such as Covid-19 pandemic and natural disasters like flooding, August 2017 landslides, and Wellington fuel tanker disasters. Furthermore, the uncontrolled an indiscriminate use of antibiotics for symptomatic treatment of common disease conditions in humans and animals has greatly contributed to the development of antimicrobial resistance. Lessons from the 2013 to 2016 Ebola epidemic fostered significant improvements in Sierra Leone's disease surveillance systems, including the revitalization of a well-structured Integrated Disease Surveillance and Response (IDSR), the introduction of the Field Epidemiology Training Program (FETP), and the launch of a One Health Platform. This paper discusses opportunities for utility of an integrated multisectoral One Health approach to health system challenges in Sierra Leone. The paper argues that only by fully implementing an integrated and well-coordinated multidisciplinary, interdisciplinary, and potentially transdisciplinary One Health approach will Sierra Leone and Africa, and indeed humanity, effectively and sustainably prevent and respond to epidemics and achieve global health and food security.

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Holistic health is all encompassing that requires solving poverty, greater social justice, quality education, good governance, and in Africa decolonization of global health and all inter-related disciplines and functions. This is readily captured by the WHO definition of health "as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". The WHO definition of health lends itself to the concept of One Health, which is not new, but it has reemerged as an important concept to both understand and help address our contemporary challenges and threats to our health. Change is the only fact we have around us in a world that is rapidly changing, complex, and progressively more interconnected. The convergence of people, animals, and our environment has created a new dynamic; one in which the health of each group is now profoundly and inextricably linked and elaborately connected. Hence the need for a One Health approach to solve wicked public health problems. Indeed, the term wicked problem first coined Horst Rittel in the paper "dilemmas in a general theory of planning" speaks to problems with many interdependent factors making them seem impossible to solve. Often, why can't we 'solve' the health problems at the human, animal, ecosystems interface is because they are wicked. Problems in health are considered wicked giving their complexity, no simple technical solution, actions precipitate unanticipated and unintended consequences, compelling and demand action, requiring innovative approaches at the individual, population, and community level. Hence the need for a One Health approach

One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems (Quadripartite One Health High Level Expert Panel). It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent. The approach mobilizes multiple sectors, disciplines, and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development.

One Health therefore calls for us to work together to build a safer environment for human and animal health. It calls for us to think, act, and work collaboratively to ensure we protect the health of humans, animals, and our environments. One Health tells us that our human health is inextricably linked to the health of animals and our environment. Intersectoral and Interdisciplinary collaboration, cooperation and partnerships should be the norm and requires a mindset shift from our normal sectoral work processes. The lessons of the deadly 2014 Ebola Outbreak in West Africa and Covid-19 pandemic have all increased awareness of the need for collaboration among public health, the environment and animal health professionals in detection, prevention, and control of emerging and re-emerging infectious zoonotic diseases. The adage Ebola is of the forest environment, animals, humans is a perfect case for the utility of One Health in our intervention.

The experiences and lessons of the Ebola outbreak in West Africa also formed the basis for the first One Health Technical and

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Ministerial Meeting that was held in Dakar, 2016. This meeting organized by the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), the World Animal Health Organization (OIE), the West African Health Organization (WAHO), the Regional Centre for Animal Health (CRSA) of the Economic Community of West African States (ECOWAS), the United States Agency for International Development (USAID) and the World Bank brought together representatives of delegations from 15 ECOWAS countries, including 38 ministers and representatives of ministers.

A key outcome of this One Health Technical and Ministerial meeting was a draft Regional Strategic Roadmap for implementing the One Health approach, highlighting three major thematic areas: (i) coordination and partnership; (ii) preparation and interventions; and (iii) surveillance. The different countries then prepared their national action plans for implementing the One Health approach. The National action plan for Sierra Leone was launched in 2017 by the Vice President of Sierra Leone. This plan constitutes one of the stages towards compliance with commitments taken by States in the communiqué issued by Ministers in charge of human health, animal health, wildlife, and wild flora of West African countries. Sierra Leone along with Liberia was among the first two countries to launch the One Health Platform and a One Health Secretariat in 2017, which showed extreme commitment to strengthen our capacity to utilize One Health approach in preparation and response to infectious disease and other issues including food security, antimicrobial resistance, and so on. The country's One Health vision is "a healthy Sierra Leone with people and animals co-existing in a safe environment, achieved through effective One Health collaboration.". Since many human diseases have their origins in animals, it is necessary for different sectors to work together in detecting, preventing, mitigating, and responding to disease outbreaks. Encouraging and facilitating collaboration among representatives from the human, animal and environmental health fields with a One Health focus/approach can strengthen countries' capacity to respond effectively to infectious diseases outbreaks.

Currently Sierra Leone, Africa and world faces a lot of global health issues that can only be addressed along a One Health lens. Ebola, Marburg, Lassa Fever and other emerging or re-emerging deadly zoonotic infectious diseases continue to be a major threat to our health systems in Sierra Leone, Guinea, and Liberia. As shown in the Covid-19 pandemic, and re-emergence of Ebola and Marburg in Guinea in 2021 and our ongoing challenge with Lassa Fever, typhoid, malaria, cholera, and so on, there is an urgent need to utilize One Health approach for preparedness and response to the various emerging threats. Second, increase population and land use activities are exerting tremendous pressure on our fragile ecosystems leading to deforestation and climate change, that further threatens to disrupt the ecological balance between humans, animals, and our environment.

Third, rising temperatures and precipitation due to global warming and Climate change has both direct and indirect impacts on health and health systems in Sierra Leone and Africa. While Africa contributes negligible amounts to global emissions of carbon dioxide and other

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greenhouse gases causing global warming, it bears the brunt of the consequences. Extreme heat waves, rising sea level, changes in precipitation resulting in flooding and droughts, and intense hurricanes can directly cause injury, illness, and even death. The effects of climate change can also indirectly affect health through alterations to the environment. For example, worsening air pollution levels can have negative impacts on respiratory and cardiovascular conditions. Changes in temperature and rainfall can alter the survival, distribution, and behavior of insects and other species that can lead to changes in infectious diseases. Increases in precipitation, storm surge, and sea temperature can lead to more water-related illnesses. Climate change can also affect food safety, exposing people to contaminated foods that can result in foodborne illnesses. In addition, climate change can affect mental health and well-being. Flooding and extreme health can also affect health systems through disruption of power supplies, which impact cold chains and vaccine storage in health facilities. Furthermore, climate change induced droughts can impact food security, which affects nutrition and health; high rates of maternal and child mortality are often associated with anemia and malnutrition.

Fourth, antimicrobial resistance is on the increase and poses a serious global health threat. At the same, chemical toxicity, pesticides, hazardous substances, and radiation pollution in the environment poses significant threats to animal and human health, including endocrine disruptions, reproductive and developmental effects, neurotoxicity, immune system effects, and cancers. Fifth, Food borne pathogens and toxins including mycotoxins such as Aflatoxins poses a lot of threat to population health and well-being. Increase incidence of liver cancers and food borne toxicity outbreak from salmonellas, listeria, and other pathogens are on the rise globally. Sixth, there is increasing concern about biosafety and biosecurity and the need to prevent the intentional or negligent release of biological materials in the world. Hence, there is a need to develop policies and practices to prevent laboratory infections and negligent release of biological materials into the hands of rogue elements. The potential weaponization of deadly pathogens poses a real concern.

Finally, social determinants of health including poverty, social injustices, armed violence, urbanization, and gender inequity constitute a major challenge to health and well-being of humans in Sierra Leone/Africa and are further exacerbated by climate change, weak governance, lack of education, corruption, lack of social services, lack of justice and human rights, lack of accessibility (lack of good roads and transportation), lack of energy and power, food insecurity and hunger, lack of employment and opportunities. The lack of one or more of these factors create structural violence, that results in non-communicable and communicable diseases in populations. The rise of drug substance and Kush epidemic now a public health emergency is associated with several of these social structural determinants of health. The result of the combination of structural violences, climate change, lack of opportunities, and drug substance abuse is increasing mental health in Sierra Leone and other African countries.

All these threats require strong utility of the One Health Approach for prevention, detection, and control. Considering this ongoing and

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emerging issues from zoonotic infectious diseases epidemics, antimicrobial resistance, food safety and security, air and water pollution, climate change, and so on, there is a need for:

Strong leadership, commitment, collaboration, and coordination from government sectors within the One Health platform.

Strong community ownership and building indigenous knowledgebase methods.

Building entrepreneurship and empowering individuals, families, communities, and communities.

Developing research and development capability and capacity in all health and related disciplines and functions at all levels.

Building sustainability across all sectors and disciplines and ensure continuity of the programs. Reduce donor dependencies and develop pathways for funding national programs.

Develop surveillance and laboratory capacity for prompt detection, identification, diagnosis, reporting of infectious pathogens across the human, animal, and environmental sectors.

Develop strong laboratory capacity for characterization and identification of chemical toxicants.

Solve poverty, promote social justice, and sustainable development in all sectors for health and well-being of the population

Need to decolonize public health systems, education and empower African centred approaches to health.

Finally, the goal is to get to One World, One Health, and One Medicine. The quote American Veterinarian Lonnie King “nowhere is remote and no one is disconnected” is what Covid19 has taught us and also the need for greater collaboration among sectors and partners at district, national, regional, and global levels