

# Implementation challenges of an integrated One Health surveillance system in humanitarian settings: A qualitative study in Palestine

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## Abstract

**Objectives:** Several factors have changed interactions between people, animals, plants, and the environment – renewing the relevance of the One Health surveillance system in the fight against zoonotic diseases such as COVID-19. Therefore, this study aimed to explore barriers to implementing an integrated One Health surveillance system in Palestine.

**Methods:** This qualitative study was conducted from April 2020 until August 2020. Data were collected using semi-structured interview guides. Seven key stakeholders were interviewed during data collection. A thematic analysis was performed.

**Results:** Four overarching themes emerged explaining barriers to integrated implementation of the One Health surveillance system. They are lack of policy coherence, limited financial resources, poor governance and leadership, and lack of One Health training programmes.

**Conclusion:** Improved understanding of the transmission and effective control (including One Health approach) of zoonotic disease and better governance and leadership are critical in the diseases that threaten public health, such as the COVID-19.

## Keywords

COVID-19 pandemic, zoonotic diseases, One Health, challenges, Palestine

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## Introduction

The emerging zoonoses, such as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), are a growing public health security concern due to their ability to spread across the globe rapidly, plus their subsequent adverse impacts on a wide range of sectors, including health, trade, commerce, and tourism.<sup>1</sup> A multi-sectoral response to the phenomenon is evident. Therefore, the One Health (OH) approach provides the needed conceptual framework to bridge the gap between sectors and enhance effective prevention and control of zoonotic diseases.<sup>2,3</sup>

The World Health Organization (WHO) defines OH as an approach to designing and implementing programmes, policies, legislation, and research. Multiple sectors communicate and work together to achieve better public health outcomes.<sup>4</sup> Yet, practical application of OH remains a challenge, especially in developing countries.<sup>2,5</sup> Several studies have identified persisting challenges in establishing and implementing OH programmes, many of which are related to the importance of including a diverse range of relevant experts. Everyone

brings unique skills and views to the cause. Despite the consensual OH definition that emerged in recent years, the level of collaboration required in the OH approach is not yet agreed upon.<sup>6,7</sup>

The recent success stories of OH surveillance tend to concentrate on the apparent interfaces between human and veterinary medicine, such as zoonoses and food safety.<sup>8</sup> The lack of a clear definition and accompanying vision for the future of OH acts as a barrier to interdisciplinary collaboration, and

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fragmented approaches by different sectors limit professionals' ability to collaborate across disciplines are the most common two implementation challenges.<sup>9</sup> Collaboration in an OH surveillance system can take many forms (across sectors, disciplines, decision-making scales, and public–private partnerships) and be implemented at different stages of the surveillance process (from planning to the dissemination of surveillance results) with varying degrees of integration.<sup>10</sup>

The issues that the Palestinian healthcare system faces are comparable with those of other nations in the area confront. In Palestine, there are four healthcare providers: the Palestinian Ministry of Health (MOH), the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), non-governmental organizations (NGOs), and the private sector, with the MOH serving as the primary provider and accountable governor. The fragmentation of the Palestinian health system and the fact that it is an emergency-oriented, highly political system with acute limitations in resources, capacity, and supplies that are reliant on unpredictable international help is a distinguishing feature. The healthcare costs are not made public, and the healthcare outcomes are not up to par with present spending levels. Over the previous decade, overall health expenditures (public and private) have varied at the cost of lower-priority sectors that get enough funding. In Palestine, long-term depletion of essential medications and supplies, restricted access to healthcare, and violence against health professionals and system facilities are significant hurdles and health determinants.<sup>11,12</sup>

In Palestine, major interrelated sectors, including the health, environmental, and agricultural sectors, are fragmented and lack coordination.<sup>13</sup> As a result, the impacts of the COVID-19 pandemic on Gaza have been wide-ranging and severe – fascinated by the increased unavailability of potable water and sanitation and disposable wastewater systems and their associated health and economic threats.<sup>14–16</sup> These, in addition to many other factors, have deepened the fragility of Gaza's health system and efforts towards universal health coverage during the COVID-19 pandemic.<sup>17–19</sup>

There is broad recognition that the OH approach to health through an improved surveillance system is central to a resilient and sustainable health system.<sup>20</sup> A recent commentary discussed OH principles' contributions in strengthening the global response to the COVID-19 pandemic.

Social, economic, and environmental conditions in Palestine may further intensify infectious outbreaks. High population density and water shortage are among the main limiting factors in facing a disease such as COVID-19, where the key preventive measures are isolation of the sick, physical distancing, and personal hygiene.<sup>12</sup> Accordingly, the availability of an integrated surveillance infrastructure could help health decision-makers take appropriate measures in providing a multi-disciplinary response to zoonotic disease, including COVID-19.<sup>21</sup>

In Palestine, the importance of studying the implementation obstacles of the OH approach during health emergencies

is relevant and timely. This study aimed to explore barriers to the effective implementation of an integrated OH surveillance system in Palestine. Findings would be serving as a roadmap to help improve policy response to COVID-19, particularly in fragile states.

## Materials and methods

### *Study design, period, and area*

This qualitative study was conducted from April 2020 to August 2020 in Palestine. Data were gathered across three Palestinian territories, including the Gaza Strip, West Bank, and Eastern Jerusalem.

### *Data collection tool*

We developed open-ended questions, gathered and modified according to the outlined principles in the relevant literature that discussed gaps in the understanding of the barriers and enablers to implementing an OH surveillance system,<sup>9,22,23</sup> and can be seen in Supplemental File 1.

The instrument focused on five themes, namely, (1) poor multi-sectoral communication, (2) lack of multi-sectoral confidence, (3) limited funding, (4) lack of OH training programmes, and (5) poor governance and leadership. Questions were debated within the study team as well as with the help of foreign scientists and local specialists in Palestine to assess trustworthiness and reliability.

The questions were piloted with three key informants to check their clarity and provide a basis for cross-checking subsequent responses. Building on the pilot, we revised the questions included in the data collection instrument.

### *Sampling methods*

Seven key informants with diverse backgrounds and experiences were purposively sampled for interviews in order to guarantee to cover the key informants such as practitioners, researchers, policymakers, and representatives from the Palestinian key sectors. The initial list of possible participants was compiled based on the expertise of the first author, a Palestinian who has worked in the three sectors for more than 15 years and has a background in public and environmental health. To achieve sample representation, experts were consulted, and thorough peer reviews were conducted. The participant lists were then combined into a single final list. The key informants were a public health officer, environmental health specialist, medical entomologist, medical practitioner, veterinary epidemiologist, microbiologist, and an agriculture engineer. In-depth interviews were conducted face to face and virtually via Skype call due to the COVID-19 pandemic movement restrictions measures. The diversification was done in order to have a wide range of perspectives and a thorough comprehension.

## Data analysis

Audio recordings were made of the information gathered during the in-depth interviews. The meetings were held in Arabic and were concurrently translated and transcribed onto Microsoft Word (MS) sheets, which were subsequently reviewed, reviewed, and cleaned for correctness. During data collection and processing, field notes were preserved and used. A thematic analysis of data was performed manually.<sup>24</sup> The first author built themes and codes and then went over each transcript line by line. The data were then organized into a matrix based on the various themes and codes. Selected data were discussed with the study team.

## Ethics approval

The study protocol was approved by the Helsinki Ethical Committee in Palestine (Code: PHRC/HC/735/20). Written consent from interviewees was obtained. Researchers also assured interviewees of confidentiality and anonymity of the information they provided.

## Results

All participants emphasized the importance of the effective implementation of an integrated OH surveillance system in Palestine. The following themes emerged from the analysis: poor multi-sectoral communication, lack of multi-sectoral confidence, limited funding, lack of OH training programmes, and poor governance and leadership. Details are explained next.

### Poor multi-sectoral policy coherence

Study participants emphasized that health today is faced with more complex and interlinked challenges, including economic, social, and environmental factors and the importance of the OH approach in efforts to achieve sustainable health development. However, the finding revealed the absence of structured collaboration and coordination across sectors and institutions, leading to several policy incoherencies:

... to a large extent, it can be said that the Palestinian health, environmental, agricultural, educational, etc. sectors in Palestine are fragmented and managed by different institutions, including the Palestinian National Authority (PNA), UNRWA, private industry, and NGOs. These sectors suffer from a lack of multi-sectoral communication; each agency implements its programs according to their priorities, influencing the capacity to tackle the disease outbreaks. (Public health officer)

According to study participants, these fragmentations have led to a lack of confidence and professional tensions between policy actors. To move forward, participants believe that a comprehensive review and restoration of the trust are

necessary to effectively implement an integrated OH surveillance system and OH approach to health in general:

... admittedly, there is a cumulative crisis of trust among all Palestinian executive, legislative, and other civil institutions. Successive Governments cannot be exempted from deepening this crisis for failing to embark on policy reforms. These trust crises have negatively affected the development of health and environmental systems. (Environmental health specialist)

### Limited funding

Based on study participants' views, Palestine had a dismal economy before the emergence of the COVID-19 pandemic. According to interviewees, the Palestinian economy has been highly dependent on international aid, and the economy continues to deteriorate. They believed that the Government of Palestine does not have the required financial resources to support the implementation of integrated OH surveillance system. They further highlighted that Israeli's control over Palestinians and their territory also has retarded multi-sectoral cooperation and monitoring to enhance OH's approach to health:

... how do you expect the health system of an economy that is collapsing (due to financial constraints) to be that mindful of animal health or the surrounding environment? This is Palestine; what works for the rest of the world does not often work for us. (A medical entomologist concerned with the role of insects in the causation of disease in animals and humans)

### Absence of training programmes on OH approach

Participants revealed that understanding disease transmission is an essential requirement for effective control and management in Palestine. They pointed out the importance of the Ministry of Education to restructure the traditional educational systems to incorporate training programmes on the OH approach in the university curriculum and to consistently organize capacity building workshops for professionals in non-academic institutions to understand the relevance of multi-disciplinary collaboration and communication, and integrated surveillance systems. Interviewees believe that this could also help address the policy incoherence threatening sustainable health development:

... we're still trained either as vets or doctors or environmental scientists, so we have a much-siloed view of the world. (Agriculture engineer)

... from the experience that we are currently experiencing in the fight against COVID-19 in Palestine, the general scene suggests a state of Siloelity and isolation enjoyed by the working parties due to the different preferences and priorities. Therefore, it is imperative to form a crisis cell that includes specialists in

human, animal, and environmental health similar to timely response to a zoonotic infectious disease outbreak. (Medical practitioners)

### Governance and leadership

Participants also revealed poor governance and leadership as significant implementation challenges of an integrated OH surveillance system in Palestine. Participants stressed that the multifaceted nature of the health and OH approach demands establishing an institution that could play a leading role in coordinating activities across sectors. According to interviewees, effective implementation would require a mix of knowledge and experience of experts from diverse backgrounds, including health, environmental, agricultural, social, economic, and political sectors:

... any effective response to infectious diseases will require an adequate institutional capacity to manage surveillance system targeting One health, i.e., to facilitate and coordinate activities, including engaging actors like decision-makers, ministers, and officials from all sectors. (Veterinary epidemiologist)

... as is the case elsewhere in the world, the development and implementation of the OH approach require a combination of insights from human and animal health, environmental and social sciences, and the integration of various public, political, civil society, and business sectors. (Microbiologist)

### Discussion

Several factors have changed interactions between people, animals, plants, and the environment,<sup>25</sup> renewing the importance of integrated surveillance systems to fight zoonotic diseases such as COVID-19.

While this approach is not new, it has become more relevant in recent years. Still, its implementation remains a challenge for most countries worldwide.<sup>2,5</sup> To this end, this study aimed to explore barriers to the effective implementation of an integrated OH surveillance system in Palestine. The following themes emerged from the thematic analysis: poor multi-sectoral communication, limited funding, absence of OH approach in educational curricula, and poor governance and leadership.

Globalization has deepened the spread of novel diseases of animal origin.<sup>1</sup> COVID-19 has infected humans and other animal species, and infected humans can aid in reverse-zoonotic virus transmission to animals. Traditional veterinary jobs should adapt to encompass transdisciplinary functions, given the fast-evolving interactions among humans, animals, and ecosystems.<sup>26</sup> The current COVID-19 pandemic has drawn global attention to the need to regulate live animal markets – the supposed source of the Coronavirus<sup>27</sup> – and strengthen integrated surveillance systems for emerging infectious diseases. While this is achievable by developed and prosperous countries, to the developing and fragile

countries suffering from humanitarian conditions, this goal is challenging to achieve. The primary reason being that food markets are included in the food distribution systems where such diseases are challenging to control and monitor.<sup>28</sup> Again, the COVID-19 pandemic has highlighted the importance of improved governance of infectious disease surveillance systems to enhance the application of the OH approach at the local, regional, national, and global levels.

Pandemics lead to inequality, which disproportionately affects individuals and groups – people living in the fragile state being the most vulnerable. This is already widely evident in the current COVID-19 pandemic.<sup>29</sup> COVID-19-related mortality rates also exhibit a robust regional relationship.<sup>29</sup> Although participants in this study pointed out the importance of the OH approach, according to them, most environmental determinants of health, such as potential pathogens in soil, air, water, and diseases that can affect biodiversity, are often ignored. This notion resonates with the broader literature and is acknowledged in several studies.<sup>9,30,31</sup> Considering the inadequate understanding of the OH approach, there is the need for enhanced training of students<sup>5,32,33</sup> and other professional individuals across sectors to improve multi-sectoral responses to health.

Several studies have shown that problems strongly influence challenges influencing the application of OH initiatives in obtaining conditions, which already started in the initial stage and continue until monitoring and evaluation. This is especially the case for challenges of conducting OH surveillance, which is driven mainly by a lack of resources and manpower.<sup>34–36</sup>

In response to the outbreak of the COVID-19 virus in Palestine, the MOH developed the national COVID-19 surveillance system based on the existing open-source DHIS2 software. The system reflects the WHO case definition and reporting form, in addition to the Palestinian case management criteria and workflow. The system is capable of generating indicators at the output and outcome levels, and allows health workers to track information at the patient level.<sup>37,38</sup>

The difficulties in stakeholder cooperation stem from the fact that for the knowledge co-creation envisioned in OH innovations, a diverse team of scientists working together but within their own silo is insufficient. Nonetheless, such flimsy collaborations result from a long history of fragmented systems and practices that limit actors' and organizations' ability to collaborate and incorporate varied ideas, approaches, and activities.<sup>39–41</sup>

The findings of the current study should be interpreted in light of certain limitations. To begin with, the limited sample size of this qualitative study emphasizes the need for more large-scale research in the field. Limitations are imposed by the various interviewing approaches utilized (a mix of face-to-face and virtual interviews).

The only used in-depth-interviewing data collection tool acts as a limitation, since employing a future mixed data collection method study in including scoping and desk review,



quantitative approach, qualitative approach, focus group discussions, and social network analysis would be helpful for (1) triangulation of results; (2) examination of overlapping or different facets of a phenomenon; (3) initiation or discovering of paradoxes, contradictions, and/or fresh perspectives; (4) development or use of the methods sequentially; and (5) expansion to add to the breadth or scope of the study.

In addition, widening the scope of participants to include more stakeholders such as practitioners, academics, policymakers, and representatives from relevant industries would provide a broader depth of understanding and strengthen the validity of the findings.

Furthermore, including additional stakeholders, such as practitioners, researchers, policymakers, and representatives from key sectors, would give a deeper level of insight and increase the validity of the findings. Despite this, participants branched a broad scope of expertise from varying fields, bringing a multitude of experience to the study.

## Conclusion

The study highlights the barriers to implementing OH surveillance systems for controlling zoonotic diseases, like COVID-19. Four overarching findings were identified. They include lack of policy coherence, limited financial resources, poor governance and leadership, and lack of training programmes on OH. We suggest that improved understanding of disease transmission of disease and enhanced governance and political will to improve integrated OH surveillance systems are critical to controlling zoonotic diseases that threaten public health, such as the COVID-19.

## Pathway forward and policy recommendation

In summary, the following are the key policy recommendations relevant to the questions addressed in this article:

- A clear concept and shared vision for OH's future should be agreed upon, and cross-disciplinary tertiary training could help new professionals improve their OH knowledge.
- With the participation of relevant policymakers, a formal governing body should be established.
- Future research should concentrate on this topic in order to offer unambiguous evidence of the advantages of adopting the OH approach in Palestine.
- In order to address the prevention of new zoonotic illnesses in Palestine and overseas, interdisciplinary communication about zoonoses and collaboration among relevant sectors are critical.

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## Author contributions

S.A., K.Z., and A.A. participated in the design of the study. S.A. performed the data collection and drafted the manuscript. K.Z. supervised the study and participated in the draft review. A.A. assisted with writing and manuscript preparation. All authors have read and approved the final version of the manuscript and agree with the order of presentation of the authors.

## Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Data availability

The data used to support the findings of this study are available from the corresponding author upon request.

## Ethical approval

Ethical approval for this study was obtained from the Helsinki Ethical Committee in Palestine (Code: PHRC/HC/735/20).

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## Informed consent

Written consent from interviewees was obtained. Researchers also assured interviewees of confidentiality and anonymity of the information they provided.

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## Supplemental material

Supplemental material for this article is available online.

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