**MOSAIC DOMAIN I: DETECTION AND ASSESSMENT OF AN EMERGING OR RE-EMERGING RESPIRATORY VIRUS**

**SCENARIO BASED DISCUSSION**

**Facilitator Guide**

The purpose of these scenarios is to assist country representatives in mapping out which individual surveillance approaches, including those systems that may be part of an overarching framework or strategy e.g., Integrated Disease Surveillance and Response (IDSR), meet or are positioned to meet the objectives of Mosaic Domain I. It can also provide insights into how functional each of these approaches is and help country representatives determine any needs and corresponding priority actions that will ensure surveillance approaches can meet objectives. This facilitator guide includes scenarios, corresponding questions, and suggested probes to ensure comprehensive discussion of each topic. Additional information on surveillance approaches is also included at the end of each case and/or inject to support facilitators.

Countries are encouraged to adapt these scenarios according to their contexts and needs, as indicated by the highlighted yellow “blank” text. However, questions and probes have been formulated to ensure that essential functionalities are covered. These functionalities are outlined in ANNEX 1 and bolded under each inject. Therefore, any adaptation should ensure that these functionalities are still addressed.

Furthermore, it is possible to broaden the scope of Domain I scenarios to be compatible with an all-hazard approach, if desired. Since event-based surveillance (EBS) and other early warning systems are designed to detect events that aren't easily captured in indicator-based surveillance systems (e.g., new, or rare events), they can detect a wide range of health events, including from various pathogens and environmental or chemical events. As such, it is feasible to probe about other relevant pathogens or events beyond respiratory conditions to fully assess the functionality of such systems. It is recommended to keep the initial question focused on respiratory pathogens but inquire further about other priority pathogens according to national context as is relevant. In this way, Domain I scenarios can support broader system enhancements.

Domain I Objectives

1. Rapidly detect emerging or re-emerging respiratory virus outbreaks and other events
2. Assess transmissibility, risk factors for transmission, and extent of infection from an emerging or re-emerging respiratory virus
3. Describe clinical presentation and risk factors for severe outcomes associated with an emerging or re-emerging respiratory virus

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Key Acronyms and Terms:

* **EBS**: Event-based surveillance
* **NNDS**: National Notifiable Disease and Conditions Surveillance
* **Disease surveillance focal point for EBS** may refer to the person:
	+ To whom an EBS signal is reported, most often a surveillance officer;
	+ Who carries out triage, verification, and communication related to EBS signals. Who should be designated at all applicable levels (e.g., at community, local, facility-based, intermediate, and national levels).

# CASE 1, INJECT 1: Detection in Health Facilities

***A small rural hospital in (insert district/town name) admits a 35-year-old farmer with an acute respiratory infection. The patient has a fever and needs oxygen support. The hospital performs a/an (insert relevant test(s) for context, e.g. malaria, influenza) test, which is negative. Broad-spectrum antibiotics are started based on a possible diagnosis of pneumonia of unknown origin. Overnight, the patient gets worse and is transferred to a referral hospital in (insert capital or other major city) where he is placed on a ventilator and given additional antibiotics.***

***The next day, a nurse from [original hospital (can insert hospital/district name)] calls the referral hospital to see if a diagnosis has been made for the young farmer because that same morning, the clinician and nurse who originally cared for the patient developed a cough and fever and were unable to come to work. The current diagnosis for the patient provided by the referral hospital is still pneumonia and no pathogen has been identified.***

*The following questions should assist you in determining which core and enhanced surveillance approaches and investigations the country uses to address* ***Domain I Surveillance Objective 1: Rapidly detect emerging or re-emerging respiratory virus outbreaks and other events.***

***Functionalities being assessed: 1, 2 (see*** ANNEX 1***)***

**Questions for Discussion**

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| **Q 1.1. Do your surveillance approaches have formal policies and/or procedures for immediate reporting of unusual, novel, or emerging respiratory cases or events in healthcare settings?** |
| ***Possible core surveillance approaches:*** *NNDS, Health facility EBS, Laboratory networks* ***Possible enhanced surveillance approaches****: Syndromic surveillance, Targeted special population surveillance* |
| **Probe: Health Facility EBS** |
| Is there a surveillance approach in healthcare settings to support early detection of unusual and/or novel events that may not be readily identified by other routine surveillance approaches but pose a risk to public health? If yes:* Is the approach formalized or informal? What modalities are used (hotline, mobile application, etc.)
* Which health facilities participate (different levels of care: primary, secondary, tertiary?)
	+ Does your health facility EBS extend to private health facilities?
* If yes, what signals are used? (i.e. are only confirmed cases/outbreaks reported or can they also be suspected or based on unusual presentation and/or treatment failure?)
* Do health workers in health facilities undergo routine training to report unusual signals?
	+ If yes, which health workers are included?
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| **Probe: NNDS**  |
| Describe the existing national notifiable disease surveillance approach, and its reportable (respiratory) diseases/syndromes or unusual events:* Are unusual respiratory conditions or clusters of severe respiratory illness designated for immediate reporting under the NNDS or other system?
* Does your NNDS extend to private health facilities?
* Are health workers trained and empowered to recognize and immediately report high-consequence respiratory and unusual diseases or syndromes? Is this part of NNDS or another system?
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| **Probe: Laboratory testing** |
| Do you have mechanisms for immediate specimen collection and prioritized testing of respiratory samples from events/outbreaks within healthcare facilities? |

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| **Q 1.2 Do your surveillance approaches define clear roles, responsibilities, and mechanisms for staff to report these events from health facilities?** |
| ***Possible core surveillance approaches****: NNDS, Health facility EBS, Laboratory networks****Possible enhanced surveillance approaches****: Syndromic surveillance, Targeted special population surveillance* |
| **Probe: SOPs**  |
| Whatstandard operatingprocedures (SOPs) are in place to ensure healthcare facility staff identify cases of notifiable diseases as well as detect signals of an unusual and/or respiratory events? * Are all staff trained on these SOPs?
 |
| **Probe: Reporting Mechanisms & Focal Points** |
| What mechanisms are available for staff to report immediately to the proper point of contact? Are there any challenges to immediate reporting with these mechanisms?* Do disease surveillance focal points exist at healthcare facilities and/or national and subnational administrative levels to facilitate timely communication and coordination, including feedback on reported events?
* For NNDS, is a focal point responsible for routine, weekly reporting also responsible for immediate reporting? If they are unavailable, are there additional trained staff?
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| **Probe: Private health facilities** |
| Can your early warning surveillance approaches detect other cases (or deaths) that may have sought care in private healthcare facilities?  |

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| **Q 1.3 Where are such reports from a health facility received, and what happens after they are received?**  |
| ***Possible core surveillance approaches****: NNDS, Health facility EBS, Laboratory networks* ***Possible enhanced surveillance approaches****: Syndromic surveillance, Targeted special population surveillance* |
| **Probe: Verification** |
| * What training occurs for intermediate level (e.g., state/regional/provincial) surveillance staff to verify signals received from healthcare facilities? Does training include:
	+ The signals and their definitions?
	+ how to manage and monitor reports, including ways to gather more relevant information and verify the event?
	+ how and when to notify upper/national public health authorities (i.e. what triggers an escalation)?
* Are there written SOPs or guidelines for the verification?
* Are there resources to support verification activities that take place in the field?
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| **Probe: Data/event management system** |
| What data or event management systems are in place to organize, track, and address notifiable disease and EBS reports in a timely manner? * Are any systems electronic? Are they interoperable with any other surveillance systems?
* At what sub-national levels (local, intermediate, national) and to which departments is such a system accessible?
* Are standardized forms used to record, manage, and monitor events?
* Can updated information (e.g., on new cases, diagnoses, etc.) be easily linked within your system to the original (index) case?
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# CASE 1, INJECT 2: Investigation in Health Facilities

***The next day, the clinician from [insert original facility name as above] who cared for the patient gets worse. He now has difficulty breathing and is admitted to the hospital for monitoring. More hospital staff, and even some patients, are getting sick with similar symptoms. By the end of the week, the small hospital has reached full bed capacity, is quickly becoming overwhelmed, and struggling to accommodate patients or contain further disease spread.***

*The following questions should assist you in determining which core and enhanced surveillance approaches and investigations the country uses to address* ***Domain I Surveillance Objective 2: Assess transmissibility, risk factors for transmission, and extent of infection from an emerging or re-emerging respiratory virus*** *and* ***Surveillance Objective 3: Describe clinical presentation and risk factors for severe outcomes associated with an emerging or re-emerging respiratory virus.***

***Functionality being assessed: 2 (see*** *ANNEX 1****)***

**Questions for Discussion**

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| **Q 1.4 Who is responsible for the initial investigation? Are risk assessments conducted and documented to ensure a proportionate response?**  |
| ***Possible core surveillance approaches****: NNDS, Investigations and Studies (outbreak investigation), Health facility EBS* |
| **Probe: Risk assessment SOPs and tools** |
| Are SOPs, tools or guidelines available for risk assessment? * Are these for the national and/or sub-national levels?
* Is risk assessed considering quantitative and qualitative data available on the pathogen, routes of exposure and local context?
* Is there a risk characterization step i.e. assigning a “risk level”?
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| **Probe: Response coordination** |
| How are response actions coordinated or adjusted to reflect new and/or updated information received as the situation evolves? |

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| **Q 1.5 How would a reportable event be notified under the IHR (2005)?** |
| ***Possible core surveillance approaches****: Investigations and Studies (outbreak investigation), NNDS, Health facility EBS* |
| **Probe: National IHR Focal Point** |
| Do staff know who the national IHR Focal Point is? |

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| **Facilitator supporting information** |
| *Health workers should feel a flexibility to report what they sense is unusual (guided by signal definitions like a cluster of SARI cases, as opposed to reporting based on rigid case definitions only) in a way that does not create negative repercussions.****For notifiable diseases****, this means that health workers are equipped to recognize and submit case notifications subject to immediate reporting directly into the appropriate surveillance system database or to a designated surveillance officer who manages such reports.* ***For health facility EBS,*** *this means that doctors, nurses, and other support staff actively report pre-defined signals of unusual events to a surveillance officer, health facility leadership, or other designated focal point through a formal health facility EBS system. Reporting is done immediately through approved mechanisms (e.g., electronic system, in-person notification, text messaging/Whatsapp) and according to predetermined reporting flows to the level responsible for triage of the notification, or other relevant response.**Signals of events may include:** *a cluster of SARI cases or deaths of unknown or novel cause;*
* *cases of unusual respiratory illness that do not squarely fit within any current notifiable or recognized disease but warrant immediate reporting for abnormal presentation;*
* *a single case of disease, in some settings (e.g., a notifiable disease like Avian Influenza or disease under elimination like measles);*
* *cases that do not respond to standard treatment;*
* *sick healthcare workers who have been exposed to potentially contagious patients;*
* *a sudden surge in ER visits and/or hospital admissions, among others.*

*For discussion purposes, in some countries immediate reporting of an unusual event via NNDS and health facility EBS signal reporting might overlap. They can functionally look identical, though a report might go through one system or another. The aim is for the surveillance approach to function effectively and meet the objective.**When there are complementary surveillance systems in place (e.g., healthcare facility EBS reporting from both public and private facilities), and all healthcare facilities report through the national notifiable disease surveillance approach (which could be enhanced in response to an event), data from multiple systems can be triangulated to check for further outbreak cases.* *A communication mechanism should exist to alert neighboring regional health offices and healthcare facilities to the possibility of additional cases.****Alert management*** *This is the systematic process of managing all incoming information, from signal verification to risk assessment and characterization, in order to decide if a response is required to mitigate the public health risk. For efficiency, all signals should preferably be channeled into a common system so that they can be investigated and managed systematically.**All reports of signals or unusual events, regardless of the approach through which it is reported, should be* ***verified.*** *The verification process involves quickly confirming the key information originally reported and gathering only additional details needed to determine authenticity and nature of the event. This can provide information on any epidemiologic links between cases through consultation with key community members and review of health facility records to determine if patients reside near each other, share familial/social links, or work for the same employer. This process may also include soliciting trusted community sources about the case-patients in question and their environments, recent symptoms, manner and timing of death, and any other relevant context that may indicate the cause of death.**Verified events detected through a healthcare facility EBS approach are ideally logged by trained users at multiple levels of the public health surveillance system and are subsequently managed centrally at the national level where other data sources may be consulted and linked. National EBS staff have designated roles to investigate, analyse, and report data and are co-located with and/or have established communication mechanisms with the country’s International Health Regulations (IHR) focal point, who reports the event to WHO according to pre-established guidelines for the level of risk determined for the event (see below).****An (electronic) event management system*** *should be in place for timelier data sharing around detected and verified events. Ideally this system should allow linkages between cases in a cluster or outbreak.**National surveillance staff have designated roles to investigate, analyse, risk assess and report events and are co-located with and/or have established communication mechanisms with the country’s International Health Regulations (IHR) focal point, who reports relevant events to WHO according to pre-established guidelines for the level of risk determined for the event.* ***Risk Assessment:*** *In public health, risk is assessed considering quantitative and qualitative data on the hazard, exposure and context. Risk assessment is part of the overall process of risk analysis (which includes risk assessment, risk management and risk communication). During epidemics, pandemics, and other public health events, decision making regarding response measures should rely on iterative, comprehensive, standardized and transparent risk analysis. It is important that risk assessments are documented and reviewed as new information becomes available.****Health Facility Investigations****In health facilities, initial investigations may be conducted by facility or national surveillance staff/epidemiologists or by multi-disciplinary national or sub-national outbreak response teams.* ***Outbreak investigation and response****A multidisciplinary rapid response team from the intermediate and/or national level should be trained annually. Their role is to support verification (e.g., visiting/contacting hospital staff and patient family members to collect more details and specimens), case finding, risk assessment, and/or initial response activities (e.g., contact tracing, quarantine/isolation of suspected cases/patients, clinical management, risk communication and community engagement, etc.) to supplement any local response.**Depending on the information collected from the outbreak investigation and response, an Incident Management System or similar response coordination mechanism may be created to manage current needs.****Notification under the IHR (2005):*** *Under the IHR (2005), States Parties are required to carry out an assessment of public health events occurring within their territories utilizing the decision instrument provided in Annex 2 of the Regulations, and then to notify WHO of all qualifying events within 24 hours of such an assessment via the IHR focal point.* *[IHR Amendment to Annex 2 (to come into force on 19 September 2025): “Any event of potential international public health concern, and those of unknown causes or sources,* ***in particular clusters of cases of severe acute respiratory disease of unknown or novel cause****, and those involving other events or diseases than those listed in the box on the left and the box on the right shall lead to utilization of the algorithm.”]***Further information on core surveillance approaches:** Health Facility Event-Based Surveillance: see Mosaic Framework Domain I, page 25National Notifiable Disease Surveillance: see Mosaic Framework Domain I, pages 26-28Laboratory Networks: see Mosaic Framework Domain I, page 28Investigation and Studies; see Mosaic Framework Domain I, pages 29-30 |

# CASE 2, INJECT 1: Detection and Assessment in the Community

***Community members [specify e.g. neighbors, village head, NGO workers] have become concerned about several people from [X community e.g., remote village, religious community, informal settlement, refugees, Internally Displace Persons, unhoused] with severe respiratory symptoms. None of the sick individuals have gone to a health facility for care, since [insert reason e.g., no healthcare access, distrustful of health system, etc.] One person is rumored to have died.***

*The following questions should assist you in determining which core and enhanced surveillance approaches and investigations the country uses to address* ***Domain I Surveillance Objective 1: Rapidly detect emerging or re-emerging respiratory virus outbreaks and other events.***

***Functionalities being assessed: 2-4, 7 (see*** ANNEX 1***)***

**Questions for Discussion**

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| **Q 2.1 Can your early warning surveillance approaches capture this type of information from communities and/or community focal points (e.g., through a network of individuals in the community or in priority communities who detect and report event signals) in a timely way?** |
| ***Possible core surveillance approaches****: Community EBS* ***Possible enhanced surveillance approaches****: Media EBS, Targeted special population surveillance* |
| **Probe: Key Reporters & Reporting Mechanisms** |
| * Is the approach formalized or informal?
* What kind of key community focal points / reporters are included [e.g., c*ommunity health workers, the public (e.g., village leaders), religious leaders, civil society members, teachers, NGOs]*?
* How is this information reported and to which authorities?
* Is information reported at the local level or direct to the national level? If directly to the national level, how is a timely and appropriate response determined?
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| **Probe: Targeted surveillance in “hard to reach” populations** |
| * Is event-based surveillance for any population(s) managed differently or separately from other routine or early warning surveillance data (e.g., other NGOs/partners /departments responsible)?
* Are there any geographic areas and/or populations that are hard to reach and NOT currently covered by the approaches discussed so far that may be a priority for surveillance?
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| **Q 2.2 Can your early warning surveillance approaches reliably confirm or deny these informal reports or rumors from community members or key individuals?**  |
| ***Possible core surveillance approaches****: Community EBS, Health facility EBS, NNDS* |
| **Probe: Verification**  |
| How can you verify this information and ensure that it is authentic (i.e., truly occurring)? |
| **Probe: Preliminary Investigation & Response Capacities** |
| If the reports are verified as true, how would your surveillance/investigation approaches ensure that the appropriate response actions are taken?* Are there multidisciplinary rapid response teams at the national and intermediate levels?
* If yes, do team members comprise all relevant sectors and with expertise and training that includes epidemiology, data management, clinical management, infection prevention and control, laboratory, animal health, risk communication and community engagement, and logistics?
* Have responders been trained to support verification, risk assessment, and conduct outbreak investigation activities?
* How quickly can teams be deployed (<48 hours)?
* Are regular exercises undertaken?
* Is there a national FETP? If not, are national staff trained in a regional FETP or other similar programme?
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| **Q 2.3.** **Are outbreak investigations to characterize person, place, and time regularly conducted in response to verified events?** |
| ***Possible core surveillance approaches***: Investigations and studies |
| **Probe:** **Outbreak protocol** |
| Do you have a respiratory event/outbreak protocol, or does your outbreak protocol included specifics for respiratory event investigations, including measures of severity, priority animal exposures, etc.? |
| **Probe: Resources** |
| Does your country have the **surge capacity** and core resources **for rapid investigation** (e.g. for surveillance and epidemiology/case management/contact tracing)? Outbreak response kit? incl. lab equipment, personal protective equipment, communication means, deployment checklist etc.  |
| **Probe: Analyses** |
| Are basic descriptive epidemiologic analyses of person, place and time, such as proportions and epi curves, performed and reported as part of these initial investigations? |

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| **Q 2.4** **Are epidemiological investigations conducted to further characterize events and outbreaks (e.g., outbreak investigation studies like cohort and case-control studies, or other risk factor or transmission studies)?** |
| ***Possible core surveillance approaches***: Investigations and studies |
| **Probe: Triggers** |
| Are there clear triggers or criteria to initiate an investigation? |
| **Probe: Protocols** |
| Have standardized protocols for investigations or studies been developed/adapted to the country context to assess clinical presentation, clinical severity, risk factors including for severe outcomes associated with infection or transmissibility, risk factors for transmission, and extent of infection from an emerging or re-emerging respiratory virus? (e.g. for H5N1, for MERS) |
| **Probe: Analysis** |
| Are more advanced descriptive epidemiologic analyses, such univariable/multivariable logistic regression to calculate risk ratios or odds ratios, performed as part of these studies? |
| **Probe: Roles and responsibilities** |
| Are roles and responsibilities for implementing the investigation or study defined and agreed with all stakeholders - including administering questionnaires and carrying out sampling? (E.g., do local teams carry out interviews or is a dedicated team needed?) |

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| **Q 2.5 Are there mechanisms to coordinate and share information with other sectors or agencies (e.g., animal health partners, law enforcement, governance structures)?**  |
| ***Possible core surveillance approaches****: Community EBS, NNDS, Community EBS, Investigations and Studies (outbreak investigation)****Possible enhanced surveillance approaches****: Media EBS, Targeted special population surveillance* |
| **Probe: SOPs & MOUs** |
| Are co-ordination mechanisms for information sharing between these sectors formal or informal? i.e. are there SOPs, information sharing agreements or MOUs in place?  |

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| **Facilitator supporting information (optional)** |
| ***Community EBS (CEBS)****CEBS is the ‘systematic detection and reporting of events of public health significance within a community, by community members. ‘Community’ can be more broadly defined to include high-risk communities or specific settings (please see p. 25-26 of the Mosaic Framework for a full description).**When a formal system is in place, CEBS or other disease surveillance focal points exist in communities to detect and report events of public health significance from communities to the public health system. Community health workers, community-based animal health workers, the public (e.g., village leaders), religious leaders, civil society members, teachers, and similar groups can be trained to detect and immediately report broad and simple signals of unusual health events occurring in their communities. CEBS systems at least cover high-risk populations and/or settings (e.g., cross-sector, human-environmental interface) or hard-to-reach communities where routine surveillance may be more challenging.**Information initially captured as a signal is reported to the community EBS focal point at the local, facility, or intermediate level depending upon existing reporting lines and capacity. Not all signals may become real events. As such, they all need to be triaged, verified, and risk assessed before a response may be initiated.* *CEBS can be expensive so discussion can surround which high risk populations or specific settings may be a priority such as considering whether some existing surveillance approaches already cover some populations.****Alert management including verification:*** *see above facilitator supporting information for case 1.****Multi-sector cross-notification and co-ordination*** *The One Health concept requires multi-sectoral and multidisciplinary coordination by environmental, human and animal health counterparts to detect, assess and respond to the emergence of new viruses from animals at a time that is sufficiently early to support control efforts. Following the report of a zoonotic disease or signal, cross-notification of alerts between animal health and human health authorities should take place at every level (local, regional, national), with a coordinated One Health risk assessment and response. In a few countries, there are examples where human and animal health sectors have agreed to share data on a select set of pathogens of high priority to both (e.g. avian Influenza, anthrax, etc). Regular meetings and coordination calls between relevant partners at multiple jurisdictional levels is recommended. This occurs routinely, and during outbreaks, joint investigations are undertaken by multidisciplinary rapid response teams, with ongoing cross-sectoral information sharing as indicated in an incident response structure.****Outbreak Investigation and Response: s****ee above in facilitators notes under case 1.****Investigations and studies****Investigations including enhanced surveillance, outbreak investigation (including cohort and case control studies) and other specialized investigations (such as the ‘first few X cases and contact’, ‘household transmission’, ‘closed setting transmission’, ‘health workers’ transmission, rapid assessment of clinical severity and risk factor investigations) and other seroepidemiological studies are essential to be implemented during the early stages of virus emergence. These allow to rapidly estimate key transmission and epidemiological parameters, including secondary attack rates, the basic reproduction number (R0) and the effective reproduction number (Rt), severity, seroprevalence, and to determine if human-to-human spread is occurring.**They also provide critical initial data about clinical presentations and infection severity (for example, the probability of a severe outcome for a given infection) and risk factors for transmission.**Where possible, high-quality investigations and studies should be conducted within a standardized framework such as the WHO Unity Studies initiative (e.g. for Influenza and MERS-CoV) or the Consortium for the Standardization of Influenza Seroepidemiology (CONSISE) so that parameters can be compared across different settings.***Further information on core surveillance approaches:** Community Event-Based Surveillance: see Mosaic Framework Domain I, page 25-26Investigation and Studies; see Mosaic Framework Domain I, pages 29-30 |

# CASE 2, INJECT 2: Detection by laboratory networks (including samples from communities)

***You have confirmed that there were indeed multiple cases with respiratory symptoms in [X population or location, as above]. Staff from the regional [health office/rapid response team] are deployed to collect swabs from the sick individuals in their homes.***

*The following questions should assist you in determining which core and enhanced surveillance approaches and investigations the country uses to address* ***Domain I Surveillance Objective 1: Rapidly detect emerging or re-emerging respiratory virus outbreaks and other events; Surveillance Objective 2: Assess transmissibility, risk factors for transmission, and extent of infection from an emerging or re-emerging respiratory virus; and Surveillance Objective 3: Describe clinical presentation and risk factors for severe outcomes associated with an emerging or re-emerging respiratory virus.***

***Functionalities being assessed: Functionality 5,6 (see*** *ANNEX 1****)***

**Questions for Discussion**

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| **Q 2.6 Do you have mechanisms for immediate specimen collection and prioritized testing of respiratory samples from community outbreaks?**  |
| ***Possible core surveillance approaches;*** *Laboratory networks, Community EBS, Investigations and Studies (outbreak investigation)* |
| **Probe: Specimen collection in the “field”** |
| Are outbreak responders able to collect samples for priority epidemic-prone diseases, including respiratory disease events? * Where can responders access information on required specimen collection equipment, PPE, storage and transport of specimens?
* Is this equipment readily available to responders?
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| **Probe: SOPs or algorithms** |
| Are there SOPs or algorithms in place to immediately collect specimens, test them, and report results from epidemic-prone diseases and unusual respiratory disease events? |

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| **Q 2.7 Which laboratories (private, public, academic etc.), and at which levels, are designated to immediately test and report specimens from outbreaks of epidemic-prone diseases and other unusual respiratory disease events?** |
| ***Possible core surveillance approaches;*** *Laboratory networks, Community EBS, Investigations and Studies (outbreak investigation)* |
| **Probe: Laboratory signals** |
| Do any of these labs have a list of signals to trigger reporting rare or unusual laboratory events? |
| **Probe: National Policy** |
| If a laboratory detects a rare or unidentifiable pathogen, what steps are taken? * Does the country have a national laboratory policy to immediately report detections of epidemic-prone diseases and unusual or unidentifiable pathogens?
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| **Q 2.8** **When laboratory results are reported from outbreak cases, to whom are they reported?** |
| ***Possible core surveillance approaches****: Community EBS, Health facility EBS, Investigations and Studies (outbreak investigation), Laboratory networks* |
| **Probe: Outbreak data linkages** |
| What mechanism is used to link lab data with epidemiologic and clinical data, and how quickly does this occur? |

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| **Facilitator supporting information**  |
| ***Laboratory Networks*** *A network of laboratories composed of clinical (public, private) and/or academic laboratories may exist in the country, and they may perform testing of respiratory viruses for clinical management, surveillance, or research. Molecular testing for key suspected respiratory diseases is either available in the affected location, or cold chain and transportation is robust enough to immediately send samples to the nearest lab with this capacity. Samples that may be prioritized for testing (e.g., all samples originating from unexplained respiratory deaths, or according to a risk assessment that has been completed per protocol) are clearly labeled as such.**Outbreak investigation guidelines should contain information on how to collect samples for priority epidemic-prone diseases and respiratory disease events including specimen collection equipment, PPE required, storage and transport of specimens.**Field staff /rapid response teams should be aware and regularly updated as to where and when specimens can be sent for priority testing.* *A molecular testing algorithm should exist that facilitates testing of specimens from cases of notifiable diseases, as well as any from unusual respiratory disease events to determine whether the pathogen is a known agent (e.g., influenza A(H5)) or an unidentifiable pathogen that may require further testing or genomic sequencing. Laboratories where these specimens can/should be sent for this testing are specified. In countries where genomic sequencing is undertaken, a genomic sequencing algorithm should also be in place.**Laboratory personnel across all relevant laboratories in country should be trained to immediately report rare or unidentified/unsubtypeable pathogens through designated mechanisms, including to the country’s IHR focal point when necessary. This reporting may occur as part of an event-based surveillance system, or potentially through a national notifiable disease surveillance system or sentinel surveillance system. Official agreements are in place for transport to other (international) laboratories for additional testing as needed.***Further information on core surveillance approaches:** Laboratory Networks: see Mosaic Framework Domain I, page 28 |

# CASE 3: Detection and Assessment of Potential Zoonotic Events

***A [large poultry slaughterhouse or other relevant location from which zoonotic transmission could occur (e.g., wet market)] is located on the outskirts of [insert town name]. One morning, managers noticed that multiple employees who work in the same area of the [above facility/location] were absent. They learn from staff who did come to work that several of the absent employees had told colleagues the day before that they felt sick with flu-like symptoms and therefore suspect that these employees stayed home. By the end of the week, 15 employees have become ill and are absent from the [above facility/location].***

*The following questions should assist you in determining which core and enhanced surveillance approaches and investigations the country uses to address* ***Domain I Surveillance Objective 1: Rapidly detect emerging or re-emerging respiratory virus outbreaks and other events*** *and* ***Surveillance Objective 2: Assess transmissibility, risk factors for transmission, and extent of infection from an emerging or re-emerging respiratory virus.***

***Functionalities being assessed: Functionality 3, 4 (see*** *ANNEX 1****)***

**Questions for Discussion**

**Questions for Discussion**

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| **Q 3.1 Do your early warning surveillance approaches include mechanisms for reporting illness or absences (or other “event” signals) from such settings where zoonotic transmission could occur?** |
| ***Possible core surveillance approaches****: Community EBS****Possible enhanced surveillance approaches****: Media EBS, Targeted special population surveillance* |
| **Probe: Key reporters & Reporting mechanisms** |
| What kind of key community reporters are included (e.g., employer, unions, local authorities, etc.)* Is the approach formalized or informal?
* How is this information reported to authorities?
 |
| **Probe: Investigation** |
| How would your surveillance system go about identifying the absent workers and determining if they are sick or where they might have sought care? |
| **Probe: Detection in other congregate/community settings** |
| Are there mechanisms to detect illness, absences, or other “event” signals from additional priority settings, such as schools, prisons, long-term (elder or disability) care facilities, other industry (e.g., mining)?* How are these cases reported?
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| **Q 3.2 Who is responsible for managing this potential cluster of zoonotic disease and implementing control measures to prevent more transmission within the setting and surrounding communities?** |
| ***Possible surveillance approaches****: Community EBS, Investigations and Studies (outbreak investigation)* |
| **Probe: Multi-sector coordination**  |
| Are there established & formal information sharing mechanisms between human and animal health authorities to facilitate a timely, coordinated response?* Does cross-notification of alerts between animal health and human health authorities occur at every administrative level and in both directions (i.e. animal health to human health and vice versa)?
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| **Facilitator supporting information** |
| ***Community Event-Based Surveillance (CEBS):*** *See facilitator supporting information under case 2, inject 1.**The facility and/or community may have identified a focal point (e.g., a key reporter or a local public health office) or mechanism (e.g., hotline or online reporting) to whom alerts such as these may be reported.* *Weekly notifiable disease reporting from nearby healthcare facilities is also cross-checked to gather additional information on cases who may have sought care.* *Risk assessment of events will trigger responsible parties to respond accordingly. These may include activation of a cross-sector response structure with local government and facility management through the city public health office, implementation of non-pharmaceutical interventions throughout the facility/location, and/or deployment of a multi-disciplinary rapid response team, among others. It’s also possible that a media monitoring system could detect this event (see case 4 facilitator supporting information), in which case the central level may contact the local surveillance office to prompt further investigation.***Further information on core surveillance approaches:** Community Event-Based Surveillance: see Mosaic Framework Domain I, page 25-26Investigation and Studies; see Mosaic Framework Domain I, pages 29-30 |

# CASE 4: Media Event-based surveillance

***Users across various online media platforms (e.g. Facebook & Twitter/X) begin sharing information related to an apparently sudden spike in severe hospitalizations in children with respiratory symptoms in [insert region(s)/province(s) names]. You want to confirm whether this is true, and if so, whether these cases pose an immediate health risk to the population.***

*The following questions should assist you in determining which core and enhanced surveillance approaches and investigations the country uses to address* ***Domain I Surveillance Objective 1: Rapidly detect emerging or re-emerging respiratory virus outbreaks and other events***

***Functionalities being assessed: 1, 3 (see*** *ANNEX 1****)***

**Questions for Discussion**

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| **Q 4.1** **Do you have a structured approach for monitoring media for reports of unusual respiratory or other events?** |
| ***Possible core surveillance approaches****: Health facility EBS, Community EBS, NNDS****Possible enhanced surveillance approaches****: Media EBS, syndromic surveillance* |
|  **Probe: Early warning data triangulation** |
| How would you quickly determine if other data sources are also seeing unusual cases or increases in cases?* Is there a platform and/or protocol that enables review and comparison of multiple early warning data sources?
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| **Facilitator supporting information**  |
| ***Media EBS****If installed, media monitoring may be leveraged to identify and track any online communications about unusual events or other occurrences causing concern among members of the public. This involves systematic monitoring of traditional and digital media including specific social media sources, government and official web sites, news sites, blogs, and collaborating initiatives. Epidemic Intelligence from Open Sources (EIOS) is one example of an initiative and supporting technology to facilitate media monitoring.**A centralized event management system is ideal to review any similar reports that may have been detected by an EBS system in the area.**If reports already exist, data are complete enough to determine the status of the report, i.e., whether the event has been verified or discarded, and if verified, information to discern whether this is the same event being shared on social media.* *The national notifiable disease surveillance system, syndromic and sentinel surveillance databases or weekly bulletins are also cross-checked for any unusual spikes in pediatric respiratory-related hospitalizations in the same or other areas. The cross-checking of multiple sources of information is enabled by central housing and visualization of multiple data streams.***Further information on core surveillance approaches:** Health Facility Event-Based Surveillance: see Mosaic Framework Domain I, page 25Community Event-Based Surveillance: see Mosaic Framework Domain I, pages 25-26National Notifiable Disease Surveillance: see Mosaic Framework Domain I, pages 26-28**Enhanced surveillance approach:**Media Event-Based Surveillance:see Mosaic Framework Domain I, page 31-32 |

# ANNEX 1: Functionality indicators to guide discussion

1. Country surveillance approaches have formal policies and procedures for immediate reporting of unusual, novel, and/or emerging cases or events **in healthcare settings**, including:
2. Reporting of respiratory disease cases with unusual presentation, clinical course and/or response to treatment
3. Reporting of unusual surges in admissions and/or emergency department visits
4. Disease or clusters of illness in healthcare providers
5. From private sector healthcare providers
6. Country response capabilities include:
7. Execution of a structured and documented national risk assessment
8. Fully staffed rapid response teams with the entire spectrum of skill sets needed for effective response available for immediate deployment at different administrative levels
9. Adequate laboratory support for immediate testing of samples from outbreaks and epidemic-prone diseases
10. Country has formalized early warning surveillance approaches that can capture signals of emerging outbreaks and/or events in a timely way from **all priority geographic areas and settings**, including:
	1. Remote areas with limited access to healthcare facilities
	2. Vulnerable settings and marginalized populations
	3. Persons with occupational exposures to animals
	4. Schools, large employers, and/or congregate community settings such as prisons or markets
11. Country early warning approaches have formal mechanisms in place to share information and data between relevant agencies, including animal health
12. Country has a national policy for laboratories to immediately report detections of epidemic-prone diseases and unidentifiable pathogens, which covers:
13. Private, public, academic, public health, clinical and other laboratories
14. At all administrative levels of testing
15. Country early warning and notifiable disease surveillance approaches can collect and link epidemiological and clinical data from cases to laboratory results
16. Country possesses:
	1. Methods to assess transmissibility, risk factors for transmission, and extent of infection from an emerging or re-emerging respiratory virus
	2. Methods to describe clinical presentation and risk factors for severe outcomes associated with an emerging or re-emerging respiratory virus