

Challenges of One Health implementation to eradicate zoonotic and vector-transmitted diseases

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The World Health Organization (WHO) has announced the importance of the One Health approach to increase public health.¹ One Health is a collaborative and innovative effort from various disciplines and sectors that work at the local, national, and global levels.² One Health concept is expected to include not only the research field but also designs, programs implementation, policies and laws. This approach covers a scope, including zoonotic control, in addition to food security and the eradication of antibiotic resistance.¹

Zoonotic diseases can be transmitted from animals to humans or vice versa. The transmission can go through direct and indirect contact, through consumption of animal products, or through animal or insect vectors.³⁻⁴ Diseases transmitted through animals or vectors are called vector-transmitted diseases. Therefore, zoonotic and vector-transmitted diseases occur due to human, animal, and environmental interactions. The involvement of humans, animals, and the environment in a zoonotic and vector transmission cycle indicates an association between the disease and the public knowledge, attitude and behaviour towards a healthy lifestyle and environment.

Indonesia is a tropical country with large geographical areas, various biodiversity, and diverse cultures. Indonesia is also a developing country with a low-middle socioeconomic level. The environmental and socio-economic condition of the Indonesian people can cause zoonotic and vector-transmitted diseases to remain a health problem in Indonesia. The zoonotic diseases include rabies, avian influenza, anthrax, leptospirosis and plague. Meanwhile, the vector-transmitted diseases include dengue, malaria, and lymphatic filariasis.⁵

The world currently experiences globalization era and global warming which can lead to climate change. This global change makes zoonotic and vector-transmitted diseases spread to territories that have never been at risk of diseases; moreover, this may lead to a pandemic. The global warming can disrupt dynamics interaction among humans, infectious agents, zoonosis carriers, and insect vectors; consequently, this triggers zoonotic epidemic and vector-transmitted diseases, both to re-emerge diseases and to emerge new diseases.⁶ Several epidemic vector-transmitted diseases included Zika (mosquito vector), Chikungunya (mosquito vector), zoonotic Ebola (mutated virus in monkeys or chimpanzees), H₅N₁ (mutated virus in poultry), and the most recent virus of SARS- Cov II (Covid-19) (mutated virus in bats).⁷⁻¹¹ The widespread dengue cases in Western Europe and Sub-Tropical America are also a consequence of global warming and the population's high mobility in the era of globalization. Preventing zoonotic and vector-transmitted diseases is difficult to implement as the diseases are complex and influenced by various factors, such as changing demographics, environmental conditions, and climate affecting the ecosystem. Therefore, the zoonotic and vector-transmitted diseases countermeasure cannot be conducted locally and territorially. It encompasses national, global, and multi-sectoral aspects.

One Health approach is a new paradigm related to the disease eradication caused by parasites. One health concept discerns that the diseases, including zoonotic and vector-transmitted diseases, are generated from interaction among humans and animals. The disease eradication using the One Health approach is a comprehensive eradication involving studies of humans as sufferers and infection sources, animals as infection sources or vectors, and the environment as a supporting factor leading to interactions among humans, animals, and pathogens. Therefore, multidisciplinary collaboration is required among related fields, including human health, animal health, environment, sociology, information technology, and other related fields. Multi-sectoral collaboration is not only in the context of study fields but also in organizations, such as governments, non-profit organizations, private sectors, public organizations, and the community.

The 21st century is an era of participation and digitization. In the participation era, individuals and communities contribute according to their competencies to reach the same goal, to increase human well-being. The digitization era has facilitated collaboration between individuals and the community through communication and information technology. However, there are some challenges to overcome in multi-sectoral and multidisciplinary collaboration. The challenges for example are the difference in technology and knowledge, the difference in funding ownership, the difference in natural resources ownership, and the difference in human resource quality, as well as a tendency to prioritize certain groups and personal interests.

In preventing the zoonotic and vector-transmitted diseases epidemic, One Health concept requires a higher effort to be effectively implemented. Discussing and working together, supporting and completing each other, and optimizing the potential by putting aside personal interest for the sake of the community are that can make the One Health concept run successfully and effectively.

REFERENCES

1. WHO. One Health. <https://www.who.int/news-room/questions-and-answers/item/one-health>
2. Barrett MA and Osofsky SA. One Health: Interdependence of people, other species, and the planet. Chapter 30; 364-377.
3. WHO. Zoonoses. <https://www.who.int/news-room/fact-sheets/detail/zoonoses>
4. Mubemba B, Mburu MM, Changula K, Muleya W, Moonga LC, Chambaro HM, et al. Current knowledge of vector-borne zoonotic pathogens in Zambia: A clarion call to scaling-up “One Health” research in the wake of emerging and re-emerging infectious diseases. *PLoS Neglected Tropical Diseases*. 2022;16(2): e0010193.
5. Kemenkes RI. Rencana aksi kegiatan pencegahan dan pengendalian penyakit tular vektor dan zoonotik tahun 2015-2019. <https://e-renggar.kemkes.go.id/file2018/e-performance/1-465842-4tahunan-265.pdf>
6. Rupasinghe R, Chomel BB, López BM. Climate change and zoonoses: A review of the current status, knowledge gaps, and future trends. *Acta Tropica*. 2022;226:106225.
7. Boni MF. Zika: The emerging epidemic. *Emerging Infectious Diseases*. 2017; 23(10), 1762.
8. Weaver SC, Forrester NL. Chikungunya: Evolutionary history and recent epidemic spread. *Antiviral Research*. 2015;120:32-39
9. Buseh AG, Stevens PE, Bromberg M, Kelber ST. The Ebola epidemic in West Africa: Challenges, opportunities, and policy priority areas. *Nursing Outlook*. 2015;63(1):30-40.
10. Su S, Bi Y, Wong G, Gray GC, Gao GF, and Li S. Epidemiology, evolution, and recent outbreaks of Avian Influenza Virus in China. *Journal of Virology*. 2015;89(17): 8671-8676.
11. Susilo A, Rumende CM, Pitoyo CW, Santoso WD, Yulianti M, Herikurniawan H, et al. Coronavirus Disease 2019: Tinjauan Literatur Terkini. *Jurnal Penyakit Dalam Indonesia*:7 (1):45-67. DOI: <http://dx.doi.org/10.7454/jpdi.v7i1.415>