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Unusual Respiratory Event Surveillance Assessment: 2014



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EXECUTIVE SUMMARY

Objective: The objective of this multi-country discussion was to investigate ways to improve the implementation, in Latin America and the Caribbean, of unusual respiratory event surveillance (unusual severe acute respiratory infection [SARI]), which is necessary for early detection of novel influenza viruses with pandemic potential.

Methodology: Each participant from each of the three participating countries (Colombia, Ecuador, and El Salvador) received a questionnaire prior to the meeting to self-evaluate their current unusual SARI surveillance system/event based surveillance system (EBS). The questionnaire consisted of 33 questions divided into six categories: Overall Organization, Standard Operating Procedures/Reference Documents, Timeliness, Response, Coordination with Partners, and Communication. During the meeting, the participants were asked to discuss their self-evaluations, highlight their strengths and weaknesses, and propose plans of action for improvement.

Findings: Each participant identified strengths and weaknesses within their current unusual SARI surveillance system. When the data were compiled, it became apparent that the countries shared several strengths, some of which are highlighted here. The three countries have an unusual SARI surveillance system, and have established a case definition. Each country can adequately capture all the SARI cases that test positive for non-subtypeable influenza; and the NIC laboratory professionals in charge can safely send samples from their laboratory to the WHO-CC according to international standards. On the other hand, the three countries also shared several common weaknesses. For instance, all countries reported difficulty adequately capturing oseltamivir resistant cases; a lack of coordination between the Ministry of Health and the Ministry of Agriculture for cases with animal/bird exposure; and difficulty conducting both investigations and sample testing within 24 hours of case detection and unusual SARI risk evaluations within 48 hours of an unusual respiratory event.

Discussion: Based upon these weaknesses, participants offered several proposals to improve the structure and functioning of their unusual SARI surveillance systems. For example, in order to combat the lack of surveillance regarding oseltamivir resistance, countries proposed the inclusion of oseltamivir use as a variable in the current data collection for their surveillance system. Regarding the lack of communication between the Ministry of Health and the Ministry of Agriculture, countries suggested that each ministry should establish an office that serves as a direct line of contact with the other respective ministry. Finally, in response to the lack of timely investigation, evaluation, and verification of results, the countries proposed to create specialized groups to coordinate rapid response.

Conclusion: There are many strengths in the current unusual SARI surveillance systems, and through these discussions, common areas that warrant additional attention were identified. The information provided in this report can serve as a template for other countries in the region that are also developing unusual SARI surveillance systems. Ultimately, the findings highlight the difficulties that these countries have made to establish their unusual SARI surveillance system, and the steps they plan to take to address these difficulties.

ACKNOWLEDGMENTS

The influenza team of the Pan American Health Organization (CHA/IR/V) wants to express special thanks to all the authorities and epidemiology and laboratory professionals of Colombia, Ecuador, El Salvador, and Nicaragua that have participated directly and indirectly in this meeting about the surveillance of unusual respiratory events in the Americas. For their dedication regarding the implementation of this surveillance system in their countries, even their daily work in the search of respiratory viruses with pandemic potential. It is because of their accomplished labor that we have laid out a feasible objective in this meeting, to update new guidelines of surveillance based on their experience.

Similarly, we want to thank the authorities of Colombia: the Ministry of Health in Colombia and the National Institute of Health for the strong collaboration as a host country for the celebration of this finding. The personnel of the Pan American Health Organization of Colombia deserve a special mention for its work and dedication in organizing the reunion, as well as the points of contact of PAHO in the participating countries.

Finally, this project is possible thanks to the work and enthusiasm of the persons in the countries of the Americas that work daily in the establishments of health and laboratories of the surveillance of influenza and other respiratory viruses. Their strength and motivation to improve the surveillance of influenza in their countries justifies the content of the present report and paves a path to continuous improvement of our surveillance system.

ACRONYMS

EBS: event based surveillance

EI: epidemic intelligence

IBS: indicator based surveillance

IHR: International Health Regulations

ILI: influenza like illness

NIC: National Influenza Center

NFP: National Focal Point

RRT: Rapid Response Team

SARI: severe acute respiratory infection

WHO-CC: Collaborative Center of the World Health Organization

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1- INTRODUCTION

Emerging respiratory viruses can often be highly infectious and cause serious illness. Novel influenza viruses in particular, can emerge in an immunologically naïve population and as such, especially if highly transmissible, be associated with increased morbidity and often mortality.

In the last century there have been three major influenza pandemics: the first occurred in 1918 (influenza A/H1N1 influenza) and was responsible for the death of approximately 40 to 50 million people throughout the world, mainly young; the second was in 1957 (influenza A/H2N2 influenza) and the third in 1968 (influenza A/H3N2 influenza), with approximately 2 and 1 million deaths worldwide, respectively.

More recently, in 2008, human cases of avian influenza A (H5N1) occurred associated with a high case-fatality ratio. Globally, a series of preparative measures were initiated to plan for a possible pandemic. First, the WHO Regional Office of South-East Asia published a set of guidelines in 2008 that focused on providing health policy makers and epidemiologist with the technical information to provide an early warning component to their surveillance systems.¹ Second, the WHO Regional Office of the Western Pacific Region published a guide for implementation of Event Based Surveillance.² Shortly after, in preparation for the event that influenza A (H5N1) spread to the Americas, PAHO published a similar guideline and training document, with the objective of providing public health professionals with the necessary tools to rapidly identify and adequately manage suspect cases with pandemic potential.³

In order to carry out the objective of being able to rapidly identify and adequately manage suspect cases, it is important to have standardized case definitions of both ILI and SARI for sentinel surveillance, and a list of inclusion criteria for unusual SARI for nationwide surveillance (see Table 1).

Table 1. Case Definitions of ILI, SARI, and unusual SARI.

<p>ILI Case Definition:</p> <p>An acute respiratory infection with:</p> <ul style="list-style-type: none">• measured fever of $\geq 38^{\circ}\text{C}$;• and cough;• with onset within the last 10 days.	<p>Unusual SARI Case Definition:</p> <ul style="list-style-type: none">• Patients with SARI that do not respond to treatment, or with deterioration in their clinical course and with inconclusive laboratory tests.• SARI without a determined cause that occurs in a healthcare worker that cared for patients with respiratory infections.• SARI that is associated with infections in animals (infected and dead poultry or pigs)• Clusters of SARI or pneumonia: two or more cases in members of the same family, work places, or social networks.• An unexpected pattern of respiratory disease or pneumonia such as an increase in apparent mortality, a shift in the age group associated with severe influenza, or a change in the pattern of clinical presentation of influenza-associated disease.• An abundance of SARI cases: abrupt, unexpected changes in the trend of respiratory disease observed in routine surveillance
<p>SARI Definition:</p> <p>An acute respiratory infection with:</p> <ul style="list-style-type: none">• history of fever or measured fever of $\geq 38^{\circ}\text{C}$;• and cough;• with onset within the last 10 days;• and requires hospitalization.	

¹ "Early warning and response to outbreaks and other public health events: A guide" WHO (SEARO), 2008.

² "A Guide to Establishing Event-based Surveillance" WHO (WPRO), 2008.

³ "Health Establishments Preparation for Unusual or Unexpected Cases or Clusters of Severe Acute Respiratory Infection (SARI)" WHO (PAHO), 2008.

	<p>systems.</p> <ul style="list-style-type: none"> • Cases of infection with an influenza virus that is not circulating in humans.⁴
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Because of the guidelines recommended by PAHO in 2008, countries particularly in Latin America—Argentina, Nicaragua, Costa Rica, Colombia, El Salvador, and Ecuador among others—began to implement, what they called, a surveillance system of “unusual SARI” or unusual respiratory events (Table 2). These unusual cases could act as a warning signal for professionals to initiate the process of investigation, verification, and response in a timely manner.

Table 2. Event Based Surveillance Systems Names and Affiliated Country.

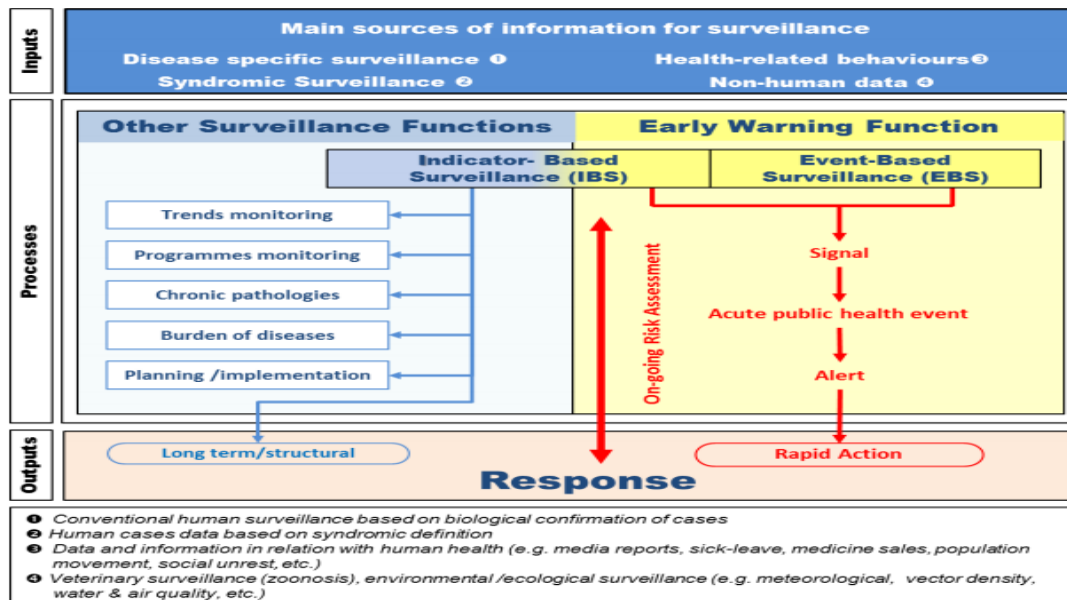
Argentina	Unusual Respiratory Event Surveillance
Nicaragua	Unusual Respiratory Event Surveillance
Costa Rica	Unusual SARI Surveillance
Colombia	Unusual SARI Surveillance
El Salvador	Unusual Hospitalized SARI Surveillance
Ecuador	Event-based or Outbreak Surveillance

The 2009 H1N1 influenza pandemic served as a test to see how far countries had come in developing unusual respiratory event surveillance. The 2009 H1N1 influenza pandemic revealed weaknesses in the establishment of surveillance systems regionally and globally and additionally revealed that countries had focused many resources on the strengthening of indicator based surveillance systems for SARI/ILI but should also strengthen unusual respiratory event surveillance.

The 2013 and 2014 H7N9 avian influenza and MERS-CoV outbreaks further emphasized the need to strengthen unusual SARI surveillance. Due to the renewed attention on countries’ unusual SARI surveillance systems, several weaknesses became apparent.

⁴ *Ibid.*

Figure 1. Sources of Information for Surveillance ⁵



In response to the misuse of unusual SARI surveillance systems, in 2014 the WHO published an update to the 2008 SEARO document, which elaborated on the implementation process of an Early Warning and Response (EWAR) system specifically tailored to event based surveillance. The main objective of this updated EWAR system is multi-sector based early detection and response to all hazards and potential health risks of a country.⁶

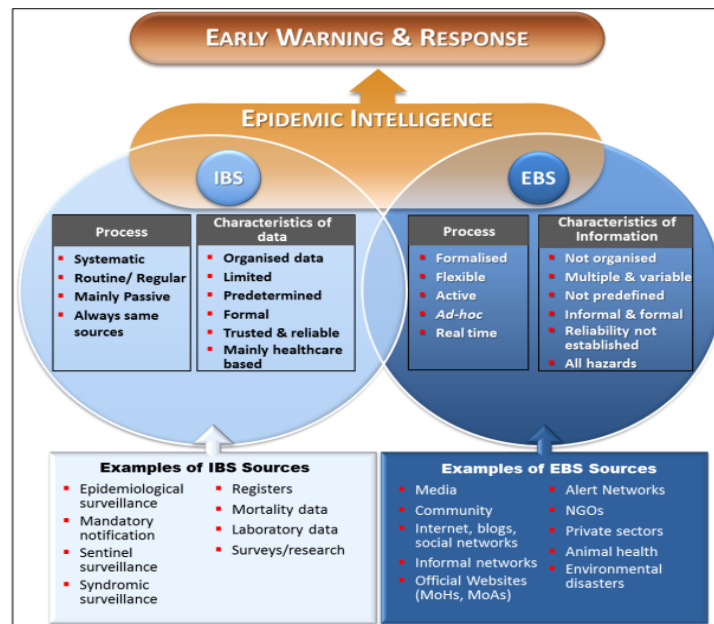
According to this 2014 WHO document, EWAR consists of three important early detection components: the Indicator Based Surveillance (IBS) system, the Event Based Surveillance (EBS) system, and Epidemic Intelligence (EI). The IBS system (sentinel SARI surveillance) is a routine surveillance system that consists of collection and analysis of systematic data. On the other hand, the EBS system is less structured—the data received in the EBS system can come from a variety of sources ranging from the media to local communities itself. These sources can be official or unofficial in nature, but EBS plays an essential role in the EWAR system overall. Finally, the EI system integrates the information from both the EBS and IBS systems with the objective of providing early detection of verified health risks. Both the IBS and EBS components of EWAR produce alerts that must be continuously verified by the EWAR staff (of the EI system). This is particularly important with EBS in which the highly sensitive system may pick up on false information and rumors.⁷

⁵ This figure is from: Early detection, assessment and response to acute public health events: Implementation of Early Warning and Response with a focus on Event-Based Surveillance.” WHO, 2014.

⁶ Early detection, assessment and response to acute public health events: Implementation of Early Warning and Response with a focus on Event-Based Surveillance.” WHO, 2014.

⁷ Ibid.

Figure 2. Early Warning and Response System Components⁸



Because EBS is a relatively new part of the EWAR system, it can be a difficult concept to grasp. While unusual respiratory event surveillance is typically considered an EBS system, because unusual respiratory event surveillance can be relatively hard to detect, it requires integration of information from both IBS and EBS sources in practice. Given the complexity of the unusual respiratory event surveillance in the Americas, PAHO began to work with three Latin American countries (Colombia, Ecuador, and El Salvador) to complete a performance review of their respective unusual SARI surveillance systems. The objective of this review was to evaluate the current strengths and weaknesses of their unusual SARI systems, define and prioritize plans to improve their current unusual respiratory surveillance system, and to generate new guidelines for the implementation of unusual SARI surveillance systems. With these goals in mind, a follow up conference was held in September of 2014 in Bogota, Colombia to reevaluate these countries' progress.

⁸ This figure is from: Early detection, assessment and response to acute public health events: Implementation of Early Warning and Response with a focus on Event-Based Surveillance." WHO, 2014.

2- STRENGTHS AND AREAS FOR IMPROVEMENT

The following tables and their associated graphs indicate on a scale from 0 to 100 the participants' perception of the strengths and areas for improvement of their country's unusual SARI surveillance system within the seven categories of the survey: overall organization, standard operating procedures/reference documents, timeliness, response, coordination with partners, and communication.

The strengths and areas for improvement presented here were based on the highest and lowest score(s) within each category. Since the overall questionnaire consisted of 33 items, 1-2 areas of improvement per category were selected so that a realistic amount of proposals could be managed. Taking into consideration the total number of items asked, it was determined that 7 areas for improvement would be a reasonable amount to manage. The cut off lines in the figures are standardized and were determined with this objective in mind.

Table 2.1. Survey Responses Regarding the Overall Organization of Unusual SARI Systems

OVERALL ORGANIZATION	SCORE
<ul style="list-style-type: none">Information sources to detect unusual respiratory events or unusual SARI (severe acute respiratory infection) are well identified. (Question 3)	90%
<ul style="list-style-type: none">There is a close relationship between the surveillance of unusual respiratory events/unusual SARI system's coordination team and the International Health Regulations (IHR) National Focal Points (NFP). (Question 4)	78%
<ul style="list-style-type: none">Properly functioning systems and procedures exist to capture, record, and monitor unusual respiratory events. (Question 5)	78%
<ul style="list-style-type: none">The surveillance of unusual respiratory events/unusual SARI surveillance system has a coordination team. This team is specific to this function and is operational. (Question 1)	73%
<ul style="list-style-type: none">The surveillance of unusual respiratory events/unusual SARI system coordination team has adequate staffing, materials, and funding. (Question 2)	43%

Figure 2.1. Strengths and Weaknesses of the Overall Organization of Unusual SARI Systems

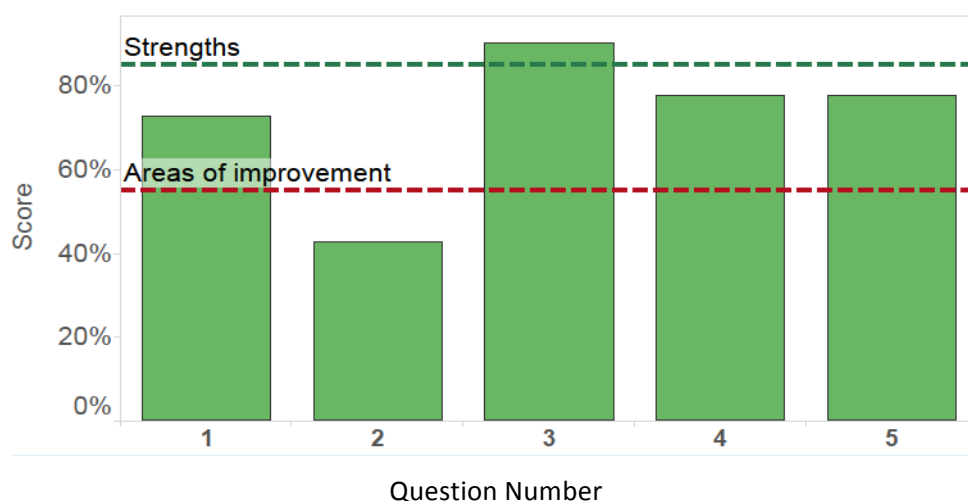
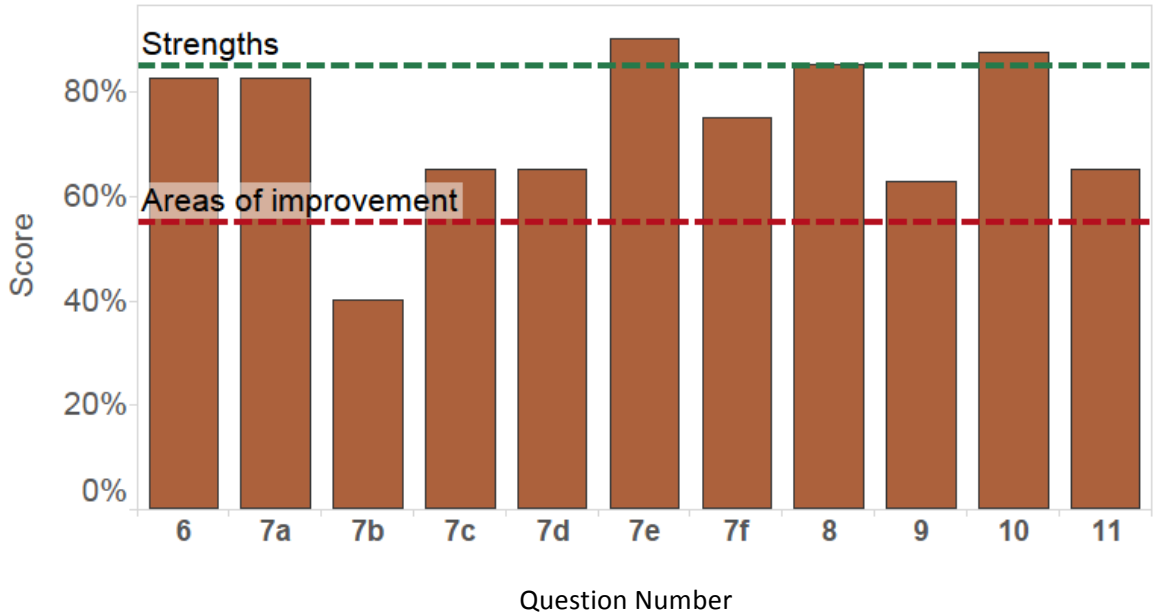


Table 2.2. Survey Responses Regarding the Standard Operating Procedures/Reference Documents of Unusual SARI Systems

STANDARD OPERATING PROCEDURES/REFERENCE DOCUMENTS	
• The country's surveillance of unusual SARI system appropriately captures all SARI cases positive for non-subtypeable influenza. (Question 7e)	90%
• Operating procedures for collection and transportation of clinical samples have been developed, are available at all levels (national and local), and are compatible with international guidelines. (Question 10)	88%
• Operating procedures for all surveillance of unusual SARI system key functions (case-finding, case investigation, risk assessment, response, etc.) have been developed and are available. (Question 8)	85%
• The country's surveillance of unusual SARI system appropriately captures all pneumonia outbreaks outside the influenza season. (Question 7a)	83%
• A surveillance of unusual SARI system case definition exists and is available. (Question 6)	83%
• The country's surveillance of unusual SARI system appropriately captures all SARI cases from countries with circulating respiratory viruses with pandemic potential. (Question 7f)	75%
• The country's surveillance of unusual SARI system appropriately captures all cases of unexplained SARI in health workers who work with patients with respiratory infections. (Question 7c)	65%
• The country's surveillance of unusual SARI system appropriately captures all cases of respiratory Infection in people/workers in contact with sick animals (birds, pigs). (Question 7d)	65%
• Operating procedures for infection control in health facilities have been developed, are available at all levels (national, regional, and local), and are compatible with international guidelines. (Question 11)	65%

<ul style="list-style-type: none"> Baselines and alert thresholds in routine surveillance systems are defined (e.g., SARI sentinel surveillance). (Question 9)⁹ 	63%
<ul style="list-style-type: none"> The country's surveillance of unusual SARI system appropriately captures all oseltamivir-resistant cases. (Question 7b) 	40%

Figure 2.2. Strengths and Weaknesses of the Standard Operating Procedures/Reference Documents of Unusual SARI Systems

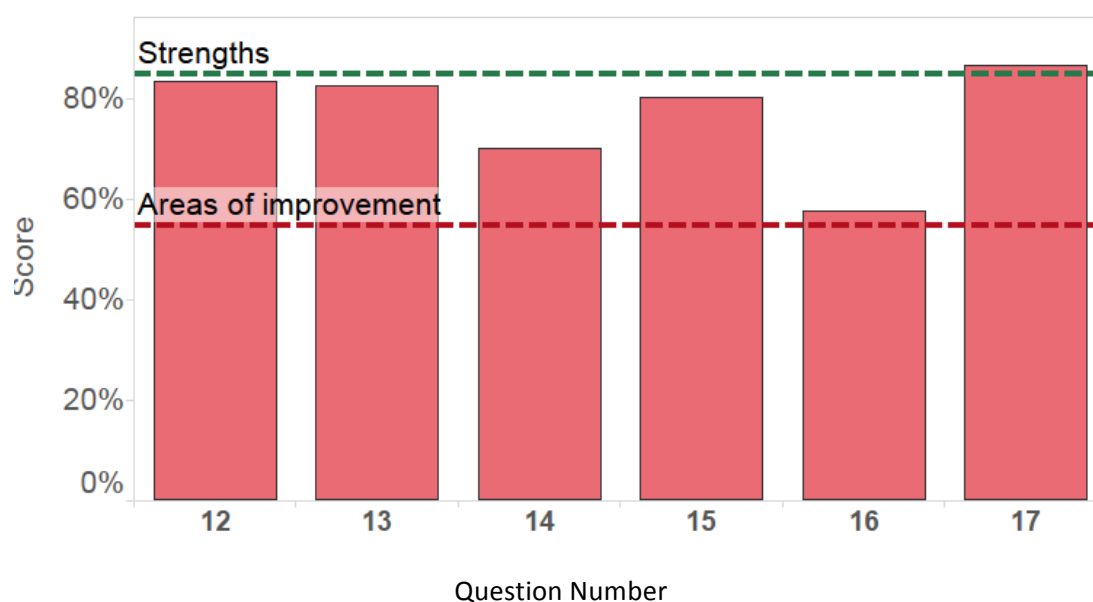


⁹ This topic was included as an area of improvement as it appeared important per meeting discussions.

Table 2.3. Survey Responses Regarding the Timeliness of Unusual SARI Systems

TIMELINESS	
<ul style="list-style-type: none"> The NFP responds on a timely basis to verification requests from WHO (the NFP should respond to 100% of verification requests from WHO within 24 hours). (Question 17) 	87%
<ul style="list-style-type: none"> Surveillance of unusual SARI system timeliness and operating procedures (investigation, risk assessment, and response) are routinely evaluated and reviewed. (Question 12) 	83%
<ul style="list-style-type: none"> Unusual SARI events and cases are reported promptly by all health facilities (at least 80% of all reporting units report on a timely basis). (Question 13) 	83%
<ul style="list-style-type: none"> If the unusual event requires it, capacity exists to send rapid response teams (RRTs) promptly (multidisciplinary RRTs should be sent within 48 hours of detection of an unusual event or SARI). (Question 15) 	80%
<ul style="list-style-type: none"> Unusual events and alerts are investigated promptly and risks are assessed (all unusual events or SARI should be confirmed within 24 hours and assessed within 48 hours). (Question 14) 	70%
<ul style="list-style-type: none"> If the unusual event/SARI so warrants, WHO is notified in a timely manner (NFP should notify WHO of all events meeting the notification criteria in Annex 2 of the IHR within 24 hours of risk assessment). (Question 16)¹⁰ 	58%

Figure 2.3. Strengths and Weaknesses of the Timeliness of Unusual SARI Systems

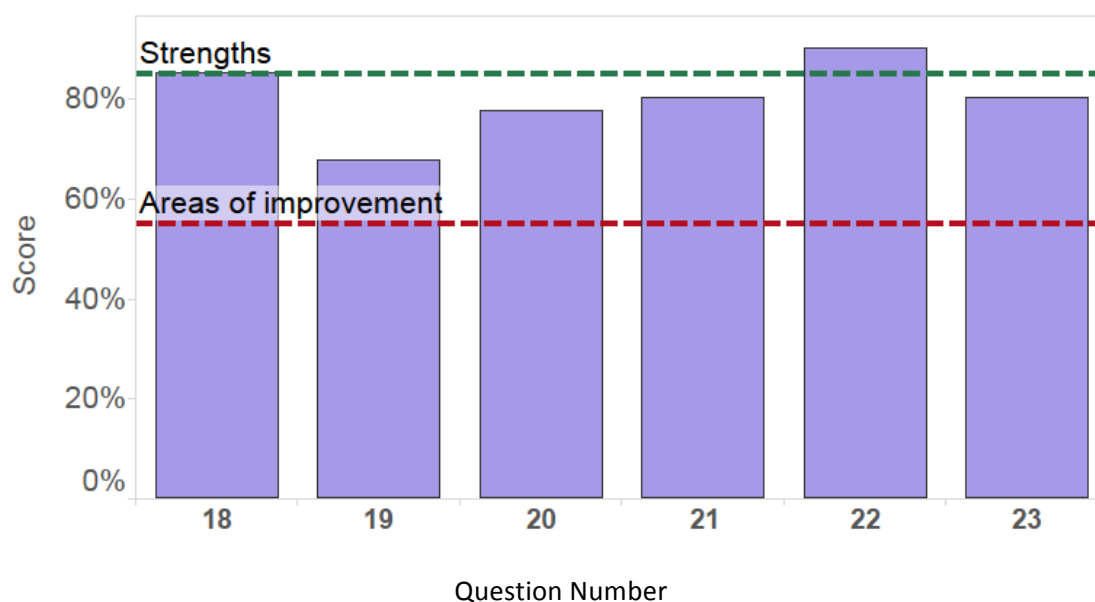


¹⁰ This topic was included as an area of improvement as it appeared important per meeting discussions.

Table 2.4. Survey Responses Regarding the Response of Unusual SARI Systems

RESPONSE	
<ul style="list-style-type: none"> The professionals in charge have been trained in safe shipment of samples from the surveillance of unusual SARI system, according to international standards. (Question 23) 	90%
<ul style="list-style-type: none"> Operating procedures for investigation of and response to unusual SARI have been developed and are available. (Question 18) 	85%
<ul style="list-style-type: none"> Biosafety procedures in laboratories and health facilities (at the national level) have been implemented and are regularly monitored. (Question 23) 	80%
<ul style="list-style-type: none"> Unusual SARI respiratory samples are sent to the national influenza center (national laboratory) within 48 hours of sample collection and if necessary, to the WHO Collaborating Center. (Question 21) 	80%
<ul style="list-style-type: none"> There is access to oseltamivir, vaccines, and materials (for sample collection and transportation) to respond to unusual SARI at relevant sites (national level). (Question 20) 	78%
<ul style="list-style-type: none"> Baselines and alert thresholds are appropriately used in routine surveillance systems (e.g., sentinel surveillance of SARI) for taking action. (Question 19)¹¹ 	68%

Figure 2.4. Strengths and Weaknesses of the Response of Unusual SARI Systems



¹¹ This topic was included as an area of improvement as it appeared important per meeting discussions.

Table 2.5. Survey Responses Regarding the Coordination with Partners in Unusual SARI Systems

COORDINATION WITH PARTNERS	
<ul style="list-style-type: none"> There is good coordination between the national influenza center (national laboratory) and the WHO Collaborating Center for diagnosis and confirmation of unusual SARI and to support investigation of outbreaks. (Question 26) 	87%
<ul style="list-style-type: none"> Duties and responsibilities of surveillance of unusual SARI system authorities and other stakeholders have been defined. (Question 24) 	78%
<ul style="list-style-type: none"> Surveillance of unusual SARI system multisectoral and multidisciplinary coordination and communication mechanisms exist and function. (Question 25) 	78%
<ul style="list-style-type: none"> National and local level surveillance of unusual SARI system coordination teams receive laboratory results in a timely fashion for decision-making and action. (Question 28) 	77%
<ul style="list-style-type: none"> There is timely and good quality coordination for decision-making and required action between the Ministry of Health and Ministry of Agriculture (or similar) on unusual SARI cases at the human-animal interface. (Question 27) 	50%

Figure 2.5. Strengths and Weaknesses of the Coordination with Partners in Unusual SARI Systems

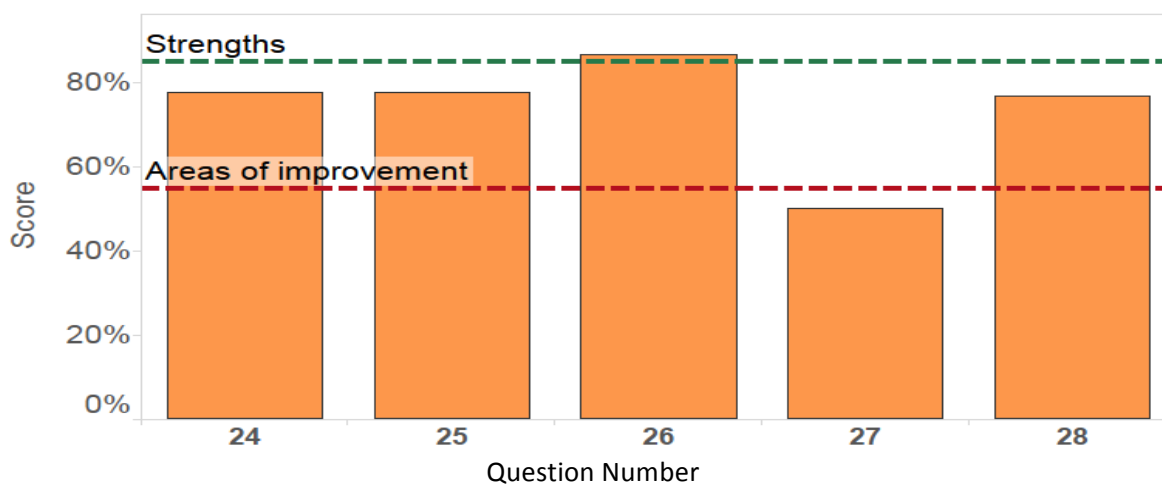
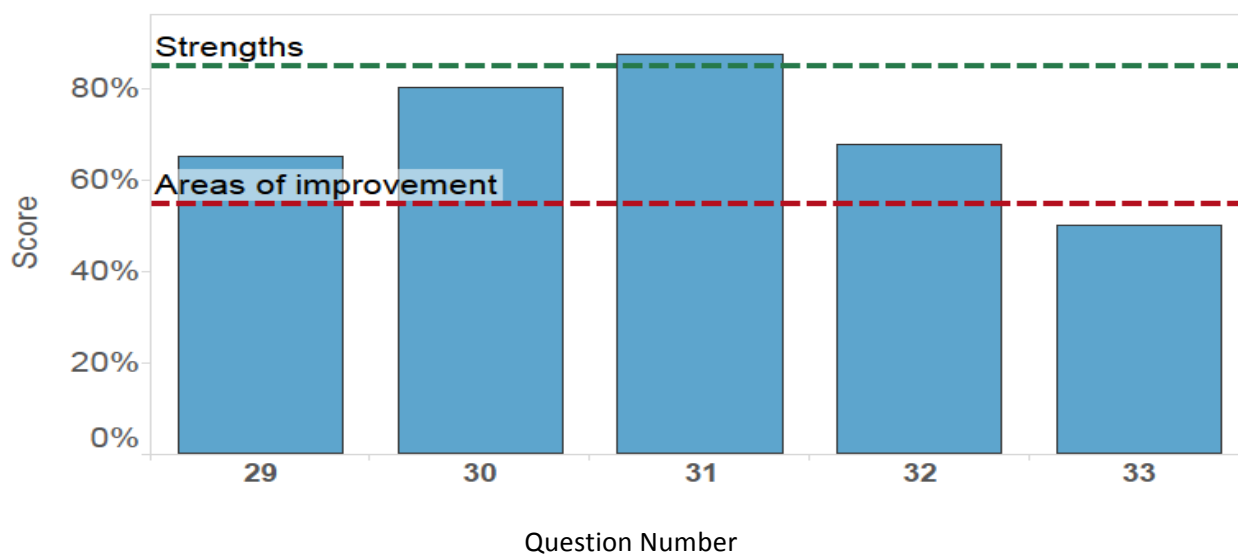


Table 2.6. Survey Responses Regarding the Communication of Unusual SARI Systems

COMMUNICATION	
• Feedback on surveillance results is provided to all required levels. (Question 31)	88%
• A national report with routine surveillance results is published weekly (e.g., SARI sentinel surveillance). (Question 30)	80%
• Policies, operating procedures, or guidelines for approval and release of press bulletins during a pandemic virus emergency have been developed. (Question 32)	68%
• Risk communication operating procedures have been developed and are available for different levels. (Question 29)	65%
• Staff training in risk communication. (Question 33)	50%

Table 2.5. Strengths and Weaknesses of the Communication in Unusual SARI Systems

SUMMARY OF RESULTS

Based upon the countries' self evaluation and discussions during the meeting, the principal strengths of the surveillance of unusual SARI in the countries of the region were identified as the following:

- Countries have established an unusual SARI case definition that is used to detect unusual SARI in hospitals.
- Overall, these countries surveillance of unusual SARI appropriately captures all SARI cases that are positive for non-subtypeable influenza.
- Operating procedures for collection and transportation of clinical samples have been developed, are available at the national, regional, and local levels, and are compatible with international guidelines.
- The NFP responds to verification requests from the WHO on a timely basis (within 24 hours).
- Trainings in the safe shipment of samples are well established and follow international standards.
- There is good coordination between the national influenza center (national laboratory) and the WHO Collaborating Center for diagnosis and confirmation of unusual SARI and to support investigation of outbreaks.
- Feedback on surveillance results is provided to all required levels.

The areas that were identified as needing improvement were the following:

- The coordination team for the unusual SARI surveillance system does not have adequate staffing, materials, and funding.
- Baselines and alert thresholds in routine surveillance systems are not well defined.
- The case definition and detection of unusual SARI requires an increase in sensitivity and specificity.
- Countries do not notify the WHO of neither unusual SARI event investigation nor verification within 24 hours nor risk evaluation within 48 hours of an unusual respiratory event.
- Deficient coordination between Ministry of Health and Ministry of Agriculture on unusual SARI cases at the human-animal interface for decision-making and required action.
- Staff training in risk communication is lacking: there are no policies, operating procedures, or guidelines for approval and release of press bulletins during a pandemic virus emergency.

3- NEXT STEPS/IMPROVING UNUSUAL SARI SURVEILLANCE SYSTEMS

From the 7 areas of improvement identified from the countries' unusual SARI systems, 38 proposals and/or development activities were written in conjunction with the participants (Annex 4.4).

These responses were assessed during the meeting discussions by the focus groups in a priority matrix (Annex 4.4) based on the following criteria:

- Importance
- Urgency
- Feasibility

Each participant took into account the importance of addressing the proposal, the urgency of the proposal, and the feasibility of its implementation. The participants ranked each proposal's importance, urgency, and feasibility based on a scale from 1-5. These numbers were then tabulated into percentages from 0-100 representing the priority level of each proposal.¹²

The following table details the complete list of the 38 proposals with their corresponding score grouped by the identified area for improvement.

Table 3.1. Areas for Improvement and their Associated Proposals

The unusual SARI surveillance system coordination team does not have adequate staffing, materials, or funding.	Priority Level (0-100)
Initiate an advocacy process with the country's high authorities to identify mechanisms that ensure resources for human talent and materials.	54.1
Establish minimum requirements for processes that define minimum labor requirements for surveillance down to the local level.	53.8
Train on the coordination team management components with activities that have attainable objectives.	50.1
Establish processes that ensure job security to create continuity within the coordination team.	46.1
The unusual SARI surveillance system has deficient low-sensitivity detection of oseltamivir resistance.	Priority Level (0-100)
Continue developing surveillance systems for unusual events to increase sensitivity of the surveillance system to oseltamivir-resistant strains.	78.2
Train clinical physicians and pediatricians in the use of oseltamivir.	57.4
Promote standardization of techniques to detect oseltamivir resistance.	51.4

¹² The three numbers for each category were multiplied to get a maximum score of 125 (I x U x F). The total number of participants' scores for each individual proposal was added together to achieve a cumulative score. That cumulative score was divided by the maximum point possible (number of participants X 125) and multiplied by 100 to achieve a percentage for each proposal.

Include oseltamivir use as a required variable in surveillance systems for the purpose of monitoring its use.	51.3
The unusual SARI surveillance system has low sensitivity to healthcare workers.	Priority Level (0-100)
Establish a specific list of occupations related to the subject being investigated.	50.9
Improve sensitivity of case definition to capture healthcare workers in the surveillance system.	48
The unusual SARI surveillance system has low sensitivity to capture potential cases involving workers with human-animal interface.	Priority Level (0-100)
Strengthen the coordination between Ministry of Public Health and Animal Health.	60.4
Improve animal health surveillance systems to improve detection of sick humans in contact with sick or dead animals.	50.1
The unusual SARI criteria “cases between the ages of 5-65 without co-morbidities” is non-specific, generating a high burden of false positive cases. Usual acute respiratory infection cases are often misclassified as unusual events through this criterion.	Priority Level (0-100)
Adjust the case definition to eliminate this criterion.	74.4
Maintain ongoing training and seek strategies that reach the local level (e.g., online training).	60.5
Continue with ongoing monitoring and assessment of the case definition to determine whether additional adjustments must be made.	54.7
Baselines and alert thresholds have not been developed and are not available in routine surveillance systems (using historical data).	Priority Level (0-100)
Establish the baseline for each participating country strategy and decide on several alert thresholds, based on historical data, so that routine surveillance systems generate alerts to take action.	64
Include baselines in weekly reports and bulletins.	61.5
Review the information available for each country for a minimum of three years to calculate baselines for each strategy.	57.9
Organize periodic meetings for sharing and exchanging information among countries.	51.5
Investigation and verification of an unusual SARI does not occur in a timely manner (within 24 hours).	Priority Level (0-100)
Intensify training at different levels of care in the system for case capture, notification, and preparation of case closure reports.	79.6
Create specialized working teams for follow-up and monitoring from case capture to outcome report and case closure.	60.7
Implement and standardize online reporting system (for countries that have not implemented this).	56.9

Upgrade computer systems to deal with more variables and be analysis-friendly.	56.3
Set up a real-time registry using tablets or computer tools to promptly post information on unusual patients that are found.	31.5
Risk assessment of unusual SARI does not occur in a timely manner (within 48 hours).	Priority Level (0-100)
Optimize and coordinate channels of communication among all involved parties.	67.8
Create groups specialized in immediate response plans and conduct training on their activation.	55.4
Perform quality control and monitoring of all above-mentioned processes.	50.6
Training in risk communication is lacking: there are no policies, operating procedures, or guidelines for approval and release of press bulletins during a pandemic virus emergency.	Priority Level (0-100)
Develop a risk communication plan establishing routes, persons in charge, spokespeople, channels of communication, etc. and establish mechanisms for communicating with the press.	76.7
Evaluate the risk communication process itself to determine whether revisions must be made.	70.2
Define process documents and develop a risk communication plan, establishing routes, persons in charge, spokespeople, channels of communication, etc. and establish mechanisms for communicating with the press.	66.3
Establish a risk communication policy that includes official spokesperson, official channels, budget for communication, source of official data, and ethical considerations.	61.2
Measure the impact of risk communications strategies implemented.	48.3
Deficient coordination between Ministry of Health and Ministry of Agriculture (or similar) on unusual SARI cases at the human-animal interface for decision-making and required action.	Priority Level (0-100)
Set up an early warning system with defined telephone chains, specifically between Ministry of Health and Ministry of Agriculture.	63.8
Set up an area or office in both institutions to make direct contact in each situation.	54.2
Establish a coordinated inter-institutional work group that meets regularly and in which plans and actions are established and decisions made.	53.9
Each institution should know the technical, operational, and diagnostic capabilities and limitations of both institutions, and should have process documents.	50.7
Prepare process documents in each institution.	45.1
Regularly evaluate each institution alone and inter-institutionally.	38.6

SUMMARY OF PRINCIPAL WEAKNESSES AND THEIR ASSOCIATED PROPOSALS IN ORDER OF PRIORITY

1) Baselines and alert thresholds in routine surveillance systems are not well defined.

Overall Action:

- Establish baseline and alert thresholds

Rational:

- Baseline and alert thresholds can help to identify an unusual respiratory event that requires investigation.

Specific Country Proposals:

Proposal 1: Intensify training at different levels of care on the system for case capture, notification, and elaboration of case closure reports. (79.6%)

Proposal 2: Create specialized working teams for follow-up and monitoring from case capture to outcome report and case closure. (60.7%)

Proposal 3: Establish the baseline for each participating country strategy and decide on several alert thresholds, based on historical data, so that routine surveillance systems generate alerts to take action. (64%)

Proposal 4: Include baselines in weekly reports and bulletins. (61.5%)

2) The case definition and detection of unusual SARI requires an increase in sensitivity and specificity.

Overall Actions:

- Modify the case definition: "SARI cases among previously healthy adults".
- Improve detection of:
 - Oseltamivir resistance cases
 - Respiratory disease in humans that is associated with illness in animals
 - Severe, unexplained lower respiratory illness occurring in healthcare workers

Rational:

- The current case definition of unusual SARI needs to be updated.

Specific Country Proposals:

Proposal 1: Continue developing/strengthening surveillance systems for unusual events to increase sensitivity of the surveillance system to detect oseltamivir-resistant strains. (78.2%)

Proposal 2: Adjust the case definition to eliminate this criterion. (74.4%)

Proposal 3: Maintain ongoing training, seeking strategies that reach the local level (e.g., online training). (60.5%)

Proposal 4: Strengthen coordination between Ministry of Public Health and Animal Health. (60.4%)

3) Investigation and verification of unusual SARI does not occur in a timely manner (within 24 hours).

Overall Actions:

- Investigate all the unusual SARI cases
- Follow up every SARI case (usual and unusual) until its output is registered (death or discharge).

Rational:

- Every case with a virus of pandemic potential needs to be investigated and monitored until case closure.

Specific Country Proposals:

Proposal 1: Intensify training at different levels of care on the system for case capture, notification, and elaboration of case closure reports.

Proposal 2: Create specialized working teams for follow-up and monitoring from case capture to outcome report and case closure.

4) Deficient coordination between Ministry of Health and Ministry of Agriculture on unusual SARI cases at the human-animal interface for decision-making and required action.

Overall Action:

- Increase coordination between the two agencies through an early warning system with defined telephone chains.

Rational:

- Coordination between Ministry of Health and Ministry of Agriculture will help to better capture cases at the human animal interface.

Specific Country Proposals:

Proposal 1: Set up an early warning system with defined telephone chains, specifically between Ministry of Health and Ministry of Agriculture. (63.8%)

5) Staff training in risk communication is lacking: there are no policies, operating procedures, or guidelines for approval and release of press bulletins during a pandemic virus emergency. (Communication)

Action:

- Establish specific risk communication infrastructure (including: official spokesperson, official channels of communication, budget for communication, and mechanism for press communication)

Rational:

- Communication between agencies and with the public is a priority for the management of health emergencies.

Specific Country Proposals:

Proposal 1: Develop a risk communication plan establishing routes, persons in charge, spokespeople, channels of communication, etc. and establish mechanisms for communicating with the press. (76.6%)

Proposal 2: Evaluate the risk communication process itself to determine whether revisions must be made. (70.2%)

Proposal 3: Define process documents and develop a risk communication plan, establishing routes, persons in charge, spokespeople, channels of communication, etc. and establish mechanisms for communicating with the press. (66.3%)

Proposal 4: Establish a risk communication policy that includes an official spokesperson, official channels, budget for communication, source of official data, and ethical considerations. (61.2%)

As a result of the discussions throughout the meeting and the analysis conducted in this report, it appears that three major improvements in the unusual SARI surveillance systems of countries are needed:

1. **Improve the unusual SARI Case Definition**
 - Refine definition to truly capture unusual cases.
 - Increase Coordination between Ministry of Health and Ministry of Agriculture for cases at human animal interface.
 - Publish scientific evidence among the participant countries.
2. **Establish Baseline (average epidemic curve) and Alert Threshold**
 - Better define baselines and alert thresholds for all countries.
 - Determine new analysis technique for countries in tropical regions.
3. **Develop an “Investigation of Unusual Respiratory Event” training**
 - Proper investigation of Unusual SARI cases and contact tracing
 - Includes Risk Communication, Risk Assessment, Proper Notification

4- ANNEXES

4.1- PROFILES OF THE PARTICIPATING COUNTRIES

4.1.1- COLOMBIA



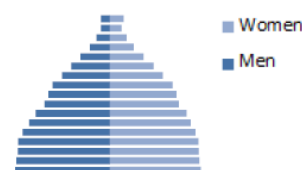
Colombia – Influenza and Other Respiratory Virus (ORV) Surveillance

(updated August 2014)

Sociodemographic indicators (2013)

Source: Pan American Health Organization. Health Situation in the Americas: Basic Indicators, 2013.

- Total population: **48,321,000**
- Life expectancy (years)
- Men: **70.4**
 - Women: **77.7**
 - Total: **74.0**
- General mortality rate per 1,000 inhabitants
- All causes: **6.7**
 - Communicable diseases: **0.46**
- Hospital beds per 1,000 inhabitants: **1.5**
- Public health expenditure (% of GDP): ...



Surveillance Systems

Surveillance Systems	Scope	Sample Collection	Data Collection
ESI (ILI) Surveillance	Sentinel	Yes	Nominal
SARI Surveillance	Sentinel	Yes	Nominal
Unusual SARI Surveillance	National	Yes	Nominal
ARI Mortality Surveillance in <5-year-olds	National	Yes	Nominal
ARI Morbidity Surveillance	National	No	Aggregate

Sentinel Sites

SARI Hospitals (N=19)

Amazonas, Antioquia, Arauca, Barranquilla, Bogotá (5), Boyacá (2), Cartagena, Caldas, San José del Guaviare, Meta, Nariño (2), Tolima, Valle

ILI Centers (N=10)

Amazonas, Antioquia, Arauca, Boyacá, Cartagena, Caldas, San José del Guaviare, Meta, Norte de Santander, Valle

National Influenza Center (N=1)

National Institute of Health of Colombia

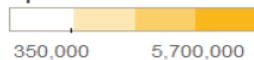
- Techniques realized: IFI, RT-PCR, viral isolation
- Average samples/year: 10,452

Regional laboratories with PCR and IFI capacity (N=3)

LSPD del Distrito de Bogotá
LSPD de Antioquia
LSPD de Nariño

Regional laboratories with IFI capacity but without PCR capacity (N=13)
(Not shown on the map)

Population



Information Systems

Integration of epidemiological/virologic information	Yes	The data bases generate bulletins/reports automatically	No
Integration of different surveillance information systems	Yes	A national bulletin/report is published weekly	Yes
Allows for monitoring of the sentinel site system	Yes	Includes SARI/ILI sentinel surveillance data	No
Provides influenza activity indicators	Yes	Data reported to PAHO/WHO system FluID	Yes
Provides interactive online dashboard	No	Data reported to PAHO/WHO system FluNet	Yes

Reporting

Colombia – Influenza and ORV Surveillance

SARI/ILI Sentinel Surveillance

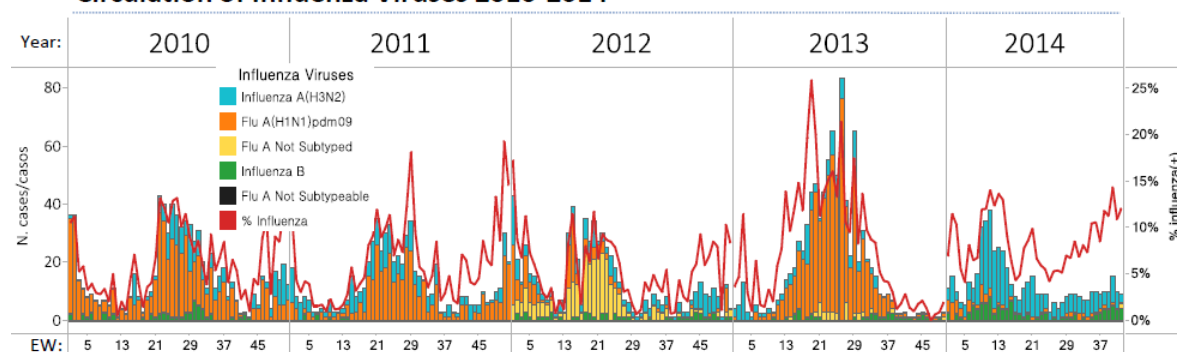
SARI case definition: Person with acute respiratory infection with history of fever and cough of no more than 10 days of progression, that requires intra-hospital management.

ILI case definition: Patient with acute respiratory infection, with fever greater than or equal to 38°C and cough, of no more than 7 days of progression, and that requires ambulatory clinical management.

Sentinel Surveillance Characteristics		SARI	ILI
General	PAHO/WHO case definition	No	No
	Trainings per year	1-2	1-2
Case selection/sampling	Selection for sampling	Minimum quota 5/site	Minimum quota 5/site
	Systematic randomized sampling	Yes	Yes
	Collection of clinical-epidemiological variables	Yes	Yes
	Frequency of sample shipment to the laboratory	Weekly	Weekly
Data management, analysis, reporting	Frequency of national data updates	Weekly/monthly	Weekly/monthly
	Denominator of number of cases	All hospitalized	All ambulatory visits
	Use of baselines or endemic channels	No	No
Evaluation/monitoring	Sentinel establishments are evaluated	Yes	Yes
	Number of evaluations per year	2	<1

Laboratory Surveillance	
National Influenza Center (NIC)	Yes
Year initiated as NIC	2007
Receive samples from all surveillance systems	Yes
Weekly average of samples in the country (2011-2013)	201
Labs have access to epidemiological case information	Yes
Sends samples to WHO Collaborating Center	Yes
Detection of other respiratory viruses by PCR	Yes
There is a plan for quality control in the laboratory network	Yes

Circulation of Influenza Viruses 2010-2014*



Vaccines

Vaccine composition	Southern hemisphere (since 2008)
Vaccination time-frame	April
Percentage of older adults (>60 years) that received the vaccine against influenza, 2013	28
Percentage of children (6-23 months) that received the vaccine against influenza, 2013	81

Influenza Pandemic Preparedness Plan

Country has a Pandemic Preparedness Plan	Yes
Year last updated	2010
Year first devised	2007

* Source: Pan American Health Organization. *Regional Influenza and Other Respiratory Virus Surveillance*, PAHO-WHO. Available at: http://ais.paho.org/hip/viz/ed_flu.asp

Unless otherwise specified, all data was collected by the PAHO/WHO Influenza Surveillance Team from one or more of the following sources: PAHO questionnaires completed by epidemiology or laboratory experts, influenza bulletins published/ shared by the countries, country presentations in regional influenza meetings, consultation with country influenza surveillance experts. The document was submitted to the national counterpart for revision.



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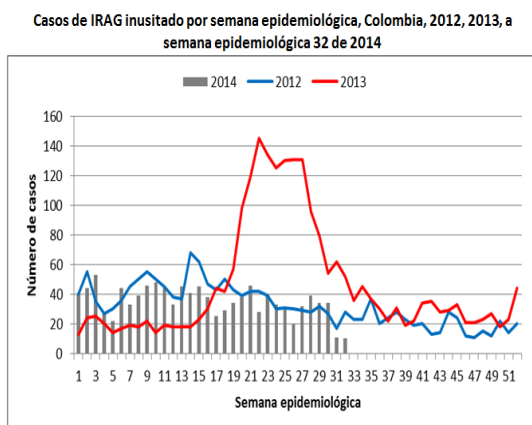


World Health
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CHARACTERISTICS OF THE UNUSUAL RESPIRATORY EVENT SURVEILLANCE SYSTEM IN COLOMBIA

(Source: Colombia participant presentation)

Fig. 1. Cases of unusual SARI based on epidemiologic week



Tab. 1. Cases of unusual SARI based on case definition

Casos de IRAG inusitados por año según criterios de definición, Colombia, 2012, 2013 y 2014			
Case Definition	2012	2013	2014
Individuals between 5 and 65 years without underlying disease	1250	2327	923
Health care worker or worker in the pork or poultry sector	54	102	49
Travel history	26	48	25
Death from acute respiratory infection of unknown cause	74	138	83
Total	1672	2327	1222

Fig. 2. Distribution of respiratory viruses based on age

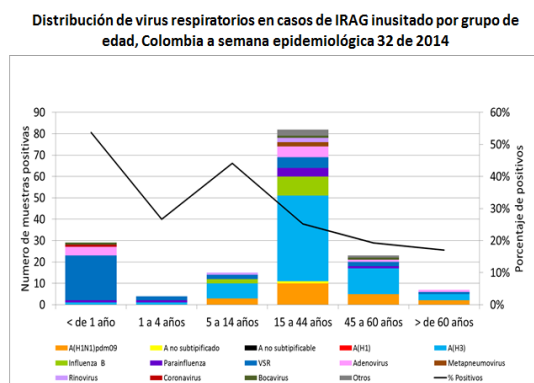
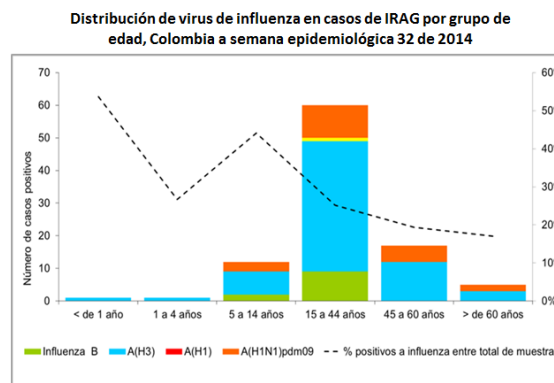


Fig. 3. Distribution of influenza virus based on age



STRENGTHS OF THE UNUSUAL EVENT SURVEILLANCE SYSTEM IN COLOMBIA¹³

- The unusual SARI surveillance system exists and has a case definition.
- The country's unusual SARI surveillance system captures SARI cases attributable to non-subtypeable influenza A.
- Standard Operating Procedures (SOPs) for collection and transport of clinical samples have been developed, are available at all levels (national and local), and are aligned with international guidelines.
- If a case of unusual SARI is detected, WHO is notified in a timely manner (Note: National Focal Point [NFP] should notify WHO of all events meeting the notification criteria in Annex 2 of the IHR within 24 hours of risk assessment).
- The NFP responds to WHO requests for verification in a timely manner (Note: NFP should respond to 100% of WHO requests for verification within 24 hours).

¹³ All the strengths listed here are self evaluations on behalf of these countries based on the questionnaire.

- SOPs for investigation of and response to unusual SARI cases have been developed and are available.
- There is coordination between the National Influenza Center and the WHO Collaborating Center for diagnosis and confirmation of unusual SARI cases and to support the investigation of outbreaks.

AREAS FOR IMPROVEMENT IN THE UNUSUAL RESPIRATORY EVENT SURVEILLANCE SYSTEM IN COLOMBIA

1. OVERALL ORGANIZATION

Area for Improvement	Priority Actions
<ul style="list-style-type: none"> • The unusual SARI surveillance system coordination team does not have adequate staffing, materials, and funding. 	<ul style="list-style-type: none"> • Ensure a budget for hiring staff, and for materials and equipment.

2. STANDARD OPERATING PROCEDURES/REFERENCE DOCUMENTS

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • SOPs for infection control in health care facilities have not been fully developed, been made available at all levels (national and local), or been compatible with international guidelines. 	<ul style="list-style-type: none"> • Prepare an operating procedures manual for infection control in health facilities, compatible with international guidelines. • Validate an operating procedures manual for infection control in health facilities, compatible with international guidelines. • Implement an operating procedures manual for infection control in health facilities, compatible with international guidelines. • Evaluate and monitor the implementation of an operating procedures manual for infection control in health facilities, compatible with international guidelines.

3. TIMELINESS

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • The unusual SARI surveillance system's timeliness and operating procedures (investigation, risk assessment, and response) are not routinely evaluated and reviewed. 	<ul style="list-style-type: none"> • Develop an indicator for evaluation and monitoring of unusual cases. • Evaluate and monitor unusual SARI cases using the indicator.

4. RESPONSE

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • Baselines and alert thresholds are not appropriately used in routine surveillance systems (e.g., sentinel surveillance of SARI) for taking action. 	<ul style="list-style-type: none"> • Analyze existing information to determine whether it can be used to develop baselines. • Develop baselines if possible. • Orient and retrain personnel on baseline use and analysis.

5. COORDINATION WITH PARTNERS

Area of Improvement	Priority Actions
<ul style="list-style-type: none">There is not timely and good quality coordination for decision-making and required action between the Ministry of Health and Ministry of Agriculture regarding unusual SARI cases involving animal exposure.	<ul style="list-style-type: none">Establish and activate channels of communication among the surveillance offices of the corresponding ministries.

6. COMMUNICATION

Area of Improvement	Priority Actions
<ul style="list-style-type: none">Staff training in risk communication is lacking.	<ul style="list-style-type: none">Determine ways to improve risk communication training.

4.1.2- ECUADOR



Ecuador – Influenza and Other Respiratory Virus (ORV) Surveillance

(updated August 2014)

Sociodemographic indicators (2013)

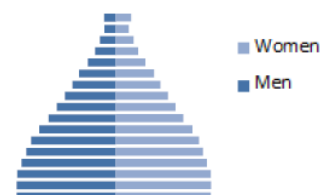
Source: Pan American Health Organization. Health Situation in the Americas: Basic Indicators, 2013.

Total population: **15,738,000**
 Life expectancy (years)
 - Men: **73.7**
 - Women: **79.4**
 - Total: **76.5**

General mortality rate per 1,000 inhabitants
 - All causes: **6.1**
 - Communicable diseases: **0.61**

Hospital beds per 1,000 inhabitants: **1.6**

Public health expenditure (% of GDP): ...



Surveillance Systems

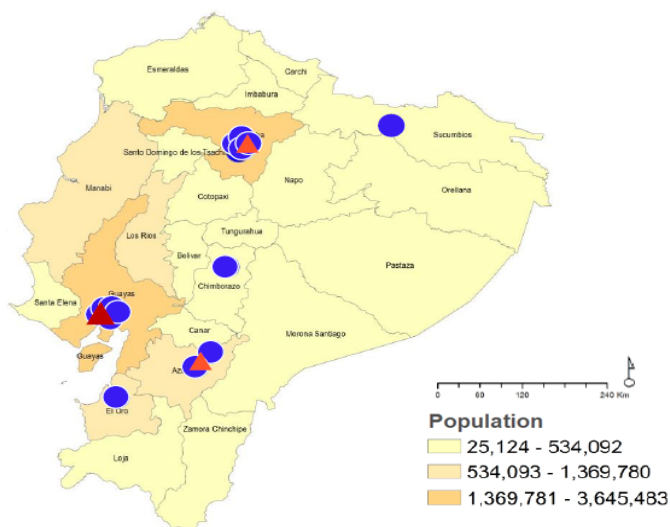
Surveillance Systems	Scope	Sample Collection	Data Collection
Sentinel SARI Surveillance	Sentinel	Yes	Nominal
Event- or Outbreak-based Surveillance	National	Yes	Aggregate

Sentinel Sites

▲ National Influenza Center (N=1)
 Instituto Nacional de Salud Pública e Investigación (INSPI) Guayaquil
 - Techniques realized: IF, RT-PCR, viral isolation
 - Average samples /year: 6,240

▲ Regional Laboratories with PCR Capacity (N=2)
 INSPI Cuenca
 INSPI Quito
 - Techniques realized: RT-PCR, IF

● SARI Hospitals (N=17)
 Quito (6), Guayaquil (6), Azogues, Cuenca, Imbabura, Riobamba, Nueva Loja



Information Systems

Integration of epidemiological/virologic information	Yes
Integration of different surveillance information systems	Partial
Allows for monitoring of the sentinel site system	Yes
Provides influenza activity indicators	Yes
Provides interactive online dashboard	No

Reporting

The data bases generate bulletins/reports automatically	No
A national bulletin/report is published weekly	Yes
Includes SARI/ILI sentinel surveillance data	Yes
Data reported to PAHO/WHO system FluID	Yes
Data reported to PAHO/WHO system FluNet	Yes

Unless otherwise specified, all data was collected by the PAHO/WHO Influenza Surveillance Team from one or more of the following sources: PAHO questionnaires completed by epidemiology or laboratory experts, influenza bulletins published/ shared by the countries, country presentations in regional influenza meetings, consultation with country influenza surveillance experts. The document was submitted to the national counterpart for revision.

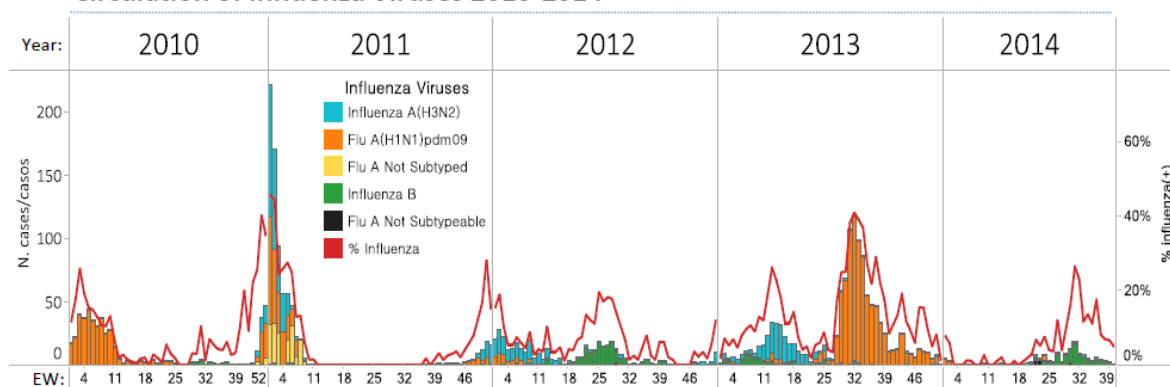
Ecuador – Influenza and ORV Surveillance

SARI/ILI Sentinel Surveillance

SARI case definition: Acute respiratory infection with history of fever or measured fever $\geq 38^{\circ}\text{C}$ and cough, with onset in the last 10 days, that requires hospitalization

Sentinel Surveillance Characteristics			SARI	ILI	Laboratory Surveillance	
General	PAHO/WHO case definition	Yes	NA	National Influenza Center (NIC)		Yes
	Trainings per year	<1	NA			
Case selection/sampling	Selection for sampling	Not standardized	NA	Year initiated as NIC		2006
	Systematic randomized sampling	No	NA	Receive samples from all surveillance systems		Yes
	Collection of clinical-epidemiological variables	Yes	NA	Weekly average of samples in the country (2011-2013)		120
	Frequency of sample shipment to the laboratory	Daily	NA			
Data management, analysis, reporting	Frequency of national data updates	Weekly	NA	Labs have access to epidemiological case information		Yes
	Denominator of number of cases	All hospitalized	NA	Sends samples to WHO Collaborating Center		Yes
	Use of baselines or endemic channels	No	NA			
				Detection of other respiratory viruses by PCR		No
Evaluation/monitoring	Sentinel establishments are evaluated	Yes	NA	There is a plan for quality control in the laboratory network		Yes
	Number of evaluations per year	1	NA			

Circulation of Influenza Viruses 2010-2014*



Vaccines

Vaccine composition	Northern hemisphere (since 2006)
Vaccination time-frame	Oct-Dec
Percentage of older adults (>55 years) that received the vaccine against influenza, 2012	54
Percentage of children (6-59 months) that received the vaccine against influenza, 2012	83

Influenza Pandemic Preparedness Plan

Country has a Pandemic Preparedness Plan	Sí
Year last updated	2013 (draft)
Year first devised	2009

*Source: Pan American Health Organization. *Regional Influenza and Other Respiratory Virus Surveillance*, PAHO-WHO. Available at: http://ais.paho.org/phis/viz/ed_flu.asp



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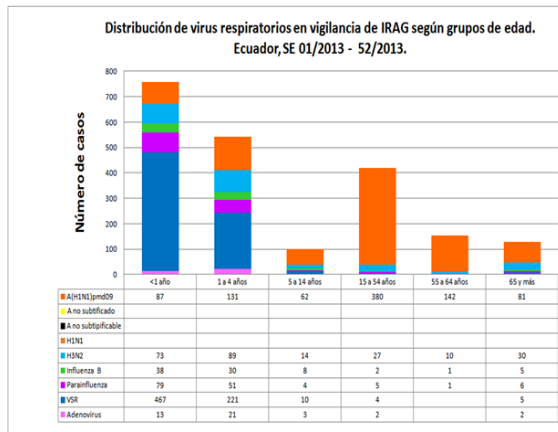
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CHARACTERISTICS OF THE UNUSUAL RESPIRATORY EVENT SURVEILLANCE SYSTEM IN ECUADOR

(Source: Ecuador participant presentation)

SARI SURVEILLANCE

Fig. 1. Distribution of respiratory viruses based on age



UNUSUAL RESPIRATORY EVENTS SURVEILLANCE

Fig. 2. Distribution of respiratory viruses based on age

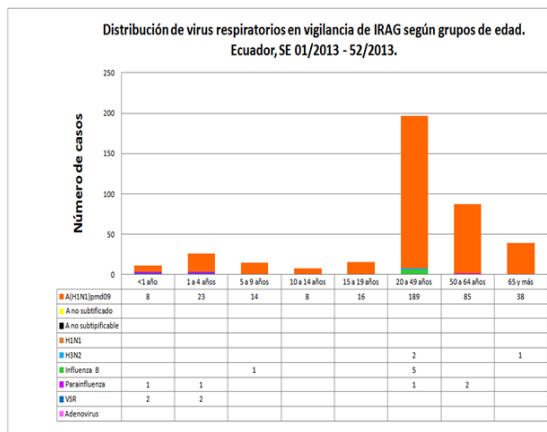


Fig. 3. Distribution of respiratory viruses based on severity

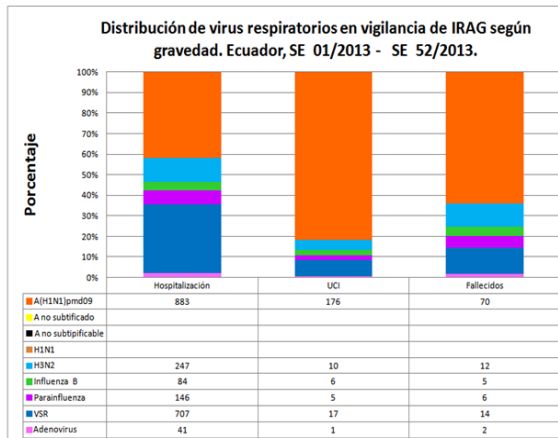


Fig. 4. Distribution of respiratory viruses based on severity

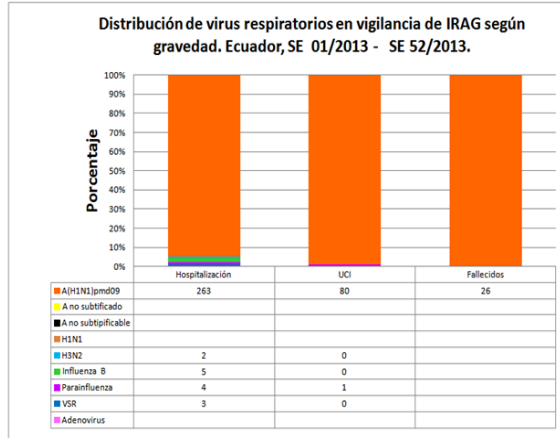


Fig. 5. Distribution of influenza and other respiratory viruses

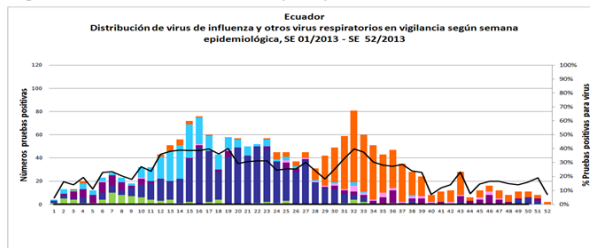
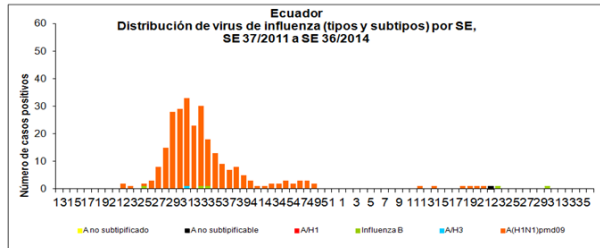


Fig. 6. Distribution of the types and subtype of influenza virus



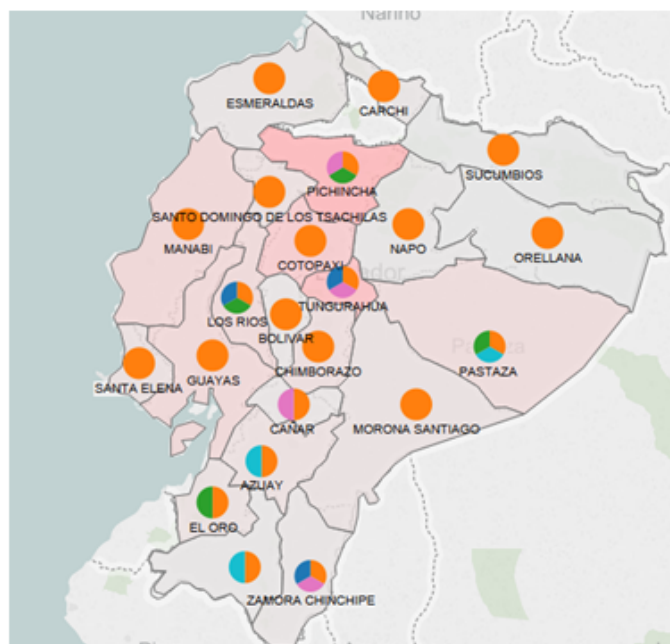
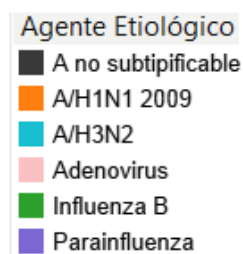


Fig. 7. Map of respiratory viruses in Ecuador



STRENGTHS OF THE UNUSUAL EVENT SURVEILLANCE SYSTEM IN ECUADOR¹⁴

- A specific and operational team exists to coordinate the unusual SARI surveillance system and the laboratory.
- Information sources to detect unusual respiratory events or unusual SARI are well identified.
- There is a close relationship between the unusual SARI surveillance system's coordination team and the IHR NFP.
- The laboratory is capable of handling cases of non-subtypeable influenza A samples.
- A national report is published weekly with results of routine surveillance.
- Personnel is trained, specialized, and assigned to different work areas.
- Laboratories and hospitals have a sufficient supply of materials and reagents.

AREAS OF IMPROVEMENT FOR THE UNUSUAL EVENT SURVEILLANCE SYSTEM IN ECUADOR

1. OVERALL ORGANIZATION

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> Sustainable funding for surveillance is not guaranteed. 	<ul style="list-style-type: none"> Allocate funds to surveillance systems at participating institutions. Decentralize resources to the regional offices. Plan to have resources for laboratory infrastructure, equipment, software, and budget allotments for the hiring and training of personnel.
Area of Improvement	Priority Actions
<ul style="list-style-type: none"> Job security for human resources to ensure surveillance systems is lacking. 	<ul style="list-style-type: none"> Create permanent appointments in coordination with the Ministry of Finance,

¹⁴ All the strengths listed here are self evaluations on behalf of these countries based on the questionnaire.

	<p>personnel, and participating institutions with the required profile for the technical areas involved.</p> <ul style="list-style-type: none"> • Discuss means to avoid high turnover of trained and specialized staff.
--	---

2. STANDARD OPERATING PROCEDURES/REFERENCE DOCUMENTS

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • Presently, the data capture system does not adequately capture all the case definitions included in the unusual SARI system. 	<ul style="list-style-type: none"> • Upgrade computer systems; purchase licenses for software that enables advanced analyses (SPSS, Stata) and their respective training courses at all levels. Geo-spatial analysis (ArcGIS). • Offer training on software system updates through seminars and workshops. • Set up a system to digitize cases captured by providing tablets in health units.
Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • Policies, operating procedures, or guidelines for approval and release of press bulletins during a pandemic have not been fully developed. 	<ul style="list-style-type: none"> • Update procedure manuals, including new case definitions. • Hold regular meetings to review manuals and operating procedures through seminars and workshops. • Offer training on the use of software, procedures, and guideline updates.

3. TIMELINESS

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • Training is needed to conduct antiviral resistance testing, since at present these are being sent to the Centers for Disease Control and Prevention (CDC) in Atlanta for testing. 	<ul style="list-style-type: none"> • Identify means to offer training in specific subjects for laboratory personnel. • Determine ways to offer training and an update in microbiological techniques for respiratory virus detection through workshops, courses, and seminars. • Seek methods to offer epidemiology training for influenza laboratories.

4. RESPONSE

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • Rapid response teams (RRTs) and multidisciplinary RRTs take more than 48 hours to be deployed. 	<ul style="list-style-type: none"> • Mandate timely activation of RRTs. • Mandate provision of personal protective equipment, triple packaging for shipment of infectious substances, and couriers. • Offer ongoing training on mechanisms for rapid response activation through courses, workshops, and seminars.

5. COORDINATION WITH PARTNERS

Area of Improvement	Priority Actions
<ul style="list-style-type: none">Multisectoral and multidisciplinary coordination and communication mechanisms (Ministry of Agriculture, Livestock, Aquaculture, and Fisheries, human-animal interface) are lacking with regard to the SARI/unusual SARI system.	<ul style="list-style-type: none">Hold regular meetings with different multidisciplinary and multisectoral institutions.Implement plans for infection surveillance in animals and coordinate with surveillance in humans.Develop an animal surveillance system.

6. COMMUNICATION

Area of Improvement	Priority Actions
<ul style="list-style-type: none">Risk communication operating procedures are not available at the national, regional, and local levels.	<ul style="list-style-type: none">Develop operating procedures through workshops and meetings.Share operating procedures.Train epidemiological surveillance and laboratory personnel in risk communication operating procedures.

4.1.3- EL SALVADOR



El Salvador – Influenza and Other Respiratory Virus (ORV) Surveillance

(updated July 2014)

Sociodemographic indicators (2013)

Source: Pan American Health Organization. Health Situation in the Americas: Basic Indicators, 2013.

Total population: **6,340,000**

Life expectancy (years)

- Men: **67.8**
- Women: **77.1**
- Total: **72.6**

General mortality rate per 1,000 inhabitants

- All causes: **7.5**
- Communicable diseases: **0.71**

Hospital beds per 1,000 inhabitants: **1.1**

Public health expenditure (% of GDP): **4.3**



Surveillance Systems

Surveillance Systems	Scope	Sample Collection	Data Collection
SARI Surveillance	Sentinel	Yes	Nominal
ILI Surveillance	Sentinel	Yes	Nominal
Pneumonia Mortality Surveillance	National	Yes	Nominal
Pneumonia and Acute Respiratory Infection Surveillance	National	No	Aggregate
Hospitalized Pneumonia Surveillance	National	No	Nominal
Hospitalized Unusual SARI Surveillance	National	Yes	Nominal

Sentinel Sites

● SARI Hospitals (N=5)

Hospital San Juan de Dios Santa Ana
Hospital San Salvador SS Benjamin Bloom
Hospital Cojutepeque "Nuestra Señora de Fátima"
Hospital Zacatecoluca "Santa Teresa"
Hospital San Miguel "San Juan de Dios"

▲ National Influenza Center (N=1)

Laboratorio Nacional de Referencia Doctor Max Bloch
- Techniques realized:
IFI, RT-PCR, viral isolation
- Average samples/year: 2,392

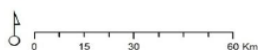
● ILI Centers (N=8)

San Salvador (3), Santa Ana (2),
Cuscatlán, La Libertad, San Miguel

▲ Laboratories without PCR capacity (N=2)

Local Laboratory – Western Unit (Santa Ana)
Local Laboratory – Eastern Unit (San Miguel)
- Techniques realized: IFI

Population
 149,326 - 344,235
 344,236 - 660,652
 660,653 - 1,567,156



Information Systems

Integration of epidemiological/virologic information	Yes
Integration of different surveillance information systems	Yes
Allows for monitoring of the sentinel site system	Yes
Provides influenza activity indicators	Yes
Provides interactive online dashboard	Yes (internal use)

Reporting

The data bases generate bulletins/reports automatically	Yes
A national bulletin/report is published weekly	Yes
Includes SARI/ILI sentinel surveillance data	Yes
Data reported to PAHO/WHO system FluID	Yes
Data reported to PAHO/WHO system FluNet	Yes

El Salvador – Influenza and ORV Surveillance

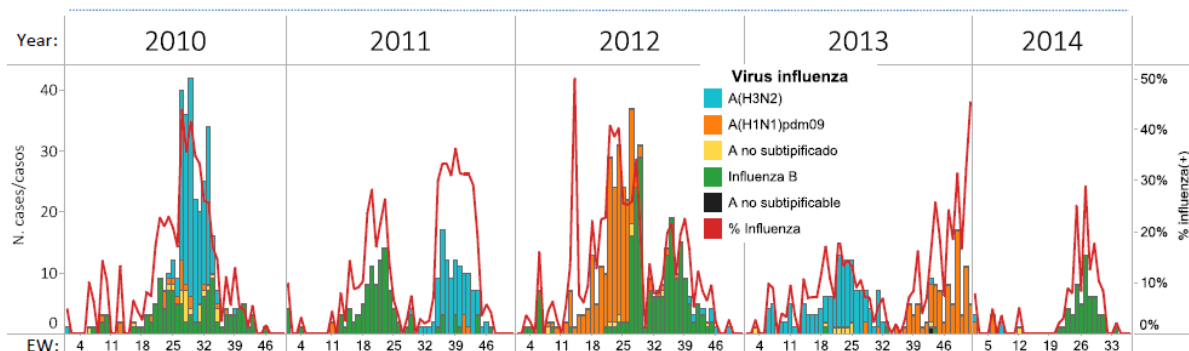
SARI/ILI Sentinel Surveillance

SARI case definition: Any patient of any age with history of sudden fever greater than 38°C, cough or sore throat, dyspnea (difficulty breathing), and need for hospitalization

ILI case definition: Any patient of any age with history of sudden fever greater than 38°C, cough or sore throat and the absence of another diagnosis

Sentinel Surveillance Characteristics			Laboratory Surveillance	
	SARI	ILI		
General	PAHO/WHO case definition	No	National Influenza Center (NIC)	Yes
	Trainings per year	2	Year initiated as NIC	2005
Case selection/sampling	Selection for sampling	Quota 5/site	Receive samples from all surveillance systems	Yes
	Systematic randomized sampling	No	Weekly average of samples in the country (2011-2013)	46
	Collection of clinical-epidemiological variables	Yes	Labs have access to epidemiological case information	Yes
	Frequency of sample shipment to the laboratory	Weekly	Sends samples to WHO Collaborating Center	Yes
Data management, analysis, reporting	Frequency of national data updates	Weekly	Detection of other respiratory viruses by PCR	No
	Denominator of number of cases	All hospitalized	There is a plan for quality control in the laboratory network	Yes
	Use of baselines or endemic channels	Yes		
Evaluation/monitoring	Sentinel establishments are evaluated	Yes		
	Number of evaluations per year	1		

Circulation of Influenza Viruses 2010-2014*



Vaccines

Vaccine composition	Southern hemisphere (since 2004)
Vaccination time-frame	May-Sep
Percentage of older adults (≥60 years) that received the vaccine against influenza, 2010	89
Percentage of children (6-59 months) that received the vaccine against influenza, 2010	87

Influenza Pandemic Preparedness Plan

Country has a Pandemic Preparedness Plan	Yes
Year last updated	2013
Year first devised	2009

* Source: Pan American Health Organization. *Regional Influenza and Other Respiratory Virus Surveillance*, PAHO-WHO. Available at: http://ais.paho.org/phis/viz/ed_flu.asp

Unless otherwise specified, all data was collected by the PAHO/WHO Influenza Surveillance Team from one or more of the following sources: PAHO questionnaires completed by epidemiology or laboratory experts, influenza bulletins published/ shared by the countries, country presentations in regional influenza meetings, consultation with country influenza surveillance experts. The document was submitted to the national counterpart for revision.



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STRENGTHS OF THE UNUSUAL EVENT SURVEILLANCE SYSTEM IN EL SALVADOR¹⁵

- Information sources to detect unusual respiratory events or unusual SARI are well identified.
- Capacity building for the implementation of IHR in the country is available.
- A national plan for response to respiratory events with pandemic potential exists.
- Integration of epidemiological information of cases with laboratory results from surveillance by public and private health institutions, and coordination for investigation of cases of unusual SARI by RRTs exists.
- The country's unusual SARI surveillance system appropriately captures surveillance data.
- A national report is published weekly with results of routine surveillance.
- Multisectoral and multidisciplinary coordination and communication mechanisms within the unusual respiratory events/unusual SARI surveillance system exist and function.

AREAS OF IMPROVEMENT FOR THE UNUSUAL EVENT SURVEILLANCE SYSTEM IN EL SALVADOR

1. OVERALL ORGANIZATION

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • Unusual SARI surveillance system coordination teams are not strengthened with regard to staffing, materials, and funding. 	<ul style="list-style-type: none"> • Strengthen technical capabilities of the system's coordination team through ongoing training activities. • Seek increased funding for the unusual SARI surveillance system. • Evaluate human resources needs at all levels.
Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • Systems and procedures to capture, record, and monitor unusual respiratory events are not effective. 	<ul style="list-style-type: none"> • Adopt new strategies for case monitoring. • Regularly evaluate the national epidemiological surveillance system (VIGEPES).

2. STANDARD OPERATING PROCEDURES/REFERENCE DOCUMENTS

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • The unusual SARI surveillance system case definition is not well defined. 	<ul style="list-style-type: none"> • Review the SARI/unusual SARI case definition and include it in the manual. • Perform regular supervision at the local level to ensure surveillance system compliance with the manual. • Build local-level health worker capacity for sentinel site surveillance.
Area of Improvement	Priority Actions
<ul style="list-style-type: none"> • Operating procedures for unusual SARI surveillance system key functions (case-finding, case investigation, risk assessment, response, etc.) are not well developed and strengthened. 	<ul style="list-style-type: none"> • Develop a continuing education plan emphasizing case finding. • Conduct regular evaluations to measure impact and response capacity.

¹⁵ All the strengths listed here are self evaluations on behalf of these countries based on the questionnaire.

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> Availability is not ensured at all levels (national and local) of operating procedures for infection control in health facilities, compatible with international guidelines. 	<ul style="list-style-type: none"> Conduct regular evaluations of compliance with the unusual SARI surveillance system's procedures.

3. TIMELINESS

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> Timely reporting of unusual SARI events and cases by all health facilities is not adequately established. 	<ul style="list-style-type: none"> Strengthen inter-institutional ties to ensure timely notification. Evaluate systematically the timely notifications by all health facilities.

4. RESPONSE WITH PARTNERS

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> Access to oseltamivir, vaccines, and materials (for sample collection and transportation) to respond to unusual respiratory events/unusual SARI at relevant sites (national level) is inadequate. 	<ul style="list-style-type: none"> Review the budget and seek an increase for regional and national laboratories to expand coverage and ensure supplies.

5. COMMUNICATION

Area of Improvement	Priority Actions
<ul style="list-style-type: none"> Feedback on surveillance results to all required levels is not adequately established. 	<ul style="list-style-type: none"> Evaluate the methodological compliance of the Standard Operating Procedures of situation rooms at the national, regional, local levels.
Area of Improvement	Priority Actions
<ul style="list-style-type: none"> Health workers lack training in risk communication. 	<ul style="list-style-type: none"> Develop a continuing education plan for health workers involved in the unusual SARI surveillance system.

4.2- QUESTIONNAIRE



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Américas

Questionnaire

Lessons learned and next steps of the national surveillance of unusual respiratory events/unusual severe acute respiratory infections

The survey of “National Surveillance of Unusual Respiratory Events or Unusual Severe Acute Respiratory Infection (SARI) System” is a tool designed by the Central Office of the Pan American Health Organization- PAHO/WHO for the improvement of its implementation and development in the countries of the Americas.

This survey seeks to assess the functionality of the Unusual Respiratory Event/Unusual SARI Systems in the countries in which they have been implemented and are being developed. The results of this survey will not be published with the data by country. The data will not be used to conduct comparisons between countries, but rather to identify strengths and areas of improvement in each of the participating countries. This instrument will help countries orient and plan how to continue the improvement of these systems.

The survey consists of 33 items grouped into 6 categories that correspond to the key elements in the development of the program: 1) basic concepts and organization, 2) reference documents and standard operating procedures, 3) timeliness, 4) response, 5) coordination, and 6) communication. This is a self evaluation survey of influenza surveillance, for which each item should be assessed by the influenza surveillance team coordinator according to his/her own experiences, perceptions and/or available information, using a scale of 5 categories.

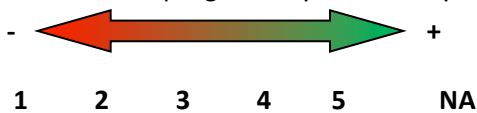
We invite you to complete this questionnaire, with the following basic instructions on completing and sending the survey.

Thank you in advance for your time and valuable participation.

COMPLETION INSTRUCTIONS

COMPLETION INSTRUCTIONS

- Please indicate your first and last name(s), the country you represent, and your position.
- The survey consists of 33 items grouped into 6 categories that correspond to the key elements in the development of the program: 1) basic concepts and organization, 2) reference documents and standard operating procedures, 3) timeliness, 4) response, 5) coordination, and 6) communication. This survey will require approximately 30-45 minutes to complete.
- To score each of the items keep in mind your own experiences, perceptions and/or available information. Indicate your level of agreement or disagreement with each item on a scale of 1 to 5, with 1-“complete disagreement” and 5- “complete agreement”. Similarly, if you decide, you have the option to mark “Not applicable” (NA) in those aspects that do not apply to the situation of the surveillance program in your country.



- To complete your scoring, find the box that you want ☐, and click it. Only mark one option for each item asked.
- You can leave the question without a response if you do not know or prefer not to answer.
- In each of the 6 categories, there is space in which you can indicate in free text those aspects that have not been outlined in the closed ended questions that you consider important and/or any clarifications any of your assessments.
- Finally, in the last part of the questionnaire, you will find another box for free text to define strengths and weaknesses according to your point of view of the Unusual Respiratory Events/Unusual SARI System. To write in each free text box, find the shaded space and click it.
- Complete this questionnaire in electronic format and send it to the following email address: cerpamau@paho.org by Wednesday September 17th. You can also send us questions or concerns to the same email.

QUESTIONNAIRE

NATIONAL SURVEILLANCE OF UNUSUAL RESPIRATORY EVENTS OR OF THE UNUSUAL SEVERE ACUTE RESPIRATORY INFECTION NATIONAL SURVEILLANCE.

COUNTRY:

FIRST AND LAST NAME:

POSITION:

[illegible]

[illegible]

facilities have been developed, are available at all levels (national, regional, and local), and are compatible with international guidelines	
Observations:	
TIMELINESS	
	<div> <div>-</div> <div> </div> <div>+</div> </div> <div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>NA</div> </div>
12. Surveillance of unusual SARI system timeliness and operating procedures (investigation, risk assessment, and response) are routinely evaluated and reviewed	<div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> </div>
13. Unusual SARI events and cases are reported promptly by all health facilities (at least 80% of all reporting units report on a timely basis)	<div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> </div>
14. Unusual events and alerts are investigated promptly and risks are assessed (all unusual events or SARI should be confirmed within 24 hours and assessed within 48 hours)	<div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> </div>
15. If the unusual event requires it, capacity exists to send rapid response teams (RRTs) promptly (multidisciplinary RRTs should be sent within 48 hours of detection of an unusual event or SARI)	<div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> </div>
16. If the unusual event/SARI so warrants, WHO is notified in a timely manner (NFP should notify WHO of all events meeting the notification criteria in Annex 2 of the IHR within 24 hours of risk assessment)	<div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> </div>
17. The NFP responds on a timely basis to verification requests from WHO (the NFP should respond to 100% of verification requests from WHO within 24 hours)	<div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> </div>
Observations:	
RESPONSE	
	<div> <div>-</div> <div> </div> <div>+</div> </div>

26. There is good coordination between the national influenza center (national laboratory) and the WHO Collaborating Center for diagnosis and confirmation of unusual SARI and to support investigation of outbreaks	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
27. There is timely and good quality coordination for decision-making and required action between the Ministry of Health and Ministry of Agriculture (or similar) on unusual SARI cases at the human-animal interface	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
28. National and local level surveillance of unusual SARI system coordination teams receive laboratory results in a timely fashion for decision-making and action	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Observations:	
COMMUNICATION	
	<div> <div>-</div> <div>+</div> </div> <div> 1 2 3 4 5 NA </div>
29. Risk communication operating procedures have been developed and are available for different levels	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
30. A national report with routine surveillance results is published weekly (e.g., SARI sentinel surveillance)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
31. Feedback on surveillance results is provided to all required levels	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
32. Policies, operating procedures, or guidelines for approval and release of press bulletins during a pandemic virus emergency have been developed	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
33. Staff training in risk communication	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Observations:	

FREE TEXT

List 3 STRENGTHS AND AREAS FOR IMPROVEMENT that, in your opinion, have been or could be influencing the functioning of the unusual SARI surveillance system in your country:

STRENGTHS

- 1.
- 2.
- 3.

AREAS FOR IMPROVEMENT

- 1.
- 2.
- 3.

4.3- PARTICIPANT AGENDA

Objective:

Evaluate the unusual SARI surveillance system and recognize the experience of the countries where they have implemented the system.

Generate evidence that allows us to update the new guidelines associate with the surveillance of unusual respiratory events.

Location and Date:

Bogota, Colombia; September 18 – 19, 2013

Participants:

- Professional epidemiologists and laboratory professionals associated with influenza surveillance in Colombia, Ecuador, and Nicaragua.

Agenda

September 18, 2013:

9:00am – 1:30pm

- Presentation of meeting objectives and introductions. PAHO and PAHO-COL
- Presentation of the unusual SARI surveillance systems:
 - Colombia
 - Ecuador
 - El Salvador
 - Nicaragua
- Data analysis: Clinical comparison- epidemiology between usual and unusual cases of SARI by country

2:30pm – 5:00 pm

- Document revision associated with unusual SARI surveillance
- Focus Group: Revision of the individual characteristics of each country's unusual respiratory event surveillance system: 1- Timeliness, 2- Sensitivity and Positive Predictive Value, 3- Representation, 4- Utility

September 19, 2013:

9:00am – 1:30pm

- Focus Group: Revision of the individual characteristics of each country's unusual respiratory event surveillance system: 1- Timeliness, 2- Sensitivity and Positive Predictive Value, 3- Representation, 4- Utility

2:30pm – 5:00 pm

- Meeting summary, agreements, and next steps
- Scheduling of participation in associated activities and future products

Future Products

- Meeting report
- Updated guidelines of unusual respiratory event surveillance: to define whether to integrate a chapter in the PAHO Influenza Surveillance Guide 2014, or create a new guide regarding this topic.
- Draft a publication regarding the results of the unusual SARI data analysis (2011-2013)

4.4- PRIORITIZATION MATRIX

AREAS OF IMPROVEMENT:	PROPOSALS
The unusual SARI surveillance system coordination team does not have adequate staffing, materials, or funding.	<p>Initiate an advocacy process with the country's high authorities to identify mechanisms that ensure resources for human talent and materials.</p> <p>Establish processes that ensure job security to create continuity within the coordination team.</p> <p>Establish minimum requirements for processes that define minimum labor requirements for surveillance down to the local level.</p> <p>Train on the coordination team management components with activities that have attainable objectives.</p>
The unusual SARI surveillance system has deficient low-sensitivity detection of oseltamivir resistance.	<p>Train clinical physicians and pediatricians in the use of oseltamivir.</p> <p>Include oseltamivir use as a required variable in surveillance systems for the purpose of monitoring its use.</p> <p>Continue developing surveillance systems for unusual events to increase sensitivity of the surveillance system to oseltamivir-resistant strains.</p> <p>Promote standardization of techniques to detect oseltamivir resistance.</p>
The unusual SARI surveillance system has low sensitivity to healthcare workers.	<p>Improve sensitivity of case definition to capture healthcare workers in the surveillance system.</p> <p>Establish a specific list of occupations related to the subject being investigated.</p>
The unusual SARI surveillance system has low sensitivity to capture potential cases involving workers with human-animal interface.	<p>Improve animal health surveillance systems to improve detection of sick humans in contact with sick or dead animals.</p> <p>Strengthen the coordination between Ministry of Public Health and Animal Health.</p>
The unusual SARI criteria "cases between the ages of 5-65 without co-morbidities" is non-specific, generating a high burden of false positive cases. Usual acute respiratory infection cases are often misclassified as unusual events through this criterion.	<p>Adjust the case definition to eliminate this criterion.</p> <p>Maintain ongoing training and seek strategies that reach the local level (e.g., online training).</p> <p>Continue with ongoing monitoring and assessment of the case definition to determine whether additional adjustments must be made.</p>
Baselines and alert thresholds have not been developed and are not available in routine surveillance systems (using historical data).	<p>Review the information available for each country for a minimum of three years to calculate baselines for each strategy.</p> <p>Establish the baseline for each participating country strategy and decide on several alert thresholds, based on historical data, so that routine surveillance systems generate alerts to take action.</p> <p>Organize periodic meetings for sharing and exchanging information among countries.</p> <p>Include baselines in weekly reports and bulletins.</p>
Investigation and verification of an unusual respiratory event does not occur in a timely manner (within 24 hours).	<p>Implement and standardize online reporting system (for countries that have not implemented this).</p> <p>Intensify training at different levels of care in the system for case capture, notification, and preparation of case closure reports.</p> <p>Set up a real-time registry using tablets or computer tools to promptly post information on unusual patients that are found.</p> <p>Upgrade computer systems to deal with more variables and be analysis-friendly.</p> <p>Create specialized working teams for follow-up and monitoring from case capture to outcome report and case closure.</p>
Risk assessment of unusual respiratory events does not occur in a timely manner (within 48 hours).	<p>Perform quality control and monitoring of all above-mentioned processes.</p> <p>Create groups specialized in immediate response plans and conduct training on their activation.</p> <p>Optimize and coordinate channels of communication among all involved parties.</p>
Training in risk communication is lacking: there are no policies, operating procedures, or guidelines for approval and release of press bulletins during a pandemic virus emergency.	<p>Develop a risk communication plan establishing routes, persons in charge, spokespersons, channels of communication, etc. and establish mechanisms for communicating with the press.</p> <p>Establish a risk communication policy that includes official spokesperson, official channels, budget for communication, source of official data, and ethical considerations.</p> <p>Define process documents and develop a risk communication plan, establishing routes, persons in charge, spokespersons, channels of communication, etc. and establish mechanisms for communicating with the press.</p> <p>Evaluate the risk communication process itself to determine whether revisions must be made.</p> <p>Measure the impact of risk communications strategies implemented.</p>
Deficient coordination between Ministry of Health and Ministry of Agriculture (or similar) on unusual SARI cases at the human-animal interface for decision-making and required action.	<p>Set up an area or office in both institutions to make direct contact in each situation.</p> <p>Establish a coordinated inter-institutional work group that meets regularly and in which plans and actions are established and decisions made.</p> <p>Set up an early warning system with defined telephone chains, specifically between Ministry of Health and Ministry of Agriculture.</p> <p>Each institution should know the technical, operational, and diagnostic capabilities and limitations of both institutions, and should have process documents.</p> <p>Prepare process documents in each institution.</p> <p>Regularly evaluate each institution alone and inter-institutionally.</p>

- Proposals were graded on a scale of 1 to 5 in terms of importance, urgency, and feasibility, with a maximum score of one 125 (importance X urgency X feasibility).



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