Journal of
Dairy & Veterinary Sciences
ISSN: 2573-2196

Review Article
Volume 17 Issue 5 - July 2025
DOI: 10.19080/JDVS.2025.17.555973

Dairy and Vet Sci J

Surveillance Strategies for Emerging Zoonotic Diseases in South Asia

Jenish Adhikari[1], Pradeep Chaudhary[1*], Sohan Gupta[2] and Krishna Prasad Chaudhary[2]

[1]Bangladesh Agricultural University, Bangladesh

[2]Baruneshor Ma.Vi. molung-Ranpur,Okhaldhunga, Nepal

[2]Lumbini Integrated Development Orgazanization, Nepal

Submission: June 24, 2025, **Published:** July 08, 2025

***Corresponding author**: Pradeep Chaudhary, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh. Email: pradeep.vet7859@gmail.com

Abstract

South Asia, being a region with dense population, rapidly changing ecosystem and very close human and animal interaction, have increased the threat of zoonotic disease like never before. Zoonoses still progresses to challenge both public and animal health sectors, from diseases like rabies and brucellosis to emerging threats like Nipah and Avian Influenza. This review article deep dives into the current landscape of zoonoses surveillance status in South Asian countries, focusing the need for a dynamic, joint approach under the One Health framework. We have studied both traditional and modern innovative surveillance methods, which includes passive reporting, syndromic alerts, mobile-based technologies, and geospatial mapping tools etc. DHIS2, PREDICT, rabies control collaborations are some of the examples of commonly accepted cross-sectorial surveillance approaches, contributing in integrating animal, human, and environment health sectors under the One Health frameworks [1]. Studying the country-wise examples, this review points out vital gaps in cross sectorial coordination due to fragmented systems, manpower scarcity, and limited diagnostics infrastructures. Those gaps and the challenges still persist and limits the effective surveillance [2, 3]. For strengthening of such, structuring strong One Health coordination facilities, training veterinarians and community health workers and improving international Tripartite or Quadripartite support systems like., WHO, FAO, WOAH, UNEP is crucial [4]. Focusing in the real-world challenges and opportunities, this article sheds light on reactive outbreak responses to precision based, timely, anticipatory monitoring of zoonotic threats which will eventually safeguards both the animal and human health in these most vulnerable regions of Asia.

Keywords: Surveillance strategies; Zoonotic diseases; One health; Global Health; South Asia

Introduction

Zoonotic diseases arise from human interactions with animals, leading to the unintended transmission of pathogens between them. Zoonoses remain a significant cause of morbidity and mortality among human populations, having been a source of pandemics throughout human history [5]. The transmission of an infectious agent from an animal to a human being initiates a series of events that involve the entry, primary replication, dissemination to target organs, and establishment of infection within those organs [6]. There are over 250 zoonotic diseases that humans acquire directly or indirectly from a wide range of animal species. Out of all human infections, four-fifths are zoonotic infections that contribute to mortality and morbidity across all age groups and sexes [6]. The direct impact of zoonoses can be significant, resulting in illness, financial losses, adverse effects on personnel morale, negative publicity, and legal implications. Indirect effects stem from the risk of human infection, barriers to livestock trade, additional costs associated with control programs, and marketing produce to ensure its safety for human consumption, as well as the loss of market due to diminished consumer confidence [7]. There are three main categories of zoonoses: [a] endemic zoonoses, which are widespread and affect both humans and animals, such as Brucella and the rabies virus; [5], [b] epidemic zoonoses, which have sporadic temporal and spatial distributions, like the 2009 H1N1 influenza pandemic [6], emerging and re-emerging zoonoses, which have existed before but are now rapidly increasing in prevalence or range, such as MERS-CoV. [7].

Both the emerging and re-emerging zoonotic disease have become a major public health concern nowadays. In developing countries, especially in the South Asian region, nearly 40% [600 million people] are living in poverty and is also the hub for nearly all known zoonoses. The emergence of diseases like leishmaniasis, trypanosomiasis, Nipah virus, and SARS-CoV infections, as well as the resurgence of diseases like rabies, leptospirosis, anthrax, influenza, helminth, and fungal zoonoses, has created a serious public health consequence and socioeconomic impact in South Asian countries [8]. Over the past two decades, Southeast Asia has also seen several zoonotic diseases emerge, severely impacting the regional economy and causing significant loss of life among both animals and humans so it is considered a region to monitor for future emerging zoonotic diseases [9].

To alleviate the risk of zoonotic disease transmission among animals and humans, it's essential to understand the underlying causes and origins of these outbreaks by observing the previous trends of zoonoses outbreaks over time [10]. Surveillance strategies must be flexible and adaptable to emerging disease situations. Since zoonotic diseases can emerge before humans show symptoms, there's an opportunity to anticipate and prevent disease by implementing control measures [11]. Recent advances in artificial intelligence, remote sensing, environmental biosensors, and geospatial modeling have enabled more precise, real-time detection and mapping of zoonotic risk. These tools can help identify outbreaks earlier, pinpoint hotspots, and improve targeted interventions at the human-animal-environment interface. [12]

Types of Surveillance Strategies

Surveillance is an ongoing process in general, but in an epidemiological context, it is the systematic process that involves ongoing data collection, analysis, interpretation and explanation of the data regarding animal health to investigate emerging diseases [13]. The major types of surveillance strategies which has a crucial role in identifying the emerging diseases and protecting Animal and public health is mentioned below:

Active Surveillance

The term "active surveillance" describes surveillance operations that are purposefully designed and executed gather specific data. It is also called proactive and systemic method of disease surveillance [14]. This method, which is usually supervised by Veterinary Authorities and also enables data collecting to be customized to satisfy certain decision-making requirements. Active monitoring is frequently more expensive and time-consuming than passive techniques, but this type of surveillance offering greater control and relevance [15].

Zoonotic infections, those that can be spontaneously transmitted from animals to humans account for 60% of known infectious diseases and up to 75% of emerging infectious diseases [EIDs]. Some major importance of Active surveillance is it helps to provide early warning capabilities that are essential for early detection and response to zoonotic threats [16]. Active surveillance helps understand the intricate ecological relationships between animals, viruses, and humans that underlie illness emergence [16]. The key human-animal interfaces where spillover is most likely to happen should be the focus of surveillance [17].

Active surveillance targeted Field Investigations

High-risk interfaces include sampling at farms, live-animal marketplaces, and wildlife habitats where there is a high frequency of human-animal interaction. [18,19] Disease hotspots are areas where zoonotic risks are increased by urbanization, deforestation, or climate change [e.g., bat habitats for Ebola/Nipah viruses] [20].

Sampling Strategies for the Active surveillance

The pathogenic sample can be collected from wildlife Sampling like bats for corona viruses and rodents for hantaviruses additionally, primates for zoonotic retroviruses. [21] Livestock are also tested for anthrax in cattle and poultry for avian influenza [H5N1]. [22] There are also some vectors like mosquitoes which can be sampled by trapping for arbovirus, and tick can be sampled for Lyme disease. [23] Other sampling can be taken, like wastewater for the detection of SARS-COV-2, and also soil can be tested for the identification of pathogens like Bacillus anthracis [Anthrax] [24,25].

Passive surveillance

Passive surveillance is routinely and commonly conducted method. The primary goal of surveying the landscape for livestock diseases and identifying any status changes. These programs are typically partially visible or indirect, depending on farmer interviews and notifications. This is a crucial component of early warning. [26] Based on symptoms or test results, veterinarians, physicians notify public health or animal health authorities about cases of zoonotic diseases such as avian influenza, brucellosis, or rabies. [27]

For example, strengthening pandemic preparedness for early detection in Nepal is conducted in avian influenza bio-surveillance. [28]

Syndromic Surveillance

In order to identify outbreaks of emerging diseases faster than using traditional laboratory techniques, syndromic surveillance [SyS] is an early-warning system that trace pre-diagnostic health indicators such as symptoms, behavioral changes. [29] To make confirmation of disease before outbreak several kinds of data source can be used such as pharmacy sale, Livestock mortality, reproductive disorder, veterinary clinic report, climate data, vector report which may be signal of emerging disease. [34,36]. Therefore, major objective and core principle of syndromic surveillance is to detect and identify the unusual symptom or heath event in human and anmal. [33]

Evidence-Based Surveillance system

EBS is a proactive monitoring method that uses data sources that are unstructured and informal in nature to identify possible emerging zoonotic disease outbreaks before official confirmation. It enhances traditional indicator-based surveillance [IBS] by em-

How to cite this article: Jenish Adhikari, Pradeep Chaudhary, Sohan Gupta and Krishna Prasad Chaudhary. Surveillance Strategies for Emerging Zoonotic Diseases in South Asia. Dairy and Vet Sci J. 2025; 17(5): 555973. DOI:10.19080/JDVS.2025.17.555973

phasizing the rapidness and scope of detection, particularly in environments with limited resources. Therefore, this EBS system help to rapid detection of unusual symptom health events that may signal emerging zoonotic disease. [34]. For EBS data source are News media like local and international reports, social media such as trends and keyword search, community reports by veterinarians and informal former reports can be used for capture the emerging diseases. [35,36].

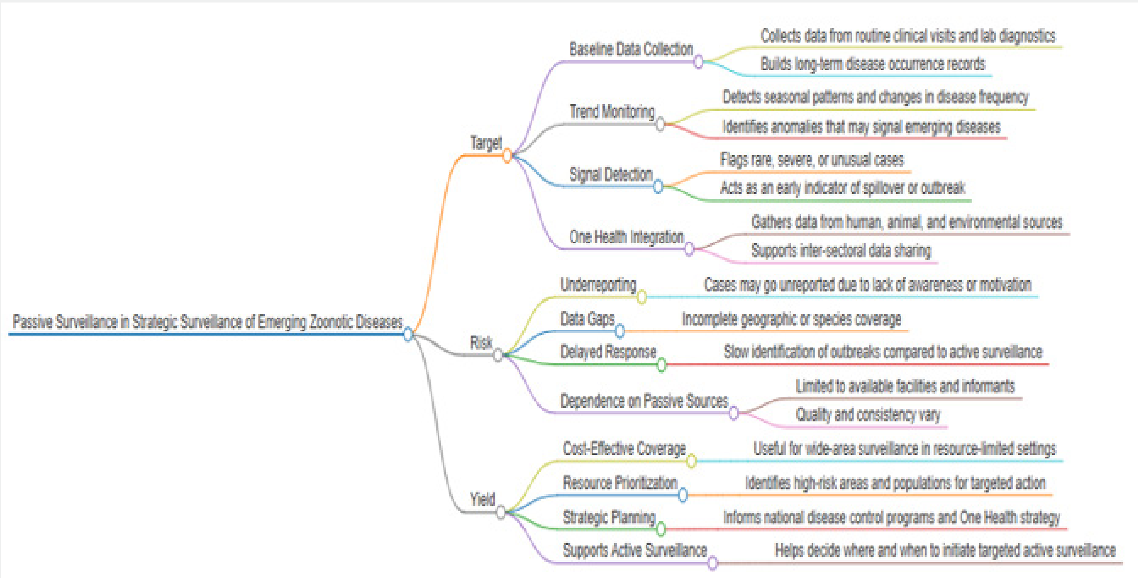

Figure 1: Passive Surveillance in Strategic of Emerging Zoonotic Diseases

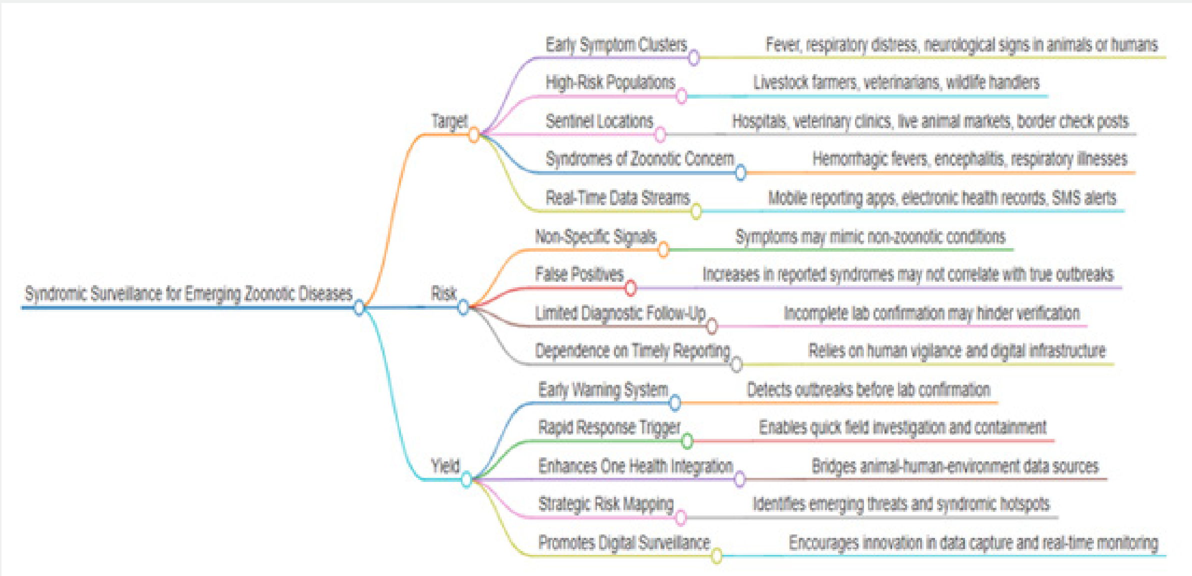

Figure 2: Syndromic Surveillance for Emerging Zoonotic Diseases.

Cross-Sectoral Surveillance [One Health Approach]

The One Health foundation specifically highlights that human, animal, and environmental health are deeply interconnected. Integrated surveillance ensures that emerging zoonoses are identified early, boosting prevention and control strategies [37]. There are digital platforms that support animal health alongside human health data. For example, Tanzania and Indonesia use DHIS2 to collect and analyze community-level reports on animal and human health, improving the early warning of [38].

How to cite this article: Jenish Adhikari, Pradeep Chaudhary, Sohan Gupta and Krishna Prasad Chaudhary. Surveillance Strategies for Emerging Zoonotic Diseases in South Asia. Dairy and Vet Sci J. 2025; 17(5): 555973. DOI: 10.19080/JDVS.2025.17.555973

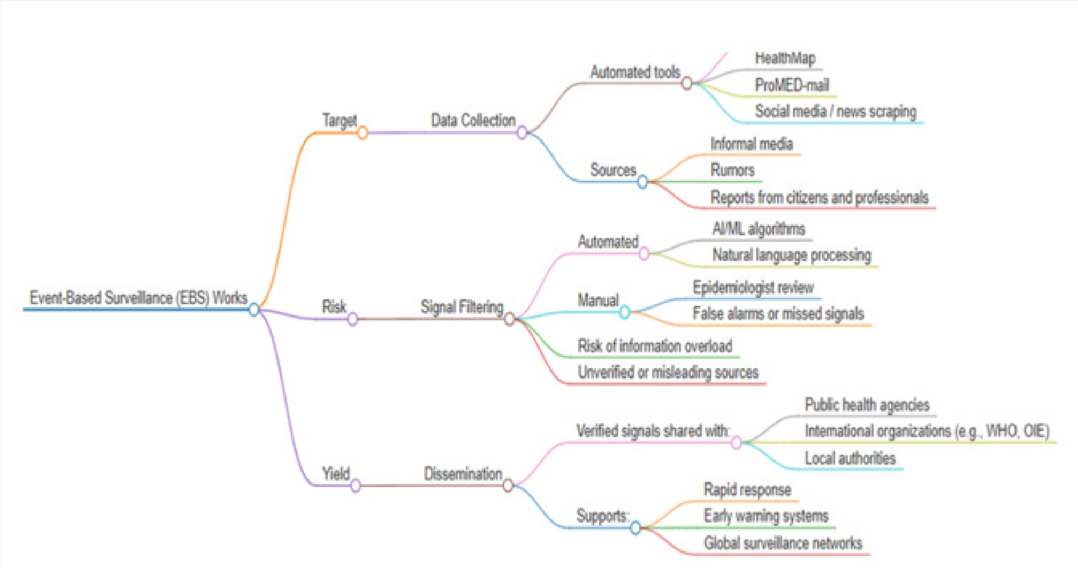

Figure 3: Event-Based Surveillance (EBS) Works.

Effective One Health systems rely on robust data-sharing across ministries [Health, Livestock, Environment]. Bangladesh has established a One Health Secretariat that integrates events-based surveillance and visual dashboards, enabling real-time, multi-sectoral data exchange [37]. Programs like CDC's PREDICT promotes sharing of laboratory and outbreak data among our integrated ecosystems, leading to coordinated informations and formal national One Health platforms, as in Rwanda [1]. Programs like Mission Rabies and the Global Alliance for Rabies Control exemplify One Health approaches by coordinating vaccination campaigns, community education, and joint surveillance across sectors [39]. Utilizing the SARE framework to coordinate sector plans, the WHO National Bridging Workshop for Rabies [NBW-R] has been carried out in Ghana and Bali to identify and improve collaboration barriers across ecological, animal, and human health [40].

These given examples confirms that cross-sectoral surveillance promotes identification and response to zoonotic threats, outbreak preparedness, and supports vaccination and awareness among the netizens.

Country-wise Snapshots

The country wise surveillance status of zoonotic disease in discussed below where Nepal, India and Bangladesh is described more on the availability of data and the later are detailed in the table given below.

Brucellosis Surveillance & Reporting in Nepal

Brucellosis is endemic in Nepal most commonly occurs in Bovine and caprine species but the sufficient scale of surveillance is not yet conducted it is only seen that few farms only perofom testing of Brucellosis. [41]. A sero-survey which carried out in hitwan around 2015-2016 by using RBPT and ELISA, revealed 11% prevalence in cattle, which signals the need for mass screening, farmer education, and immunization initiatives [42]. Government measure is obstructed by a lack of funding, insufficient laboratory equipment and tools and cultural barriers including bans on the killing of cattle [41].

Antimicrobial Resistance [AMR] Surveillance in Nepal

In spite of growing awareness of AMR, Nepal does not have a unified national system for monitoring the disease in both humans and animals. Although integration is still insufficient, ongoing hospital-led and university-based programs seek to track trends of vulnerability, especially in zoonotic infections.

Integrated Disease Surveillance Program [IDSP] in India

This program started in 2004 with the support of World Bank and now under the National Health Mission. It comprises a central unit [NCDC], state and district units across nearly all districts, collecting weekly syndromic ['S'], probable ['P'], and lab-confirmed ['L'] data [43]. Media-scanning and verification cells detect unusual events; Rapid Response Teams investigate spikes [43]. Veterinarians integrated into RRTs for zoonotic disease cooperation across sectors. Working with ICAR institutes such as IVRI and NIVEDI increases lab capacity for zoonotic illnesses such glanders, JE, anthrax, and leptospirosis. [44]. Regional reporting often oriented with ProMED for global situational awareness [45].

GHSA-Supported Zoonotic Surveillance Bangladesh

GHSA is a hospital-based surveillance system which was started in 2013-2017 and screened over 11,400 inpatients for zoonotic exposure, among them 2% reported related with animals, that has 16% mortality in those cases. Notably, 88% remained etiologically undiagnosed. [46]. GHSA and CDC this system incorporates and

How to cite this article: Jenish Adhikari, Pradeep Chaudhary, Sohan Gupta and Krishna Prasad Chaudhary. Surveillance Strategies for Emerging Zoonotic Diseases in South Asia. Dairy and Vet Sci J. 2025; 17(5): 555973. DOI:10.19080/JDVS.2025.17.555973

structured exposure screening, diagnostic testing, and integrates data-sharing between human health, livestock, and wildlife agencies which reflects One Health principles. Challenges include limited diagnostic capacity, lack of wildlife surveillance, and the need for expanding laboratory networks.

The country wise snap shot of all South Asian nations are summarized below in the table.

Table

Country	Key One Health Initiatives	Priority Zoonoses	Reference Link
Bangladesh	One Health Secretariat coordinating IEDCR & DLS; surveillance for Nipah, anthrax, rabies	Nipah, anthrax, rabies, avian flu	[47]
India	Integrated Disease Surveillance Programme (IDSP); syndromic & lab-based reporting	JE, leptospirosis, rabies, H1N1	[48]
Nepal	DLS veterinary labs & FAO-supported projects; joint training workshops	Brucellosis, PPR, FMD	[49]
Pakistan	Field Epidemiology & Laboratory Training Program (FELTP); WHO-assisted surveillance	CCHF, brucellosis, rabies	[50]
Sri Lanka	National Rabies Control Program & wildlife health surveillance	Rabies, TB, leptospirosis	[51]
Bhutan	One Health Zoonotic Disease Prioritization (OHZDP); joint risk assessment	Rabies, anthrax, leptospirosis	[52]
Afghanistan	NGO-Ministry campaigns; One Health rabies prevention with CDC support	Rabies, brucellosis, CCHF	[53]
Maldives	HPA-led surveillance for zoonotic influenza and waterborne diseases	H1N1, dengue (vector zoonoses)	[54]

Technological Tools in Surveillance

Mobile-Based Reporting Tools

In India, Vet Helpline is commonly used, and other similar mobiles apps are used for the real-time reporting of animal health incidents. These solutions have significantly raised reporting rates in other situations. For instance, Kenya's smartphone app enabled offline data gathering with automatic syncing and increased disease reports in distant locations. [55] [56]. Animal, human, and environmental data are all integrated into DHIS2 platforms, which are broadly used throughout South Asia. It offers hospital and field-based zoonotic disease surveillance modules in nations like Bangladesh and Nepal. [57]

GIS & Remote Sensing for Outbreak Mapping

Planning buffer zones around outbreak areas, identifying hotspots, and visualizing disease spreading are all made possible by GIS tools. In veterinary epidemiology, to control Rift Valley fever, foot-and-mouth disease, and other illnesses these instruments are used. [58]. For dengue surveillance in India GIS and remote sensing have been used, helping to map flood zones and breeding grounds and fuel AI-driven prediction tools like PRISM H. [59]. When GIS combined with applications like SaTScan, which identify temporal and spatial clusters of zoonotic illnesses, supports implementable outbreak notifications. [60].

Diagnostic Labs & Early Detection Systems

As of 2019, there were 105 labs in India's three-tiered network of Viral Research & Diagnostic Laboratories [VRDL], which offer lab-confirmed diagnoses for newly emerging viral zoonoses. [1]. Nepal's SPEED project [FAO–Pandemic Fund] that is implemented to strengthening animal health lab systems, training technicians, and upgrade infrastructure for quick zoonotic detection [16]. PCR-grade detection is now available at remote locations by field-portable molecular diagnostics tool such as Truenat TM, which was authorized for COVID-19 and in Bangladesh it is currently used for Tuberculosis scaling. These tools increase disease identification rates from about 65% to almost 95% and decrease diagnosis time [61].

Challenges in South Asia

South Asia is the hotspot of the many zoonotic disease's emergence due to high population density and close interaction with human and animal. Large portion of human pathogens about 60% are zoonotic and more than 800 pathogens have been identified till the date which causes zoonosis. There are several diseases, Avian influenza and coronavirus are the just few of them so there are significant challenges in South Asia for surveillance of emerging zoonotic diseases. [62]

The major challenges are listed below:

- Weak intersectoral collaboration between Human, animal, and environmental health sectors hindering integrated surveillance. For example, Bangladesh and Nepal lack formalized data-sharing mechanisms between veterinary and public health agencies. [63]
- Limited policy integration of Some nations, like Thailand, rely on ad hoc epidemic responses, while others have national One Health frameworks. [64]
- Resource and infrastructure gap also cause Diagnostic limitations Due to insufficient lab capacity, particularly for ge-

How to cite this article: Jenish Adhikari, Pradeep Chaudhary, Sohan Gupta and Krishna Prasad Chaudhary. Surveillance Strategies for Emerging Zoonotic Diseases in South Asia. Dairy and Vet Sci J. 2025; 17(5): 555973. DOI: 10.19080/JDVS.2025.17.555973

nomic sequencing, about more than 50% of zoonotic outbreaks in South Asia are confirmed retrospectively. Additionally, Surveillance work depends on an external funding source, which also create gap for surveillance. [65]

- Data and reporting issues, like underreporting and poor data integration, delay or suppress the reporting system in Asian countries. [66]

- Low awareness and cultural practices like consumption of wild animal enhance the outbreaks of zoonotic diseases and also create some barrier for the reporting, which consequences in delay reporting. [67,68]

Recommendations & Way Forward

Strengthening One Health Coordination Platforms

Establish national One Health organizing committees that include the ecology, livestock, biodiversity, and medical ministries. Encourage this through common management frameworks, plans for action, and frequent collaboration sessions [69]. Use of resources, like National Bridging Training and Collaborative Assessments of Risk, to help with cross-sectoral, the highest risk analysis and preparation, that make possibility of Implementation and customization of the One Health Collaborative Course of Action [2022–26] [70].

Capacity Building for Veterinarians & Community Health Workers

Implement field epidemiology training programs based on core competencies [surveillance, outbreak response, One Health communication], as defined by FAO-led working groups [71]. Enhance diagnostic and public health skills at district and community levels via sustained training for veterinarians and health workers, supported by both international agencies and national programs [72].

International Collaboration [WHO, FAO, OIE, UNEP Tripartite/Quadripartite]

Strong collaborations with organizations like WHO-FAO-WOAH-UNEP for tripartite or quadripartite relationships to acquire funding opportunities for zoonotic surveillance, gather technical information's and tools and to access the shared framework [73]. Participation in programs like, Asia Pacific Quadripartite workshops and GF-TADs coordination networks, to open gates for cross-border disease intelligence sharing, vaccine strategies, and coordinated control of transboundary threats [74].

Conclusion

The dense human population, close human interactions and ecological disturbances poses persistent and increasing threat to livelihoods and makes the region hotspot for occurrence and emergence of diseases in South Asian countries. Due to this, the need for integrated, collaborated, cross-sectorial zoonotic surveillance is very much critical. The best protection against potential outbreaks is a strong monitoring system that is based on the One Health model and is bolstered by data-sharing systems, empowering community health worker, and coordinated interministerial plans. On the other hand, advances in technology like compact diagnosis, GIS-based outbreak mapping, and mobile reports can significantly improve early warning and quick reaction functions.

Rapid response needs to be subordinated to readiness and control. Risks can be reduced when they become epidemics by making investments in frontline capability, experimental systems, collaborative assessments of risk, and community-level education. Accessibility to international expertise, funds, and standardized frameworks is ensured by fortifying relationships with global collaborators like WHO, FAO, WOAH, and UNEP.

In conclusion, South Asia must shift from fragmented and reactive disease control to anticipatory, integrated, and sustainable zoonotic surveillance systems for the health of its people, animals, and ecosystems.

References

1. Kelly TR, Machalaba C, Karesh WB, Crook PZ, Gilardi K, Nziza J, et al. (2020) Implementing One Health approaches to confront emerging and re-emerging zoonotic disease threats: lessons from PREDICT. One Health Outlook 2(1):1.
2. (2025) IISER Pune team develops 20-min Covid, Zika test that doesn't need lab for results | Pune News - Times of India [Internet].
3. Ishra R, Md Haque A (2024) One Health: Status, opportunities and challenges in Bangladesh. One Health Bull 4(4):139.
4. One health SEARO (2025) [Internet]. [cited 2025 Jun 20].
5. Ghasemzadeh I, Namazi S (2025) Review of bacterial and viral zoonotic infections transmitted by dogs. J Med Life 8(4):1-5.
6. Al-Omari A, Rabaan AA, Salih S, Al-Tawfiq JA, Memish ZA (2019) MERS coronavirus outbreak: Implications for emerging viral infections. Diagn Microbiol Infect Dis 93(3):265-85.
7. CDC (2019) Centers for Disease Control and Prevention. 2009 H1N1 Flu Pandemic Timeline.
8. Tennakoon Tmah., Wijesundera Kk (2023) Emerging and Re-emerging Zoonoses in South Asia. In: One Health [Internet]. John Wiley & Sons, Ltd p. 273-285.
9. Gilbert N (2012) Cost of human-animal disease greatest for world's poor. Nature [Internet].
10. Sharan M, Vijay D, Yadav JP, Bedi JS, Dhaka P (2023) Surveillance and response strategies for zoonotic diseases: a comprehensive review. Sci One Health.
11. Burroughs T, Knobler S, Lederberg J (2022) Surveillance and Management of Zoonotic Disease Outbreaks. In: The Emergence of Zoonotic Diseases: Understanding the Impact on Animal and Human Health: Workshop Summary [Internet]. National Academies Press (US)
12. Frontiers | Precision Surveillance of Zoonotic Diseases: Innovations in Early Detection and Mapping [Internet].
13. Lee S (2025) Surveillance in Veterinary Epidemiology [Internet].
14. WHO strategy for collecting safety data in public health programmes: complementing spontaneous reporting systems [Internet].

How to cite this article: Jenish Adhikari, Pradeep Chaudhary, Sohan Gupta and Krishna Prasad Chaudhary. Surveillance Strategies for Emerging Zoonotic Diseases in South Asia. Dairy and Vet Sci J. 2025; 17(5): 555973. DOI:10.19080/JDVS.2025.17.555973

15. surveillane and epidemology (2018) paris, france: world organization for animal health.

16. Sharan M, Vijay D, Yadav JP, Bedi JS, Dhaka P (2023) Surveillance and response strategies for zoonotic diseases: a comprehensive review. Sci One Health 2:100050.

17. Capacity building efforts and perceptions for wildlife surveillance to detect zoonotic pathogens: comparing stakeholder perspectives | BMC Public Health.

18. Achieving an Effective Zoonotic Disease Surveillance System - Sustaining Global Surveillance and Response to Emerging Zoonotic Diseases - NCBI Bookshelf [Internet].

19. Levinson J, Bogich TL, Olival KJ, Epstein JH, Johnson CK, Karesh W, et al. (2013) Targeting Surveillance for Zoonotic Virus Discovery. Emerg Infect Dis 19(5):743.

20. Leifels M, Khalilur Rahman O, Sam IC, Cheng D, Chua FJD, Nainani D, et al. (2023) The one health perspective to improve environmental surveillance of zoonotic viruses: lessons from COVID-19 and outlook beyond. ISME Commun 2(1):107.

21. Levinson J, Bogich TL, Olival KJ, Epstein JH, Johnson CK, Karesh W, et al. Targeting Surveillance for Zoonotic Virus Discovery. Emerg Infect Dis. 2013 May;19(5):743–7.

22. Sougrenoma Désiré Nana, Jean-Hugues Caffin, Raphaël Duboz, Nicolas Antoine-Moussiaux, Aurélie Binot, et al. (2025) Towards an integrated surveillance of zoonotic diseases in Burkina Faso: the case of anthrax. BMC Public Health

23. Mary JR, Gilchrist (2025) Surveillance and Management of Zoonotic Disease Outbreaks - The Emergence of Zoonotic Diseases - NCBI Bookshelf

24. Nana SD, Caffin JH, Duboz R, Antoine-Moussiaux N, Binot A, Diagbouga PS, (2022) et al. Towards an integrated surveillance of zoonotic diseases in Burkina Faso: the case of anthrax. BMC Public Health. 22(1):1535.

25. (2025) The one health perspective to improve environmental surveillance of zoonotic viruses: lessons from COVID-19 and outlook beyond | ISME Communications.

26. (2025) Manual on Livestock Disease Surveillance snd Information Systems.

27. (2025) AAHA.

28. (2025) One Health.

29. Sharan M, Vijay D, Yadav JP, Bedi JS, Dhaka P (2023) Surveillance and response strategies for zoonotic diseases: a comprehensive review. Sci One Health.

30. Abat C, Chaudet H, Rolain JM, Colson P, Raoult D (2016) Traditional and syndromic surveillance of infectious diseases and pathogens. Int J Infect Dis 48:22-28.

31. De Nardi M, Küker S, Salah S, Qtananni I, Rosso F, Baiomy S (2025) Animal health syndromic surveillance system in Jordan, a road map for a pilot model. Front Vet Sci.

32. Wang CX, Xiu LS, Hu QQ, Lee TC, Liu J, Shi L, et al. (2023) Advancing early warning and surveillance for zoonotic diseases under climate change: Interdisciplinary systematic perspectives. Adv Clim Change Res. 14(6): 814-826.

33. Shapiro JT, Cazeau G, DiBiagio R, Dupuy C, Morignat E, Dórea F, et al. (2025) Current practice and future directions in syndromic surveillance for animal health: A scoping review and analysis. Prev Vet Med.

34. Norzin T, Ghiasbeglou H, Patricio M, Romanova S, Zaghlool A, Tanguay F, et al. Event-based surveillance: Providing early warning for communicable disease threats. Can Commun Dis Rep. 49(2–3):29-34.

35. (2025) Digital Biosurveillance for Zoonotic Disease Detection in Kenya.

36. Tahoun MM, Sahak MN, Habibi M, Ahadi MJ, Rasoly B, Shivji S, et al (2024) Strengthening event-based surveillance (EBS): a case study from Afghanistan. Confl Health 18(1):39.

37. (2025) iedcr. OneHealth Event Based Surveillance (EBS)

38. (2025) One Health [Internet]. DHIS2.

39. (2025) Mission Rabies. In: Wikipedia.

40. (2025) WHO pilots workshop to increase One Health collaboration for rabies control.

41. (2025) Review of Brucellosis in Nepal.

42. (2025) Sero-Surveillance of Brucellosis in Cattle of Chitwan District, Nepal. International Journal of Applied Sciences and Biotechnology.

43. (2024) Integrated Disease Surveillance Programme. In: Wikipedia.

44. Chethan Kumar HB, Hiremath J, Yogisharadhya R, Balamurugan V, Jacob SS, Manjunatha Reddy GB, et al. (2021) Animal disease surveillance: Its importance & present status in India. Indian J Med Res.153(3):299.

45. Dinesh AS, Mathur V, Ansil BR, Chandru V, Chellam R, Vanak AT, et al. (2020) Health Heatmap of India: An Open Data Platform. J Indian Inst Sci 100(4):701–16.

46. Das P, Sazzad HMS, Aleem MA, Rahman MZ, Rahman M, Anthony SJ, et al. (2019) Hospital-based zoonotic disease surveillance in Bangladesh: design, field data and difficulties. Philos Trans R Soc B Biol Sci 374(1782):20190019.

47. (2025) Knowledge Repository Home.

48. Information Technology: Integrated Disease Surveillance Programme(IDSP).

49. (2025) One Health

50. (2025) TEPHINET. Pakistan Field Epidemiology and Laboratory Training Program.

51. (2025) WHO Sri Lanka | World Health Organization.

52. (2025) Tripartite supported National Workshops on One Health Zoonotic Diseases Prioritization and Joint Risk Assessment under Pandemic Fund in Bhutan.

53. (2025) Outbreak-Situation-Report-Week-6-12-august-2023.pdf

54. (2025) HPA Maldives.

55. Goel V, Mathew S, Gudi N, Jacob A, John O. A scoping review on laboratory surveillance in the WHO Southeast Asia Region: Past, present and the future. J Glob Health. 13:04028.

56. Njenga MK, Kemunto N, Kahariri S, Holmstrom L, Oyas H, Biggers K, et al. (2021) High real-time reporting of domestic and wild animal diseases following rollout of mobile phone reporting system in Kenya. PLoS ONE. 16(9): e0244119.

57. (2025) One Health. DHIS2.

58. Dhama K, Verma AK (2013) A Perspective on Applications of Geographical Information System (GIS): an Advanced Tracking Tool for Disease Surveillance and Monitoring in Veterinary Epidemiology. 2: 14-24.

59. Standard B. GIS, remote sensing key to battling vector-borne diseases, say experts.

60. (2024) SaTScan. In: Wikipedia.

61. (2025) Viral Research and Diagnostic Laboratories. In: Wikipedia.

How to cite this article: Jenish Adhikari, Pradeep Chaudhary, Sohan Gupta and Krishna Prasad Chaudhary. Surveillance Strategies for Emerging Zoonotic Diseases in South Asia. Dairy and Vet Sci J. 2025; 17(5): 555973. DOI: 10.19080/JDVS.2025.17.555973

62. (2025) One Health. Highlights detail.

63. (2023) Truenat. In: Wikipedia.

64. Bhatia R, Narain JP (2010) The Challenge of Emerging Zoonoses in Asia Pacific. Asia Pac J Public Health 22(4): 388-394.

65. Halton K, Sarna M, Barnett A, Leonardo L, Graves N (2013) A systematic review of community-based interventions for emerging zoonotic infectious diseases in Southeast Asia. Jbi Database Syst Rev Implement Rep 11(2):1-235.

66. Saba Villarroel PM, Gumpangseth N, Songhong T, Yainoy S, Monteil A, Leaungwutiwong P, et al. (2023) Emerging and re-emerging zoonotic viral diseases in Southeast Asia: One Health challenge. Front Public Health.

67. Getchell M, Wulandari S, de Alwis R, Agoramurthy S, Khoo YK, Mak TM, et al. Pathogen genomic surveillance status among lower resource settings in Asia. Nat Microbiol. 9(10):2738-2747.

68. (2025) Surveillance and response strategies for zoonotic diseases: a comprehensive review – ScienceDirect.

69. Uncovering the risks of wild animal diseases in Southeast Asia. CGIAR.

70. (2025) Asia Pacific Quadripartite One Health Workshop.

71. (2025) Strengthening joint risk assessment using the One Health approach in South-East Asia.

72. (2025) Development of core competencies for field veterinary epidemiology training programs. Frontiers.

73. Multi-country initiative launched to strengthen pandemic preparedness.

74. Zhou XN, Guo X, Zhang X (2025) Findings and Recommendations. In: Zhou XN, Guo X, Zhang X, editors. Global One Health Index Report 2022. Singapore: Springer Nature p: 137-144.

75. (2025) 1st South Asia TADs Coordination Meeting - WOAH – Asia.

DOI:10.19080/JDVS.2025.17.555973

 How to cite this article: Jenish Adhikari, Pradeep Chaudhary, Sohan Gupta and Krishna Prasad Chaudhary. Surveillance Strategies for Emerging Zoonotic Diseases in South Asia. Dairy and Vet Sci J. 2025; 17(5): 555973. DOI:10.19080/JDVS.2025.17.555973