

ASSESSMENT

After-action review of leptospirosis outbreak response in Latvia in 2025

August 2026

Key findings

- Multisectoral operational collaboration mechanisms should be strengthened in Latvia to ensure clear information flows, well-defined roles and responsibilities, and consistently applied procedures during leptospirosis preparedness and response activities. Establishing structured coordination platforms – supported by harmonised protocols and shared data systems – would significantly reinforce national capacity to detect, jointly assess, and respond to future outbreaks through a One Health approach.
- Systematic involvement of environmental institutions would be beneficial, given the influence of environmental conditions on leptospirosis transmission. For example, mechanisms can be established to support sharing of relevant information on climate patterns and weather to support effective surveillance, prevention, risk assessment and response planning.

Introduction

From September to December 2025, Latvia experienced an acute outbreak of leptospirosis following an exceptionally wet summer. During this period, 69 confirmed cases were reported, a 20-fold increase compared with the annual mean of three cases reported between 2020 and 2024.

In late 2025, the Latvian Centre for Disease Prevention and Control (CDPC) made a request to the European Centre for Disease Prevention and Control to design and facilitate an after-action review of the outbreak response. Through the European Union Health Task Force, ECDC supported Latvian national experts and stakeholders to implement the after-action review. ECDC experts led the methodological approach and served as the primary facilitators of the action review workshop, supported by two leptospirosis experts¹ from the EU Health Task Force's External Expert Pool.

The after-action review workshop took place in Riga, Latvia on 19 and 20 March 2026. It focused on three response areas: i) national surveillance systems, ii) cross-sectoral collaboration and communication, and iii) the One Health approach. The overarching and area-specific findings, together with related recommendations, are presented in this report.

¹ The two external experts were from Austria and France.

The recommendations identified in this after-action review should be incorporated into an action plan, either through developing a new plan or by making additions to any relevant existing plans (e.g. a national action plan for health security). Such plans should also address recommendations from other lesson learned activities and assessments, such as those resulting from the national Public Health Emergency Preparedness Assessment conducted by ECDC in 2025.²

Scope and objectives of the after-action review

The after-action review focused on assessing key technical areas of outbreak response following a leptospirosis outbreak in Latvia. The period under review was the acute phase of the outbreak from September to December 2025. In particular, the performance of the existing national surveillance system was reviewed, with a focus on early detection and response, cross-sectoral communication and collaboration, and the implementation of a One Health approach.

The after-action review provided an opportunity for the stakeholders who had been involved to share experiences and jointly analyse the multisectoral response. The review's main objectives were to:

- Identify challenges, instances of good practice, gaps and opportunities to strengthen early detection and response within the national surveillance system;
- Assess collaboration across sectors; and
- Develop actionable recommendations to enhance surveillance, response and multisectoral coordination under the One Health framework.

Outbreak context

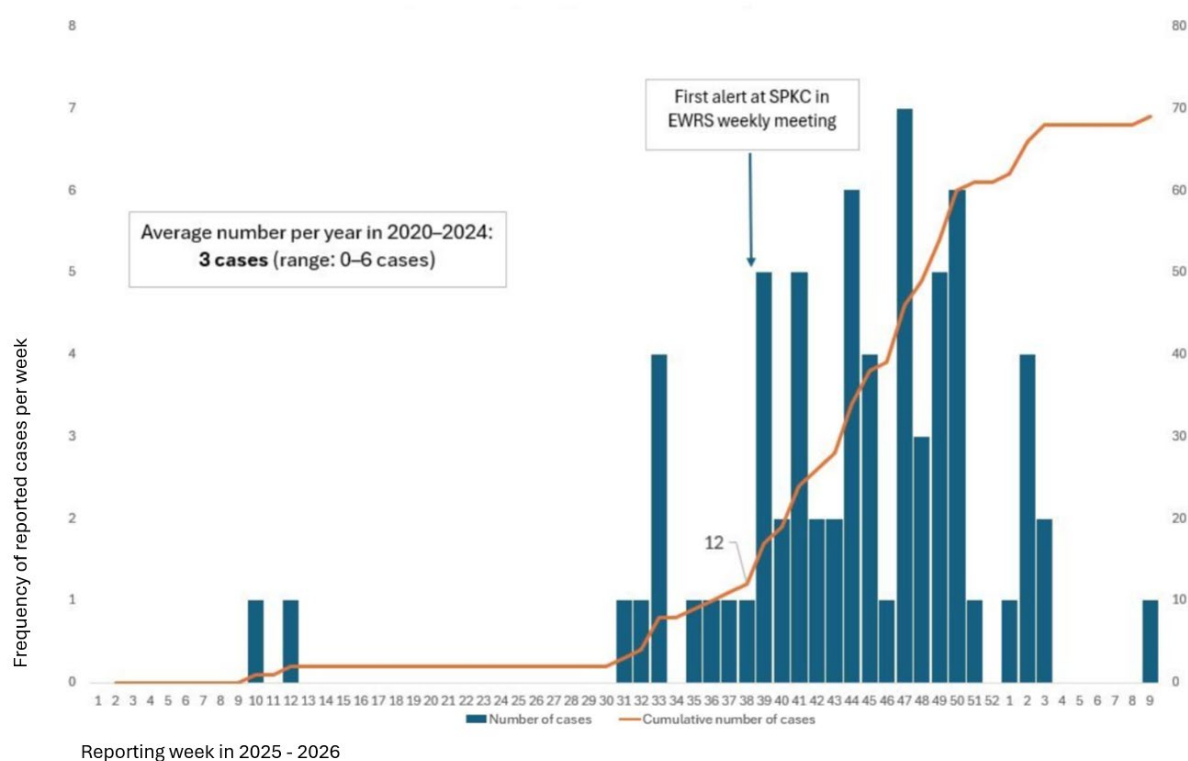
The leptospirosis outbreak in Latvia occurred following an exceptionally wet summer. Severe flooding between May and June led to prolonged waterlogging, which resulted in substantial agricultural losses and disruption of land use. These environmental conditions likely facilitated the survival of *Leptospira* in the environment and increased transmission within the small mammal reservoir, which ultimately led to an elevated likelihood of exposure for human and domesticated animal populations.

In 2025, CDPC reported 69 confirmed human leptospirosis cases, a 20-fold increase compared with the annual mean of three cases reported between 2020 and 2024 (Figures 1 and 2). Latvia uses the European Union (EU) case definition for leptospirosis³, which relies on laboratory confirmation through PCR, culture or a diagnostic MAT titre.

Of the 69 confirmed cases, 38 were reported in men. Cases in adults under 70 years old occurred mostly in men, while cases in adults above 70 years old occurred mostly in women. Cases were identified across several administrative territories, extending beyond historically endemic areas such as Zemgale, with a predominance in lowland regions of Latvia, particularly in and around the capital Riga (Figure 3).

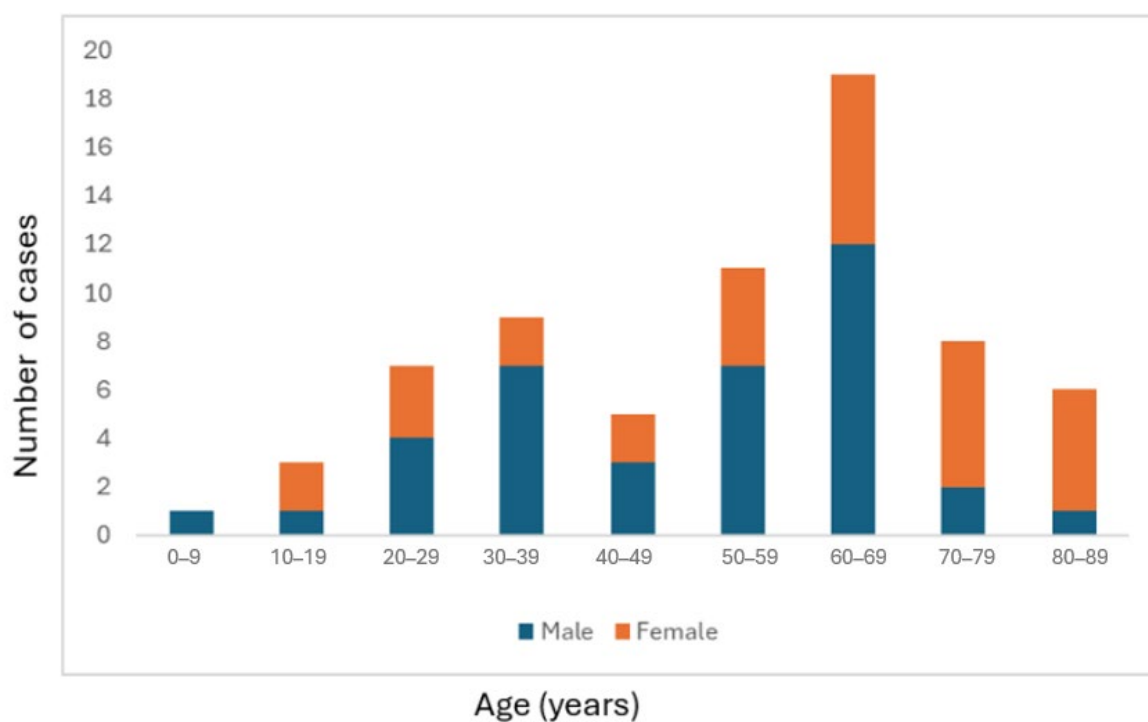
² European Centre for Disease Prevention and Control. Country report: ECDC Public Health Emergency Preparedness Assessment for Latvia, 2025. Stockholm: ECDC; 2025. Available at: <https://www.ecdc.europa.eu/en/publications-data/country-report-ecdc-public-health-emergency-preparedness-assessment-latvia-2025>

³ Commission Implementing Decision (EU) 2018/945 of 22 June 2018 on the communicable diseases and related special health issues to be covered by epidemiological surveillance as well as relevant case definition (https://eur-lex.europa.eu/eli/dec_impl/2018/945/oj/eng).

Figure 1. Number of human leptospirosis cases reported in Latvia, by week, 2025 and 2026 (N=69)

Source: Latvian Centre for Disease Prevention and Control (CDPC)

EWRS: Emergency Warning and Response System; SPKC: Centre for Disease Prevention and Control (in Latvian).

Figure 2. Age and sex distribution of human leptospirosis cases in Latvia, 2025 and 2026 (N=69)

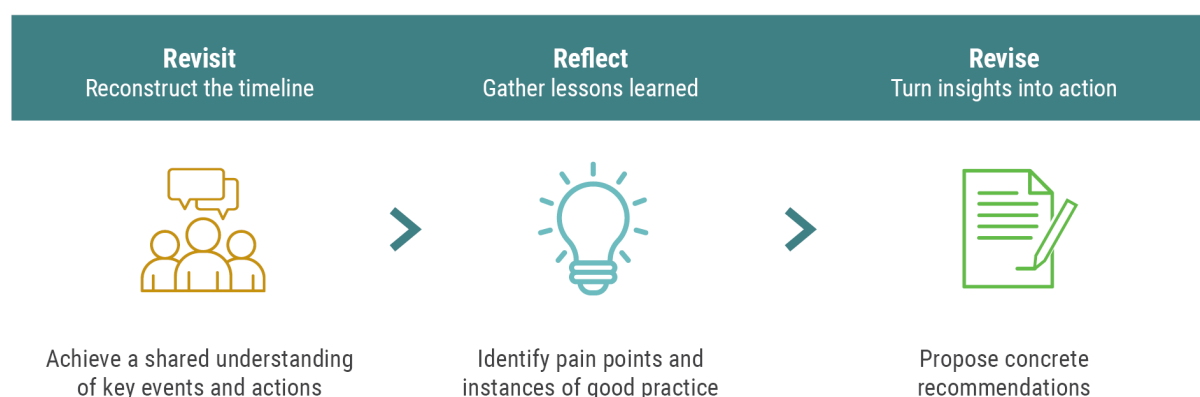
Source: Latvian Centre for Disease Prevention and Control (CDPC)

Figure 3. Geographical distribution of human leptospirosis cases in Latvia in 2025 and 2026

Source: Latvian Centre for Disease Prevention and Control (CDPC)

2 Methods

The after-action review was conducted using the process described in the ECDC [‘Guide for designing and conducting in-action and after-action reviews, 2026’](#)⁴. The action review workshop followed the structured and participatory methodology described in the guide (Figure 1).

Figure 1. Overview of the ECDC methodology for conducting action review workshops

Source: ECDC

As per the methodology, the workshop was organised into three phases, each comprising specific steps:

- **Revisit** – Reconstruct the timeline of the response (events and actions);
- **Reflect**– Identify pain points (challenges) and instances of good practices, then prioritise and analyse pain points;
- **Revise** – Develop actionable recommendations.

⁴ European Centre for Disease Prevention and Control (ECDC). Guide for designing and conducting in-action and after-action reviews. Stockholm: ECDC; 2026. Available at: <https://www.ecdc.europa.eu/en/publications-data/guide-designing-and-conducting-action-and-after-action-reviews>

To ensure participants had a shared understanding of leptospirosis and the outbreak context, the workshop began with three introductory presentations that covered laboratory and surveillance aspects of leptospirosis, the One Health Framework, and an overview of the outbreak under review.

More detailed information on the results of the workshop exercises can also be found in Annex 1. Further details of the after-action review agenda and design can be found in Annexes 2 and 3.

3 Findings

During Phase 1 of the after-action review workshop (Revisit), a timeline of the response was reconstructed to achieve a shared understanding of key events and actions during the leptospirosis outbreak in Latvia (Figure 1A, Annex 1).

Phase 2 of the workshop (Reflect) gathered the lessons learned by identifying pain points (referred to herein as 'challenges') and instances of good practice (Figure 2A, Annex 1).

The pain points that were identified were then grouped into four main areas:

- Laboratory testing and logistics;
- Surveillance, threat detection, risk assessment;
- Intersectoral data availability and sharing;
- Intersectoral collaboration and communication.

Participants were asked to vote on the most critical pain points (i.e. those that, if addressed, would have the highest impact during future responses). These are italicised and annotated with an asterisk (*) in the following sections.

Laboratory testing and logistics

The acute phase of the leptospirosis outbreak was a critical period, when laboratory testing and logistics were stretched to cope with a rapid increase in human cases and evolving operational demands. The system faced challenges related to sample collection and transportation of samples, as well as limitations in laboratory capacity and coordination.

Key challenges

Key challenges relating to the laboratory testing and logistics in Latvia included:

- *Challenges in laboratory logistics for human sample collection and processing, especially in relation to testing at the primary healthcare level*.*
- *Information on circulating strains at the national level was incomplete, which affected the ability to conduct molecular epidemiology*.*
- *Limited knowledge of leptospirosis among general practitioners, including indication for laboratory testing, appropriate clinical samples and laboratory testing procedures*.*
- Leptospirosis laboratory testing costs for pet animals are conducted by private veterinarians and are not covered by the state budget, resulting in a likely under-reporting of suspected or confirmed cases of leptospirosis in pets.

Good practice

The current system demonstrates several key strengths in Latvia.

Serology testing and serogroup identification via [Microscopic Agglutination Test \(MAT\)](#) are an important component of laboratory-supported surveillance, contributing to a better understanding of the local epidemiology of the disease. However, serogroup identification by MAT is challenging and not always accurate. Going forwards, the identification of strains should be based on culture isolation or genotyping, which would require the implementation of new testing methodologies, to be covered under state financing. Support from commercial laboratories also enhanced overall testing capacity and provided flexibility during the period of high demand. These elements provide a strong foundation for further strengthening of laboratory coordination, logistics and diagnostic capabilities. Improving clinical recognition and early laboratory testing and diagnosis would also be beneficial to support early antibiotic treatment and patient recovery.

Latvia also maintains systematic passive leptospirosis surveillance in livestock. When cases of abortion occur in cattle, sheep, goats or swine, leptospirosis is one of the mandatory diseases for laboratory testing. Similarly, testing sick livestock for leptospirosis is mandatory and suspected/confirmed cases are reported to the Food and Veterinary Service (FVS), with such work covered under the state budget.

Surveillance, threat detection and risk assessment

This leptospirosis outbreak highlighted the need to further strengthen surveillance, threat detection and risk assessment in Latvia. The after-action review findings indicate that there are gaps in the current surveillance system, which misses automation for threat signal detection and data analysis, therefore relying on manual outbreak detection and data analysis that is not as rapid during an emergency.

Additionally, the review pointed to the need to ensure field epidemiologists conducting routine work (e.g. risk assessments for public health threats) are sufficiently trained and have the required competence.

Key challenges

Key challenges relating to surveillance, threat detection and risk assessment in Latvia included:

- Insufficient training on surveillance, infection diseases, threat detection and risk assessment for newly recruited epidemiologists.
- *Insufficient technical capacity for field epidemiology*.*
- Absence of national guidelines for leptospirosis treatment in humans.
- *Lack of automated, real-time data analysis hinders the detection of anomalies and the issuance of early warning signals. Without defined thresholds and automated analysis, manual review becomes the only detection mechanism, delaying community-wide outbreak detection and response*.*
- *Weekly CDPC report does not include a risk assessment for each reported threat*.*
- *Need for further development of CDPC emergency operations team*.*
- Under-reporting of leptospirosis in pet animals by veterinary practitioners, despite leptospirosis being an obligatory registrable disease in animals.

Good practice

Weekly Emergency Warning and Response System (EWRS) meetings involving all CDPC epidemiologists support information exchange and situational awareness at both national and EU levels through the review and discussion of weekly surveillance data, reported outbreaks and information on international events from the EU or global sources (e.g. EWRS, EpiPulse, International Health Regulations (IHR)).

The use of the EU case definition⁵ during the outbreak ensured consistency in case classification and comparability of data. The legal framework for public health and surveillance provided a strong foundation for response activities.

The CDPC benefits from an established infectious disease team, including a dedicated risk assessment staff. The introduction of a structured approach and templates for rapid risk assessments and communication with the FVS would further support systematic analysis and informed decision-making during public health events.

Ongoing digitalisation of human infectious disease notification systems represents an important step towards improving data availability and sharing across sectors. This process has the potential to enhance the timeliness, accessibility and completeness of data, thereby supporting more efficient information exchange and more informed decision-making during public health events.

Intersectoral data availability and sharing

This leptospirosis outbreak highlighted the importance of effective intersectoral data availability and sharing to support timely risk assessment and coordinated response. The after-action review findings indicate that clearly defining roles and responsibilities, strengthening data exchange mechanisms and having regular platforms for joint analysis, improving reporting practices, and enhancing coordination between sectors would significantly improve the ability to develop a comprehensive epidemiological understanding and support evidence-based decision-making.

⁵ Commission Implementing Decision (EU) 2018/945 of 22 June 2018 on the communicable diseases and related special health issues to be covered by epidemiological surveillance as well as relevant case definitions. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018D0945&from=EN#page=27>

Key challenges

Key challenges relating to intersectoral data availability and sharing in Latvia included:

- *Challenges in structured data exchange between human and animal health systems*.*
- *Lack of information on changes in synanthropic rodent populations for risk assessment; limited information and oversight regarding rodent abundance by private pest control companies, and no evaluation of the efficiency of their service*.*
- Limited availability of representative data on leptospirosis in pet animals due to under-ascertainment (as mentioned previously); therefore, insufficient data exchange between the veterinary and public health sectors, including during periods of increased leptospirosis activity.
- *Under-reporting of leptospirosis cases in pet animals from the veterinary sector to the FVS – even though leptospirosis is an obligatory registrable disease in animals*.*
- Lack of availability and integration of meteorological data (e.g. rainfall) in risk assessments in both public health and animal health surveillance.

Good practice

Latvia has established a legal framework for joint management of zoonotic health threats, with clear partners in the human and animal sectors and mechanisms for sharing information between sectors. However, a unified system for integrated structured data sharing across the human, animal and environmental sectors would enhance these collaborations.

Intersectoral collaboration and communication

The after-action review findings indicate that clearer structures for collaboration, well-defined roles and responsibilities, and regular communication mechanisms across sectors are essential to support coordinated risk assessments, joint decision-making and the implementation of coherent One Health interventions in a timely manner.

Key challenges

Key challenges that were identified relating to the intersectoral collaboration and communication in Latvia included:

- *Limited involvement of the environmental sector in the One Health approach, including surveillance and response activities*.*
- Absence of harmonised response protocols across the human and animal health sectors.
- *Absence of a multisectoral operational working group on zoonoses*.*
- Limited intersectoral communication about leptospirosis and other rodent and vector-borne infections.

Good practice

Communication with the public is prioritised. The establishment of risk communication channels – such as the use of social media and official webpages – support the timely dissemination of information to the public. These tools provide an effective platform for raising awareness and communicating public health messages during outbreaks, and they can be further leveraged to support coordinated communication across sectors.

Turning insights into action through concrete recommendations

In Phase 3 of the after-action review workshop (Revise), participants analysed prioritised pain points using an Impact x Feasibility Matrix (see Figure 4A, Annex 1) and turned insights into action through concrete recommendations.

The final output was a Corrective Actions Table (Table A, Annex 1) that included proposed actions to address each prioritised pain point, the objectives of the proposed action, and how to ensure implementation of the action and/or increase feasibility.

Key challenges and recommendations

The most pressing key challenges to address and accompanying recommendations are presented in Table 1.

Table 1. Key findings from after-action review of the leptospirosis outbreak in Latvia in 2025

Challenges	Recommendations
CDPC faces challenges to rapidly identify, assess, and respond to public health risks.	Continue to develop the CDPC emergency operational team, provide additional relevant training for team specialists, and implement modern automated signal detection technologies.
Information exchange between One Health stakeholders in the human, veterinary and environment sectors can be limited in Latvia, and case-related data is not shared in a consistent and timely manner.	Establish a unified, interoperable and privacy-preserving electronic information system to significantly improve efficiency, particularly by enabling a common risk assessment framework across the human, animal health and environmental sector.
Multisectoral coordination is limited.	Establish an operational working group to support information sharing, joint risk assessment and collaboration across human health, animal health and environmental health authorities to benefit all sectors. Strengthen collaboration mechanisms by establishing clear roles and responsibilities, standardised protocols, and structured coordination platforms that enable efficient information and data exchange, to support effective, synchronised and reactive response efforts.
The environmental sector in Latvia is only partially engaged in preparedness and response, despite its importance for understanding, predicting and mitigating environmental drivers of leptospirosis outbreaks.	Integrate the environmental sector into the multisectoral operational working group to facilitate timely involvement of the environmental sector and their joint response. However, the specific roles and responsibilities of the environmental sector need to be clearly defined.

4 Conclusions and next steps

The findings of this after-action review provide a solid basis for strengthening cross-sectoral preparedness and response to leptospirosis, as well as other zoonotic threats in Latvia. In addition to the area-specific findings, several cross-cutting issues require attention.

The after-action review highlighted the need to strengthen operational multisectoral collaboration mechanisms to ensure that information flow, roles and responsibilities, and operational processes are clearly defined and consistently applied. Establishing structured coordination platforms – supported by harmonised protocols and shared data systems – would significantly enhance the country's capacity to detect, jointly-assess and respond to future leptospirosis outbreaks, as well as other disease events benefiting from a One Health preparedness and response approach.

During the after-action review, limited involvement of the environmental sector during the leptospirosis outbreak was highlighted as a challenge. Given the influence of environmental conditions on leptospirosis transmission, a stronger and more systematic involvement of environmental institutions is recommended (e.g. to provide relevant information on climate patterns and weather). Such involvement would be beneficial to support effective surveillance, prevention, risk assessment and response planning. The recommendations identified in this after-action review should be incorporated into an action plan (either through the development of a new plan or additions to an existing plan, e.g. the national action plan for health security), along with recommendations from other activities and assessments that capture lessons learned, such as those following the national Public Health Emergency Preparedness Assessment conducted by ECDC in 2025.

Acknowledgments

We would like to acknowledge the contributions of the two experts from the European Health Task Force Member State Expert Pool: Mathieu Picardeau (WHO Collaborating Centre for Reference and Research on Leptospirosis) and Amélie Desvars-Larrive (University of Veterinary Medicine Vienna, Austria and 'Health Across Species' Complexity Science Hub, Vienna, Austria), for their valuable technical advice and support throughout.

Annex 1. Results from the after-action review of leptospirosis outbreak response in Latvia from September to December 2025

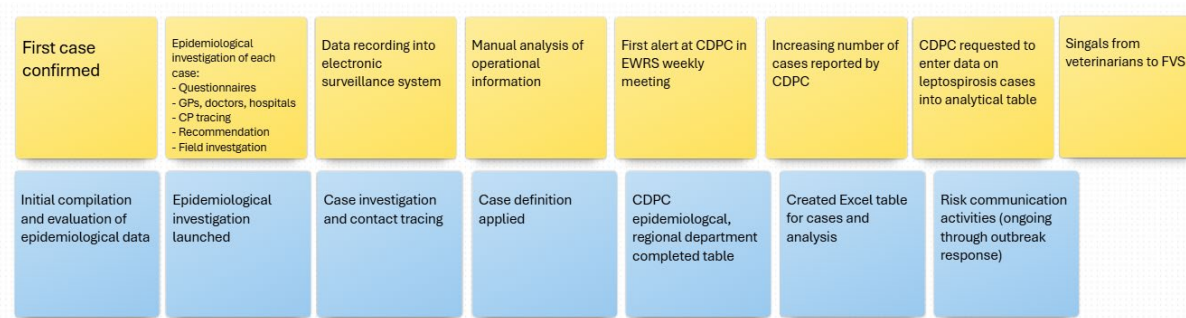
The after-action review of a leptospirosis outbreak in Latvia in 2025 was designed and conducted using the ECDC ['Guide for designing and conducting in-action and after-action reviews'](#). There are three phases of the ECDC methodology for conducting action reviews (Figure 1) and each phase consists of two steps.

Phase 1: Revisit

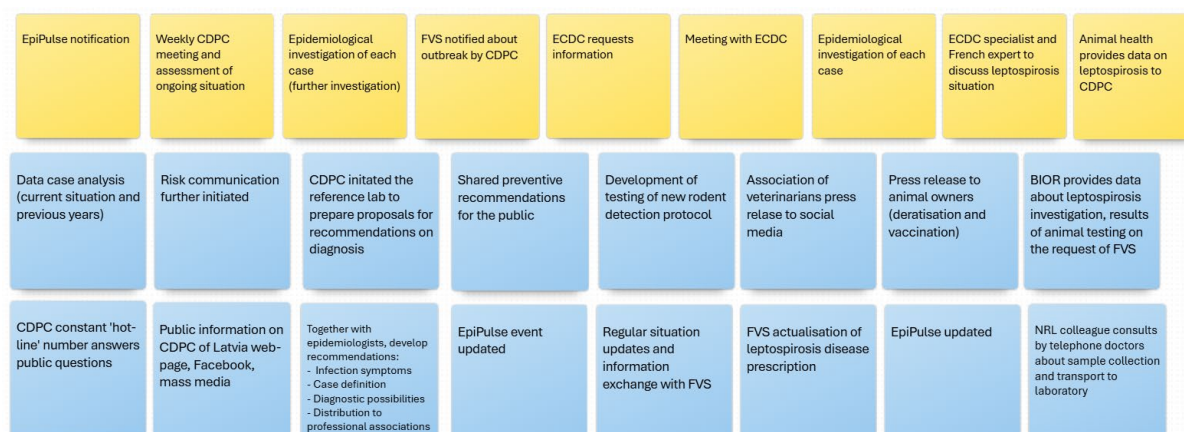
The aim of Phase 1 was to determine what happen and what actions were taken during the response. Participants reconstructed the timeline to achieve a shared understanding of key events and actions. Participants were instructed to use yellow sticky notes for events and blue for actions. All participants had the opportunity to first consider their events and actions (individually and/or in groups) before there was a discussion in plenary to reach consensus (Figure 1A).

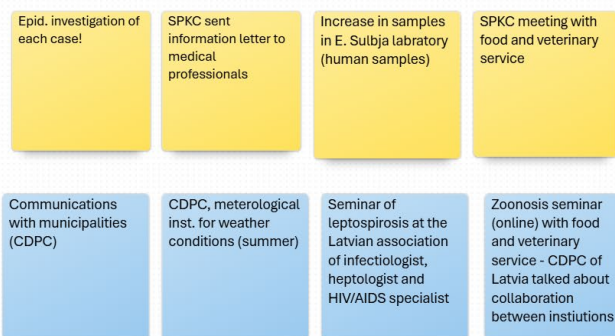
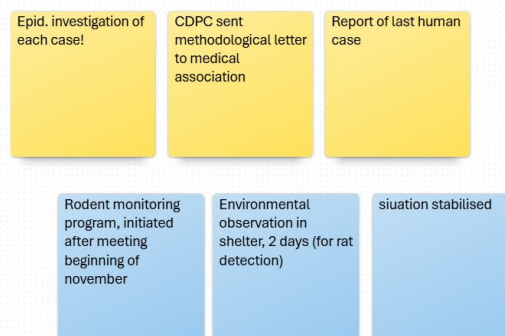
Figure 1A. Events (yellow) and actions (blue) identified during the after-action review of leptospirosis outbreak response in Latvia from September to December 2025

September



October



November**December**

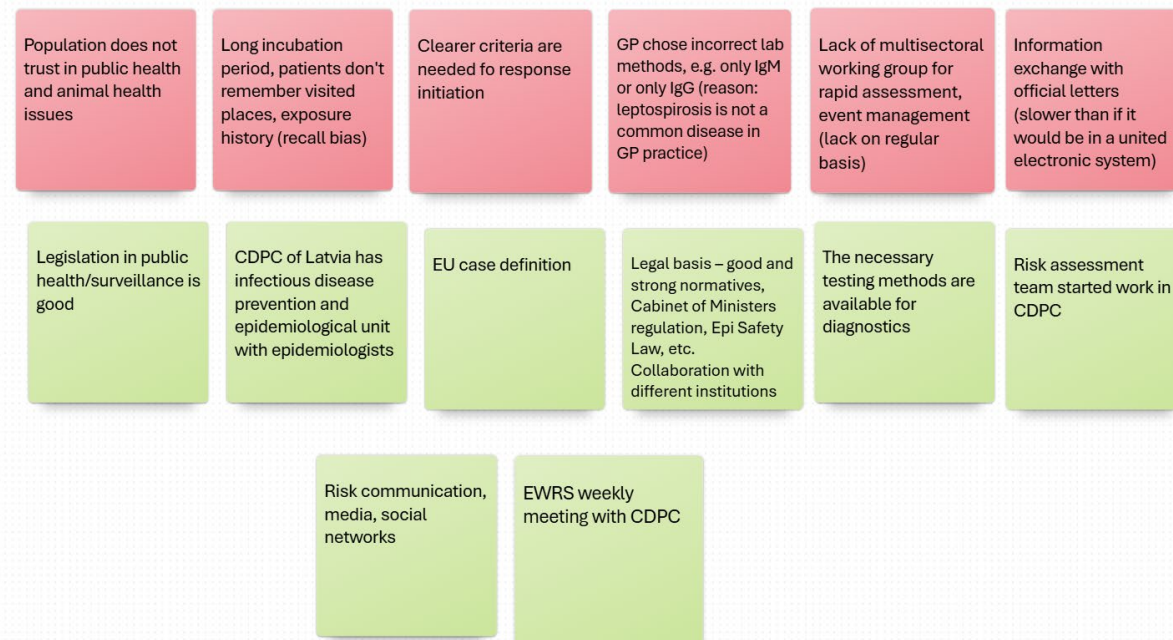
BIOR: Institute of Food Safety, Animal Health and Environment, Latvia; CDPC: Centre for Disease Prevention and Control, Latvia; CP: contact person; EWRS: Early Warning and Response System; FVS: Food and Veterinary Service; GP: general practitioner; NRL: national reference laboratory.

Minor edits have been made to improve the readability of the sticky notes for the purpose of this report. As CDPC was mostly used, a few uses of SPKC (Slimību profilakses un kontroles centrs, the name in Latvian) have been edited to CDPC.

Phase 2: Reflect

The aim of Phase 2 was to determine what was challenging and what went well. Participants gathered the lessons learned by identifying pain points (challenges) using red sticky notes and instances of good practice using green sticky notes. As with Phase 1, participants had an opportunity to first consider challenges and instances of good practice (individually and/or in groups) before there was a discussion in plenary to reach consensus (Figure 2A).

Figure 2A. Pain points (pink) and instances of good practice (green) identified during the after-action review of leptospirosis outbreak response in Latvia from September to December 2025

September

October and November



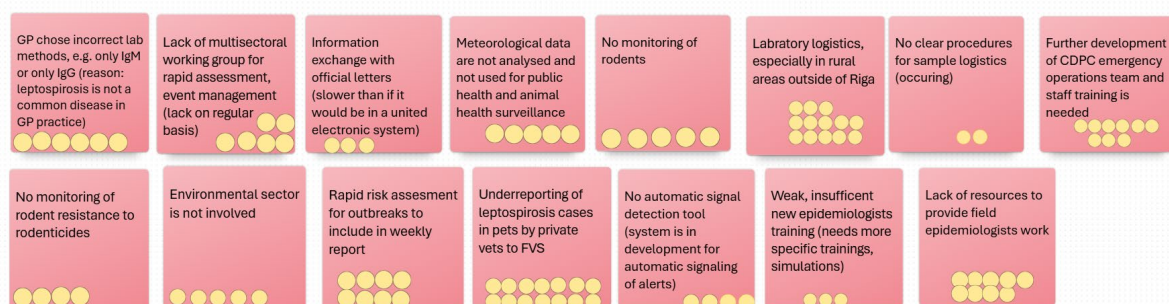
December



CDPC: Centre for Disease Prevention and Control, Latvia; EU: European Union; EUTHF: European Union Health Task Force; EWRS: Early Warning and Response System; FVS: Food and Veterinary Service; GP: general practitioner. Minor edits have been made to improve the readability of the sticky notes for the purpose of this report. As CDPC was mostly used, a few uses of SPKC (Slimību profilakses un kontroles centrs, the name in Latvian) have been edited to CDPC.

As a last step in Phase 2, participants were asked to vote on the pain points that – if addressed – would have the most impact on improving the next response. The pain points that received the most votes were taken forward into Phase 3 as the 'prioritised pain points' (Figure 3A).

Figure 3A. Prioritised pain points identified during the after-action review of leptospirosis outbreak response in Latvia from September to December 2025

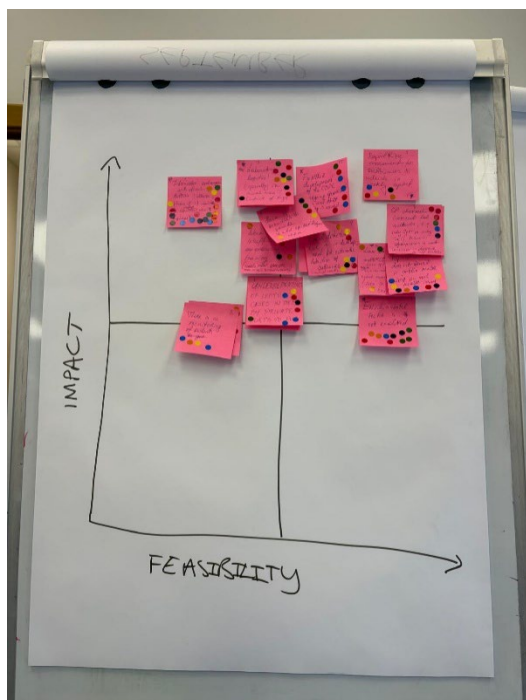


CDPC: Centre for Disease Prevention and Control, Latvia; FVS: Food and Veterinary Service; GP: general practitioner. Minor edits have been made to improve the readability of the sticky notes for the purpose of this report. As CDPC was mostly used, a few uses of SPKC (Slimību profilakses un kontroles centrs, the name in Latvian) have been edited to CDPC.

Phase 3: Revise

The aim of Phase 3 was to determine what can be done to improve and turn insights into action through concrete recommendations. Participants were asked to analyse the prioritised pain points using an Impact x Feasibility Matrix that facilitates an assessment of the feasibility of addressing the issue on one axis and the potential impact of doing so on the other (Figure 4A).

Figure 4A. Impact x Feasibility Matrix created during the after-action review of leptospirosis outbreak response in Latvia from September to December 2025



The last step in the AAR was for participants to take a forward-looking perspective focused on translating the insights from the workshop into corrective actions, by creating a Corrective Actions Table (Table 1A).

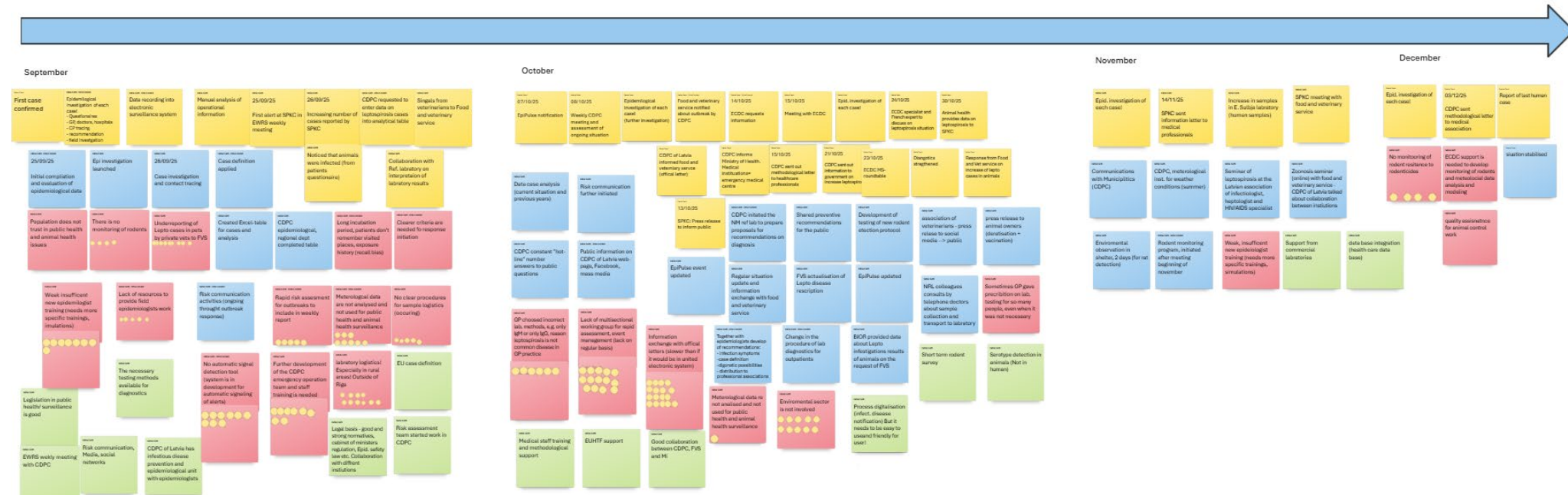
Table A. Corrective Action Table created during the after-action review of leptospirosis outbreak response in Latvia from September to December 2025

Time for implementation	Pain point (challenge)	Proposed action to address this issue	Objectives of the proposed action	How to assure implementation of this action and/or increase feasibility?
For short-term implementation (in 6 months to 1 year)	Lack of a multisectoral operational working group, supporting joint risk assessment and event management for zoonotic/One Health threats	Establish a multisectoral operational working group for zoonotic infections, meeting on a regular basis and including relevant experts from human, animal, health inspectorate and environmental sectors	Strengthen intersectoral coordination and collaboration, including information sharing and joint approaches during events (such as risk assessments, risk communication, logistics, joint statements, etc.)	Establish an agreement from relevant sectors to participate, including consensus on frequency and format of meetings Define the membership and Terms of Reference (ToR), clearly outlining roles, responsibilities and decision-making procedures Prepare concise meeting notes and summaries, documenting key discussions, decisions taken, assigned responsibilities and follow-up actions Provide evidence-based recommendations to policymakers to support official decisions on operational matters during outbreaks or other emergency events
	Weekly CDPC report does not include a brief summary of the risks assessed	Develop templates/an algorithm for a standardised approach to conduct risk assessments (Reach out to ECDC for support to develop risk assessment templates/an algorithm and/or training on risk assessment)	Standardised procedure for routine risk assessment	Include risk assessment in the template for the weekly epi report Ensure training of staff and confidence to use the risk assessment tools as routine
	No automated signal detection tool for outbreaks/unusual events and criteria for response indication	Continue to develop and introduce a signal detection tool for public health (and perhaps future roll-out for animal health). Routinely use risk assessment as a criteria for decisions on response options to outbreaks/threats	Faster detection and response to public health threats	Ensure resources (including IT) for development, defining of user group, training and routine use of the signal detection tool Ensure relevant stakeholders have access to the national early warning signal and risk assessment (explore potential for Epi+ for this use)

For mid-term implementation (in 1–3 years)	Further development of the CDPC emergency operations team needs	Arrange training on the existing emergency operations standard operating procedures (SOPs), including signal detection, threat assessment, and emergency management and response decision-making Define roles and responsibilities, including when surge capacity is required	Strengthen emergency management	Finalise SOPs of CDPC emergency operations team Provide training using ECDC materials and other relevant support resources
	Environmental sector is partially involved in preparedness and response to infectious disease health threats	Map the animal and human health needs from the environmental sector (e.g. through a survey). Reach out to relevant stakeholders in the environmental sector that may cover these needs; understand the capacities and potential for collaborations and information/data sharing for preparedness and response to One Health threats (bi-directional). Discuss potential participation in outbreak response. Request ECDC/the EU Health Task Force to arrange a webinar or bilateral meeting with another EU Member State with good examples of approaches to include the environmental sector Explore the ability to include and analyse environmental data (e.g. meteorological data)	Better understand the potential for collaboration with the environmental sector Strengthen collaboration between sectors, including during outbreak response	Assign this task to a focal point Conduct stakeholder mapping Consider engaging university students (public health, veterinary medicine, environment), as additional resources to support this work
	Challenges in laboratory human sample logistics, particularly from outpatients (not hospitalised); lack of a universal system	Map options for sample transportation, including what existing options are publicly funded Identify scenarios for when sample transportation is needed and develop a document that outlines solutions for each scenario, including a scenario for surge capacity	Faster and standardised procedures for sample transportation	Seek decision from the National Health Service and Ministry of Health for implementation (and funding) of the scenario document
	General practitioners (GPs) choosing incorrect laboratory methods or samples, or not selecting the right patients for testing, as leptospirosis is not a common disease in GP practice	Clearer guidance/protocols for GPs for testing and treatment for rare/uncommon pathogens, including those diseases that may re-emerge. Ensure the guidance is easily accessible for GPs. Prioritise/rank diseases for inclusion. Evaluate existing laboratory tests, validate their use and appropriateness to meet EU case definition	Appropriate laboratory testing to meet case definition Increase awareness among GPs	Define the focal point to develop the guidance/protocol Engage the national health service for their input and dissemination
	Lack of technical and professional capacity for field epidemiology	Develop training materials for field epidemiologists; adapt ECDC materials Develop a training plan; training of existing staff Arrange mentoring programme for new/less experienced staff and means for professional exchange between field epidemiologists Establish a coordinator for field epidemiology training	Improve the technical and professional capacity for field epidemiology	Build field and analytical epidemiology training as continuous professional development for existing staff

For long-term implementation (in 3-5 years)	Lack of country-level information on circulating strains	Strengthen the molecular epidemiology for leptospirosis within a One Health approach Compare the isolates circulating among humans and animals Consider linkage with European Union reference laboratories (EURLs) for sequencing of serotypes	Overview of circulating leptospirosis strains to inform risk factors, clinical outcomes, options for control and validation of the testing algorithm Monitor existing and emerging genotypes over time	Produce guidance for characterisation of leptospirosis serotypes
	Under-reporting of leptospirosis cases in pet animals from vets to Food and Veterinary Service (FVS)	Improve existing system for reporting to FVS (and consider a new electronic reporting system over the longer term); work with human health to identify the exact information that should/can be reported to the human health sector Increase awareness for veterinarians; contact veterinary associations, discuss the barriers for reporting and potential ways to increase reporting	More complete reporting from veterinarians and sharing of relevant information with the human health sector	Review and update information-sharing arrangements between the animal health and human health sectors Contact the veterinary association Conduct an awareness campaign with veterinarians
	Information exchange between sectors appears to be slow, sharing of structured case-related data could be more efficient through a unified electronic information system	Development of an electronic system to rapidly share/integrate information between sectors	Faster information exchange between sectors	Learn experience/best practice from other countries Define database/system needs Development/implementation of the new IT system Ensure inclusion of the relevant legislation (and the potential for One Health legislation outlining responsibilities and collaboration)
	There is no routine monitoring of rodents/small mammals or other wildlife that can serve as a reservoir, which is needed for early alerting on potential risks related to changes in vector populations	Develop a proposal on possible options to establish rodent monitoring, including mapping any current systems Seek international experience/best practice for rodent monitoring Consider quality assurance/checks on companies that are implementing animal control/culling	Provide recommendations for establishing a rodent monitoring system	Consider as a task under the intersectoral operational working group

Figure 6A. Overall timeline created during the after-action review of the leptospirosis outbreak response in Latvia from September to December 2025



Yellow: key events; Blue: main actions taken; Pink: pain points; Yellow dots: votes to prioritise pain points; Green: instances of good practice.
This figure is presented to offer a visualisation of the timeline created during the after-action review. For legible versions of the sticky notes, please see the previous Annex figures.

Annex 2. After-action review agenda

Date	Activities
19 March 2026 – Workshop 'After-action review: Leptospirosis Outbreak'	
8:30–9:00	Arrival and registration of participants
9:00–10:15	Session 1: Introduction and briefing Presentations: - Overview of the leptospirosis Outbreak, Latvia – Centre for Disease Prevention and Control of Latvia - Leptospirosis: a neglected and re-emerging zoonotic disease – Mathieu Picardeau, WHO Collaborating Centre for Reference and Research on Leptospirosis - One Health & systems-based approaches – Amélie Desvars-Larrive, University of Veterinary Medicine Vienna, Austria and 'Health Across Species' Complexity Science Hub, Vienna, Austria - Background to after-action review and overview of the methodology – ECDC
10:15–10:30	Coffee break
10:30–12:00	Session 2: Revisit – What happened? Step 1: Participants discuss relevant events that happened during the selected period of the response under review and collaboratively recreate the timeline.
12:00–13:30	Lunch break
13:30–15:30	Session 3: Revisit – What actions were taken in response? Step 2: Participants identify and list the actions that were taken during the response under review.
15:30–16:00	Summary of Day 1
20 March 2026 November – workshop 'learnings'	
8:30–9:00	Arrival and registration of participants
9:00–9:15 Plenary English	Recap of Day 1 and overview of Day 2
9:15–10:45	Session 4: Reflect – What went well and what was challenging? Step 3: Participants build on the timeline of events and actions created during the Revisit phase (Steps 1 and 2) by adding the pain points and instances of good practice that they observed. Step 4: Participants vote to select the most critical pain points so that these can be assessed further in the next session.
10:45–11:15	Coffee break
11:15–12:00	Session 5: Revise – What can be done to improve? Step 5: The prioritised pain points from Step 4 are analysed using the Impact x Feasibility Matrix.
12:00–13:30	Lunch break
13:30–15:00	Session 5: Continued Step 6: Practical actions and activities are proposed by filling in the Corrective Actions Table.
15:00–16:00	Session 6: Evaluation and closing session

Annex 3. Summary of the after-action review format

Date(s) of the AAR activity	19–20 March 2026
Location(s)	Riga, Latvia
Set-up	Face-to-face, onsite
Participating institutions and entities	- Ministry of Health, Latvia - Centre for Disease Prevention and Control, Latvia - Sectoral Crisis Management Unit, Department of Strategic Planning and Preparedness - Inpatient Service Unit, National Health Service - Animal Infectious Disease Surveillance Division, Food and Veterinary Service - Food Distribution Surveillance, Food and Veterinary Service - Ministry of Agriculture - Health Inspectorate, Public Health Department - Latvian Centre of Infectious Diseases, Riga East University Hospital - Microbiology and Pathology Laboratory, Institute of Food Safety, Animal health and Environment 'BIOR' - Department of Infectious Disease Risk Analysis and Prevention, Centre for Disease Prevention and Control - University of Veterinary Medicine, Vienna (Member State Expert) - Leptospirosis Reference Laboratory, Institute Pasteur (Member State Expert) - ECDC (Facilitators)
Total number of participants and observers (if applicable)	27
Period covered by the review	September to December 2025
Response areas reviewed	- Country-level coordination, planning and monitoring - Risk communication, community engagement and infodemic management - Surveillance, case investigation and contact tracing - One Health - National laboratory system