Strengths and gaps of animal disease surveillance systems in Asia and the Pacific: lessons from the application of FAO's Surveillance Evaluation Tool (SET)

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Context
Animal diseases, including endemic, transboundary, and zoonotic animal diseases, continue to have significant impacts on livelihoods, food security, and public health across Asia and the Pacific. Their economic consequences can be substantial, affecting production systems, trade, household incomes, and public health. Effective animal disease surveillance systems are therefore a cornerstone of protecting both animal and human populations, enabling early detection, timely response, and the design of evidence-based disease control programmes.

Despite their importance, veterinary surveillance systems are often underfunded compared to public health systems. This imbalance creates persistent challenges in implementing comprehensive and sustainable surveillance activities, particularly at subnational and field levels. In this context, strengthening surveillance capacities requires not only technical solutions but also evidence-based prioritization of resources and coordinated action across multiple stakeholders.

Several evaluation frameworks are available to assess surveillance systems, each with different scopes and objectives. The World Health Organization (WHO)'s Joint External Evaluation (JEE) focuses primarily on public health capacities, with some components addressing intersectoral coordination for surveillance. The Performance of Veterinary Services (PVS) Pathway, developed by the World Organisation for Animal Health (WOAH), assesses veterinary services more broadly, including selected elements related to surveillance. Lastly, the Food and Agriculture Organization of the United Nations (FAO)'s Surveillance Evaluation Tool (SET), is specifically dedicated to animal disease surveillance systems and comprises 96 indicators covering institutional organization, laboratory capacity, surveillance activities, workforce, data management, communication, and evaluation. SET was developed based on the *Outil d'Analyse des Systèmes de Surveillance* (OASIS) by French Agency for Food, Environmental and Occupational Health & Safety (ANSES).

SET missions follow a structured and participatory process. The preparatory phase involves assembling an evaluation team, engaging national focal points, and reviewing relevant documentation such as surveillance plans, standard operating procedures, and regulatory frameworks. The implementation phase consists of an approximately 10-day in-country mission during which a wide range of stakeholders are interviewed, including representatives from veterinary services, field officers, community animal health workers, laboratory personnel, private sector actors, and stakeholders from public and environmental health sectors. This multi-actor engagement is central to understanding the operational realities of surveillance systems. Based on interviews and document review, the evaluation team scores the system across the 96 indicators and develops tailored recommendations in close coordination with national authorities. The post-mission phase culminates in a final report shared with the Chief Veterinary Officer, and, where authorized, published for broader dissemination.
Between 2019 and 2025, SET was implemented in six countries in Asia (Indonesia, Viet Nam, Cambodia, Lao PDR, Pakistan, and the Philippines) under a variety of projects aimed at strengthening national surveillance capacities. The regional application of the tool has provided a unique opportunity to identify common strengths and gaps across diverse country contexts, while also fostering dialogue among stakeholders and partners.

Outcome / impact
The use of SET in Asia and the Pacific has highlighted both shared strengths and recurring areas for improvement across animal disease surveillance systems in the region (Figure 1). These findings provide a practical evidence base for guiding national and regional capacity-building efforts.

Common strengths identified include:
- Institutional organization: Information-sharing between sectors occurs in many countries, often through informal mechanisms, particularly when addressing One Health issues.
- Laboratory networks: Diagnostic capacities are in place for priority diseases, especially within central veterinary laboratories.
- Surveillance activities: Active surveillance programmes are conducted, notably for high-impact diseases such as highly pathogenic avian influenza (HPAI) and African swine fever (ASF).

- Surveillance workforce: Opportunities exist for field epidemiology training, including programmes such as the Fiels Epidemiology Training Programme for Veterinarians (FEPTV), the Indonesian Pelvi programme, and the Applied Veterinary Epidemiology Training (AVET).
- Data management: Electronic reporting tools have been developed and piloted in several countries across the region.
- Communications: Informal communication networks, often using messaging applications such as WhatsApp or Telegram, are widely used and effective for rapid information exchange.
- Evaluation: Multiple external evaluations (e.g. SET, PVS, JEE) have been conducted, contributing to increased awareness of system strengths and weaknesses.

At the same time, several systemic gaps were consistently identified:
- Institutional organization: Surveillance activities are frequently dependent on project-based funding, largely supported by external partners. Sustainable domestic funding streams remain limited, and resources for essential field activities (such as travel, training, and operational supplies) are often insufficient.
- Laboratory networks: Maintaining laboratory operations is challenged by constraints in reagent supply, limited implementation of quality assurance systems, and a lack of laboratory information management systems (LIMS) in many settings.
- Surveillance activities: Key elements such as clearly defined surveillance objectives, standardized case definitions, and formalized procedures (including standard operating procedures and surveillance plans) are often lacking. Risk assessments are not routinely conducted and therefore do not consistently inform surveillance design.
- Surveillance workforce: Training opportunities are not systematically structured, and there is limited formal onboarding or refresher training for personnel involved in surveillance at different levels of the system. Many training activities remain linked to external projects rather than embedded within a comprehensive national workforce development strategy.
- Data management: Regular analysis of surveillance data is limited, and results are not consistently used to inform decision-making. Feedback of epidemiological analyses to field actors is often insufficient, with analyses typically conducted on an ad hoc basis in response to specific requests or emergencies rather than as part of routine processes.
- Communications: External communication strategies targeting the public and key surveillance partners are often underdeveloped.
- Evaluation: Few systems have established key performance indicators or internal monitoring and evaluation mechanisms to support continuous self-assessment and improvement.

Beyond identifying strengths and gaps, SET has demonstrated tangible impacts at country level. In Indonesia, recommendations from the evaluation guided the development of coordinated zoonotic disease surveillance guidelines, the implementation of training activities at national and subnational levels, and the joint prioritization of zoonotic diseases across sectors. The integration of surveillance data was further strengthened through the use of the SIZE platform to facilitate information sharing between sectors. In Pakistan, findings from the evaluation contributed to a government commitment of approximately 4 billion Pakistani rupees to invest in strengthening the national animal disease surveillance system. More broadly, SET outputs have supported countries by providing an evidence base for designing surveillance-related projects, facilitating coordination among development partners, and informing national policies and strategies to advocate for resource allocation.

However, some limitations affect the general overview of surveillance system capacities in Asia and the Pacific. External evaluations provide only a snapshot in time and may not fully capture evolving system capacities. Differences in methodologies across evaluation frameworks can lead to variations in findings, and not all evaluation reports are publicly available, limiting the completeness of regional analyses. Additionally, the diversity of country contexts means that regional generalizations may not fully reflect specific national situations.

Relevance for others
This case highlights the value of structured surveillance evaluations as practical tools to support evidence-based decision-making and multi-actor engagement. For countries, such evaluations help identify strengths and gaps while enabling prioritization of capacity-building efforts based on concrete evidence. The participatory nature of SET, involving stakeholders from multiple sectors and administrative levels, also facilitates dialogue and shared understanding of surveillance challenges and opportunities.

For development partners and regional organizations, the aggregation of evaluation findings provides a strategic overview of common priorities, enabling better alignment of interventions with country needs and promoting more efficient use of resources. This is particularly important in contexts where multiple partners are engaged in surveillance capacity development.

Recommendations

This regional overview of gaps and strengths in Asia and the Pacific represents a first step to developing coordinated strategies to build surveillance systems capacities in the region. In order to continue to maximise the impacts of such evaluations to partner countries, several recommendations can be made:

- Continue conducting surveillance system evaluations across the region to fill existing gaps in the regional overview and strengthen the evidence base
- Ensure stronger linkage between evaluation outputs and the design and implementation of surveillance-related projects and initiatives
- Advocate for increased and sustained government investment in animal disease surveillance systems
- Promote coordinated approaches to surveillance capacity-building, enabling governments and development partners to work towards shared strategic roadmaps rather than parallel initiatives
- Strengthen linkages with existing frameworks and regional mechanisms, such as One Health platforms and regional organizations such as the Association of Southeast Asian Nations (ASEAN), to support harmonized and scalable approaches to surveillance capacity building
- Conduct comparative evaluations every 3–5 years to monitor progress at national and regional levels
- Expand the use of impact assessments to better understand and demonstrate the benefits of surveillance system evaluations

Figure 1. Comparative gaps and strengths of animal disease surveillance in Asia and the Pacific based on FAO's Surveillance Evaluation Tool (SET)

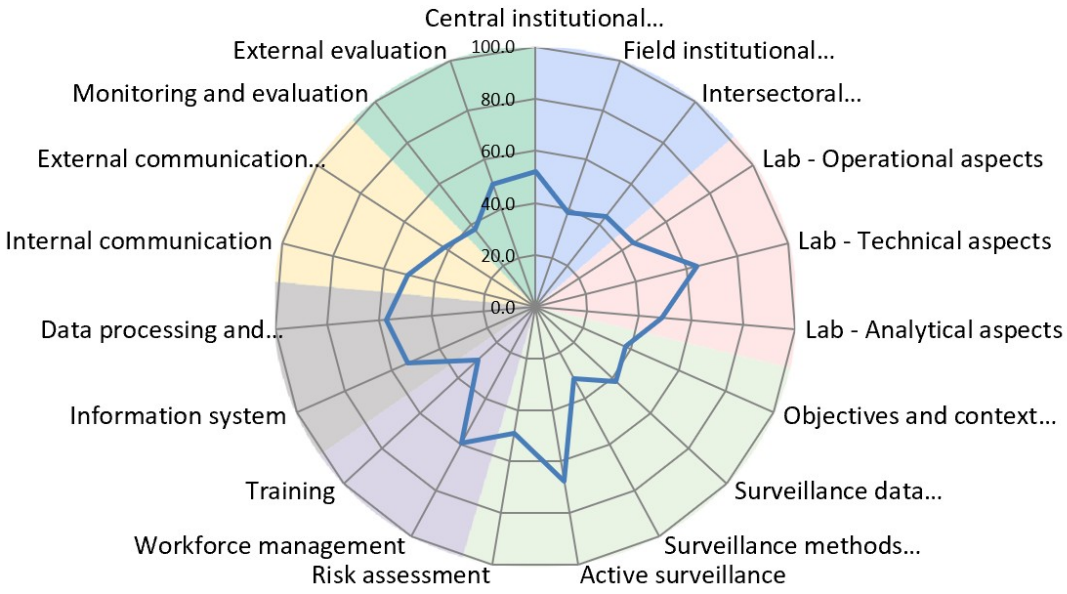


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Keywords: Surveillance evaluation, Evidence-based capacity-building, Translating evidence into policy.