



Seeing risk early: Why surveillance and cross-sectoral data sharing matter for One Health

Surveillance only works when information moves across sectors and triggers action. As multi-hazard risks rise, One Health shows where intelligence – and the data behind it – breaks down, and why that matters

One Health in context

For those working in global health, surveillance is often treated as a technical function. In practice, **it is a governance and co-ordination challenge**: it relates to who observes risk, who reports it, how information flows, and whether signals are acted on across sectors.

Many health threats – zoonoses, antimicrobial resistance (AMR), foodborne disease, climate-sensitive vector-borne disease, waterborne illness, and exposure to chemical pollutants – emerge outside the formal human health system. As risks increasingly interact – for example, when flooding contaminates water supplies – **surveillance and risk assessment need to be multisectoral and to cover all hazards, rather than be limited to single-disease approaches.**

Yet surveillance systems remain fragmented by sector, geography and mandate – including the separation between human, animal and environmental monitoring systems, and the separation from other data systems which may support prevention or preparedness, such as water quality monitoring or climate data. Data relevant to health risks are often collected but not routinely shared or jointly analysed across institutions. Timely information exchange can be inhibited by unclear data-sharing mandates, restrictions on disclosure, concerns over who owns and can share data, and limited trust between institutions about how information will be used.

One Health approaches to surveillance aim to improve linkages, routine communication routes, and integrated situational awareness – including how data are shared, connected and jointly interpreted across sectors – rather than creating entirely new, and interoperable, systems. In practice, many surveillance failures reflect breakdowns in data sharing or communication, rather than gaps in data collection. However, integration involves trade-offs and sensitivities that must be actively managed.

Why it matters

- Early warning signals often exist – including from climate, animal health, water quality or environmental monitoring – but may sit in the wrong sector, preventing them from being acted upon.
- Delayed detection increases the human, economic and political cost of response.
- Surveillance failures are frequently co-ordination, communication and data-sharing failures, not necessarily gaps in data collection.
- Integrated multisectoral surveillance underpins pandemic preparedness, AMR control, health security and broader all-hazards risk management – including environmental and chemical exposures – but can also introduce delays, political sensitivities, or data-sharing constraints if governance arrangements are weak.
- Water contamination events and wastewater signals can provide early indicators of public health threats, but only if information is shared, interpreted jointly and communicated across sectors.
- These issues intersect directly with systems strengthening and resilience.

Practical examples

- **'Scaling Antimicrobial Resistance Surveillance Nationally: The Case of the Fleming Fund in Kenya'**. Although focused on AMR, this case study is fundamentally about national surveillance governance. It documents efforts to co-ordinate surveillance across sectors and institutions, including sharing data and aligning reporting processes, revealing both progress and persistent constraints. The case study illustrates how vertical investment can strengthen surveillance capacity, but also how alignment, ownership and sustainability remain central challenges.
- **Integrated surveillance in Kenya (pastoralist communities)**. This study examines surveillance approaches in pastoralist settings where mobility, remoteness and limited service access complicate detection. It shows how integrating human and animal health surveillance – including reporting and communication across sectors – can improve awareness of emerging risks. At the same time, it highlights structural constraints, such as fragmented reporting lines, uneven capacity and reliance on informal information flows. Integration improves visibility and multi-hazard awareness, but does not automatically ensure co-ordinated response.

- **'Innovative tools for One Health surveillance: ALERT, a collaborative serious game'**. This study explores the use of a serious game to strengthen understanding of surveillance roles, communication and co-ordination across sectors. Rather than generating surveillance data, the tool focuses on how people interact within surveillance systems. It highlights that capacity gaps often relate to processes, communication and decision-making, not only technology.
- **'CGIAR initiative on One Health'**. This initiative demonstrates how environmental monitoring – particularly water surveillance – can contribute to One Health surveillance systems. Through watershed monitoring in Ethiopia and India, it linked environmental signals, such as pathogens and AMR in water systems, to human and animal health risks. The initiative highlights the value of environmental data, while illustrating the co-ordination and data-sharing challenges involved in translating this information into policy and action.

Common challenges in practice

- **Sectoral silos** between human, animal and environmental surveillance systems.
- **Fragmented reporting lines** between sub-national and national levels.
- Surveillance systems that generate data but do not ensure data are shared, jointly analysed or translated into co-ordinated response.
- **Process and co-ordination weaknesses** – including limited routines for cross-sector data sharing and joint interpretation – not only technical gaps.
- **Dependence on externally funded or vertical programmes**, particularly given the higher upfront investment required to establish integrated surveillance and data-sharing systems.
- Limited routine cross-sector interaction and data exchange outside crisis periods.
- Political and economic sensitivities that discourage early data sharing, even when risks have already been identified.

Factors needed to make these approaches work

- **Clear communication pathways.** Knowing who reports to whom – across human, animal and environmental sectors – matters as much as detection itself.
- **Joint risk assessment and response.** Surveillance is stronger when sectors move beyond parallel reporting to co-ordinated risk assessment, investigation and shared decision-making.
- **Joint training on risk assessment.** Regular cross-sector training and simulation exercises help teams interpret signals together, understand each other's mandates, and apply shared risk assessment approaches during crisis or emerging events.
- **Shared situational awareness.** Systems function better when data are routinely shared and interpreted collectively across sectors and levels.
- **Routine data sharing and interoperability between systems,** enabling information to move across sectors without requiring entirely new platforms.
- **Community participation.** Engaging frontline actors in surveillance design and reporting improves early detection and increases the relevance of the data obtained in remote or high-risk settings.
- **Governance alignment.** Surveillance works best when embedded in formal co-ordination structures and technical working groups, rather than relying on ad hoc collaboration.
- **Capacity beyond technology.** Skills in co-ordination, interpretation and system management are as critical as laboratory and data infrastructure.

Possible entry points for those working in global health

- **Engaging with and strengthening existing platforms.** Where surveillance, International Health Regulations or One Health coordination mechanisms exist, those working in global health can encourage broader engagement across sectors.
- **Advocating for more integrated, all-hazards approaches.** In settings where surveillance and data remain siloed or disease-specific, there may be opportunities to highlight the value of linking data across sectors in line with International Health Regulations all-hazards approaches — including biological, chemical, radiological, food safety and environmental risks.
- **Supporting alignment of existing investments.** Where significant single-sector investments in surveillance are underway, small, targeted support may help strengthen linkages across sectors — for example by enabling data sharing, interoperability or joint analysis — and enhance broader One Health value.
- **Encouraging joint interpretation of data.** Facilitating or supporting processes where existing human, animal and environmental information is reviewed together can strengthen shared risk assessment and more co-ordinated decision-making.
- **Recognizing sub-national and operational dynamics.** Many surveillance and data-sharing challenges emerge at district or community level, where sectors interact in practice and where communication pathways are often less formalised.

Want to know more?

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Key resources:

- 'One Health Explainer' – <https://www.cabi.org/cabi-publications/one-health-explainer/>
- 'Scaling Antimicrobial Resistance Surveillance Nationally: The Case of the Fleming Fund in Kenya' – <https://doi.org/10.1079/onehealthcases.2024.0009> (National programme case study / implementation and learning case)
- 'Integrated surveillance in Kenya (pastoralist communities)' – <https://cbs.ifrc.org/resources/multi-sectoral-one-health-approach-disease-prevention-early-detection-and-control> (Operational case study / implementation evidence)
- 'Innovative tools for One Health surveillance: ALERT, a collaborative serious game', in *One Health Atlas* (p. 94) – <https://www.quae-open.com/produit/336/9782759240265/one-health-atlas> (Conceptual and applied learning tool / innovation example)
- 'CGIAR initiative on One Health', in *One Health Atlas* (p. 98) – <https://www.quae-open.com/produit/336/9782759240265/one-health-atlas> (Programme / implementation case example)

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