

Chapter 13

Determinants of Interoperability in Intersectoral One–Health Surveillance: Challenges, Solutions, and Metrics

Yusuf Mshelia

 <https://orcid.org/0000-0001-7799-8583>

Data Aid, Nigeria

Kikiope O. Oluwarore

*One Health and Development Initiative,
Nigeria*

Abraham Zirra

 <https://orcid.org/0009-0009-9140-7028>

*Food and Agriculture Organization of
the United Nations, Nigeria*

Daniel Damilola Kolade

*Nigeria Center for Disease Control,
Nigeria*

Joshua Loko

 <https://orcid.org/0009-0005-4563-1097>

JSI Nigeria, Nigeria

Jerry Shitta Pantuvo

 <https://orcid.org/0009-0005-0141-1498>

UK Health Security Agency, UK

ABSTRACT

The evolving nature of health threats necessitates robust interoperability in One-Health (OH) surveillance systems that integrates human, animal, and environmental health data. This chapter addresses the critical determinants of interoperability in OH surveillance, focusing on technical, semantic, organizational, and policy dimensions. Technical, semantic, organizational and policy and regulatory interoperability were

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discussed. In this light, the chapter discussed the challenges, solutions and the the KPIs for evaluating interoperability. A checklist is presented with key performance indicators (KPIs) to measure interoperability effectiveness, including data standardization rates, integration success, cybersecurity compliance, and user satisfaction.

I. INTRODUCTION

Interoperability is the ability of different systems, organizations, and sectors to work together seamlessly. It enables the integration and sharing of data, resources, and knowledge of different collaborating sectors like human, animal, and environmental health actors as in the One Health (OH) approach. Interoperability in OH surveillance is critical for addressing the complex and interconnected health challenges of the 21st century. The OH approach recognizes that the health of humans, animals, and ecosystems are interdependent (WHO, 2017). Hence, effective surveillance engaging the OH approach requires seamless data exchange and communication across various sectors and disciplines, including public health, veterinary science, environmental science, and more. Interoperability in OH facilitates efficient data sharing, comprehensive analysis, collaborative response, and resource optimization (Hufnagel, 2009; Zinsstag et al., 2011):

OH is a collaborative, multisectoral, and transdisciplinary approach that aims to achieve optimal health outcomes by recognizing the interconnection between people, animals, plants, and their shared environment (Control & Prevention, 2020). It emphasizes the need for integrated efforts across various sectors to address health challenges that arise at the interface of human, animal, and environmental health.

The scope of OH surveillance includes surveillance of diseases that affect human populations, including zoonotic diseases that can be transmitted from animals to humans (Jones et al., 2008), monitoring and managing health issues in livestock, wildlife, and companion animals, which can have direct or indirect impacts on human health (Karesh et al., 2012; Lueddeke, 2015) and assessing environmental factors that influence the health of humans and animals, such as water quality, pollution, and climate change (Lueddeke, 2015) through intersectoral surveillance.

Intersectoral surveillance in OH, involves systematic collection, analysis, and sharing of health-related data across different sectors and disciplines. It aims to provide a comprehensive understanding of health threats and to support coordinated action. This will include building and maintaining networks of stakeholders from various sectors, including public health agencies, veterinary services, environmental organizations, and research institutions (Coker et al., 2011); developing and implementing data systems that can integrate information from different sources and provide a unified view of health trends and threats (Dixon et al., 2020; Martin

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