



Strengthening One Health systems for outbreak management

Outbreak response is faster and more effective when human, animal and environmental sectors share intelligence, co-ordinate action and learn together – One Health helps connect the right actors before, during and after a crisis

One Health in context

For those working in global health, outbreak response is often experienced through human health systems: case detection, clinical management, risk communication, vaccination (where relevant), and public health control measures. But some outbreaks cannot be understood or managed effectively through the human health sector alone. Zoonotic, foodborne, antimicrobial resistance- (AMR-) driven and environmentally-driven outbreaks may require information from, and action by, animal health, agriculture, environment or local government actors.

Rift Valley Fever illustrates this clearly. Human cases may be part of a wider outbreak involving livestock, vectors, environmental conditions and community practices. In such cases, responses may require linking human health surveillance and treatment with animal health information, laboratory confirmation, vector control, risk communication and community engagement. Without these links, response can be delayed, poorly targeted or disconnected from the drivers of transmission.

A One Health approach supports more effective outbreak management by linking four key functions:

- **preparedness:** establishing co-ordination mechanisms, surveillance systems and workforce capacity before crises occur
- **detection:** identifying and interpreting signals across sectors, including human, animal and environmental data
- **response:** co-ordinating action across relevant sectors, including containment, treatment, risk communication, vector control, animal health measures or food safety actions, where relevant to the outbreak
- **after-action learning:** reviewing system performance to strengthen future preparedness and response

Outbreaks place systems under pressure, requiring rapid decision-making, clear communication and co-ordinated action. Where systems are fragmented, delays in detection, unclear roles or weak communication pathways can increase the scale and impact of outbreaks. Where co-ordination is functional, One Health approaches can improve the timeliness, targeting and effectiveness of response.

Why this matters

- Many outbreaks originate at the human–animal–environment interface and cannot be managed effectively by a single sector.
- **Early warning signals often exist across sectors** (e.g. unusual morbidity or mortality in livestock or wildlife) – but may not be shared or jointly interpreted.
- Delays in detection and response increase human, economic and political costs.
- Outbreaks expose weaknesses in co-ordination, communication and decision-making systems.
- **Effective response depends not only on technical capacity**, but also on governance, trust and shared situational awareness.

Practical examples

- **‘One Health Response for Rift Valley Fever Outbreak in Sudan’.** This study documents a co-ordinated response to a zoonotic outbreak involving both human and animal health sectors. Joint surveillance, laboratory confirmation and vector control measures were implemented alongside risk communication and community engagement. The response benefited from existing collaboration mechanisms, enabling faster information sharing and co-ordinated action. However, the study also highlights challenges in aligning data systems, ensuring timely communication across sectors, and sustaining co-ordination beyond the immediate response phase.

- **Integrated surveillance in Kenya (pastoralist communities)**. This study demonstrates how integrating human and animal health surveillance in high-risk pastoralist settings can support earlier detection of zoonotic threats. Community-based reporting and cross-sector information sharing improved situational awareness, particularly in remote areas with limited formal services. The study shows how such systems can strengthen preparedness and detection, but also highlights constraints in translating early signals into co-ordinated response in the absence of clear decision-making pathways and sustained institutional support.
- **Strengthening Antimicrobial Resistance Surveillance and Response in Zimbabwe**. While focused on AMR, this study illustrates how cross-sector surveillance systems contribute to broader outbreak preparedness and response. Efforts to strengthen laboratory capacity, data systems and governance structures improved the ability to monitor and respond to emerging resistance patterns. The study highlights the importance of integrating human, animal and environmental data, while also noting challenges in co-ordination, data sharing and sustaining capacity across sectors.

Common challenges in practice

- Fragmented surveillance systems and limited cross-sector data sharing.
- Legal, institutional or trust-related barriers to information exchange.
- Unclear roles and responsibilities during response.
- Weak linkages between detection and decision-making.
- **Limited capacity** for joint risk assessment and interpretation.
- **Co-ordination mechanisms** that exist on paper but are not operationalized.
- **Resource constraints** and reliance on external support during crises.
- Limited systematic after-action review and learning.

Factors that make these approaches work

- **Pre-established co-ordination** mechanisms and trusted relationships.
- **Clear communication** pathways across sectors and levels.
- **Joint risk assessments** and shared situational awareness.
- **Integration of surveillance across** human, animal and environmental domains.
- **Workforce capacity** in co-ordination, interpretation and response.
- Institutionalization of learning through after-action reviews.

Possible entry points for those working in global health

- **Strengthening preparedness through existing platforms.** Outbreaks provide opportunities to engage with or support existing One Health or health security co-ordination mechanisms, helping improve cross-sector participation and readiness.
- **Enabling co-ordinated, multisectoral surveillance and risk assessment.** Before or during outbreaks, those working in global health can promote the use and joint interpretation of existing human, animal and environmental information to strengthen early detection, situational awareness and decision-making. This can include targeted technical assistance to link single-sector surveillance investments and translate data into shared risk assessments.
- **Understanding sources and drivers of emergence.** Clarifying what is known about the initial origin of an outbreak or supporting targeted origin investigations and analysis of emergence drivers, can help to inform response decisions, risk communication and cross-sectoral co-ordination.
- **Embedding One Health considerations in response planning and analysis.** Those working in global health can encourage the explicit consideration of animal, environmental or food system dimensions in response plans, funding proposals or analytical products, where relevant to the outbreak.
- **Brokering targeted cross-sector technical support.** During outbreaks, those working in global health can help countries access or align technical assistance across human, animal and environmental sectors where response challenges sit between mandates or fall outside single-sector support.
- **Encouraging or convening cross-sector engagement in response planning.** Early involvement of relevant sectors (e.g. animal health, agriculture, environment) during outbreaks can help clarify roles, information flows and co-ordination mechanisms.
- **Supporting after-action learning.** Post-outbreak reviews can provide opportunities to identify cross-sectoral co-ordination gaps and inform system strengthening ahead of future events.

Want to know more?

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Key resources:

- 'One Health Explainer' – <https://www.cabi.org/cabi-publications/one-health-explainer/>
- 'One Health Response for Rift Valley Fever Outbreak in Sudan' – <https://www.preprints.org/manuscript/202408.1358> (Empirical outbreak response case study)
- 'A multi-sectoral One Health approach for disease prevention, early detection and control' – <https://cbs.ifrc.org/resources/multi-sectoral-one-health-approach-disease-prevention-early-detection-and-control> (Operational case study / implementation evidence)
- 'Strengthening Antimicrobial Resistance Surveillance and Response in Zimbabwe: A Coordinated One Health Approach' – <https://openknowledge.fao.org/items/ad6887f5-69b9-41e9-97bf-7a52e1ecf39c> (National implementation case study / programme documentation)

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