Guide for Monitoring and Evaluating Avian Influenza Programs in Southeast Asia

September 2008

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MEASURE Evaluation

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PART 2

NOTES ON THE DISEASE TERMINOLOGY USED IN THIS GUIDE

This guide uses the term *highly pathogenic avian influenza (HPAI)* to refer to cases of avian influenza A/H5N1 as well as other strains of avian influenza that cause high mortality in poultry. Human cases of infection with influenza A/H5N1 virus are distinguished by using the term *human infection with H5N1 virus*. In general, we use the term *HPAI programs* when referring to efforts to prevent and control HPAI in poultry and wild bird populations and sporadic cases of human infection with H5N1 virus.

Although the guide specifically addresses human infection with H5N1 virus, the indicators provided can easily be adapted to account for the prevention and control of other novel influenza viruses. Novel influenza viruses are those virus subtypes that have infected a human host and differ from currently circulating human influenza H1 and H3 viruses.[1] Novel influenza viruses (including H5N1) provide a critical element for the potential emergence of an *influenza pandemic*. An influenza pandemic can occur when a new influenza strain to which human populations have little immunity emerges and acquires the ability to transmit in an efficient and sustained manner among human hosts. In recognition of the danger that these new influenza strains pose, the revised International Health Regulations, IHR (2005), require World Health Organization (WHO) Member States to immediately notify WHO in the event of a case of human infection with a novel influenza virus.[2] Where appropriate, the guide notes how a particular indicator or set of indicators can be adapted to account for the prevention and control of novel influenza viruses in addition to H5N1.

For policy and planning, the term used by most national governments for their operational plans is *avian influenza (AI)* or *avian and human influenza*. In Southeast Asia (SE Asia), these plans cover both the animal outbreaks of HPAI and the sporadic cases of human infection with H5N1 virus. In public awareness-raising messages and materials, countries most often use less-technical translations similar to *avian influenza* or *bird flu*. This terminology is used in the specific example of Knowledge, Attitudes, and Practices (KAP) survey questions included in the behavior change communication section. However, in general, in the policy and planning and behavior change communication sections of this guide we use *HPAI* to be consistent with the overall guide terminology.

The countries of SE Asia are engaging in preparedness planning for the emergence of an influenza pandemic. This guide specifically addresses efforts to prevent and control an influenza pandemic of avian origin. As of the writing of this guide, the countries of the region have not yet faced the emergence of a 21st century pandemic strain of influenza from any of the currently circulating influenza strains. We use *pandemic planning/programs* to refer to efforts to prepare for an influenza pandemic corresponding to WHO Pandemic Phase 6.

[1] Centers for Disease Control and Prevention. (2007). Novel Influenza A Virus Infections: 2007 Case Definition. http://www.cdc.gov/ncphi/disss/nndss/casedef/novel_influenzaA.htm.

[2] WHO. (2005). *Revision of the International Health Regulations Resolution WHA 58.3*. Geneva; 23 May, http://www.who.int/ipcs/publications/wha/ihr_resolution.pdf.

List of Acronyms

AED	Academy for Educational Development
AI	Avian Influenza
BCC	Behavior Change Communications
CFR	Case Fatality Rate
CORE	Child Survival Collaborations and Resources Group
DHS	Demographic and Health Survey
FAO	Food and Agricultural Organization
HFS	Health Facility Survey
HPAI	Highly Pathogenic Avian Influenza
KAP	Knowledge, Attitudes, and Practices
M&E	Monitoring and Evaluation
NGO	Nongovernmental Organization
OIE	World Organization for Animal Health
OR	Operations Research
PPE	Personal Protective Equipment
RHIS	Routine Health Information System
SOP	Standard Operating Procedure
SPA	Service Provision Assessment
TADInfo	Transboundary Animal Disease Information System
UNICEF	United Nations Children's Fund
UNSIC	United Nations System Influenza Coordination
USAID	U.S. Agency for International Development
CDC	U.S. Centers for Disease Control and Prevention
WHO	World Health Organization

Guide for Monitoring and Evaluation of Avian Influenza Programs in Southeast Asia

Part 1

CHAPTER 1: OVERVIEW OF THE GUIDE

Rationale for the Guide

This guide responds to the need for countries to measure progress in their efforts to reduce the risk of the emergence of an influenza pandemic. Beginning in late 2003 and early 2004, the global community watched as a new highly pathogenic avian influenza (HPAI) virus A/H5N1 appeared in Asia and sporadically infected humans. Since then, the virus has spread throughout Asia, Europe, and North and sub-Saharan Africa. It has proven capable of direct bird-to-human transmission and of infection between many different hosts, including wild birds, poultry, humans, cats, and pigs.[1] Global health experts fear that the virus could mutate and become capable of efficient and sustainable human-to-human transmission. Conservative estimates of the impact of the resulting influenza pandemic suggest that 20 percent of the population would fall ill[2] and that the global economy would suffer more than $2 trillion in damages.[3]

Global experts agree that the world is increasingly at risk for the next influenza pandemic. The World Health Organization (WHO) monitors the risk of an influenza pandemic using clearly defined pandemic phases (see the chart on the following page). These phases were revised in 2005 to address the current threat of H5N1 as well as the potential for multiple pandemic threats from H5 and H7 viruses circulating simultaneously. In this guide, we use *HPAI* to refer to H5N1 as well as other strains of avian influenza that cause high mortality in poultry.

As of the printing of this guide, the world is in the pandemic alert period (WHO Phase 3), and countries are continuing to witness outbreaks in poultry as well as cases of human infection with H5N1, particularly in Southeast (SE) Asia. In 2007 alone, five new countries were added to the list of those nations impacted by H5N1, bringing the total number of impacted countries to 60. The virus has become entrenched in at least five countries, offering increased opportunities for bird-to-human and human-to-human transmission and the emergence of a resulting influenza pandemic.[4]

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[1] WHO. (2005). *WHO Avian Influenza Timeline.* Geneva; 28 October. http://www.who.int/csr/disease/avian_influenza/Timeline_28_10a.pdf.

[2] WHO. (2007). Chan, Margaret. *Opening Remarks at the New Delhi International Ministerial Conference on Avian and Pandemic Influenza.* New Delhi, 4 December. http://www.who.int/dg/speeches/2007/20071204_new_delhi/en/index.html

[3] World Bank (2007). Burns, Andrew; van der Mensbrugghe, Dominique; Timmer, Hans. *Evaluating the Economic Consequences of Avian Influenza.* Washington, DC. http://siteresources.worldbank.org/INTTOPAVIFLU/Resources/EvaluatingAIeconomics.pdf.

[4] World Bank and United Nations Systems Influenza Coordinator. (2007). *Third Global Progress Report on Responses to Avian Influenza and State of Pandemic Readiness.* Washington, DC; December. http://siteresources.worldbank.org/INTTOPAVIFLU/Resources/UN_WB_AHI_ProgressReportFinal.pdf.

WHO's Pandemic Phases[5]

Pandemic Phase	Definition
Interpandemic Period	
Phase 1:	No new influenza viral subtypes have been detected in humans. An influenza viral subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered low.
Phase 2:	No new influenza viral subtypes have been detected in humans; however, a circulating animal influenza viral subtype poses a substantial risk of human disease.
Pandemic Alert Period	
Phase 3:	Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to close contacts.
Phase 4:	Small cluster(s) with limited human-to-human transmission, but spread is highly localized, suggesting that the virus is not well-adapted to humans.
Phase 5:	Larger cluster(s), but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans but may not yet be fully transmissible (substantial pandemic risk).
Pandemic Period	
Phase 6:	Pandemic phase: Increased and sustained transmission in the general population.
Post-Pandemic Period	Return to the interpandemic period (Phase 1).

The countries of SE Asia have been the most profoundly affected by this threat, accounting for more than 70 percent of human infections.[6] The region is on the front lines of the global effort to control the disease. However, the international community has recognized that SE Asia does not face this threat alone; it is a "shared and complex" threat that requires a collective global response. In November 2005, at the WHO/Food and Agriculture Organization of the United Nations/World Organization for Animal Health (WHO/FAO/OIE)/World Bank-sponsored meeting on HPAI and human pandemic influenza, countries of the region (Cambodia, Indonesia, Laos, Thailand, and Vietnam) reported on their efforts to prevent and control the virus in poultry, respond to sporadic cases of human infection with H5N1, and prepare for the emergence of an influenza pandemic.[7] The conclusions from that meeting highlighted the need for international resources to complement national efforts, particularly in countries that lack resources.

As a direct follow-up to the November 2005 meeting, the Government of China, the World Bank, and the European Commission sponsored the International Pledging Conference for Avian and Human Influenza in Beijing in January 2006. A key focus for the conference was the concrete identification of financial and technical assistance needs of countries as part of a coordinated global strategy on avian and human pandemic influenza. At the end of the conference, the participants issued a declaration with specific recommendations, including the

[5] WHO. (2005). *WHO Global Influenza Preparedness Plan.* Geneva, http://www.who.int/csr/resources/publications/influenza/GIP_2005_5Eweb.pdf.
[6] WHO. (2008). Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO. 1 February. http://www.who.int/csr/disease/avian_influenza/country/cases_table_2008_02_01/en/index.html.
[7] *Beijing Declaration* at the International Pledging Conference on Avian and Human Pandemic Influenza (final as of 18 January). Beijing, 17–18 January 2006.

following: "The international community should conduct analysis and provide detailed guidance on a range of important issues—such as *monitoring and evaluation* [emphasis added]—that respond to individual country circumstances." The first edition of this guide, published in June 2007, responded to this pressing need.

As the world enters its sixth year of responding to the challenges posed by H5N1, the global community has recognized the need to move from an emergency mindset to a mid- to long-term perspective. The joint World Bank-UN Third Global Progress Report on Responses to Avian Influenza and State of Pandemic Readiness, released in December 2007, states that "nations should seize the opportunity of this extraordinary momentum to expand from short-term responses to longer-term strategies".[8] Similarly, Ambassador John E. Lange, head of the U.S. delegation to the December 2007 New Delhi International Ministerial Conference on Avian and Pandemic Influenza, highlighted the need to shift efforts to longer-term capacity building in his opening remarks at that conference.[9] Monitoring and Evaluation (M&E) systems form a critical element in these longer-term approaches. They provide decision-makers with access to timely, high-quality, relevant data for program design and management. The current edition of the guide assists national programs in their efforts to design and execute strong M&E systems in support of short-, mid-, and long-term objectives.

Objectives of the Guide

The overarching objective of the guide is to encourage the use of M&E to support effective and evidence-based national HPAI programs. The development of an M&E framework is a critical component for monitoring progress in the prevention and control of HPAI and the reduction of the risk of an influenza pandemic. Specific objectives of the guide are to:

- Present a logical framework for understanding the key components for national HPAI programs and the relationships between components
- Provide standard M&E terminology for HPAI indicators
- Support the use of M&E data in the design and implementation of national HPAI programs.

Developing M&E frameworks for rapidly emerging infectious diseases such as HPAI can be challenging. The constantly changing nature of these diseases often hampers effective strategic planning and program development. However, as countries respond to an increasing geographic spread of HPAI, the early development of a comprehensive M&E framework provides programs with standard measures to monitor progress at national, regional, and global levels. In this spirit, a broad-based group of stakeholders came together to develop this guide.

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[8] UN System Influenza Coordination and World Bank. (2007). Responses to Avian Influenza and State of Pandemic Readiness: Third Global Progress Report.

[9] U.S. Department of State. (2007). Lange, John E. Opening Remarks at the New Delhi International Ministerial Conference on Avian and Pandemic Influenza. New Delhi, 4 December. http://www.state.gov/g/avianflu/96208.htm.

Methodology

From its inception, the guide has been informed by the field realities of implementing HPAI programs in the different countries in the region. The indicators were developed in dialogue with regional technical experts, country-level program managers, and officials from the ministries of health and agriculture in countries across the region. The logical framework and proposed indicators were developed at technical working group meetings convened in June, August, and October 2006 consisting of technical experts from the Food and Agricultural Organization (FAO), the office of the UN System Influenza Coordination (UNSIC), the United Nations Children's Fund (UNICEF), WHO, the U.S. Agency for International Development (USAID), Abt Associates, the Academy for Educational Development (AED), and the U.S. Centers for Disease Control and Prevention (CDC).

Because of the rapid emergence of HPAI programs, all these indicators represent the best recommendations of technical experts in the field for appropriate methods for M&E programs. They benefit from the extensive development and careful field-testing of M&E indicators in other health fields. Where possible, we adapted indicators that are demonstrated to be both practical and useful in these other domains. However, in many cases we were required to tread new ground because the disease spans both animal and human health, has the capacity for both minor and major virological changes, and has the potential for rapid global spread and the resulting impact.

Countries in the region vary widely in their experience with the disease and their ability to harness existing human health and veterinary infrastructures to prevent and control outbreaks. In January 2007, a series of meetings and workshops with government officials; nongovernmental organizations (NGOs); and country representatives of international technical organizations in Thailand, Vietnam, and Laos assessed the utility and feasibility of collecting the proposed indicators in those countries. The meetings and workshops revealed a wide spectrum of national experiences with HPAI programs. To allow the guide to respond across this spectrum, this document recommends a set of core and additional indicators. Countries should feel free to select those indicators with the most applicability for their national context.

Intended Audience

The guide is intended to provide guidance to governments, international organizations, and NGOs in the monitoring and evaluation of HPAI programs in the areas of national planning and policy, animal health, human health, and behavior change communication (BCC). Users of the guide are not required to have an extensive background in M&E. The following audiences may find the guide particularly useful to their efforts:

- Members of national HPAI coordinating committees
- Country-level program managers and technical staff of HPAI programs in the region
- International partners and consultants responsible for planning and implementing M&E of HPAI programs in collaboration with host-country institutions.

The guide is designed for countries experiencing phases 3 through 5 of the WHO Global Pandemic Alert. As a result, it encompasses key public health interventions for the pandemic alert period. These include reducing opportunities for bird-to-bird and bird-to-human transmission as well as providing appropriate treatment and care for sporadic cases of human infection with H5N1.

Organization of the Guide

The guide is organized into the following two parts:

- Part I provides an introduction and background to M&E of national HPAI programs. It presents an overview of the state of the disease in the world today and describes the global and regional response. Part I also details central concepts in the field of M&E and provides a logical framework for understanding national-level HPAI programs.

- Part II presents indicators for each of the key components of national HPAI programs: planning and policy, animal health, human health, and BCC. The guide describes each indicator clearly in terms of definition, how to measure it, measurement tools, what it measures, and considerations for its use. For countries with limited resources to establish M&E systems for HPAI programs, the guide also suggests core and additional indicators.

This guide does not address the following areas: 1) the effectiveness of donor coordination for national programs, 2) the economic impact of HPAI (with the exception of indicators for compensation programs), 3) the plans for logistics/commodities, and 4) the implementation of regional activities. These topics are proposed for future editions of the guide.

Comments and Updates for This Edition of the Guide

The first edition of this guide, released as an interim version, was published in June 2007. It responded to the urgent need for a standardized M&E framework and indicators for new HPAI programs in the region. The interim version allowed for the rapid distribution of the framework and indicators to a wide audience involved in HPAI programs, including national coordinating committees in Laos, Vietnam, and Burma; NGO networks in Vietnam and Thailand; international donors working in the region; and United States government implementing agencies and their partners. These groups gave generously of their time to provide feedback on the framework and indicators. The current edition benefits from their insights.

Since June 2007, the world has made much progress in understanding the disease and formulating effective responses. The current edition updates the indicators to reflect new technical standards and recent country experiences. Specific updates in this edition include:

- Disease terminology revised to reflect current international practices

- Overview revised to reflect the current state of the disease as well as global, regional and country-level efforts to prevent and control it

- Definition of novel influenza A viruses provided, along with suggestions for how to modify human health indicators for the prevention and control of novel influenza A viruses
- Indicators in chapters 3–6 updated to reflect feedback received
- Additional laboratory capacity indicators added to chapter 4
- Chapter introduction and indicators in the human health section revised to reflect the entering into force of the International Health Regulations (IHR) 2005 in June 2007
- Relevant indicators in the human health section updated to reflect the 2007 release of *WHO Guidelines for Investigation of Human Cases of Avian Influenza A (H5N1).*

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World Bank (2007). Burns, Andrew; van der Mensbrugghe, Dominique; Timmer, Hans. Evaluating the Economic Consequences of Avian Influenza. Washington, DC. Available at http://siteresources.worldbank.org/INTTOPAVIFLU/Resources/EvaluatingAIeconomics.pdf.

World Bank and United Nations Systems Influenza Coordinator. (2007). *Third Global Progress Report on Responses to Avian Influenza and State of Pandemic Readiness*. Washington, DC; December. http://siteresources.worldbank.org/INTTOPAVIFLU/Resources/UN_WB_AHI_ProgressReportFinal.pdf.

WHO. (2008). *Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO*. 1 February. Available at http://www.who.int/csr/disease/avian_influenza/country/cases_table_2008_02_01/en/index.html.

CHAPTER 2: MONITORING AND EVALUATION

What Is Monitoring and Evaluation?

The goal of M&E is to measure program effectiveness, identify problem areas, gather lessons learned, and improve overall performance. M&E uses social science and epidemiological research methods and serves several purposes. First, it is a management tool for planning and implementing programs. It helps program planners and implementers track the progress and effectiveness of their efforts. Second, M&E demonstrates to planners and other decision makers that the program efforts have had measurable impacts on the outcomes of interest. It also provides insight on where resources are used most efficiently, where there are gaps, and where new strategies should be considered. Third, M&E serves as an advocacy tool to raise awareness of the severity of a situation among those in a position to change policy, commit resources, and increase or continue support of the efforts.[12]

A number of different methods or approaches are available to track the progress and effectiveness of efforts, including process, outcome, and impact evaluation and surveillance.[13]

Monitoring is the routine tracking of how well program activities are implemented using data that are collected on a regular, ongoing basis. Monitoring is used to assess whether planned activities are carried out according to schedule and are progressing towards identified targets. It also monitors service utilization. When there is an abrupt or unexpected change in monitoring data, a more formal evaluation of the activities may be needed.

Process Evaluation is carried out periodically to measure the quality of program implementation and to assess coverage. It may also be carried out to measure the extent to which the intended target population uses services. Process evaluation aims to inform midcourse corrections in the program to enhance program effectiveness. Information collected through routine data collection activities and focus groups or other qualitative methods may be used to carry out process evaluation.

Outcome and Impact Evaluations measure the extent to which stated objectives are achieved with respect to the program's goals. They are carried out to assess program results and the changes observed among the target population. Thus, they focus on changes in knowledge, attitudes, behaviors, skills, community norms, utilization of health services, and health status at the population level. An impact evaluation is a very specific type of evaluation design that establishes how much of the observed change in outcomes is attributable to specific program efforts. Impact evaluations require a rigorous experimental study design and involve complex data collection and statistical analysis procedures. This type of evaluation is usually undertaken

[12] WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs,* 1–2. See also, UNICEF. (2005). *A guide to monitoring and evaluation of the national response for children orphaned and made vulnerable by HIV/AIDS,* 10. New York, USA.
[13] WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs,* 1–2. See also, Bertrand, J.T., & Escudero G. (2002). *Compendium of indicators for evaluating reproductive health programs,* 6.

only for specific situations, such as determining the success of a project for scale-up or replication.

Surveillance is the routine collection of epidemiological data (i.e., disease outcomes) to monitor trends in disease incidence or prevalence over time. It should not be confused with, or substituted for, program monitoring. Surveillance provides little or no information on program activities. Program managers and decision makers may benefit by tracking surveillance and program monitoring data simultaneously.

Importance of Monitoring and Evaluation for National HPAI and Pandemic Preparedness Programs

Why Is M&E Important?

M&E provides program managers with the information essential to strategic planning, program design, and implementation, which facilitates informed decision making on key programmatic issues including human and financial resources.[14] As stated earlier, the benefits of the M&E of national HPAI and pandemic preparedness programs are threefold: 1) it serves as a management tool for planning and implementing a response, 2) it serves as an accountability tool for performance monitoring, and 3) it serves as an advocacy tool.

The evaluation component of M&E requires more extensive analysis of program data and plays an important role in determining whether a program is progressing towards stated objectives. Well-designed evaluation provides information on the extent to which the program brought about the desired change in the target population.[15] The M&E of HPAI programs enables program managers to measure coverage of their programs and identify gaps and opportunities for program expansion. Program managers and decision makers are better able to plan and implement a timely and appropriate response to limit the prevalence of HPAI in birds, reduce the risk of human infection with H5N1 virus, and ultimately reduce the risk of an influenza pandemic.

What Are the Characteristics of a National M&E System?[16]

In general, a national M&E system is meant to provide an overview of how and where data are collected, processed, analyzed, managed, and disseminated for efficient utilization. A national M&E system brings together research, surveillance, and monitoring of the use of resources and of program activities.[17]

An M&E system serves several purposes. It is meant to ensure the most efficient use of resources to generate the program and project data required for decision making. It is

[14] WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs,* 2.
[15] Ibid, 2.
[16] Specific data sources that exists in countries that support national M&E system for HPAI programs will be reviewed in future revisions to the guide.
[17] WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs,* 2–3.

structured to facilitate consistent data collection and analysis and to enable managers to track trends over time. It serves as a catalyst for coordination among many constituencies, including program managers, donors, and government planners, while bringing them together in one system to avoid the duplication of efforts.[18]

Ideally an M&E system includes many components. First, M&E is a staff unit or group created to monitor and evaluate activities. Second, the monitoring process must be owned and assumed by the mandated government agency. In many countries, this requires strengthening national capacity to guarantee collection and utilization of uniform, good-quality data within a sustainable framework, and additional financial resources are often needed to strengthen a management information system for HPAI. A certain amount of the annual budget needs to be allocated for this purpose. Third, the system should be founded on a strategy with clear goals and targets, guidelines for the implementation of activities, and specific indicators to monitor and evaluate program progress. Fourth, the M&E system should also include plans for data collection, analysis, and dissemination of results. Finally, the involvement of all stakeholders in collecting, providing, and analyzing information is essential for an M&E system to be successful.[19]

Challenges to the Monitoring and Evaluation of HPAI and Pandemic Preparedness Programs

Efforts to systematically monitor and evaluate HPAI and pandemic preparedness programs are new even in SE Asia, which is the epicenter of the disease. Animal health programs have existed to monitor and control diseases endemic in the region, including HPAI; however, the occurrence of recent human cases of infection with HPAI in the region has galvanized a multisectoral response to address human health concerns. Furthermore, the awareness that the virus could mutate and lead to an influenza pandemic has prompted governments and international organizations to expand their efforts to prevent and control HPAI at the national and regional levels. Initially resources to support HPAI and pandemic preparedness programs in the region came in the form of emergency funding. However, ongoing efforts are now being strengthened to address medium- to long-term solutions. In light of this context, it is critical that an M&E system be established to guide policy and program decision making.

Several factors make the M&E of HPAI and pandemic preparedness programs in SE Asia particularly challenging. First, the changing nature of the disease and its epidemiology require program development and implementation to be flexible while a new body of knowledge is accumulated and program approaches and strategies are tested or adjusted. The M&E of the programs need to be flexible in order to reflect the dynamic nature of disease and programming. Second, to be effective, HPAI and pandemic preparedness programs need to be cross-sectoral, involving partners from not only the health and agricultural sectors but also other public and private sectors. Thus, the M&E system needs to be comprehensive and cross-sectoral, which requires a high level of collaboration across sectors and among

[18] WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs,* 2–3.

[19] Adapted from WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs,* and UNICEF. (2005). *A guide to monitoring and evaluation of the national response for children orphaned and made vulnerable by HIV/AIDS.* New York, USA.

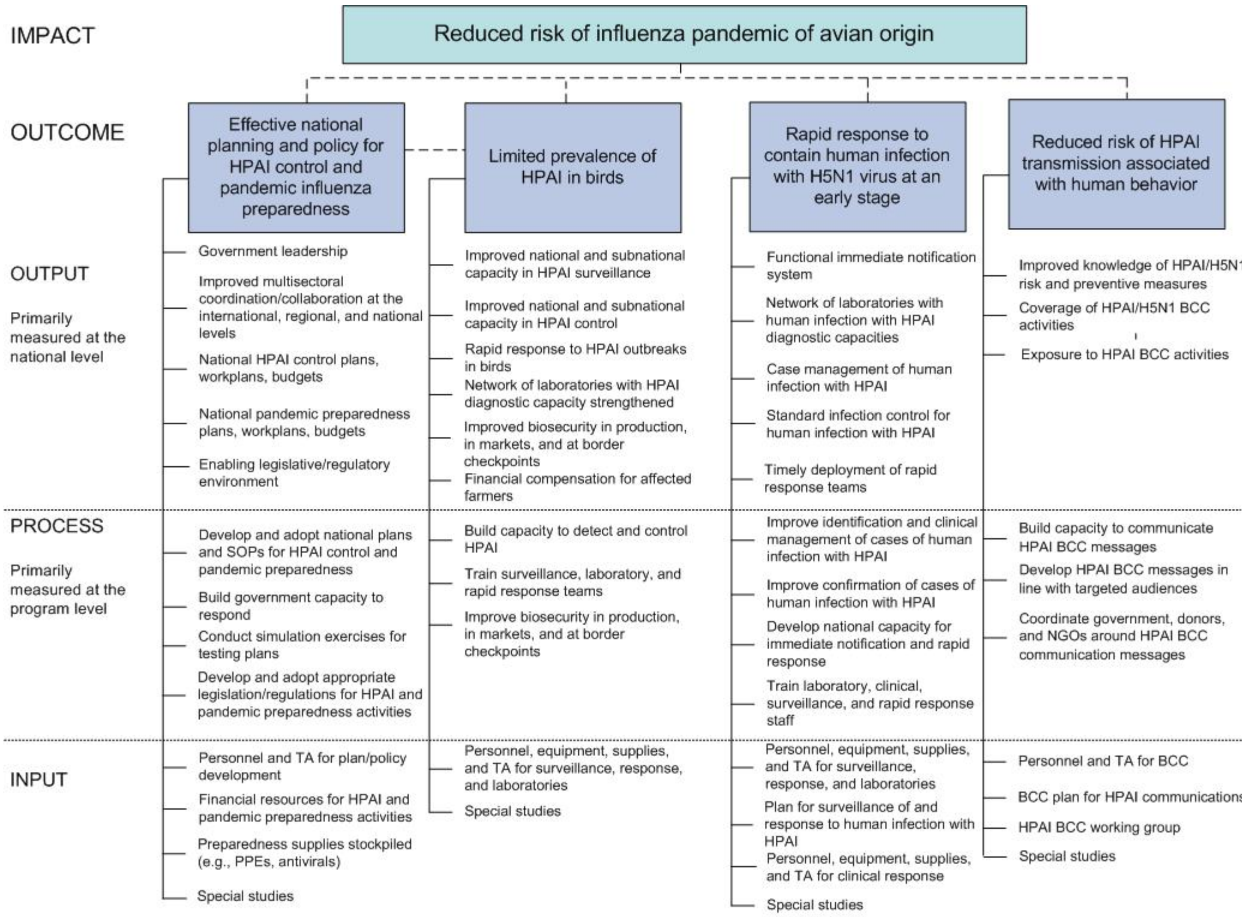
stakeholders. Third, the M&E system of HPAI and pandemic preparedness programs needs to accommodate a diverse set of donors' reporting requirements and mechanisms. Finally, in contrast to other infectious disease programs, such as HIV/AIDS, malaria, and tuberculosis, measurements of program effectiveness have not been standardized, and a broad consensus has not been reached on best measures and data collection tools. Indicator-specific issues are discussed in the Selection of Indicators section.

Logic Model and Program Framework for Understanding National HPAI and Pandemic Preparedness Programs

Logic Model

The logic model for national HPAI and pandemic preparedness programs provides greater detail on the activities associated with each of the program framework components (see the logic model on the following page). A logic model is an illustrative framework capturing a series of program events through which a program progresses towards its stated goals and objectives. There are four key elements in a program logic model: input, process, output, and outcome. *Input*s are resources that go into the program, including human and financial resources as well as supplies. *Process* is a series of program activities that are implemented and that produce *outputs. Outcomes* are results or changes that are observed among systems, people, populations, or communities.

Logic Model for National HPAI and Pandemic Preparedness Programs



Key: BCC = Behavior change communications; NGO = Nongovernmental organization; PPE = Personal protective equipment; SOP = Standard operating procedures; TA = Technical assistance

The logic model guides the selection of indicators to monitor program activities and track changes over time. Each program area in the logic model has a corresponding chapter in the guide. Chapter 3 provides an overview of the National Planning and Policy program area and lists indicators that can be used to monitor progress toward achieving the outcome of effective national planning and policy for HPAI control and pandemic influenza preparedness. Chapter 4 covers the Animal Health program area, listing indicators that address the outcome "limit prevalence of HPAI in birds." Chapter 5 addresses the Human Health program area and lists indicators related to the outcome "rapid response to contain human infection with H5N1 virus at an early stage." Chapter 6 covers the Behavior Change Communication program area and lists indicators that can be used to monitor progress toward reduced risk of HPAI transmission associated with human behavior.

A table mapping the specific indicators listed in each chapter to the components of the logic model is presented in the appendix. Similar tables with only the indicators for each program area are found in the corresponding chapter.

Program Framework

This section provides a program framework for national HPAI and pandemic preparedness programs. The framework describes the ways in which program outcomes contribute to the overall objective of reducing the risk of an influenza pandemic of avian origin. The framework presents four program components: policy and planning, animal health, human health, and BCC. It is important to note that factors external to programs in the broader context, including social, political, economic, and cultural factors, affect the outcomes and impact of an HPAI program.

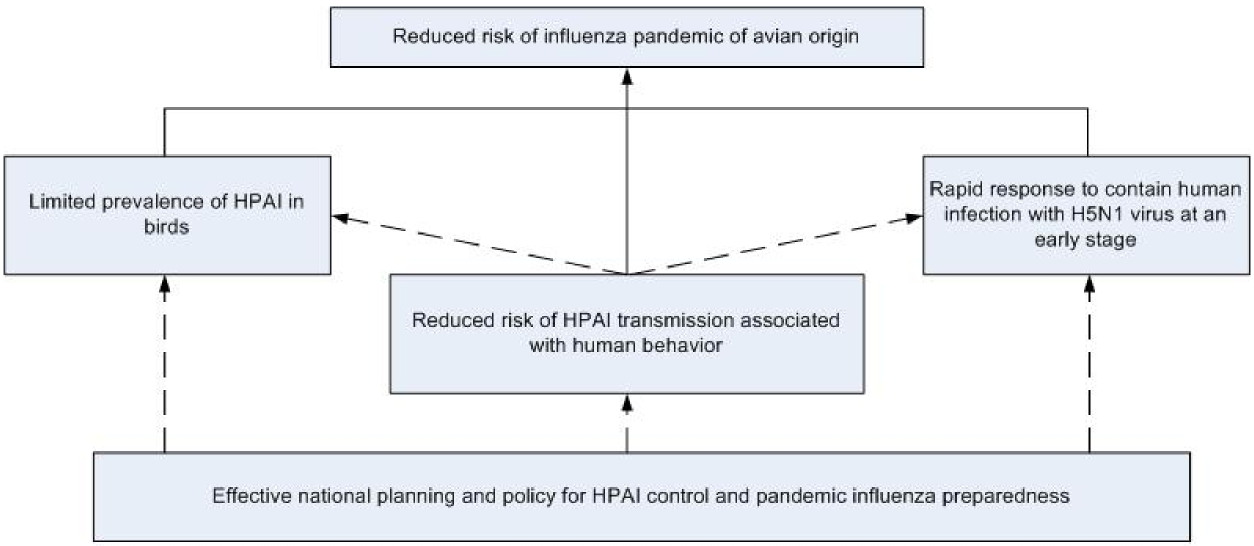


Figure 1. Highly pathogenic avian influenza program framework (outcomes and impact).
Four outcomes are expected from avian influenza programming. These outcomes progress logically.

- National planning and policy for highly pathogenic avian influenza (HPAI) control and pandemic influenza form the basis of programming to achieve the other three outcomes:
- Limited prevalence of HPAI in birds.
- Reduced risk associated with human behavior, which not only reduces bird-to-human transmission but supports reductions in bird-to-bird transmission and human-to-human transmission of HPAI
- Rapid response to contain human infection with H5N1 virus at an early stage to lower risk of an influenza pandemic

The combination of these four outcomes is expected to lower the risk of development of an influenza pandemic and help countries better prepare to mitigate the potential effect of an influenza pandemic.

Planning and Policy (Chapter 3)

National planning and policy for HPAI control and pandemic preparedness form the basis of programming to achieve the other three outcomes and as such, is presented as a foundation for the three other program areas and outcomes.

Animal Health (Chapter 4)

In the current century, no HPAI virus, including H5N1, has mutated to become capable of efficient human-to-human transmission. Human infections with H5N1 virus arise from direct contact with infected birds. As a result, prevention and control of the disease in the bird populations is the most effective way of reducing the risk of the emergence of an influenza pandemic. With a reduction in animal outbreaks, the opportunity for bird-to-human transmission of the disease is decreased. A significant portion of national program efforts is focused on controlling the disease at the source in bird populations.

Human Health (Chapter 5)

Each additional human case presents the virus with the opportunity to improve its efficiency and sustainability for human-to-human transmission. Moreover the disease has shown an extremely high fatality rate in humans, with more than 60 percent of the cases resulting in death. National programs in the region are simultaneously focused on appropriate identification and treatment of the sporadic cases of human infection with H5N1 virus and preparing for the surge in demands on the human health care system in the case of an influenza pandemic.

Behavior Change Communication (Chapter 6)

Human behavior plays a significant role in the spread of HPAI for all three methods of transmission of the disease: bird-to-bird, bird-to-human, and human-to-human. Moreover, unlike other immutable variables involved in the spread of the disease, it is possible to change human behavior. BCC seeks to reduce the risk of the emergence of an influenza pandemic by addressing the knowledge, attitudes, and behaviors of the population. National programs, along with international technical agencies such as UNICEF, have made BCC a central part of their overall response to the threats posed by HPAI and an influenza pandemic.

Selection of Indicators

How Do You Select a Good Indicator?

A core element in program monitoring and evaluation efforts is the development of a set of indicators to monitor if and how well program activities have been implemented and to evaluate whether program objectives have been achieved. An indicator should reflect the goals and objectives of the program and measure program performance that is tracked over time by the monitoring system. Ideally indicators should also reflect the multiple dimensions of the program, including quantity, quality, and cost. Indicators covering quantity are relatively easy to develop and include elements of program performance such as number of staff and activities as well as program coverage. The qualitative aspects of programs are harder to measure. However, the elements that qualitative indicators measure, such as health workers and veterinarians' competency and performance as well as adherence to standards and national protocols, are just as important as quantitative indicators and should be incorporated in the M&E system.[20]

Indicators to monitor and evaluate program effectiveness should be selected during program planning, with the involvement of implementing agencies and key stakeholders. Indicators should be selected with careful foresight and practical consideration. Clear program objectives facilitate the selection of appropriate indicators to measure program performance.[21]

Program managers may consider the following questions in selecting the indicators that are most appropriate for the program that they are implementing:[22]

- Are program objectives measurable?
- Are the data needed to measure the indicators available? If not, is it feasible to collect them?
- Are there alternative measures that need to be considered?
- How often will the program report on the different results? Will the data be available by internal or external deadlines?
- What financial support is available for M&E? Does the organization have funds to conduct a survey? Or does the budget dictate the use of existing data, such as service statistics?
- What are the requirements of the donor agency (if applicable)?

Table 1 lists standard selection criteria for judging the relevance of specific indicators.[23]

Table 1. Criteria for Indicator Selection

The following criteria are useful in helping to select indicators for program monitoring:	
Valid	Indicators should measure the condition or event they are intended to measure.
Reliable	Indicators should produce the same results when used more than once to measure the same condition or event, all things being equal (e.g., using the same methods, tools, or instruments).
Specific	Indicators should measure only the condition or event they are intended to measure.
Sensitive	Indicators should reflect changes in the state of the condition or event under observation.
Operational	Indicators should be measured with definitions that are developed and tested at the program level and with reference standards.
Affordable	The costs of measuring the indicators should be reasonable.
Feasible	It should be possible to carry out the proposed data collection.
Comparable	Indicators should be comparable (e.g., over time, across geographical lines).

[20] Adapted from WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs.*
[21] Gage, A. J., Ali, D., & Suzuki, C. (2005). *A guide for monitoring and evaluating child health programs.* MEASURE Evaluation, Carolina Population Center: University of North Carolina at Chapel Hill.
[22] Ibid, 14–15.
[23] WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs,* 4.

Another key criterion in selecting indicators in the context of HPAI programs in SE Asia is the adaptability of indicators to country-specific contexts. Countries in the region are at various levels of development, and the prevalence and impact of HPAI vary by country. Thus, the M&E of the national program's performance and effectiveness as well as the indicators to measure them need to be country specific.

Use of Core and Additional Indicators

Indicators presented in this document are classified as either core or additional indicators. These classifications have been assigned based on feedback from the technical working group members, experts, and program managers through country consultations conducted during the compilation of this guide. However, they are only suggested classifications and may vary depending on the specific needs and situations of countries and their programs.

Indicators are classified as core if they were generally believed to be highly important to monitoring and evaluating the HPAI programs, if the collection of data was feasible, and if they were relevant to the stage of the disease and the programs in the region. Indicators were classified as additional if they were viewed as being less critical, if data collection was not easy or feasible, or if they were not currently viewed as being relevant. These classifications will be reexamined in future editions of the guide.

Data Sources

Data for monitoring and evaluating HPAI programs may be obtained in many ways and at various levels. Data sources currently available are briefly summarized below.

Global Update on HPAI in Birds and Human Cases

Countries are required to report cases of HPAI outbreaks among poultry to OIE and cases of human infections with H5N1 virus to WHO as soon as they are detected. These data are available on the Web sites of OIE and WHO.[24] While the changes in the prevalence of HPAI among birds and in the number of cases of human infection with H5N1 virus cannot be linked directly to the ongoing program efforts at the national level, these data can be used to track the situation in individual countries and in the SE Asia region.

National-Level Data

Surveillance

Data collected on disease surveillance in countries for both animal health and human health are used to track the prevalence of disease over time and to detect outbreaks. Data collected are sent to OIE for animal disease and to WHO for human infection with H5N1 virus.

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[24] Update on avian influenza in animals (Type H5)/OIE, http://www.oie.int/downld/AVIAN percent20INFLUENZA/A_AI-Asia.htm. Cumulative number of confirmed human cases of avian influenza A/(H5N1) reported to WHO, http://www.who.int/csr/disease/avian_influenza/en/index.html.

Laboratory Records

Records maintained at laboratories that carry out testing and diagnoses of animal and human diseases are valuable sources of information for monitoring and evaluating the functions and performance of laboratories as well as the incidence of disease. Review of laboratory records can yield information pertaining to laboratory capacity and to the timeliness with which tests are carried out and results are reported to higher levels to prompt a response.

Household and Community-Level Data

Knowledge, Attitudes, and Practices Surveys

One common tool used in monitoring and evaluating BCC is a knowledge, attitudes, and practices (KAP) survey. To be effective, KAP surveys are usually conducted at baseline (before the planned programmatic intervention) and at intervals during and after the intervention takes place. Several donor agencies and implementing partners working in the region either have conducted or are planning to conduct such surveys. The KAP survey instruments can be adapted to monitor the results of program interventions and provide valuable data for monitoring and evaluating progress on these indicators. In preparing this guide, we relied heavily on the KAP survey implemented by AED in Cambodia, Indonesia, Laos, and Vietnam to collect information specific to individuals' knowledge, attitudes, and behavior relating to HPAI. The target population consists of backyard farmers with between 10 and 100 heads of adult poultry. For more information on how the survey can be used to monitor and evaluate HPAI BCC programs, see Chapter 6.

Demographic and Health Surveys

Demographic and Health Surveys (DHS) are comprehensive, large-sample surveys conducted to collect information on a wide range of health topics. They are usually nationally representative sample surveys, and data can sometimes be disaggregated to the level of smaller administrative units such as districts. Surveys are collected every 3–5 years (the cycle varies by country). While questions pertaining to HPAI-related knowledge and behavior are not part of the standard questionnaire module, it may be possible to add them.

Health Systems Data

Routine Health Information System Data[25]

Routine health information system (RHIS) data pertain to information collected at facilities and recorded on standard reporting forms. The information usually pertains to service statistics. It is submitted on a regular basis to higher levels in the system where the data are aggregated. RHIS is a valuable source of information for monitoring and evaluating program performance, but it does not provide information on health worker performance.

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[25] Gage, A. J., Ali, D., & Suzuki, C. (2005). *A guide for monitoring and evaluating child health programs.* MEASURE Evaluation, Carolina Population Center: University of North Carolina at Chapel Hill.

Health Facility Surveys[26]

Health Facility Surveys (HFS) are important sources of information on the quality of care. HFS measure health facility system performance. Items for measurement may include the availability of essential drugs, vaccines, supplies, equipment, and services and the infrastructure of the facility. Many health facility surveys are carried out, including the WHO integrated HFS, Basic Support for Institutionalizing Child Survival integrated Health Facility Assessment, Child Survival Collaborations and Resources Group (CORE) adapted and integrated HFS, and USAID Service Provision Assessment (SPA). Data are collected from a sample of outpatient services at first-level and referral facilities in the project area. Data collection requires direct observations of practice and performance and exit interviews with clients/patients. To measure health workers' performance for the management of human infection with H5N1 virus, these instruments would need to be adapted.

Qualitative Data[27]

Qualitative indicators are not covered in this document. Nevertheless, measuring the qualitative aspects of program effectiveness is an important undertaking. Qualitative data provide in-depth information useful for understanding the process behind observed results. When the anticipated results are not observed, qualitative data may help determine why the outcomes were not achieved and detect failures in various health system components. Qualitative data are useful not only for developing program strategies, but also for adapting or improving M&E instruments and strengthening the design of survey questionnaires. The numerous qualitative methods that are available for M&E of HPAI programs are briefly described below:

In-Depth Interviews

In-depth interviews use open-ended or unstructured questions on topics of interest to probe and elicit information about respondents' experiences, perceptions, opinions, feelings, and knowledge. (For more information about in-depth interview techniques and analysis of information, see Patton, 2002; Russell-Bernard, 1995.)

Observation

Numerous methods are available to collect rich, detailed descriptions related to "activities, behaviors, actions, conversations, interpersonal reactions, organizational, or community processes."[28] Data can be obtained through "observations, conversations, interviews, checklists, and unobtrusive methods."[29] (For more information on this methodology, see Russell-Bernard, 1995.)

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[26] Ibid.
[27] This section is adapted from Gage, A. J., Ali, D., & Suzuki, C. (2005). *A guide for monitoring and evaluating child health programs*. MEASURE Evaluation, Carolina Population Center: University of North Carolina at Chapel Hill.
[28] Gage, A. J., Ali, D., & Suzuki, C. (2005). *A guide for monitoring and evaluating child health programs*. MEASURE Evaluation, Carolina Population Center: University of North Carolina at Chapel Hill, 18–19.
[29] Ibid.

Document Review

Written materials and documents maintained at organizations and facilities and other documents, such as program and administrative records, official publications, and reports, are sources of information for understanding the process of program implementation and its effectiveness.

Data Quality

Efforts should be made to ensure that the data are appropriate, complete, consistent, and timely. Ongoing routine data collection is often impeded by the lack of proper training and supervision, which results in data of poor quality being collected. Furthermore, if the individuals who are recording the data lack an understanding of the value of the data collected and the needs for program management and lack opportunities to use the data collected, the quality will most likely be poor. In turn, poor-quality data lead to a decline in data utilization. Therefore, it is important to establish an M&E system that functions to oversee all data collection and to ensure that data are appropriately used and the results are disseminated throughout the system. Dissemination of the results to the collection level is especially important but often overlooked.[30]

Use of Indicators at Different Levels

National Level

The indicators in this guide are intended for use at the national level. They assist countries in measuring the progress of the overall national response to HPAI and pandemic preparedness. In selecting a national set of indicators, countries should be aware that this list is neither all-inclusive nor are all the indicators in the guide mandatory for collection. Countries should be guided by their local circumstances in selecting indicators, including resources available for data collection, localized epidemiology of HPAI, and the existing veterinary and human health infrastructures. In particular, several of the indicators in this guide pertain to specific approaches to HPAI prevention and control (e.g., vaccination) that may not be relevant in the context of a specific country. The indicators selected should correspond to national program objectives and activities. The indicators in this guide are presented with standard definitions and methods for measurement to facilitate the comparison of information over time and between different populations.

International Level

At present, there are no international published protocols for M&E of HPAI programs. International donor organizations are at varying stages of defining M&E systems for the portfolio of HPAI activities they support. Indicators at the global level support cross-country comparisons and tracking trends in the evolution of the disease. They also assist international donors in determining the appropriate allocation of resources for the most effective response.

[30] WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs.*

Many of the indicators in this guide lend themselves easily to aggregation at the global level. Where appropriate, international programs are encouraged to use the indicator definitions and measurements listed here to facilitate the collection of data at both the national and international levels. The use of the same definitions and measurement methods for indicators at multiple levels greatly reduces the data collection burden on countries.

Project Level

The indicators presented in this document are intended for use at the national level (e.g., proportion of people who have been exposed to HPAI-related messages through mass media). However, these indicators can be adapted to suit the M&E and reporting needs of the organizations using them. For example, if a BCC program covers a single district or set of districts, this geographical area becomes the population of interest for the program.[31] However, the indicators included in this guide will not support the full range of M&E needs that projects usually require. In most cases, projects will need to develop other indicators in order to respond adequately to their own information needs.

Some donor-funded projects need to satisfy two different needs for indicators. First, they need to work with host-country counterparts and partners in establishing the best indicators to use for monitoring and evaluating the program or project at the country level or at the regional, district, or city level that is most relevant and useful for the program or project. Second, they may need to satisfy the reporting requirement of the donor. Some indicators can be adapted to assess a program at the host-country level and at the global level by aggregating the results of their work in different countries to report to donors on the number of countries that achieved the results.[32]

Some organizations may find that some of the indicators contained in this document do not match with their own operational definitions for their program and projects. If the organizations are using a measurement method comparable to one proposed in this document, then they should use the indicators that are relevant to the project.[33]

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[31] Adapted from Bertrand, J. T., & Escudero, G. (2002). *Compendium of indicators for evaluating reproductive health programs,* 14–15.

[32] Bertrand, J. T., & Escudero, G. (2002). *Compendium of indicators for evaluating reproductive health programs,* 14–15.

[33] Gage, A. J., Ali, D., & Suzuki, C. (2005). *A guide for monitoring and evaluating child health programs*. MEASURE Evaluation, Carolina Population Center: University of North Carolina at Chapel Hill.

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OIE. *Update on avian influenza in animals (Type H5).* Available at http://www.oie.int/downld/AVIAN percent20INFLUENZA/A_AI-Asia.htm.

UNICEF. (2005). *A guide to monitoring and evaluation of the national response for children orphaned and made vulnerable by HIV/AIDS*. New York, USA.

WHO. (2004). *Compendium of indicators for monitoring and evaluating national tuberculosis programs*.

WHO. *Cumulative number of confirmed human cases of avian influenza A/(H5N1) reported to WHO*. Available at http://www.who.int/csr/disease/avian_influenza/en/index.html.


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Guide for Monitoring and Evaluation of Avian Influenza Programs in Southeast Asia

Part 2

CHAPTER 3: EFFECTIVE NATIONAL PLANNING AND POLICY FOR HPAI CONTROL AND PANDEMIC INFLUENZA PREPAREDNESS (NATIONAL PLANNING AND POLICY)

Introduction

Planning and policy development is essential to the success of any national HPAI and pandemic preparedness programs. HPAI and the potential for an influenza pandemic pose unique planning challenges for countries in the region. Because of the nature of the disease, national programs must simultaneously plan for the disease as it exists now and as it may evolve. With strong planning, national governments can respond rapidly and in a coordinated fashion to animal outbreaks and human cases as they occur.

The indicators in this section pertain to the development of national-level plans, policies, guidelines, manuals, and standard operating procedures (SOPs) and the process to ensure that these documents are developed in a manner that represents current international best practices. They also measure the budgetary commitment and human capacity support for these plans and policies. However, plans are only the first step in effective HPAI prevention and control programs. These planning/policy indicators, therefore, are linked to key implementation indicators in the other sections of this guide.

Countries differ in the degree to which HPAI control and pandemic preparedness planning are separate or integrated activities. For example, Thailand maintains two coordinating bodies: The National Committee on Avian Influenza Control and The National Committee on Influenza Pandemic Preparedness. From these committees separate national strategic plans for HPAI control and influenza pandemic preparedness, respectively, have emerged. In contrast, Laos has one national coordinating body for HPAI control and pandemic preparedness planning.

For this guide, we have elected to develop separate sets of indicators for HPAI control and pandemic preparedness planning. The guidelines from the leading technical organizations divide along these lines.[34] By separating these two aspects of planning, we were able to reflect current international best practices in each area more fully and provide measures to determine whether plans include current best practices.

The indicators in this section are divided into the following four main areas:

Multisectoral Coordination of HPAI and Pandemic Preparedness Programs

HPAI and pandemic preparedness programs require the involvement of all sectors of the government, donor community, civil society, and business. No one organization can tackle the challenges alone. In reviewing HPAI and pandemic preparedness programs, the need for strong coordination between the animal and the human health sectors is most apparent. However, the

[34] WHO. (2005).WHO c*hecklist for influenza pandemic preparedness planning.* See also WHO. (2005). *A global strategy for the progressive control of highly pathogenic avian influenza.* FAO/OIE in collaboration with WHO.

need for coordination extends past these two sectors to include, but not be limited to, the ministries of finance, education, communication, environment, defense, commerce, and tourism; donor organizations; NGOs; and business interests. The indicators in section 3.1 measure progress in establishing a clearly defined, multisectoral, and regularly functioning coordination body for national HPAI and pandemic preparedness programs.

HPAI Prevention and Control Planning

As mentioned in the introduction to this guide, no other region has been as affected by the latest strain of HPAI as SE Asia. In certain countries, the disease has become endemic in bird populations. Most countries have experienced at least one case of human infection with H5N1 virus. HPAI prevention and control planning spans surveillance of, diagnosis of, and response to the disease in both the animal and human health sectors, as well as a multitude of related HPAI prevention and control activities, such as risk reduction, stockpiling of essential supplies (such as personal protective equipment (PPEs), vaccines, and antivirals), compensation programs, and coordination mechanisms. For successful implementation of the plans, appropriate financial and human resources must be dedicated to HPAI control activities. Indicators in section 3.2 measure progress in planning for these activities.

Pandemic Preparedness and Response Planning

As of the time of the publication of this guide, no country in the world has witnessed an emergence of a pandemic strain of influenza originating from an HPAI strain. However, it has been recognized that SE Asia could be the origin of the next pandemic strain of influenza.[35] For this reason, it is of both regional and global importance that countries dedicate resources and efforts to planning for an influenza pandemic. As with HPAI control, pandemic preparedness and response planning must be matched with the appropriate testing of plans, allocation of resources, and development of human capacity to implement the plans. Above all, pandemic preparedness planning requires strong government leadership. Indicators in section 3.3 address the measurement of these activities.

Legislative and Regulatory Framework

In the past five years, both the global community and individual countries have recognized that the regulatory structures currently in place are insufficient to support effective responses to HPAI and the pandemic threat. At the global level, countries have revised and greatly strengthened the International Health Regulations to deal with the threat of emerging infectious diseases in the 21st century. These regulations took effect in June 2007, and countries have been

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[35] The National Committee on Avian Influenza Control, Government of Thailand. (2005). *National strategic plan for avian influenza control in Thailand 2005–2007,* 52.

working to revise their national regulatory environment to align with these new international regulations.[36]

In addition, countries are working to bring their legislation and regulations in line with current international technical guidelines.[37] In practice, changing key legislation and regulations can take years. Because these efforts are at their initial stages, we have elected to develop indicators focused on the existence of initial reviews of regulatory frameworks, with recommendations for change. As countries move forward in their regulatory reform efforts, additional indicators measuring later stages of progress, including the adoption and enforcement of new legislation, will become appropriate. One such indicator is included here; others may be included in a future edition of this guide.

Research Framework

There is a continuing need for research in the area of HPAI in order to help countries respond effectively and develop best practices. Identifying research priorities in a research agenda helps governments allocate resources effectively and focuses researchers on issues of national importance. A national agenda can also support policymakers in understanding the scientific evidence available for sound policy decisions as well as the gaps in existing knowledge. The indicator in section 3.5 measures progress in developing a framework to help countries focus their efforts related to HPAI research.

Measurement Tools and Data Sources

The primary measurement tool for these indicators is a review of plans, policies, guidelines, SOPs, workplans, budgets, and manuals against relevant checklists.

Methodological Challenges[38]

The development of indicators to measure progress in national planning and policy presents some specific methodological challenges.

Difficult to Quantify

With the exception of indicators tied to budget amounts, planning and policy indicators are inherently nonquantitative. For this section, we have constructed these indicators on a nominal scale (existence/absence of a plan), with the requirement that the plan meet certain minimum quality standards listed as a checklist for each indicator. However, because the determination of whether the plans meet these requirements is somewhat subjective, it can be difficult to track

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[36] Republic of Indonesia. (2006). *National strategic plan for avian influenza control and pandemic influenza preparedness 2006–2008,* 18–19. See also Government of Lao P.D.R. (2006). *National avian influenza control and pandemic preparedness plan 2006–2010,* 19.

[37] Government of Vietnam. (2005). *Vietnam integrated national plan for avian influenza control and human pandemic influenza preparedness and response 2006–2008,* 3.

[38] This section has been adapted from the *Compendium of indicators for evaluating reproductive health programs,* 31–33.

progress across countries using these indicators. Similarly, as the underlying quality elements of these indicators may change over time, it can be difficult to track progress within one country over time.

Quality Aspects in Flux

The knowledge base for HPAI and influenza pandemic is changing constantly. Although these indicators reflect the best thinking of technical experts to date on planning for HPAI control and pandemic preparedness, we fully anticipate that certain key quality elements will change as more information becomes available. In this guide, we have tried to incorporate quality measurement issues by compiling checklists to determine whether the essential elements of planning, reflecting our current knowledge, are in place. In future editions of this guide, the quality standards should be updated to reflect new knowledge. However, this will reduce countries' abilities to track progress across time. Because countries cannot know now which quality aspects will remain constant and which will require updating, the most practical option is to move forward using the currently available knowledge.

Operations in Different Arenas and at Different Levels

Planning and policy development operate in many different arenas of the government. Governments differ in their governance structures, and key policy decisions may emerge from legislative or administrative processes. Similarly, in a decentralized system, planning and policy may occur at the national or subnational levels. In some cases, the subnational levels have the most authority to enact change. This guide focuses on national-level policies and does not distinguish between legislative and administrative adoption of plans/policies.

Multistep Process

Planning and policy development is a multistep process involving many sectors and levels of the government. It is difficult to capture the multistep nature of the process in a single indicator. In cases in which the plan/policy has not been adopted yet, we have suggested that countries document progress toward adoption (e.g., in development, draft, submitted for approval). Similarly, approval is not the final stage of planning and policy development. Countries should be actively engaged in the process of reviewing and updating plans on at least an annual basis to reflect new technical guidelines and their own experience with implementing plans in the field.

Selection of Indicators

The indicators in this section were selected by the Technical Working Group as key measures of political commitment toward HPAI control and pandemic preparedness. The M&E field has long recognized that political commitment is critical to the success of national health programs; therefore, the development of many of these indicators drew upon their counterparts in other human health M&E systems. The quality aspects of these indicators have been determined based on WHO/OIE/FAO guidelines as well as the recommendations of technical experts in the field.

In addition, reviews of existing national plans and policies helped establish the overall scope of countries' planning and policy efforts.

In developing this guide, we have followed the principle of adapting, where possible, indicators that have already demonstrated their utility and feasibility in other health domains. Selected indicators from this section have been adapted from the political commitment section of the *Compendium of Indicators for Monitoring and Evaluating National Tuberculosis Programs*. In terms of measurement techniques and considerations, these indicators remain true to their original specifications.

The indicators in this chapter are as follows:

3.1 Multisectoral Coordination of HPAI and Influenza Pandemic Programs

3.1.100 Existence of Multisectoral Coordination of National HPAI Prevention and Control Programs (Core Indicator)

3.1.200 Existence of Multisectoral Coordination of National Pandemic Preparedness and Response Programs *(Core Indicator)*

3.2 Planning for HPAI Prevention and Control

3.2.100 Existence of a National, Multisectoral HPAI Prevention and Control Plan(s) (Core Indicator)

3.2.200 Existence of National HPAI Prevention and Control SOPs (Core Indicator)

3.2.300 Existence of an Explicitly Defined and Trained Command and Control Structure for HPAI Response (Core Indicator)

3.2.400 Existence of National HPAI Prevention and Control Annual Workplan(s) and Budget (Core Indicator)

3.2.500 Proportion of Financial Resources for National HPAI Prevention and Control Programs Committed by the National Government (Core Indicator)

3.2.600 Testing of National HPAI Prevention and Control Plan(s) by Simulation Exercises (Core Indicator)

3.3 Planning for Pandemic Preparedness and Response

3.3.100 Existence of a National, Multisectoral Pandemic Preparedness and Response Plan(s) (Core Indicator)

3.3.200 Existence of National Pandemic Preparedness and Response Standard Operating Procedures (Core Indicator)

3.3.300 Existence of an Explicitly Defined and Trained Command and Control Structure for Pandemic Response (Core Indicator)

3.3.400 Existence of National Pandemic Preparedness and Response Annual Workplan(s) and Budget (Core Indicator)

3.3.500 Proportion of Financial Resources for National Pandemic Preparedness and Response Committed by the National Government (Core Indicator)

3.3.600 Testing of National Pandemic Preparedness and Response Plan(s) by Simulation Exercises (Core Indicator)

3.3.700 Existence of Key Messages Related to Human-to-Human Transmission during an Influenza Pandemic and Mechanisms for Their Dissemination (Additional Indicator)

3.4 Legislative and Regulatory Framework

3.4.100 Analysis of the Legislative and Regulatory Framework with Recommendations for Changes to Support HPAI Prevention and Control (Additional Indicator)

3.4.200 Change in National Legislative and Regulatory Frameworks to Support HPAI Prevention and Control Activities in a Given Country *in Response to* International Recommendations (Additional Indicator)

3.4.300 Existence of an Analysis of the Legislative and Regulatory Framework With Recommendations for Changes to Support Pandemic Preparedness and Response (Additional Indicator)

3.5 Research Framework

3.5.100 Existence of a National Research Agenda for Special Studies on Highly Pathogenic Avian Influenza (Additional Indicator)

The following table maps the indicators presented in this chapter to the logic model shown in chapter 2.

Table 2.

Effective National Planning and Policy for HPAI Control and Pandemic Influenza Preparedness (National Planning and Policy)			
Element	**Logic Model Description**	**Relevant Indicators**	
OUTCOME	Effective national planning and policy for HPAI control and pandemic influenza preparedness		
OUTPUT	Government leadership	3.2.500	Proportion of Financial Resources for National HPAI Prevention and Control Programs Committed by the National Government
		3.3.500	Proportion of Financial Resources for National Pandemic Preparedness and Response Committed by the National Government
		3.2.300	Existence of an Explicitly Defined and Trained Command and Control Structure for HPAI Response
		3.3.300	Existence of an Explicitly Defined and Trained Command and Control Structure for Pandemic Response
	Improved multisectoral coordination/collaboration at the international, regional, and national levels	3.1.100	Existence of Multisectoral Coordination of National HPAI Prevention and Control Programs
		3.1.200	Existence of Multisectoral Coordination of National Pandemic Preparedness and Response Programs
	National HPAI control plans, workplans, budgets	3.2.100	Existence of a National, Multisectoral HPAI Prevention and Control Plan(s)
		3.2.200	Existence of National HPAI Prevention and Control SOPs
		3.2.400	Existence of National HPAI Prevention and Control Annual Workplan(s) and Budget

Effective National Planning and Policy for HPAI Control and Pandemic Influenza Preparedness (National Planning and Policy)		
Element	**Logic Model Description**	**Relevant Indicators**
OUTPUT	National pandemic preparedness plans, workplans, budgets	3.3.100 Existence of a National, Multisectoral Pandemic Preparedness and Response Plan(s) 3.3.200 Existence of National Pandemic Preparedness and Response SOPs 3.3.400 Existence of National Pandemic Preparedness and Response Annual Workplan(s) and Budget 3.3.700 Existence of Key Messages Related to Human-to-Human Transmission during an Influenza Pandemic and Mechanisms for Their Dissemination
	Enabling legislative/regulatory environment	3.4.200 Change in National Legislative and Regulatory Frameworks to Support HPAI Prevention and Control Activities in a Given Country in Response to International Recommendations
PROCESS	Develop and adopt national plans and SOPs for HPAI control and pandemic preparedness.	
	Build government capacity to respond.	
	Conduct simulation exercises for testing plans.	3.2.600 Testing of National HPAI Prevention and Control Plan(s) by Simulation Exercises 3.3.600 Testing of National Pandemic Preparedness and Response Plan(s) by Simulation Exercises
	Develop and adopt appropriate legislation/regulations for HPAI and pandemic preparedness activities.	
INPUT	Personnel and technical assistance (TA) for plan/policy development	

Effective National Planning and Policy for HPAI Control and Pandemic Influenza Preparedness (National Planning and Policy)		
Element	**Logic Model Description**	**Relevant Indicators**
INPUT	Financial resources for HPAI and pandemic preparedness activities	
	Preparedness supplies stockpiled (e.g., PPEs, antivirals)	
	Special studies	3.4.100 Analysis of the Legislative and Regulatory Framework with Recommendations for Changes to Support HPAI Prevention and Control 3.4.300 Existence of an Analysis of the Legislative and Regulatory Framework with Recommendations for Changes to Support Pandemic Preparedness and Response 3.5.100 Existence of a National Research Agenda for Special Studies on Highly Pathogenic Avian Influenza

NATIONAL PLANNING AND POLICY FOR HPAI CONTROL AND INFLUENZA PANDEMIC PREPAREDNESS (PLANNING AND POLICY)

3.1 Multisectoral Coordination of HPAI and Influenza Pandemic Programs

3.1.100 Existence of Multisectoral Coordination of National HPAI Prevention and Control Programs

Core Indicator

Definitions

A national, multisectoral HPAI working group for the planning, implementing, and funding of HPAI prevention and control programs:

- Has approved terms of reference
- Has quarterly meetings
- Has attendees who represent key organizations.

Yes: The HPAI working group exists and meets all three qualifications.
No: An HPAI working group does not exist.

OR

An HPAI working group exists but does not meet all three qualifications. State which qualification is lacking.

- A national HPAI working group's authority should be defined in its terms of reference (or other document) that state the group's goals and objectives, roles, and responsibilities.
- A national HPAI working group should meet at least quarterly and, therefore, have met four times during the year prior to measurement.
- The HPAI working group is a comprehensive group with stakeholders from all appropriate government agencies as well as representatives from United Nations (UN) agencies, bilateral or multilateral donors, and implementing partners. All stakeholders should be represented at each meeting.

What It Measures

This indicator demonstrates national commitment to a comprehensive and multisectoral approach to HPAI programs. In every country, various agencies are involved with HPAI activities; these agencies may have little experience in working closely together to implement joint programs. Ideally, all agencies implementing HPAI prevention and control activities should be coordinated through a national HPAI working group or task force. Such ministries may include the ministries of health, agriculture, communication, education, labor, transportation, finance, and energy, among others. Specific joint programs, for example between the ministries of health and agriculture, should be established.

Measurement Tools

No tool exists.

Checklist of qualifications for a functioning national HPAI working group to be used to review working group documents: terms of reference, membership rolls, meeting minutes. For example:

1. *Today's date:*

2. *What is the actual name of the national HPAI working group [terms of reference document]?*

3. *Who from what organization serves as the secretariat (responsible for convening meetings, storing documents, and ensuring that work is done) [possibly in terms of reference document]?*

4. *Are there terms of reference? If so, state name of document and date of approval [terms of reference document].*

5. *Were there four meetings of the national HPAI working group in the past year? If so, what were the dates [meeting minutes?]*

6. *Name the representatives from each stakeholder who are members of the national HPAI working group and indicate whether they attended the last meeting [membership rolls and meeting minutes].*

Stakeholder	Name	Attended Meeting of [date]
Ministry of Agriculture		
Ministry of Health		
Ministry of Communication		
Other line ministries; please name		
Other line ministries; please name		
Subnational representative		
Subnational representative		
WHO		
FAO		
UNICEF		
Other UN agency; please name		
USAID		
Japan assistance		

Stakeholder	Name	Attended Meeting of [date]
Other bilateral donor; please name		
Implementing partner; please name		
Implementing partner; please name		
Other; please name		

How to Measure It

This indicator is measured at the national level by reviewing official documents on the existence of a national HPAI working group. Such documentation should include goals and objectives of the working group (terms of reference), a list of activities carried out to date, minutes from working group meetings, and membership rolls. Evidence should be produced that the working group has met four times in the year prior to the reporting date.

Frequency

This indicator should be measured annually.

Considerations

Although this indicator defines a functioning HPAI working group by the existence of terms of reference and evidence of a current meeting with attendance by members, it does not assess the appropriateness of the national HPAI working group's mandate as stated in the terms of reference, the degree to which the composition of the working group is appropriately representative, or whether it is effective in executing its mandate.

In addition, this indicator does not measure the magnitude or quality of the contribution of key agencies, so the true degree to which this is a multisectoral body is not known. Additionally, where the national HPAI plan has decentralized planning and implementation at the subnational level, there may be local organizations that are involved with HPAI prevention and control activities but are not represented at the central level, so their presence and coordination with other local actors should be considered.

Revision History

First published June 2007 as indicator 3.1.1. Revised in current edition.

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3.1.200 Existence of Multisectoral Coordination of National Pandemic Preparedness and Response Programs

Core Indicator

Definitions

A national, multisectoral pandemic preparedness and response working group for the planning, implementing, and funding of pandemic preparedness and response activities:

- Has approved terms of reference
- Has quarterly meetings
- Has attendees who represent key organizations
- Is part of/linked to the national disaster management and response system.

Yes: The pandemic preparedness and response working group exists and meets all four qualifications.

No: A national pandemic preparedness and response working group does not exist.

OR

A pandemic preparedness and response working group exists but does not meet all four qualifications. State which qualification is lacking.

- A national pandemic preparedness and response working group's authority should be defined in its terms of a reference (or other document) that states the group's goals and objectives, roles, and responsibilities.
- A national pandemic preparedness and response working group should meet at least quarterly and, therefore, should have met four times during the year prior to measurement.
- The pandemic preparedness and response working group is a comprehensive group with stakeholders from appropriate government agencies as well as representatives from UN agencies, bilateral or multilateral donors, and implementing partners. All stakeholders should be represented at each meeting.
- The pandemic preparedness and response working group should be part of/linked to the national disaster management and response system.

What It Measures

This indicator demonstrates national commitment to a comprehensive and multisectoral approach to pandemic preparedness and response programs. In every country, there are a variety of agencies involved with pandemic preparedness and response activities; these agencies may have little experience in working closely together to implement joint programs. Ideally, all agencies implementing pandemic preparedness and response activities should be coordinated through a national pandemic preparedness and response working group or task force, and specific joint programs, for example, between the ministry of health and the ministry of security or education, should be established. The pandemic working group should assure that all sectors are involved (including energy, transportation, banking/finance, and others) and that these sectors have preparedness plans.

Measurement Tools

No tool exists.

Checklist of qualifications for a functioning, national pandemic preparedness and response working group to be used to review working group documents: terms of reference, membership rolls, and meeting minutes. For example:

1. *Today's date*
2. *What is the actual name of the national pandemic preparedness and response working group [terms of reference document]?*
3. *Who from what organization serves as the secretariat (responsible for convening meetings, storing documents, and ensuring that work is done) [possibly in terms of reference document]?*
4. *Are there terms of reference? If so, state name of document and date of approval [terms of reference document].*
5. *Were there four meetings of the national pandemic preparedness and response working group in the past year? If so, what were the dates [meeting minutes]?*
6. *Name the representatives from each stakeholder who are members of the national pandemic preparedness and response working group and indicate whether they attended the last meeting [membership rolls and meeting minutes].*

Stakeholder	Name	Attended Meeting of [date]
Ministry of Health		
Ministry of Education		
Ministry of Communication		
Other line ministries; please name		
Other line ministries; please name		
Subnational representative		
Subnational representative		
WHO		
UNICEF		

Stakeholder	Name	Attended Meeting of [date]
Other UN agency; please name		
Bilateral or multilateral donor; please name		
Other bilateral or multilateral donor; please name		
Other bilateral or multilateral donor; please name		
Implementing partner; please name		
Implementing partner; please name		
Other; please name		

How to Measure It

This indicator is measured at the national level by reviewing official documents regarding the existence of a national pandemic preparedness and response working group. Such documentation should include goals and objectives of the working group (terms of reference), a list of activities carried out to date, minutes from working group meetings, and membership rolls. Evidence should be produced that the working group has met four times in the year prior to the reporting date.

Frequency

This indicator should be measured annually.

Considerations

Even though this indicator defines a functioning pandemic preparedness and response working group by the existence of terms of reference and evidence of a current meeting with attendance by members, it does not assess the appropriateness of the national pandemic preparedness and response working group's mandate as stated in the terms of reference, the degree to which the composition of the working group is appropriately representative, or whether it is effective in executing its mandate.

In addition, this indicator does not measure the magnitude or quality of the contribution of key agencies, so the true degree to which this is a multisectoral body is not known. Additionally, where the national pandemic preparedness and response plan has decentralized planning and implementation at the subnational level, there may be local organizations that are involved with pandemic preparedness and response activities but are not represented at the central level, so their presence and coordination with other local actors should be considered.

Revision History

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3.2 Planning for HPAI Prevention and Control

3.2.100 Existence of a National, Multisectoral HPAI Prevention and Control Plan(s)

Core Indicator

Definitions

The government has adopted a multisectoral HPAI plan(s) that support(s) internationally recommended strategies and guidelines for the prevention and control of HPAI virus in poultry and cases of human infection with H5N1 virus. Essential elements of the plan include:

- Roles and responsibilities for government ministries involved in HPAI prevention and control
- Coordination mechanisms for coordination between ministries and multiple levels of the government (e.g., national, provincial, district)
- Surveillance, diagnostic capacity, and control measures for HPAI in animals
- Surveillance, diagnostic capacity, and clinical management for cases of human infection with H5N1 virus
- Compensation mechanisms for individuals impacted by HPAI control programs
- Stockpiling of essential commodities for control and preparedness
- Risk communication
- M&E plan for program implementation.

Yes: Plan has been adopted and addresses all essential elements. Cite name of plan(s) and date(s) of adoption or revision.

No: Plan has been adopted but does not address all essential elements. State missing elements.

OR

Plan has not been adopted. State status of plan (not considering, in development, in draft, submitted for approval, approved).

- Adoption refers to the government's legislative or administrative measures required to make the plan an official government document.
- The national HPAI plan may be combined with the pandemic preparedness and response plan in one document.

- The components of the national HPAI plan can be addressed in multiple national-level documents.

What It Measures

The adoption of a formal plan demonstrates political commitment to action at the central level and facilitates a more effective, strategic implementation of the HPAI control activities and policies of all ministries responsible for human health, animal health, and finance. The plan should reflect the internationally accepted HPAI strategies and specify its position in the health and agricultural systems. The plan should also refer to the role played by management units and facilities at all levels of the ministries involved. This indicator may be helpful for stimulating the development of a national HPAI plan and identifying its strengths and weaknesses.

Measurement Tools

No tool exists.

Checklist of essential elements of national HPAI plan(s) and a determination of the status of plan(s). Essential elements of the plan are listed under Definitions above.

How to Measure It

A review of the national HPAI plan(s) should be conducted and matched against the essential elements listed above. Progress towards adoption of a national HPAI plan may be monitored using the status of the plan.

Frequency

Before adoption of national HPAI plan(s), this indicator should be measured semiannually to ensure that there is progress toward approving a plan. Once adopted, the national HPAI plan(s) should be reviewed annually to ensure that it has been updated.

Considerations

Measurements of political commitment require some subjective evaluation; they are rarely useful for cross-national comparisons and may not capture trends. This indicator goes beyond identifying the existence of a national plan by defining essential elements of a complete plan according to international guidelines. This indicator does not ensure that all elements reflect international standards or that they are fully funded or implemented, only that the government has articulated political commitment to them. Likewise, the appropriateness of program goals cannot be assessed with this indicator.

Revision History

First published June 2007 as indicator 3.2.1. Revised in current edition.

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3.2.200 Existence of National HPAI Prevention and Control Standard Operating Procedures

Core Indicator

Definitions

SOPs for the prevention and control of HPAI in poultry and cases of human infection with H5N1 virus have been distributed to all implementing agencies. Topics of SOPs include:

Animal Health

- Surveillance for HPAI in poultry and wild birds
- Outbreak response for HPAI in poultry
- Biosecurity in markets and farms
- Veterinary HPAI laboratory diagnosis
- Vaccination programs for HPAI in poultry for countries with vaccination as a preferred HPAI control strategy
- Compensation programs.

Human Health

- Surveillance for cases of human infection with H5N1 virus
- Outbreak response for cases of human infection with H5N1 virus (including identification, follow-up, and management of contacts and epidemiological investigation)
- Laboratory diagnosis
- Clinical management of cases of human infection with H5N1 virus
- Infection control procedures at health facilities.

Behavior Change Communication

- Key HPAI prevention and control BCC messages, mechanism for coordination of BCC effort, and methods for dissemination of messages

Other National SOPs as Deemed Appropriate

Yes: SOPs have been distributed to all implementing agencies, including government organizations at subnational levels.

No: SOPs have not been disseminated for all elements. State which element SOPs are lacking.

- SOPs can also be referred to as protocols or guidelines.

What It Measures

The existence of SOPs signals the national government's willingness to realize HPAI-related activities and provides standard guidance to implementing agencies. Whereas SOPs may be the output of planning activities, they are the inputs for actual prevention and control activities.

Measurement Tools

No tool exists.

Checklist of recommended topics of SOPs and evidence of national distribution. Recommended topics of SOPs are listed under Definitions above.

How to Measure It

A review of government documents (SOPs and distribution lists) should be conducted and matched against the essential elements listed above.

Frequency

Before SOPs for HPAI activities are developed and distributed nationally, this indicator should be measured semiannually to ensure that there is progress toward development and distribution. Once distributed, the national HPAI SOPs should be reviewed annually to ensure that they have been updated with the latest information.

Considerations

This indicator does not address the quality and appropriateness of SOPs. The SOPs should be oriented toward implementing the guidelines of WHO, FAO, and OIE and reflect the content of national HPAI plan(s) for the prevention and control of HPAI in poultry and cases of human infection with H5N1 virus. Another exercise, content analysis, can be conducted to compare the SOPs with international guidelines and national plans.

As with other political commitment indicators, the existence of SOPs does not ensure that the procedures are used in the everyday practice of HPAI prevention and control programs. This could be because of a lack of training in specific procedures or of sufficient resources. However, without SOPs, there is no central reference or resource for program managers who need information on norms and procedures.

Revision History

First published June 2007 as indicator 3.2.2. Revised in current edition.

Last revised September 2008

3.2.300 Existence of an Explicitly Defined and Trained Command and Control Structure for HPAI Response

Core Indicator

Definitions

The government has explicitly defined a command and control structure for HPAI disease control, including emergency response scenarios. Individuals in key roles as defined in the command and control structure have been trained on their HPAI disease control and response responsibilities within the past six months.

The command and control structure is explicitly defined through a written document that details the following for both routine disease control and an emergency HPAI outbreak:

- Lines of authority and accountability
- Distribution of responsibility
- Lines of communication.

Yes: Command and control structure has been explicitly defined with the three essential elements listed above, and individuals in key roles have been trained in the past six months.

No: Command and control structure is defined but missing one or more of the essential elements listed above.

OR

Command and control structure has been explicitly defined, but individuals in key roles have not been trained in the past six months.

OR

Command and control structure has not been explicitly defined.

What It Measures

This indicator measures the government's ability to make time-sensitive and unambiguous decisions in the area of HPAI disease control and response. For decisions to be made and executed in a timely manner, it is necessary to have a clear structure in place before an HPAI outbreak. Individuals in key roles should be aware of their responsibilities and their relationships to other key government actors.

Measurement Tools

No tool exists.

Organizational charts, job descriptions, policy manuals, and training records.

Organizations responsible for training maintain training logs or a database and submit a quarterly training report to the organization responsible for overseeing and coordinating the training. The training report would include the following information:

- *Title of training*
- *Venue, date, total hours of training*
- *Topic (which could be forced into predetermined categories)*
- *Number and cadre of people trained.*

How to Measure It

A review of government documents (organizational charts, job descriptions, and policy manuals) should be conducted and matched against the essential elements listed above.

Frequency

This indicator should be measured semiannually. Training information is collected continuously and reported every six months.

Considerations

This indicator measures the extent to which the government has planned for a command and control structure during an HPAI outbreak. It does not address whether the appropriate roles/responsibilities have been selected, how the HPAI command and control structure ties into existing government command and control structures, or whether the structure as envisioned on paper will be executed in the event of an HPAI outbreak.

Revision History

First published June 2007 as indicator 3.2.3. Revised in current edition.

Last revised September 2008

3.2.400 Existence of National HPAI Prevention and Control Annual Workplan(s) and Budget

Core Indicator

Definitions

Government agencies (line ministries and subnational administrative units) have annual workplans for HPAI activities that are consistent with international guidelines and the national HPAI plan and that itemize the following for each activity:

- Timelines
- Identified responsible person
- Budgets
- Funding sources
- Partners (if appropriate)
- M&E indicators.

Yes: All relevant government agencies have annual workplans for HPAI activities that itemize timelines, the identified responsible person, budgets, funding sources, partners (if appropriate), and M&E indicators.

No: Annual workplans do not exist.

OR

Annual workplans lack one of the following items: itemized timelines, identified responsible person, budgets, funding sources, partners (if appropriate), and M&E indicators. State which item(s) is (are) missing.

OR

One or more of the government agencies lack workplans. State which government agencies lack workplans.

- Workplans are also called business plans.

What It Measures

This indicator measures the ability of the national government to translate its national HPAI plan and SOPs into a detailed annual workplan. In a decentralized system, workplans and budgets may be produced at the subnational level. The workplan can be used to determine whether there is progress.

Measurement Tools

No tool exists.

Checklist of annual workplans for HPAI activities (also used in indicator 3.2.500), which identifies agencies required to have workplans and checks for the items listed above.

How to Measure It

First, identify government agencies (line ministries and subnational administrative units) that have HPAI activities. Review relevant documents from these agencies to ensure that the HPAI annual workplan exists and that it has the elements listed above.

Frequency

This indicator should be measured annually.

Considerations

The existence of annual workplans indicates only that some planning occurred. Whether the planning is appropriate (in terms of activities or funding) or implemented successfully is not determined by this indicator.

Revision History

First published June 2007 as indicator 3.2.4. Revised in current edition.

Last revised September 2008

3.2.500 Proportion of Financial Resources for National HPAI Prevention and Control Programs Committed by the National Government

Core Indicator

Definitions

The proportion of the HPAI program budget as defined in annual workplans that is funded by the national government.

Numerator: Sum of national government funding for HPAI activities across line ministries and subnational administrative units

Denominator: Total budget required for full implementation of the HPAI annual workplans of all line ministries and subnational administrative units

Proportion = Numerator/Denominator

What It Measures

This indicator measures the national government's level of financial resources committed to HPAI prevention and control.

Measurement Tools

No tool exists.

Checklist of annual workplans for HPAI activities, which captures the total for the annual workplan's budget

How to Measure It

Review government documents to determine how much the national government has contributed (or plans to contribute) to national HPAI efforts.

Sum the total annual budget over each agency's annual workplan. Do not add monetary values of workplans from agencies that appear as line items in a higher administrative unit's annual workplan budget; for example, if a provincial agriculture's HPAI operating budget appears as a line item in the ministry of agriculture's HPAI budget, do not count the provincial agriculture's operating budget.

Frequency

This indicator should be measured annually.

Considerations

The appropriate percentage of the budget that the national government should contribute to HPAI activities has not been determined, nor has an appropriate amount to be budgeted been identified.

The components of the HPAI budget must remain fairly consistent to make comparisons over time. A more general limitation of this indicator is that most existing budgets do not cover the costs of resources that are essential for HPAI prevention and control but that are shared by HPAI programs and other programs and services (e.g., general health services, staff, buildings). These resources are usually funded primarily by the national government, but they are not measured in this indicator. As a result, the indicator may underestimate the total contribution of the national government to HPAI prevention and control as well as the overall fraction of total HPAI prevention and control costs funded by the national government.

Using a relative value for this indicator (the proportion) can be misleading. A national government can provide the majority of funds to an inappropriately small budget.

Revision History

First published June 2007 as indicator 3.2.5. Revised in current edition.

Last revised September 2008

3.2.600 Testing of National HPAI Prevention and Control Plan(s) by Simulation Exercises

Core Indicator

Definitions

The government has conducted tabletop exercises, drills, full-scale exercises, or other appropriate means to test the national HPAI prevention and control plan(s). This testing involves all implementing agencies, including the ministries of health and agriculture and other government agencies.

Yes: The national HPAI plan has been tested. State date(s) of testing.
No: The national HPAI plan has not been tested.

What It Measures

This indicator measures whether the national government has tested its capacity to make the national HPAI plan operational in various possible scenarios. The national plan may be tested in provincial exercises or in a countrywide exercise.

Measurement Tools

No tool exists.

Checklist of essential elements of national HPAI plan(s) (also used in indicator 3.2.100), which records whether the plan has been tested and the date of testing if tested. Essential elements of national HPAI plan(s) are listed under Definitions of indicator 3.2.100.

How to Measure It

Review government documents that report on testing of national HPAI plan(s) for the prevention and control of HPAI.

Frequency

This indicator should be measured annually.

Considerations

This indicator measures whether the government has tested the plan, but it does not judge the quality of the testing procedure or the outcomes of the tests (the validity of the national HPAI plan).

Revision History

First published June 2007 as indicator 3.2.6. Revised in current edition.

Last revised September 2008

3.3 Planning for Pandemic Preparedness and Response

3.3.100 Existence of a National, Multisectoral Pandemic Preparedness and Response Plan(s)

Core Indicator

Definitions

The government has adopted a multisectoral pandemic preparedness and response plan(s) that support(s) internationally recommended strategies and guidelines for pandemic prevention and control. Essential elements[39] include:

- Preparing for an emergency
- Surveillance
- Case investigation and treatment
- Preventing the spread of the disease in the community
- Emergency communication
- Maintaining essential services
- Research and evaluation.

Yes: Plan has been adopted and addresses all essential elements. Cite name of plan(s) and date(s) of adoption or revision.

No: Plan has been adopted but does not address all essential elements. State missing elements.

OR

Plan has not been adopted. State status of plan (not considering, in development, in draft, submitted for approval, approved).

- Adoption refers to the government's legislative or administrative measures required to plan an official government document.
- The national pandemic preparedness and response plan may be combined with the national HPAI plan in one document.

[39] WHO (2005). *WHO checklist for influenza pandemic preparedness planning,* http://www.who.int/csr/resources/publications/influenza/FluCheck6web.pdf.

- The components of the national pandemic preparedness and response plan can be addressed in multiple national-level documents.

What It Measures

The adoption of a formal plan demonstrates political commitment to action at the central level and facilitates a more effective, strategic implementation of pandemic preparedness and response activities and policies of all ministries responsible for human health, animal health, and finance. The plan should reflect internationally accepted pandemic preparedness and response strategies. The plan should also refer to the role of management units and facilities at all levels of the ministries responsible for health, labor, education, and other areas. This indicator may be helpful for stimulating the development of a national pandemic preparedness plan and identifying its strengths and weaknesses.

Measurement Tools

No tool exists.

Checklist of essential elements of national pandemic preparedness and response plan(s)

How to Measure It

Review the national pandemic preparedness and response plan(s) and match it (them) against the essential elements listed above. Progress towards adoption of the plan(s) may be monitored using the status of the plan.

Frequency

Before adoption of national pandemic preparedness and response plan(s), this indicator should be measured semiannually to ensure progress towards approval of a plan. Once adopted, the national pandemic preparedness and response plan(s) should be reviewed annually to ensure that it has been updated.

Considerations

Measurements of political commitment require some subjective evaluation; they are rarely useful for cross-national comparisons and may not capture trends. This indicator goes beyond identifying the existence of a national plan by defining essential elements of a complete plan according to international guidelines. This indicator does not ensure that all elements reflect international standards or are fully funded or implemented, only that the government has articulated political commitment to them. Likewise, the appropriateness of program goals cannot be assessed with this indicator.

Elements of pandemic preparedness planning not outlined in the WHO Checklist for Pandemic Preparedness Planning are not included in this indicator. Such elements include considerations of potential disruption of security, governance, and the economy, as well as the need for humanitarian response in case of the disruption of essential services. Countries may want to consider adding these considerations to their national pandemic preparedness plans.

Revision History

First published June 2007 as indicator 3.3.1. Revised in current edition.

Last revised September 2008

3.3.200 Existence of National Pandemic Preparedness and Response SOPs

Core Indicator

Definitions

SOPs for pandemic preparedness and response have been distributed to all implementing agencies. Topics of SOPs include:

- Preparing for an emergency
- Surveillance, including timely reporting of cases
- Case investigation and treatment
- Preventing spread of the disease in the community
- Emergency communication
- Maintaining essential services
- Other national SOPs as deemed appropriate.

Yes: SOPs have been distributed to all implementing agencies.

No: SOPs have not been disseminated for all elements. State which elements SOPs are lacking.

- SOPs can also be referred to as protocols or guidelines.

What It Measures

SOPs signal the national government's willingness to realize pandemic preparedness and response-related activities, and they provide standard guidance to implementing agencies. Whereas SOPs may be the output of planning activities, they are the input for actual prevention and control activities.

Measurement Tools

No tool exists.

Checklist of recommended topics of SOPs and evidence of national distribution

How to Measure It

A review of government documents (SOPs and distribution lists) should be conducted and matched against the essential elements listed above.

Frequency

Before SOPs for pandemic preparedness and response activities are developed and distributed nationally, this indicator should be measured semiannually to ensure progress towards development and distribution. Once distributed, the national pandemic preparedness and response SOPs should be reviewed annually to ensure that they have been updated.

Considerations

This indicator does not address the quality and appropriateness of SOPs. The SOPs should be oriented toward implementing the guidelines of WHO and should reflect the content of national pandemic preparedness and response plan(s). Another exercise, content analysis, can be conducted to compare the SOPs with international guidelines and national plans.

As with other political commitment indicators, the existence of SOPs does not ensure that the procedures will be used in case of an influenza pandemic. This could be because of a lack of training in specific procedures or insufficient resources. However, without SOPs, there is no central reference or resource for program managers who need information on norms and procedures.

Revision History

First published June 2007 as indicator 3.3.2. Revised in current edition.

Last revised September 2008

3.3.300 Existence of an Explicitly Defined and Trained Command and Control Structure for Pandemic Response

Core Indicator

Definitions

The government has explicitly defined a command and control structure for influenza pandemic control, including emergency response scenarios. Individuals in key roles, as defined in the command and control structure, have been trained on their influenza pandemic control and response responsibilities within the past six months.

The command and control structure is explicitly defined in a written document that details the following for both routine disease control and an emergency pandemic outbreak:

- Lines of authority and accountability
- Distribution of responsibility
- Lines of communication.

Yes: Command and control structure has been explicitly defined with the three essential elements listed above, and individuals in key roles have been trained in the past six months.

No: Command and control structure is defined but missing one or more of the essential elements listed above.

OR

Command and control structure has been explicitly defined, but individuals in key roles have not been trained in the past six months.

OR

Command and control structure has not been explicitly defined.

What It Measures

This indicator measures the government's ability to make time-sensitive and unambiguous decisions in the area of pandemic disease control and response. For decisions to be made and executed in a timely manner, it is necessary to have a clear structure in place before a pandemic outbreak. Individuals in key roles should be aware of their responsibilities and relationships to other key government actors.[40]

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[40] *WHO Checklist for influenza pandemic preparedness planning*, Geneva, WHO, 2005, 2–3

Measurement Tools

No tool exists.

Organizational charts, job descriptions, policy manuals, and training records.

Organizations responsible for training maintain training logs or a database and submit a quarterly training report to the organization responsible for overseeing and coordinating the training. The training report includes the following information:

- *Title of training*
- *Venue, date, total hours of training*
- *Topic (which could be forced into predetermined categories)*
- *Number and cadre of people trained.*

How to Measure It

A review of government documents (organizational charts, job descriptions, and policy manuals) should be conducted and matched against the essential elements listed above.

Frequency

This indicator should be measured semiannually. Training information is collected continuously and reported every six months.

Considerations

This indicator measures the extent to which the government has planned for a command and control structure in the event of an influenza pandemic. It does not address whether the appropriate roles/responsibilities have been selected, how the pandemic command and control structure ties into existing emergency command and control structures, or whether the structure as envisioned on paper will be executed in the event of a pandemic outbreak.

Revision History

First published June 2007 as indicator 3.3.3. Revised in current edition.

Last revised September 2008

3.3.400 Existence of National Pandemic Preparedness and Response Annual Workplan(s) and Budget

Core Indicator

Definitions

Government agencies (line ministries and subnational administrative units) have annual workplans for pandemic preparedness activities that are consistent with international guidelines and the national pandemic preparedness plan and that itemize the following for each activity:

- Timelines
- Identified responsible person
- Budgets
- Funding sources
- Partners (if appropriate)
- M&E indicators.

Yes: All relevant government agencies have annual workplans for pandemic preparedness activities that itemize timelines, the identified responsible person, budgets, funding sources, partners (if appropriate), and M&E indicators.

No: Annual workplans do not exist.

OR

Annual workplans lack one of the following items: itemized timelines, identified responsible person, budgets, funding sources, partners (if appropriate), and M&E indicators. State which item(s) is missing.

OR

One or more of the government agencies lack workplans. State which government agencies lack workplans.

- Workplans are also called business plans.

What It Measures

This indicator measures the ability of the national government to translate its national pandemic preparedness plan into a detailed annual workplan. In a decentralized system, workplans and budgets may be produced at the subnational level. The workplan can be used to determine whether there is progress.

Measurement Tools

No tool exists.

Checklist of annual workplans for pandemic preparedness activities (also used in indicator 3.3.500), which identifies agencies required to have workplans and checks for the items listed above

How to Measure It

First, identify government agencies (line ministries and subnational administrative units) that have pandemic preparedness activities. Review relevant documents from these agencies to ensure that the pandemic preparedness annual workplan exists and that it has the elements listed above.

Frequency

This indicator should be measured annually.

Considerations

The existence of annual workplans only indicates that some planning has occurred. Whether the planning is appropriate (in terms of activities or funding) or successfully implemented is not determined by this indicator.

Revision History

First published June 2007 as indicator 3.3.4. Revised in current edition.

Last revised September 2008

3.3.500 Proportion of Financial Resources for National Pandemic Preparedness and Response Committed by the National Government

Core Indicator

Definitions

The proportion of the pandemic preparedness program budget, as defined in annual workplans, funded by the national government

Numerator: Sum of national government funding for pandemic preparedness activities across line ministries and subnational administrative units

Denominator: Total budget required for full implementation of the pandemic preparedness annual workplans of all line ministries and subnational administrative units

Proportion = Numerator/Denominator

What It Measures

This indicator measures the national government's level of financial resources committed to pandemic preparedness.

Measurement Tools

No tool exists.

Checklist of annual workplans for pandemic preparedness activities that captures the total for the annual workplan's budget

How to Measure It

Review government documents to determine how much the national government has contributed (or plans to contribute) to national pandemic preparedness efforts.

Sum the total annual budget over each agency's annual workplan. Do not add monetary values of workplans from agencies that appear as line items in a higher administrative unit's annual workplan budget; for example, if a provincial health's pandemic preparedness operating budget appears as a line item in the ministry of health's pandemic preparedness budget, do not count the provincial health's operating budget.

Frequency

This indicator should be measured annually.

Considerations

The appropriate percentage of the budget that the national government should contribute to pandemic preparedness activities has not been determined, nor has an appropriate amount to be budgeted.

The components of the pandemic preparedness budget must remain fairly consistent in order to make comparisons over time. A more general limitation of this indicator is that most existing budgets do not cover the costs of resources that are essential for pandemic preparedness prevention and control but that are shared by pandemic preparedness programs and other programs and services (e.g., general health services, staff, buildings). These resources are usually funded primarily by the national government, but they are not measured in this indicator. As a result, the indicator may underestimate the total contribution of the national government to pandemic preparedness, as well as the overall fraction of total pandemic preparedness costs that are funded by the national government.

Using a relative value for this indicator (the proportion) can be misleading. A national government can provide the majority of funds to an inappropriately small budget.

Revision History

First published June 2007 as indicator 3.3.5. Revised in current edition.

Last revised September 2008

3.3.600 Testing of National Pandemic Preparedness and Response Plan(s) by Simulation Exercises

Core Indicator

Definitions

The government has conducted tabletop exercises, drills, full-scale exercises, or other appropriate means to test the national pandemic preparedness and response plan(s). This testing involves all implementing agencies, including the ministry of health, and other government agencies.

Yes: The national pandemic preparedness and response plan has been tested. State date(s) of testing.

No: The national pandemic preparedness and response plan has not been tested.

What It Measures

This indicator measures whether the national government has tested its capacity to make the national pandemic preparedness and response plan operational in various possible scenarios.

Measurement Tools

No tool exists.

Checklist of essential elements of national pandemic preparedness and response plan(s) (also used in indicator 3.3.100), which records whether the plan has been tested and the date of testing if tested

How to Measure It

Review government documents that report on testing of national pandemic preparedness and response plan(s).

Frequency

This indicator should be measured annually.

Considerations

This indicator measures whether the government has tested the plan but does not judge the quality of the testing procedure or the outcomes of the tests (the validity of the national pandemic preparedness and response plan).

Revision History

First published June 2007 as indicator 3.3.6. Revised in current edition.

Last revised September 2008

3.3.700 Existence of Key Messages Related to Human-to-Human Transmission during an Influenza Pandemic and Mechanisms for Their Dissemination

Additional Indicator

Definitions

The existence of key messages and the means to disseminate them are two critical components of an emergency communications plan. One of the recognized components, key messages, will be defined in the emergency communications component of the country's influenza pandemic preparedness and response plan(s). Mechanisms for dissemination should also be specified and may include a pandemic Web site, designated national and regional spokespersons, and a telephone hotline, among others.

Measurement Tools

Review the emergency communications component of the country's influenza pandemic preparedness and response plan.

What It Measures

In case of a pandemic, timely and accurate communication is critical to minimizing the economic and social consequences of the pandemic and promoting effective response. Developing key messages and mechanisms for dissemination in advance ensures that the country is able to respond quickly and effectively in case of a pandemic. The adoption of a formal emergency communications plan as part of the pandemic preparedness and response plan demonstrates political commitment to action at the central level and facilitates a more effective, strategic implementation of the pandemic preparedness and response activities and policies of all ministries responsible for human health, animal health, and finance. The development of key messages and the means for their dissemination represent critical components of an effective emergency communications plan.

The plan should reflect internationally accepted pandemic preparedness and response strategies and should refer to the role of management units and facilities at all levels of the ministries responsible for human health, animal health, and finance. This indicator may be helpful for stimulating the development of the emergency communications component of the national pandemic preparedness plan and for identifying its strengths and weaknesses.

How to Measure It

This indicator is measured by reviewing the emergency communications component of the influenza pandemic preparedness and response plan to ensure that it identifies key messages and mechanisms for their dissemination in the event of a pandemic.

Frequency

Before adoption of the national pandemic preparedness and response plan(s), this indicator should be measured semiannually to ensure that there is progress toward a complete emergency communications plan. Once adopted, the national pandemic preparedness and response plan(s) should be reviewed annually to ensure that it has been updated with the latest information.

Considerations

This indicator does not ensure that the messages reflect international standards or that the messages and means of dissemination are fully funded or implemented, only that the government has articulated political commitment to them. Likewise, the appropriateness of the messages cannot be assessed with this indicator.

Revision History

First published June 2007 as indicator 3.3.7. Revised in current edition.

Last revised September 2008

3.4 Legislative and Regulatory Framework

3.4.100 Analysis of the Legislative and Regulatory Framework with Recommendations for Changes to Support HPAI Prevention and Control

Additional Indicator

Definitions

The government has conducted an analysis of the existing laws and regulations and has made recommendations for improvement to the regulatory framework to ensure that HPAI prevention and control measures are implemented in a uniform way and in keeping with FAO/OIE/WHO recommendations. The analysis should assess and make recommendations in the following areas:

- Poultry
- Food safety
- Sanitation
- Animal trade
- Farm and market biosecurity
- Compensation programs for animals destroyed through HPAI control programs.

Yes: Analysis has taken place for all areas, and recommendations have been made. State the date recommendations were disseminated.

No: Analysis has not taken place.

OR

Analysis has not taken place for all areas. State which areas are missing.

OR

Analysis has taken place but recommendations have not been disseminated. State which areas do not have recommendations.

What It Measures

This indicator measures the first step in the government's commitment to addressing the legal and regulatory obstacles toward implementing uniform HPAI prevention and control measures. Frequently, before a country is able to take advantage of the technical recommendations of international bodies such as FAO, OIE, and WHO, legal and regulatory changes must be made.

Measurement Tools

No tool exists.

Checklist of areas in the legislative and regulatory framework to be analyzed with information on:

- *Organization/individual responsible for analysis*
- *Official title(s) of analysis document(s)*
- *Date analysis completed*
- *Recommendations made.*

How to Measure It

Review documents related to the analysis of legislative and regulatory framework.

Frequency

This indicator should be measured semiannually.

Considerations

This indicator does not measure the quality of the analysis, appropriateness of the recommendations, or availability of adequate political will (and resources) to make the necessary legal and regulatory changes.

Revision History

First published June 2007 as indicator 3.4.1. Revised in current edition.

Last revised September 2008

3.4.200 Change in National Legislative and Regulatory Frameworks to Support HPAI Prevention and Control Activities in a Given Country *in Response to* National or International Recommendations

Additional Indicator

Definitions

The government has made changes to the national legislative and regulatory framework based on the recommendations for improvement to the regulatory framework to ensure that HPAI prevention and control measures are implemented in a uniform way and in keeping with FAO/OIE/WHO recommendations.

Yes: Action has been taken in response to the recommendations for changes to the legislative and regulatory framework. State the date recommendations were implemented.

No: Changes to the legislative and regulatory framework have not been made as a result of the recommendations for changes to the legislative and regulatory framework.

What It Measures

This indicator measures whether action is being taken in order to modify the national legislative and regulatory framework based on the results of policy review and recommendations. It measures whether governments are taking action in order to improve the policy environment and demonstrates a national commitment to HPAI prevention and control activities.

Measurement Tools

No tool exists.

How to Measure It

Review the legislative/regulatory framework; interview stakeholders and key decision makers.

Frequency

This indicator should be measured annually.

Considerations

This indicator measures whether action is being taken on the recommendations resulting from an analysis of national legislative and regulatory frameworks but does not measure the effectiveness of the changes made nor whether changes are being prioritized appropriately.

It can be difficult to determine whether changes to the legislative and regulatory framework are the result of the policy analysis and recommendations or other reasons. Although in some cases, the causal relationship may be clear based on written materials or records of legislative discussions, in other cases it may be necessary to interview key stakeholders regarding the rationale for legislative and regulatory change.[41]

Because legislative and regulatory changes take a long time to occur, it may be useful for countries to track the status of proposed changes as well as whether they are implemented.

Revision History

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[41] For a discussion of the challenges, see *Compendium of Indicators for Evaluating Reproductive Health Programs,* part II-g, Operations Research (http://www.cpc.unc.edu/measure/publications/pdf/ms-02-06-vol_1_part_2_g.pdf).

3.4.300 Existence of an Analysis of the Legislative and Regulatory Framework with Recommendations for Changes to Support Pandemic Preparedness and Response

Additional Indicator

Definitions

The government has conducted an analysis of the existing laws and regulations and has made recommendations for improvement to the regulatory framework to ensure that human pandemic preparedness and response measures are implemented in a uniform way and in keeping with WHO recommendations. The analysis should assess and make recommendations in the following areas:

- Human vaccine development, licensing, and distribution
- Cross-border and domestic travel
- Quarantine measures
- Case isolation
- Impact of a state of emergency (if declared) on pandemic response measures and activities.

Yes: Analysis has taken place for all areas and recommendations have been made. State the date recommendations were disseminated.

No: Analysis has not taken place.

OR

Analysis has not taken place for all areas. State which areas are missing.

OR

Analysis has taken place but recommendations have not been disseminated. State which areas do not have recommendations.

What It Measures

This indicator measures the first step in the government's commitment to addressing the legal and regulatory obstacles toward implementing uniform human pandemic preparedness and response measures. Frequently, before a country is able to take advantage of the technical recommendations of international bodies such as WHO, legal and regulatory changes must be made.

Measurement Tools

No tool exists.

Checklist of areas in the legislative and regulatory framework to be analyzed with information on:

- *Organization/individual responsible for analysis*
- *Official title(s) of analysis document(s)*
- *Date analysis completed*
- *Recommendations made.*

How to Measure It

Review documents related to the analysis of legislative and regulatory framework.

Frequency

This indicator should be measured semiannually.

Considerations

This indicator does not measure the quality of the analysis, the appropriateness of the recommendations, or the availability of adequate political will (and resources) to make the necessary legal and regulatory changes.

Revision History

First published June 2007 as indicator 3.4.2. Revised in current edition.

Last revised September 2008

3.5 Research Framework

3.5.100 Existence of a National Research Agenda for Special Studies on Highly Pathogenic Avian Influenza

Additional Indicator

Definitions

The government has developed and published a national research agenda for special studies on HPAI. The research agenda defines key national research priorities. Essential elements of the agenda include:

- Identification of key research priority areas and rationale for these priority areas
- List of key research questions for each priority area.

Yes: Agenda has been developed and published and addresses all essential elements. Cite name of agenda(s) and date(s) of publication or revision.

No: Agenda has been published but does not address all essential elements. State missing elements.

OR

Agenda has not been published. State status of agenda (not considering, in development, in draft, submitted for publication, published).

- The components of the national research agenda can be addressed in multiple national-level documents.
- *Special studies* are assessments carried out by a national program that are outside the routine monitoring of program activities and are for special purposes relevant to the program and its informational needs (e.g., vaccine efficacy study and other operations research [OR]).

What It Measures

The publication of a formal research agenda demonstrates the identification of research priorities at the central level and facilitates effective, strategic research activities. It supports the appropriate allocation of research funding and focuses researchers on issues of national importance. A national agenda can support policymakers in understanding the scientific evidence available for sound policy decisions as well as the gaps in existing knowledge. This indicator may be helpful for stimulating the development of a national research agenda and identifying its strengths and weaknesses.

Measurement Tool

No tool exists.

Checklist for national research agenda for special studies on human infection with H5N1 virus that captures the elements listed above

How to Measure It

Review national documentation and reports against the checklist for national agenda for special studies on human infection with H5N1 virus.

Frequency

This indicator might be measured semiannually before a national agenda for special studies on human infection with H5N1 virus has been developed. Following the development of the agenda, this indicator should be reviewed annually to determine whether updates to the agenda are needed.

Considerations

This indicator provides a crude measure of the government's progress in defining national research priorities. This indicator does not ensure that the defined priorities reflect international standards or that they are fully funded or implemented, only that the government has articulated them. Furthermore, for special studies to be relevant and responsive, a high level of participation on the part of policymakers, researchers, program managers, and other stakeholders involved in human health programs is desirable.

Revision History

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References

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CHAPTER 4: LIMIT PREVALENCE OF HIGHLY PATHOGENIC AVIAN INFLUENZA IN BIRDS (ANIMAL HEALTH)

The indicators in this section enable policymakers, program managers, and evaluators to monitor progress toward improving program efforts in controlling and responding to HPAI in poultry and wild birds. These indicators also enable policymakers, program managers, and evaluators to monitor program quality and effectiveness.

Introduction

The indicators in this section measure the following aspects of programs and activities aimed to prevent, control, and respond to HPAI among birds: 1) outcomes of HPAI in birds, 2) surveillance, 3) outbreak response, 4) biosecurity, 5) sample submission and laboratory capacity, 6) vaccination of birds, 7) compensation program, 8) control of transborder transmission of HPAI, and 9) research activities. Definitions, key features, and issues related to surveillance, laboratory diagnostic capacity, biosecurity, vaccination programs, and transborder transmission of HPAI and research activities are discussed in the following sections.

Outcomes of HPAI in Birds

It is essential for countries to track the number of outbreaks in poultry and wild birds. Monitoring can be done through both a formal outbreak investigation system and execution of an active surveillance plan (see below for a description of active surveillance). A rapid increase in the number of outbreaks signals increased opportunity for the emergence of an influenza pandemic. A pattern of continuous HPAI outbreaks in a country might signal that HPAI has become endemic among birds in that country.

Surveillance

Poultry Disease Surveillance:

There are two types of poultry disease surveillance: active surveillance and passive surveillance.

Active surveillance is "based on specific targeted investigation of at-risk populations for evidence of infection that may be based on detecting exposure to the agent (antibody detection by serology) or the presence of the agent (virus or antigen detection)."[42] In general, there are two methods of active surveillance: 1) clinical active surveillance and 2) laboratory-based active surveillance. Clinical active surveillance involves village animal health workers, human health workers, or veterinary volunteers checking on the status of poultry's health by obtaining reports from owners. Reports of suspected cases of HPAI are sent to higher-level veterinary officers; they also trigger disease investigation. If during the investigation the dead or sick birds

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[42] FAO. (2004). *FAO Expert Meeting on Surveillance and Diagnosis of Avian Influenza in Asia, Bangkok, 21–23 July 2004. Guiding principles for highly pathogenic avian influenza surveillance and diagnostic networks in Asia,* p. 9. Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/Guidingpercent20principles.pdf.

show clinical signs matching the definition of HPAI, specimens are collected and sent to a laboratory for diagnosis. Laboratory-based active surveillance involves veterinary officers who design and carry out a sampling plan in selected provinces to collect cloacal or tracheal swabs of poultry in order to reach a certain target number of samples. These samples are then sent to laboratories for HPAI diagnosis. If any of the samples test positive for HPAI, control measures are launched immediately.

Passive surveillance is a surveillance system that relies on reports of ill or dead birds from village veterinarians, animal health workers and volunteers, or farmers. This system relies on the collection of information after suspected outbreaks are reported. Once received by district animal health officers, the officers investigate and collect samples if HPAI is suspected. In general, if HPAI is suspected the district reports immediately to provincial animal health officers, who report immediately to the national level, usually to the ministry of agriculture as well as the HPAI coordinating body.

For details on the criteria on "trigger points" that would initiate a disease investigation by official veterinary services, see *FAO Expert Meeting on Surveillance and Diagnosis of Avian Influenza in Asia, Bangkok, 21–23 July 2004.*[43]

Wild Bird Disease Surveillance:

Surveillance of wild bird disease differs by country. In Thailand wild bird surveillance of migratory and residential birds is conducted systematically by the Ministry of Natural Resources and Environment in cooperation with universities and the Department of Livestock Development. Active surveillance is implemented year-round in all provinces with about 4,000 samples per year collected from healthy wild birds. In Vietnam active surveillance is implemented through the collection of fecal and blood samples once a year from wild birds resident in national gardens and sanctuaries (one in the north and another in the southern part of the country). In both Thailand and Vietnam, passive surveillance (clinical sign observation) for wild birds is conducted as part of the poultry passive surveillance system. In Laos, no wild bird surveillance activities were being implemented when this document was prepared.

Laboratory Diagnostic Capacity

Samples that are collected in the field through routine surveillance or outbreak investigation are sent to laboratories for confirmation of HPAI. A number of diagnostic procedures are carried out at laboratories in countries in the region, depending on the laboratory capacity and level of diagnostic tests available at these laboratories. There are a number of HPAI diagnostic procedures available for virus detection and confirmation, including rapid screening tests,

[43] This document is available on the Internet at http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/Guiding percent20principles.pdf.

immunofluorescence tests, RT-PCR, and RRT-PCR. A number of serological tests are available to detect the circulation of the virus in an area.[44]

It is important that laboratories in the countries achieve the recommended minimal capabilities with regard to HPAI testing and that they have the capacity to send samples to OIE/FAO reference laboratories when necessary.[45] Indicators presented in this document measure human capacity in laboratory diagnostics and how efficiently laboratories carry out diagnostic tests.

Biosecurity

Improving biosecurity on poultry farms is a crucial step in disease prevention. Among the numerous measures that should be implemented to minimize the risk of transmission of HPAI are the following:[46, 47]

- Restrict access to a property or farm using fences and enclosures as barriers between clean areas where the poultry are kept and the outside environment.
- Restrict access to a property or farm to only people known by the owner, people who do not own poultry, and people who do not participate in events where birds congregate.
- Discourage close contact with backyard poultry, such as allowing poultry inside the house.
- Restrict wild birds' (resident fowl or migratory birds) contact with flocks on farms by using screens or nets.
- Visitors to farms should wash their hands and change their shoes to footwear provided by the owner. Visitors with birds of their own should not be allowed near the birds of the visiting farm.
- Collective measures should be taken if there are ducks kept on ponds or paddy fields with different owners (e.g., erecting poles with nets to separate flocks and taking turns scaring away wild birds).

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[44] For more information on the diagnostic tests and the FAO recommended minimal capabilities and ideal additional laboratory capabilities, readers are referred to FAO's *Guiding principles for highly pathogenic avian influenza surveillance and diagnostic networks in Asia* (pp. 14–18), available at http://www.fao.org/docs/eims/upload//210749/Gui_principlesHPAI_july04_en.pdf.

[45] For more information on FAO's recommended guidelines on laboratory procedures and networks, see FAO. (2004). *FAO Expert Meeting on Surveillance and Diagnosis of Avian Influenza in Asia, Bangkok, 21–23 July 2004. Guiding principles for highly pathogenic avian influenza surveillance and diagnostic networks in Asia,* p. 14. Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/Guiding percent20principles.pdf.

[46] FAO and WHO. (2006). *Animal Production and Health Manual—Preparing for Highly Pathogenic Avian Influenza.* Retrieved March 2007, from http://www.fao.org/docs/eims/upload/200354/HPAI_manual.pdf.

[47] For more information regarding how to monitor and evaluate biosecurity practices on sector 3 farms, see the "Checklist on Biosecurity" included with indicator 4.4.300 (prepared by FAO, shared by Abt Associates, obtained in March 2007).

This guide draws on FAO's definition of farm sectors and levels of biosecurity:[48]

> Sector 1: Industrial integrated system with *high-level biosecurity* and birds/products marketed commercially (e.g., farms that are part of an integrated broiler production enterprise with clearly defined and implemented SOPs for biosecurity)
>
> Sector 2: Commercial poultry production system with *moderate to high biosecurity* and birds/products usually marketed commercially (e.g., farms with birds kept indoors continuously, strictly preventing contact with other poultry or wildlife)
>
> Sector 3: Commercial poultry production system with *low to minimal biosecurity* and birds/products usually entering live bird markets (e.g., a caged-layer farm with birds in open sheds, a farm with poultry spending time outside the shed, a farm producing chickens and waterfowl)
>
> Sector 4: Village or backyard production with *minimal biosecurity* and birds/products consumed locally

As indicated above, sector 1 and 2 farms tend to be biosecure, and they have the resources to maintain their level of biosecurity. However, if an HPAI virus enters sector 1 and 2 farms, the economic impact may be greater because of the concentration of poultry in these farms. Sector 4 farms have very few birds, the majority of which are consumed locally, and consequently while the risk of virus entering the flock is higher than sectors 1 and 2, the number of birds that die and hence the economic impact from biosecurity breaches is lower. Sector 3 farms, which transport and sell birds at markets, are often cited as being the most at-risk of the four sectors. HPAI viruses have been isolated from live bird markets, indicating a considerable risk of infection with HPAI virus at these sites. The infection has the potential to spread beyond these sites with movement of people and transport of poultry.[49] In addition, due to poor biosecurity practices, the risk of bird-to-human transmission of HPAI viruses is greater in sectors 3 and 4 than in sectors 1 and 2.

Numerous indicators and measurement issues related to biosecurity practices are included in this section. Given the risk and concern of biosecurity breaches, particularly at sector 3 farms, it is important to monitor and evaluate knowledge and practices pertaining to biosecurity concepts and measures among individuals in the poultry supply and distribution chain. These measures are covered in chapter 6 of this document.

Vaccination Program

Vaccination of poultry is not a preferred strategy in some countries; therefore, indicators presented in this document are relevant only in countries where vaccination is adopted as a

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[48] FAO. (2004). *FAO Recommendations on the Prevention, Control and Eradication of Highly Pathogenic Avian Influenza (HPAI) in Asia.* Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/27septrecomm.pdf.

[49] Ibid.

preferred strategy. Consequently, these indicators have been categorized as additional indicators in this document. Five key elements critical to vaccination programs that should be monitored and evaluated are as follows:

- Adoption of a policy on the vaccination of poultry as a preferred strategy
- Implementation of a vaccination program
- Establishment of regulatory measures
- Assessment of the effectiveness of the vaccination program (post-vaccine monitoring)
- Training of vaccinators.

Compensation Program

Poultry farmers and owners affected by HPAI are compensated for the loss due to culling of birds as part of a response measure to outbreaks, and countries have policies and national compensation plans that define how compensations are provided (i.e., monetary or in-kind). The indicators presented in this document measure the extent to which such compensations are provided to qualified individuals and in a timely manner. For HPAI control and outbreak response to be effective, poultry farmers and owners need to 1) be aware that their loss will be compensated and 2) trust that compensation will be provided in a timely manner. Indicators measuring these points are not included in this document. However, in countries where the knowledge of farmers and owners regarding compensation programs and trust are issues, program managers and evaluators may refer to (or use) the survey instruments suggested in chapter 6 of this document[50] or other similar survey instruments to measure their level of knowledge and trust.

Control of Transborder Transmission

Just as important as the control of movement of people, poultry, and objects from the site of infection and the area surrounding the site is the control of the international movement of poultry and related products. While border controls only reduce and do not eliminate the risk of crossborder transmission of HPAI, it is critical that veterinary authorities implement measures for disease control and prevention.[51] Given SE Asia's geographical conditions (e.g., countries in the region share borders with each other) and the risk of transborder transmission, three indicators have been developed and included in this chapter.

However, because of the difficulty in establishing instances of poultry disease outbreaks in an area that are attributable to local versus international HPAI virus circulation, these indicators

[50] AED's survey instrument includes questions related to poultry farmers' knowledge of and expectations regarding compensation programs. For reference on AED's survey, see chapter 6.

[51] FAO. (2004). *FAO Recommendations on the Prevention, Control and Eradication of Highly Pathogenic Avian Influenza (HPAI) in Asia.* Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/27septrecomm.pdf.

are proxy measures, which provide measures of the human capacity and infrastructure required to control transborder transmission of HPAI.

Measurement Tools and Data Sources

Most of the indicators presented in this chapter rely on routine reports maintained at various levels of the animal health infrastructure, such as administrative records, surveillance and investigation reports, laboratory logbooks and records, and computerized databases of animal health information systems and networks. Some of the indicators, such as those related to biosecurity on farms and infrastructure at border checkpoints, require site visits on a regular basis.

FAO recommends that the information regarding HPAI "be stored in a computerized information system."[52] Many countries in the region are using or adapting the Trans-boundary Animal Disease Information System (TADInfo). TADInfo is a veterinary data management system developed and supported by FAO.[53] It uses a number of data sources available in developing countries obtained by 1) passive surveillance, 2) active surveillance, 3) abattoir observations, 4) livestock census, and 5) vaccination.[54] In some countries, a laboratory information system is in place where test results are entered and stored (e.g., Vietnam's LabNet, which is linked to TADInfo).

Methodological Challenges

The following are some key methodological challenges of monitoring and evaluating programs aimed to limit prevalence of HPAI among birds:

Challenges of Monitoring and Evaluating Animal Health Worker Skills[55]

Significant amounts of resources are allocated to training activities aimed to strengthen animal health workers skills in the various aspects of their work. Donor agencies and government ministries track the number of people trained over time. However, merely tracking the number of trained workers provides little information in terms of their skills and performance. These aspects can be measured through observations by a team of evaluators, pre-training and post-training. It is likely that animal health workers may abide by the guidelines more strictly while they are monitored. Observation over an extended period at their work site may reduce such observation bias.

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[52] FAO. (2004). FAO Expert Meeting on Surveillance and Diagnosis of Avian Influenza in Asia, Bangkok, 21–23 July 2004. *Guiding principles for highly pathogenic avian influenza surveillance and diagnostic networks in Asia,* p. 23. Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/Guidingpercent20principles.pdf.

[53] Laos: At the time of the country consultation visits, adjustment to Lao language was underway. Vietnam: The system is in place at the national and provincial levels.

[54] More information on TADInfo can be obtained at http://www.fao.org/ag/AGAinfo/resources/en/tadinfo/default.html.

[55] Adapted from Gage, A. J., Ali, D., & Suzuki, C. (2005). *A Guide for Monitoring and Evaluating Child Health Programs. MEASURE Evaluation* (p. 210). Carolina Population Center, University of North Carolina at Chapel Hill.

Accuracy and Timeliness of Reporting Through Passive Surveillance[56]

Issues of the validity of passive surveillance data can occur if some parts of a country are not covered effectively by the surveillance system (e.g., the probability of reporting instances of dead or sick birds varies by communities or villages). Countries in which a community-based passive surveillance system is implemented only in high-risk areas may encounter threats to the validity of passive surveillance data. Furthermore, accuracy and timeliness of reporting can be affected by the differential reporting in association with different characteristics of the person reporting incidents of dead or sick birds. Farmers who rely solely on poultry production as a source of income may be more reluctant to report instances of dead or sick birds at their farm for fear of response procedures, including culling. Knowledge of compensation programs and the level of trust in these programs may affect reporting of incidents by poultry farmers. Changes in reporting procedures over time can also introduce bias into the system, making it difficult to monitor trends or establish baseline rates to be used for the recognition of outbreaks.

Infrastructure and Communication Constraints[57]

White and McDonnel (2000)[58] describe health infrastructure and communication constraints that may affect the quality of surveillance data in low- and middle-income countries, which are relevant to animal disease surveillance. Many of these countries may face constraints such as identifying personnel to conduct surveillance and ensuring transportation and operating expenses for animal health workers to carry out routine surveillance activities and outbreak investigation or transporting specimens to laboratories. In some situations, veterinary offices at subregional levels may not have sufficient reporting forms, or the lack of a regular supply of electricity may limit use of functional computer-based systems for reporting.

Selection of Indicators

In developing this guide, we have adopted the principle of adapting, where possible, indicators that have already demonstrated their utility and feasibility in other health domains. Several indicators in this section have been adapted from the *Compendium of Indicators for Evaluating Reproductive Health Programs* (Bertrand and Escudero, 2002) and *A Guide for Monitoring and Evaluating Child Health Programs* (Gage, Ali, and Suzuki, 2005). In terms of measurement techniques and considerations, these indicators remain true to the original specifications. However, the unique nature of the HPAI programs limited our ability to adapt and apply indicators that were developed and validated in other areas of public health. Thus, the vast majority of the indicators in this chapter were developed through a consultative process with

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[56] Adapted from Gage, A. J., Ali, D., & Suzuki, C. (2005). *A Guide for Monitoring and Evaluating Child Health Programs.* MEASURE Evaluation (p. 164). Carolina Population Center, University of North Carolina at Chapel Hill.
[57] Adapted from Gage, A. J., Ali, D., & Suzuki, C. (2005). *A Guide for Monitoring and Evaluating Child Health Programs.* MEASURE Evaluation (p. 165). Carolina Population Center, University of North Carolina at Chapel Hill.
[58] White, M. E., & McDonnel, S. M. (2000). "Public Health Surveillance in Low- and Middle-Income Countries." In S. M. Teutsch & R. E. Churchill (Eds.), *Principles and Practice of Public Health Surveillance,* 2nd Ed (pp. 287–315). New York: Oxford University Press.

significant inputs from the technical working group members, technical experts, and program managers in countries of the region representing government ministries and organizations working to limit prevalence of HPAI among birds. Numerous indicators in this section have been adapted from the list of indicators developed by USAID's Washington/AI Unit.

Many of the indicators listed in this chapter are currently used to monitor programs in the region. However, the indicators presented in this chapter do not constitute a comprehensive set of indicators for monitoring and evaluating programs that aim to limit the prevalence of HPAI among birds.

The indicators listed in this chapter are as follows:

4.1 Outcomes of HPAI in Birds

4.1.100 Number of Confirmed Highly Pathogenic Avian Influenza Events in Poultry and Wild Birds

4.2 Poultry and Wild Bird Surveillance

4.2.100 Total Number of People Trained in Poultry Disease Surveillance (Core Indicator)

4.2.200 Total Number of People Trained in Wild Bird Disease Surveillance (Additional Indicator)

4.2.300 Proportion of Target Areas with Active Surveillance System for Highly Pathogenic Avian Influenza Virus Circulation Cases in Poultry (Core Indicator)

4.2.400 Existence of Active Surveillance System for Highly Pathogenic Avian Influenza Virus Circulation Cases in Wild Birds (Additional Indicator)

4.2.500 Proportion of Target Areas with Active Surveillance Submitting Surveillance Reports for Highly Pathogenic Avian Influenza to the National Level According to Standard Operating Procedures (Core Indicator)

4.2.600 Data Obtained from Active Surveillance System Analyzed, Published, and Disseminated (Additional Indicator)

4.2.700 Proportion of Reports on Suspected Outbreaks of Highly Pathogenic Avian Influenza Submitted According to the Standard Operating Procedures (Core Indicator)

4.2.800 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks That Were Notified Before Secondary Spread Had Occurred (Additional Indicator)

4.2.900 Proportion of Highly Pathogenic Avian Influenza Outbreaks Reported to the Ministry of Agriculture That Are Reported to the World Organization for Animal Health (Additional Indicator)

4.3 Outbreak Response

4.3.100 Total Number of People Trained in Highly Pathogenic Avian Influenza Outbreak Response (Core Indicator)

4.3.200 Proportion of Target Areas That Have a Trained Rapid Response Team for Highly Pathogenic Avian Influenza (Core Indicator)

4.3.300 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks with Disease Response in Accordance with National SOPs (Core Indicator)

4.3.400 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks with Disease Response Before Secondary Spread Has Occurred (Additional Indicator)

4.3.500 Average Number of Days from the Time of a Suspected Highly Pathogenic Avian Influenza Outbreak in Poultry to the Start of Response Action That Follows the National SOPs (Core Indicator)

4.3.600 Proportion of Confirmed Highly Pathogenic Avian Influenza Outbreaks in Poultry That Include an Epidemiological Investigation (Additional Indicator)

4.3.700 Average Number of Days from the Onset of a Suspected Highly Pathogenic Avian Influenza Outbreak in Poultry or Wild Birds to the Collection of Biological Specimens for Highly Pathogenic Avian Influenza Diagnosis (Additional Indicator)

4.4 Biosecurity

4.4.100 Total Number of Sector 1 and 2 Producers Trained in Biosecurity Concepts and Measures (Additional Indicator)

4.4.200 Proportion of Sector 1 and 2 Farms That Meet Biosecurity Recommendation/Guidelines Appropriate to the Sector (Additional Indicator)

4.4.300 Total Number of Animal Health Workers Trained in Biosecurity Concepts and Measures (Additional Indicator)

4.4.400 Proportion of Targeted Markets That Are Practicing Biosecurity According to Best Practices (Core Indicator)

4.5 Sample Submission and Laboratory Capacity

4.5.100 Total Number of People Trained in Laboratory Diagnosis for Highly Pathogenic Avian Influenza (Core Indicator)

4.5.200 Existence of an Inter-Laboratory Quality Assurance System for Highly Pathogenic Avian Influenza (Core Indicator)

4.5.300 National Laboratory Adheres to Biosafety Guidelines (Core Indicator)

4.5.400 Number of Laboratories That Have the Capacity to Undertake the Range of Highly Pathogenic Avian Influenza Diagnostic Tests (Core Indicator)

4.5.500 Existence of a Mechanism to Ship Highly Pathogenic Avian Influenza Specimens to Reference/International Laboratories (Core Indicator)

4.5.600 Proportion of Isolates That Requires Further Characterization per FAO Guidelines/Criteria for Which Specimens Were Sent to the Reference/International Laboratories for Further Characterization during the Reporting Period (Additional Indicator)

4.5.700 Average Number of Days between Receipt of Biological Specimen in Laboratory for Highly Pathogenic Avian Influenza Testing and Sending of the Results to the Requester (Additional Indicator)

4.5.800 Proportion of Biological Samples from Suspected Cases of Highly Pathogenic Avian Influenza That Are Received at Designated Laboratories of Sufficient Quality to Be Tested (Additional Indicator)

4.5.900 Proportion of Biological Samples of Suspected Cases of Highly Pathogenic Avian Influenza Received at Designated Laboratories with Appropriate Biohazard Packaging (Additional Indicator)

4.5.1000 Planned Highly Pathogenic Avian Influenza Tests Conducted (Additional Indicator)

4.5.1100 Proportion of Investigations of Suspected Highly Pathogenic Avian Influenza Outbreaks in Birds That Are Supported by Laboratory Tests (Core Indicator)

4.6 Vaccination

4.6.100 Total Number of People Trained in Vaccination for Highly Pathogenic Avian Influenza in Poultry (Additional Indicator)

4.6.200 Existence of a Comprehensive Vaccination Program for Highly Pathogenic Avian Influenza in Poultry (Additional Indicator)

4.6.300 Existence of a Regulatory Measure for a Comprehensive Vaccination Program in a Country (Additional Indicator)

4.6.400 Vaccination Program for Highly Pathogenic Avian Influenza in Poultry Assessed (Additional Indicator)

4.7 Compensation Program

4.7.100 Compensation Is Provided in a Timely Manner for Any Poultry or Other Property Destroyed as Part of a Highly Pathogenic Avian Influenza Control Campaign (Core Indicator)

4.7.200 Compensation Provided Is in Accordance with the National Compensation Plan for Poultry or Other Property Destroyed as Part of a Highly Pathogenic Avian Influenza Control Campaign (Core Indicator)

4.8 Control of Transborder Transmission of Highly Pathogenic Avian Influenza

4.8.100 Number of People at Border Checkpoints Trained in Border Biosecurity and Transborder Transmission (Core Indicator)

4.8.200 Existence of Inspector Teams at Border Checkpoints to Monitor Transborder Poultry Movement (Core Indicator)

4.8.300 Existence of Infrastructure to Wash and Spray Vehicles for Disinfection at Border Checkpoints (Core Indicator)

4.9 Research

4.9.100 Number of Special Studies Conducted (Additional Indicator)

The following table maps the indicators presented in this chapter to the logic model shown in chapter 2.

Table 3.

Limited Prevalence of HPAI in Birds (Animal Health)			
Element	**Logic Model Description**	**Relevant Indicators**	
OUTCOME	Limited prevalence of HPAI in birds	4.1.100	Number of Confirmed Highly Pathogenic Avian Influenza Events in Poultry and Wild Birds
OUTPUT	Improved national and subnational capacity in HPAI surveillance	4.2.300	Proportion of Target Areas with Active Surveillance System for Highly Pathogenic Avian Influenza Circulation Cases in Poultry
		4.2.400	Existence of Active Surveillance System for Highly Pathogenic Avian Influenza Virus Circulation Cases in Wild Birds
		4.2.500	Proportion of Target Areas with Active Surveillance Submitting Surveillance Reports for Highly Pathogenic Avian Influenza to the National Level According to Standard Operating Procedures
		4.2.600	Data Obtained from Active Surveillance System Analyzed, Published, and Disseminated
		4.2.700	Proportion of Reports on Suspected Outbreaks of Highly Pathogenic Avian Influenza Submitted According to the Standard Operating Procedures
	Improved national and subnational capacity in HPAI control	4.6.200	Existence of a Comprehensive Vaccination Program for Highly Pathogenic Avian Influenza in Poultry
		4.6.300	Existence of a Regulatory Measure for a Comprehensive Vaccination Program in a Country
		4.6.400	Vaccination Program for Highly Pathogenic Avian Influenza in Poultry Assessed

Limited Prevalence of HPAI in Birds (Animal Health)		
Element	**Logic Model Description**	**Relevant Indicators**
OUTPUT	Rapid response to HPAI outbreaks in birds	4.2.800 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks That Were Notified Before Secondary Spread Had Occurred 4.2.900 Proportion of Highly Pathogenic Avian Influenza Outbreaks Reported to the Ministry of Agriculture That Are Reported to the World Organization for Animal Health 4.3.200 Proportion of Target Areas That Have a Trained Rapid Response Team for Highly Pathogenic Avian Influenza 4.3.300 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks with Disease Response in Accordance with National Standard Operating Procedures 4.3.400 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks with Disease Response Before Secondary Spread Has Occurred 4.3.500 Average Number of Days from the Time of a Suspected Highly Pathogenic Avian Influenza Outbreak in Poultry to the Start of Response Action That Follows the National Standard Operating Procedures 4.3.600 Proportion of Confirmed Highly Pathogenic Avian Influenza Outbreaks in Poultry That Include an Epidemiological Investigation 4.3.700 Average Number of Days from the Onset of a Suspected Highly Pathogenic Avian Influenza Outbreak in Poultry or Wild Birds to the Collection of Biological Specimens for Highly Pathogenic Avian Influenza Diagnosis

Limited Prevalence of HPAI in Birds (Animal Health)			
Element	**Logic Model Description**	**Relevant Indicators**	
OUTPUT	Network of laboratories with HPAI diagnostic capacity strengthened	4.5.200	Existence of an Inter-Laboratory Quality Assurance System for Highly Pathogenic Avian Influenza
		4.5.300	National Laboratory Adheres to Biosafety Guidelines
		4.5.400	Number of Laboratories That Have the Capacity to Undertake the Range of Highly Pathogenic Avian Influenza Diagnostic Tests
		4.5.500	Existence of a Mechanism to Ship Highly Pathogenic Avian Influenza Specimens to Reference/International Laboratories
		4.5.600	Proportion of Isolates That Requires Further Characterization per FAO Guidelines/Criteria for Which Specimens Were Sent to the Reference/International Laboratories for Further Characterization during the Reporting Period
		4.5.700	Average Number of Days between Receipt of Biological Specimen in Laboratory for Highly Pathogenic Avian Influenza Testing and Sending of the Results to the Requester
		4.5.800	Proportion of Biological Samples from Suspected Cases of Highly Pathogenic Avian Influenza That Are Received at Designated Laboratories of Sufficient Quality to Be Tested
		4.5.900	Proportion of Biological Samples of Suspected Cases of Highly Pathogenic Avian Influenza Received at Designated Laboratories with Appropriate Biohazard Packaging
		4.5.1000	Planned Highly Pathogenic Avian Influenza Tests Conducted
		4.5.1100	Proportion of Investigations of Suspected Highly Pathogenic Avian Influenza Outbreaks in Birds That Are Supported by Laboratory Tests
	Improved biosecurity in production, in markets, and at border checkpoints	4.4.200	Proportion of Sector 1 and 2 Farms That Meet Biosecurity Recommendation/Guidelines Appropriate to the Sector
		4.4.400	Proportion of Targeted Markets That Are Practicing Biosecurity According to Best Practices

Limited Prevalence of HPAI in Birds (Animal Health)			
Element	**Logic Model Description**	**Relevant Indicators**	
OUTPUT	Financial compensation for affected farmers	4.7.100 4.7.200	Compensation Is Provided in a Timely Manner for Any Poultry or Other Property Destroyed as Part of a Highly Pathogenic Avian Influenza Control Campaign Compensation Provided Is in Accordance with the National Compensation Plan for Poultry or Other Property Destroyed as Part of a Highly Pathogenic Avian Influenza Control Campaign
PROCESS	Build capacity to detect and control HPAI.	4.6.100	Total Number of People Trained in Vaccination for Highly Pathogenic Avian Influenza in Poultry
	Train surveillance, laboratory, and rapid response teams.	4.2.100 4.2.200 4.3.100 4.5.100	Total Number of People Trained in Poultry Disease Surveillance Total Number of People Trained in Wild Bird Disease Surveillance Total Number of People Trained in Highly Pathogenic Avian Influenza Outbreak Response Total Number of People Trained in Laboratory Diagnosis for Highly Pathogenic Avian Influenza
	Improve biosecurity in production, in markets, and at border checkpoints.	4.4.100 4.4.300 4.8.100 4.8.200 4.8.300	Total Number of Sector 1 and 2 Producers Trained in Biosecurity Concepts and Measures Total Number of Animal Health Workers Trained in Biosecurity Concepts and Measures Number of People at Border Checkpoints Trained in Border Biosecurity and Transborder Transmission Existence of Inspector Teams at Border Checkpoints to Monitor Transborder Poultry Movement Existence of Infrastructure to Wash and Spray Vehicles for Disinfection at Border Checkpoints
INPUT	Personnel, equipment, supplies, and TA for surveillance, response, and laboratories		
	Special studies	4.9.100	Number of Special Studies Conducted

LIMIT PREVALENCE OF HIGHLY PATHOGENIC AVIAN INFLUENZA IN BIRDS (ANIMAL HEALTH)

4.1 Outcomes of Highly Pathogenic Avian Influenza in Birds

4.1.100 Number of Confirmed Highly Pathogenic Avian Influenza Events in Poultry and Wild Birds

Additional Indicator

Definitions

The total number of confirmed HPAI events in poultry or wild birds during the reporting period.

Disaggregation: Type of event (outbreak versus cases); Geographic area; poultry versus wild birds

- HPAI events include:
  - Outbreaks, as defined by national standards. HPAI outbreaks generally involve an unusual or abnormal level of die-off/mortality rate of poultry within a flock in a short period. Because this indicator measures confirmed outbreaks, there must be a laboratory diagnosis of HPAI.
  - Cases, detected through laboratory-based active surveillance.

What It Measures

This indicator monitors the intensity of HPAI in poultry and wild birds. An increase in the number of confirmed HPAI outbreaks and/or cases could signal an increase in the underlying prevalence of the disease in poultry and wild birds. An increase could also signal better detection and surveillance. In countries where control efforts have been relatively successful, the number and geographic distribution of cases identified through targeted active surveillance can provide information about areas that continue to be high risk and may require more intensive control efforts.

Measurement Tools

No tool exists.

For outbreaks: Investigation forms for suspected HPAI outbreak in poultry or wild birds with associated laboratory diagnosis

For cases: Active surveillance case records that include laboratory diagnostic information

How to Measure It

Extract information from outbreak investigation form and active surveillance case records on diagnosis, notification, investigation, and laboratory confirmation. Because only confirmed outbreaks and cases are included in this indicator, a laboratory diagnosis has to be conducted.

Frequency

Outbreak investigation forms are completed by the appropriate authorities continuously as outbreaks occur. The forms are submitted to the national authority through the reporting hierarchy. The frequency of reporting should be in line with national and international reporting standards for the disease.

Considerations

This indicator requires measurements over time in order to detect any significant changes over baseline. Any variation in the measure processes (definitions, sampling strategies, capacity to do the work required, willingness of the population to participate) will affect the actual measurement and the ability to compare measurements over time.

The accuracy of this indicator depends on the ability and willingness to notify the appropriate authorities of HPAI outbreaks, on the appropriate authorities conducting the investigation, on receiving an accurate laboratory diagnosis, and on reporting the results of the investigation in a timely manner to the national authority. In the absence of a formal outbreak investigation system with standard outbreak investigation reporting formats, laboratories may be used to identify cases.

When interpreting this indicator, the fact that there might be confusion on the definition of an HPAI outbreak should be considered. This might be because of confusion with other avian diseases, changes in the virology, or changing national/international standard definitions for an HPAI outbreak. Therefore, the number can be affected by errors in diagnosis or confusion regarding the outbreak definition.

Depending on the interaction of the active and routine surveillance systems, there is a potential for double-counting. If a positive sample through the active surveillance system triggers an outbreak investigation, then care should be taken in distinguishing so that measurements from the outbreak system and the laboratory are not duplicated. If cases identified through the active surveillance system result in an outbreak investigation, then all information for this indicator can come from the investigation system, as it will be more complete.

This indicator is difficult to compare across countries because it uses a number rather than a rate to track incidence. Countries differ significantly in poultry density; therefore, an increased number might be related to an increase in poultry. Similarly, an increase in number in a single country over time might be related to an increase in poultry density over that same period.

However, because many countries lack accurate poultry census data and because wild bird populations vary seasonally and are not tied to national boundaries, it would be difficult to use a rate indicator (incidence rate).

Revision History

First published September 2008.

Last revised September 2008

4.2 Poultry and Wild Bird Surveillance

4.2.100 Total Number of People Trained in Poultry Disease Surveillance

Core Indicator

Definitions

Total number of people trained in poultry disease surveillance during the reporting period.

Disaggregation: Trainee: administrative level (community, facility, district, province, national), affiliation (government, private sector, NGO), sex, primary work location (specific district or province name)

What It Measures

This indicator tracks the number of people trained in animal surveillance specifically to detect HPAI in poultry.

Measurement Tools

Training attendance records

How to Measure It

Review training attendance records at the ministry of agriculture or its departments.

Frequency

Training information is collected continuously and reported at the national level at the end of the reporting period.

Considerations

This indicator provides a crude assessment of whether a program/project is meeting its target or is making progress over time in terms of building the capacity of professionals working in the field of poultry disease surveillance. However, this indicator alone does not provide a measure of whether the content of the training provided meets the national mandate and the changing nature of the disease. Furthermore, the unit of measurement is not uniform in that one trainee may have attended a course for one day and another may have attended a course for three months.

A major limitation of this indicator is that it provides no measurement of whether the training enhanced the trainees' skills and performance. Trainees' performance assessment requires direct observation at the work site. Furthermore, this indicator does not measure the geographical coverage provided by trained individuals. Countries may want to adopt an indicator that specifies the proportion of subnational units that have an individual trained in poultry disease surveillance.

Revision History

First published June 2007 as indicator 4.1.1a. Revised in current edition.

Last revised September 2008

4.2.200 Total Number of People Trained in Wild Bird Disease Surveillance

Additional Indicator

Definitions

Total number of people trained in wild bird disease surveillance during the reporting period.

Disaggregation: Trainee: administrative level (community, facility, district, province, national), affiliation (government, private sector, NGO), sex, primary work location (specific district or province name)

What It Measures

This indicator tracks the number of people trained in animal surveillance specifically to detect HPAI among wild birds.

Measurement Tools

Training attendance

How to Measure It

Review training attendance records at government ministries and institutions working on wild bird disease surveillance.

Frequency

Training information is collected continuously and reported at the national level at the end of the reporting period.

Considerations

This indicator provides a crude assessment of whether a program/project is meeting its target or is making progress over time in terms of building the capacity of professionals working in the field of wild bird disease surveillance. However, this indicator alone does not provide a measure of whether the content of the training provided meets the national mandate and the changing nature of the disease. Furthermore, the unit of measurement is not uniform in that one trainee may have attended a course for one day and another may have attended a course for three months.

A major limitation of this indicator is that it provides no measurement of whether the training enhanced the trainees' skills and performance. Trainees' performance assessment requires direct observation at the work site. Furthermore, this indicator does not measure the geographical coverage provided by trained individuals. Countries that are actively engaged in wild bird disease surveillance activities may want to adopt an indicator that specifies the proportion of subnational units that have an individual trained in wild bird disease surveillance.

Revision History

First published June 2007 as indicator 4.1.1b. Revised in current edition.

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4.2.300 Proportion of Target Areas with Active Surveillance System for Highly Pathogenic Avian Influenza Virus Circulation Cases in Poultry

Core Indicator

Definitions

Proportion of target areas with active surveillance system for HPAI virus circulation cases in poultry.

Numerator: Number of target areas in a country with an active surveillance system to detect HPAI cases in poultry in place during the reporting period

Denominator: Total number of target areas in a country during the reporting period

- Active surveillance is "based on specific targeted investigation of at-risk populations for evidence of infection that may be based on detecting exposure to the agent (antibody detection by serology) or the presence of the agent (virus or antigen detection)."[59]

- Target areas are defined as administrative units (e.g., villages, municipalities, districts, provinces) that are considered at high risk either because of the presence of risk factors or the previous experience of outbreaks occurring in the area or are defined as participating areas in a project by the donor or partners.

What It Measures

Countries may be at different levels of implementing an active surveillance system. This indicator measures the extent to which an active surveillance system is implemented in the target areas and provides an assessment of a country's capacity to detect HPAI in poultry. Collection of samples, which is a key element in active surveillance systems for HPAI, does not have to take place in all locations within the target areas. For the samples collected to be representative, key groups (e.g., both farms and markets) need to be included but should vary over time to avoid sampling the same locations/units each time. Target areas where such mechanisms are implemented are counted in the numerator.

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[59] FAO. (2004). *FAO Expert Meeting on Surveillance and Diagnosis of Avian Influenza in Asia, Bangkok, 21–23 July 2004, Guiding principles for highly pathogenic avian influenza surveillance and diagnostic networks in Asia,* p. 9. Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/Guiding percent20principles.pdf.

Measurement Tools

- Administrative and surveillance records maintained in target areas and at the ministry of agriculture and laboratories, with information regarding collection of samples from poultry and its diagnosis
- List of target areas in a country.

How to Measure It

Using a list of target areas in a country (denominator), review administrative and surveillance records maintained in target areas to determine how many of the target areas on the list have an active surveillance system in place to detect and control HPAI in poultry.

Frequency

This indicator should be measured regularly to monitor the process as target areas in each country are expanded or reduced according to the epidemiology of HPAI.

Considerations

This indicator is not concerned with the quality of an active surveillance system in place. For an active surveillance system to be considered good quality, reporting should be not only timely but also complete and accurate. For an active surveillance system to be truly functioning, the system must have the capacity to allow appropriate authorities to systematically collect, collate, analyze, and interpret data and disseminate them to decision makers in a timely manner in order to prompt appropriate control measures/response.

Revision History

First published June 2007 as indicator 4.1.2a. Revised in current edition.

Last revised September 2008

4.2.400 Existence of Active Surveillance System for Highly Pathogenic Avian Influenza Virus Circulation Cases in Wild Birds

Additional Indicator

Definitions

Existence of surveillance system for HPAI virus circulation cases in wild birds.

Yes: Active surveillance is carried out in targeted areas to search for active HPAI virus among wild birds.

No: Active surveillance is not carried out anywhere in the country to search for active HPAI virus among wild birds.

- Active surveillance is "based on specific targeted investigation of at-risk populations for evidence of infection that may be based on detecting exposure to the agent (antibody detection by serology) or the presence of the agent (virus or antigen detection)."[60]

What It Measures

Countries may be at different levels of implementing an active surveillance system to detect HPAI virus circulation cases in wild birds. Some countries may be carrying out passive surveillance as well as active surveillance of wild birds. This indicator measures whether an active surveillance system is in place and provides an assessment of a country's capacity to detect HPAI in wild birds.

Measurement Tools

Administrative and surveillance records maintained in designated wild birds surveillance sites (e.g., bird/wildlife sanctuaries), which include information regarding the collection of samples from wild birds and HPAI diagnosis

How to Measure It

Review administrative and surveillance records maintained to determine whether active surveillance activities are carried out in designated areas to detect HPAI in wild birds.

Frequency

This indicator should be measured regularly to monitor the process as an active surveillance system for HPAI among wild birds is established.

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[60] FAO. (2004). *FAO Expert Meeting on Surveillance and Diagnosis of Avian Influenza in Asia, Bangkok, 21–23 July 2004. Guiding principles for highly pathogenic avian influenza surveillance and diagnostic networks in Asia,* p. 9. Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/Guiding percent20principles.pdf

Considerations

This indicator is not concerned with the quality of the active surveillance system in place. For an active surveillance system to be considered good quality, reporting should be not only timely but also complete and accurate. For an active surveillance system to be truly functioning, the system must have the capacity to allow appropriate authorities to systematically collect, collate, analyze, and interpret data and promptly them to decision makers in a timely manner in order to prompt appropriate control measures/response.

Revision History

First published June 2007 as indicator 4.1.2b. Revised in current edition.

Last revised September 2008

4.2.500 Proportion of Target Areas with Active Surveillance Submitting Surveillance Reports for Highly Pathogenic Avian Influenza to the National Level According to Standard Operating Procedures

Core Indicator

Definitions

Proportion of target areas with active surveillance submitting surveillance reports for HPAI at the national level according to SOPs.

Numerator: Number of target areas in a country with active surveillance submitting surveillance reports for HPAI at the national level according to SOPs during the reporting period

Denominator: Total number of target areas in a country during the reporting period

- Active surveillance is "based on specific targeted investigation of at-risk populations for evidence of infection that may be based on detecting exposure to the agent (antibody detection by serology) or the presence of the agent (virus or antigen detection)."[61]
- Target areas are defined as administrative units (e.g., villages, municipalities, districts, provinces) that are considered at high risk either because of the presence of risk factors or the previous experience of outbreaks occurring in the area or are defined as participating areas in a project by donors or their partners.
- HPAI is a notifiable disease. The official veterinary services must have a formal system for detecting and investigating outbreaks of disease and for reporting confirmed cases internationally in accordance with OIE guidelines.
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator measures the number of active surveillance sites that make bird disease surveillance data accessible at the national level according to the SOPs developed by the country.

[61] FAO. (2004). *FAO Expert Meeting on Surveillance and Diagnosis of Avian Influenza in Asia, Bangkok, 21–23 July 2004, Guiding principles for highly pathogenic avian influenza surveillance and diagnostic networks in Asia,* p. 9. Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/Guiding percent20principles.pdf.

Measurement Tools

- Administrative records (such as a table for recording timeliness and completeness of reporting from the surveillance sites at the national level)
- Computerized databases of animal health information systems and networks (e.g., FAO-developed TADInfo system)
- SOPs for active surveillance reporting.

How to Measure It

Measurement of this indicator requires records indicating exact dates when reports were sent from surveillance sites and received at the national level. At the national level, the dates on which reports were received are routinely recorded and reviewed during the analysis. The records of reports that have been received are used to:

- Identify which reporting units have reported
- Measure how many reports were submitted according to a checklist of SOPs.

Frequency

The frequency of reporting could be a minimum of every six months within a country, or it could be less than this if selected pilot areas are targeted for more frequent surveillance.

Considerations

Measurement of this indicator serves a number of programmatic purposes. If data indicate that a target area with active surveillance has not provided an appropriate report, the surveillance focal point at the site should be contacted to work with the designated staff to identify the cause of the problem and develop solutions. These solutions may include providing resources (including a sufficient and reliable supply of forms for reporting the required information, and on-the-job training to staff at the district office regarding reporting procedures). The indicator assumes that reporting forms are available for reporting at the target areas.

Revision History

First published June 2007 as indicator 4.1.3. Revised in current edition.

Last revised September 2008

4.2.600 Data Obtained from Active Surveillance System Analyzed, Published, and Disseminated

Additional Indicator

Definitions

Number of instances in which data pertaining to HPAI that were collected through active surveillance activities in a country have been analyzed, published, and disseminated during the reporting period

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

Information obtained through active surveillance activities should be analyzed, disseminated, and ultimately used to guide policies and programs to improve their effectiveness in controlling the spread of HPAI. This indicator measures the extent to which active surveillance data are analyzed and made public.

Measurement Tools

Administrative records maintained at the ministry of agriculture

How to Measure It

In order to be counted in this indicator, data obtained from active surveillance systems must have been:

1. Analyzed
2. Published in the form of a written document/report
3. Disseminated to policymakers at the national and local levels
4. Shared with international agencies (e.g., FAO, OIE).

Program managers and evaluators in countries where active surveillance is implemented to detect HPAI virus circulation among wild birds may measure this indicator separately for active surveillance of wild birds.

Frequency

This indicator should be measured at the end of the reporting period.

Considerations

This indicator merely tracks the number of instances in which data collected through active surveillance activities in a country have been analyzed, published, and disseminated. Measurement of this indicator by itself is not sufficient to assess the extent to which information obtained through active surveillance activities are used to guide programs aimed to control the spread of HPAI.

Revision History

First published June 2007 as indicator 4.1.4. Revised in current edition.

Last revised September 2008

4.2.700 Proportion of Reports on Suspected Outbreaks of Highly Pathogenic Avian Influenza Submitted According to the Standard Operating Procedures

Core Indicator

Definitions

Proportion of reports on suspected cases of HPAI submitted according to SOPs.

Numerator: Number of instances for which suspected cases of HPAI were found by passive surveillance and reported according to the SOPs during the reporting period

Denominator: Total number of suspected cases (i.e., sick or dead poultry or wild birds) found by passive surveillance during the reporting period

- *Suspected outbreak* means an unusual or abnormal level of die-off/mortality rate of poultry within a flock in a short period. It should follow the country's HPAI suspected outbreak definition.
- Reporting period may vary depending on the country's reporting period or donors' reporting requirements.

What It Measures

This indicator provides a measure of the quality of *passive* surveillance in a country by assessing whether the system is functioning according to the SOPs developed and adopted by the country. It also provides an indication of the extent of suspected cases in a country. Note that indicator 4.2.500 provides a measure of the quality of *active* surveillance in a country.

Measurement Tools

- Surveillance reports
- National HPAI SOPs document

How to Measure It

Review surveillance reports on suspected cases of HPAI against a national HPAI SOPs document. Review of reports will determine, among others, the extent to which reports are completed and data made available to the appropriate levels of authority as specified and the SOPs are followed in their entirety.

Frequency

The frequency of reporting could be a minimum of every six months within a country, or it could be less than this if selected pilot areas are targeted for more frequent surveillance. An annual evaluation or special study projects may be necessary to analyze this information.

Considerations

Measurement of this indicator serves a number of programmatic purposes. Information obtained through the measurement of this indicator can be linked to outcomes/results of laboratory tests (i.e., linking suspected cases to laboratory confirmation) and used to monitor whether the information was communicated to communities.

A major challenge in measuring this indicator is in obtaining the denominator. TADInfo contains information pertaining to all suspected cases of HPAI detected in a country through either active or passive surveillance. A review of each surveillance report may be required to calculate the denominator for this indicator.

The indicator assumes that reporting forms are available for reporting at the surveillance site level. It also assumes that the SOPs have been widely disseminated and that the surveillance site staff knows how to follow them to detect and report HPAI.

Revision History

First published June 2007 as indicator 4.1.5. Revised in current edition.

Last revised September 2008

4.2.800 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks That Were Notified Before Secondary Spread Had Occurred

Additional Indicator

Definitions

Proportion of suspected HPAI outbreaks that were notified before secondary spread had occurred.

Numerator: Number of suspected HPAI outbreaks that were notified to the government rapid response team before secondary spread occurred in known infected areas during the reporting period

Denominator: Total number of suspected HPAI outbreaks in known infected areas during the reporting period

- Suspected HPAI outbreaks: An unusual or abnormal level of die-off/mortality rate of poultry within a flock in a short period. The outbreak does not need to be laboratory confirmed as HPAI in order to be suspected. The definition of flocks differs by type of farms (e.g., commercial farms versus backyard farms). The exact definition should follow the country's suspected HPAI outbreak definition.

- Secondary spread: The definition varies by country. Normally, household-to-household spread would not be considered a secondary spread. In Thailand, secondary spread is defined as "when an outbreak spreads across subdistricts," and in Laos as "across villages." In Vietnam, one outbreak is defined as one or more cases of HPAI in a commune within 21 days. Secondary spread would include cases in neighboring communes or after 21 days.

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator measures the extent to which surveillance sites are able to detect and transmit information regarding HPAI outbreaks in a timely fashion *before secondary spread occurs*. This is important to ensure that timely decisions are made with regard to the outbreak investigation and response process.

Measurement Tools

- Administrative records

- Disease investigation records

- Surveillance records
- Outcomes of participatory disease searches in Indonesia.

How to Measure It

Measurement of this indicator requires records indicating exact dates when suspected HPAI outbreak reports were sent from surveillance sites and received at the district veterinary offices where they are aggregated and reported to the next administrative level (e.g., province) and to the central/national level. At every level, the dates on which reports were received are routinely recorded and reviewed during the analysis. These data need to be linked to the information on secondary spread to measure this indicator.

Frequency

The frequency of reporting could be a minimum of every six months within a country, or it could be less than this if selected pilot areas are targeted for more frequent surveillance.

Considerations

This is a very important concept but is difficult to measure in practice. Given that the definition of a secondary spread varies by country, cross-country comparison would not be possible.

Revision History

First published June 2007 as indicator 4.1.6. Revised in current edition.

Last revised September 2008

4.2.900 Proportion of Highly Pathogenic Avian Influenza Outbreaks Reported to the Ministry of Agriculture That Are Reported to the World Organization for Animal Health

Additional Indicator

Definitions

Proportion of HPAI outbreaks in poultry reported to the ministry of agriculture that are reported to OIE.

Numerator: Number of HPAI outbreaks in poultry over the reporting period reported to OIE

Denominator: Number of HPAI outbreaks in poultry over the reporting period reported to the ministry of agriculture

Disaggregation: H5N1 versus other OIE-notifiable HPAI outbreaks

What It Measures

HPAI in poultry is an OIE-notifiable disease. This indicator provides a rough measure of national compliance with OIE-reporting guidelines. If there is a significant difference between the number of outbreaks reported to the ministry of agriculture and the number reported to OIE, then further investigation is warranted to determine whether the discrepancy is a problem with compliance with OIE-reporting requirements or differences in national versus international definitions of outbreak and reporting requirements.

Measurement Tools

Numerator: International Level: OIE Outbreak Report Form

No tool exists at the national level.

Denominator: *National Level: Investigation forms for suspected HPAI outbreak in poultry*

How to Measure It

Numerator: Review the OIE Web site to see the number of HPAI outbreaks reported to OIE.

Denominator: Review ministry of agriculture records to identify number of HPAI outbreaks in poultry reported to national authorities.

Frequency

Outbreak investigation forms and OIE Outbreak Report Forms are completed by the appropriate authorities continuously as outbreaks occur. The forms are submitted to national and international agencies through the reporting hierarchy. The frequency of reporting should be in line with national and international reporting standards for the disease.

Considerations

The accuracy of this indicator depends on the ability to notify the appropriate authorities of HPAI outbreaks in poultry, on the appropriate authorities conducting the investigation, on receiving an accurate laboratory diagnosis for confirmed cases, and on reporting the investigation in a timely manner to the national authority.

When interpreting this indicator, it is important to note that national definitions of HPAI outbreaks often differ significantly from OIE's definition of HPAI outbreak and that reporting requirements may vary between the ministry of agriculture and OIE. Thus, a lower proportion of outbreaks reported to the ministry of agriculture that are then reported to OIE does not necessarily signal lack of compliance with OIE reporting guidelines.

Revision History

First published June 2007 as indicator 4.1.7. Revised in current edition.

Last revised September 2008

4.3 Outbreak Response

4.3.100 Total Number of People Trained in Highly Pathogenic Avian Influenza Outbreak Response

Core Indicator

Definitions

Total number of people trained in containment of poultry and wild bird disease outbreaks and passing the evaluation process during the reporting period.

Disaggregation: Trainee: administrative level (community, facility, district, province, national), affiliation (government, private sector, NGO), sex, primary work location (specific district or province name)

Topic of training: HPAI outbreak response in poultry, HPAI outbreak response in wild birds

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator tracks the number of people trained in containment of poultry and wild bird outbreaks.

Measurement Tools

Training attendance records

How to Measure It

Review training attendance records at the ministry of agriculture or its departments.

Frequency

Training information is collected continuously and is reported at the national level at the end of the reporting period.

Considerations

This indicator provides a crude assessment of whether a program/project is meeting its target or is making progress over time in terms of building the capacity of professionals and paraprofessionals working in poultry disease outbreak response. However, this indicator alone does not provide a measure of whether the content of the training provided meets the national mandate and the changing nature of the disease. Furthermore, the unit of measurement is not uniform in that one trainee may have attended a course for one day and another may have attended a course for three months.

Furthermore, this indicator does not measure the geographical coverage provided by trained individuals. See indicator 4.3.200 for the indicator that measures the geographical coverage provided by trained rapid response teams.

Revision History

First published June 2007 as indicator 4.2.1. Revised in current edition.

Last revised September 2008

4.3.200 Proportion of Target Areas That Have a Trained Rapid Response Team for Highly Pathogenic Avian Influenza

Core Indicator

Definitions

Proportion of target areas that have a rapid response team trained to implement HPAI measures according to the national HPAI operational plan and SOPs.

Numerator: Number of target areas that have a rapid response team trained to implement HPAI measures that meets international or commonly agreed-on criteria

Denominator: Total number of target areas

- The mere presence of a rapid response team in target areas on an official document is not sufficient. A target area must have a rapid response team in place that is qualified and equipped to carry out HPAI measures and must be able to deploy immediately to be counted in the numerator.
- Target areas are defined as administrative units (e.g., villages, municipalities, districts, provinces) that are considered at high risk either because of the presence of risk factors or because of the previous experience of outbreaks occurring in the area or being defined as participating areas in a project by the donor or partners.

What It Measures

Responding to animal health emergencies requires an efficient mechanism that ensures transmission of information and instructions from a national rapid response team to the response teams in the field and laboratory and for feedback of information to the national rapid response team. It is crucial that there are response teams in place in target areas to implement HPAI response measures. This indicator measures the extent to which such a mechanism is in place in the target areas.

Measurement Tools

- National operational plan and SOPs document
- Training records
- Administrative records of the rapid response team's activities in target areas.

How to Measure It

The data for measuring this indicator can be obtained by reviewing the national preparedness plan, which includes information on the rapid response team in target areas, its roles and responsibilities, its chief officer, and the team members' qualifications. To assess whether the team can deploy in a timely manner, a review of the documents pertaining to the team's activities with specific dates when actions were implemented may be necessary.

Frequency

This indicator should be measured quarterly until it reaches 100 percent. Ensuring that target areas at high risk of HPAI have a rapid response team in place is a priority. Once rapid response teams are in place in all target areas, the indicator should be measured on a regular basis to ensure that each target area has its teams properly trained with the latest information and appropriate measures and that the teams are able to deploy.

Considerations

This indicator does not measure the quality of the team's performance. Furthermore, the indicator does not provide a measure of whether each target area has a sufficient number of rapid response teams in place. There may be areas with a high concentration of poultry industries or farms or at a high risk of HPAI that may require several rapid response teams.

Revision History

First published June 2007 as indicator 4.2.2. Revised in current edition.

Last revised September 2008

4.3.300 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks with Disease Response in Accordance with National Standard Operating Procedures

Core Indicator

Definitions

Proportion of suspected HPAI outbreaks with response in accordance with national SOPs during the reporting period.

Numerator: Number of suspected HPAI outbreaks with recommended response as per SOPs during the reporting period

Denominator: Total number of suspected HPAI outbreaks during the reporting period

- Suspected HPAI outbreak: The occurrence of one or more cases of HPAI in a flock
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator measures the extent and quality of the response to a suspected HPAI outbreak.

Measurement Tools

- Surveillance records
- Investigation forms.

How to Measure It

This indicator is measured by first reviewing surveillance forms to identify confirmed outbreaks. The numerator is measured by reviewing reports of suspected outbreaks to ascertain whether the response was in accordance with national guidelines. A checklist with key components of national guidelines can be used to facilitate this process. If the checklist is complete, then the suspected outbreak can be included in the numerator.

Frequency

Records are maintained continuously. Reporting at the national level is done quarterly. The national level reports the indicator annually.

Considerations

While the international guidelines require countries to respond to confirmed HPAI outbreaks, countries are not waiting for laboratory confirmation. The calculation of this indicator will depend on the quality of the record-keeping systems at surveillance sites.

Revision History

First published June 2007 as indicator 4.2.3. Revised in current edition.

Last revised September 2008

4.3.400 Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks with Disease Response Before Secondary Spread Has Occurred

Additional Indicator

Definitions

Proportion of suspected HPAI outbreaks with disease response before secondary spread has occurred during the reporting period

Numerator: Number of suspected HPAI outbreaks with disease investigation response before the secondary spread has occurred during the reporting period

Denominator: Total number of suspected HPAI outbreaks during the reporting period

- Secondary spread: The definition varies by country. Normally, household-to-household spread would not be considered a secondary spread. In Thailand, secondary spread is defined as "when an outbreak spreads across districts," and in Laos as "across villages." In Vietnam, one outbreak is defined as one or more cases of HPAI in a commune within 15 days. Secondary spread would include cases in neighboring communes or after 15 days.

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

While the international guidelines require countries to respond to confirmed HPAI outbreaks, countries are not waiting for laboratory confirmation. This indicator provides a measure of the efficiency of response to a suspected HPAI outbreak.

Measurement Tools

- Surveillance records

- Investigation forms.

How to Measure It

This indicator is measured by first reviewing surveillance forms to identify suspected outbreaks. The numerator is measured by reviewing investigation reports of suspected outbreaks to ascertain whether the response as according to the national operating procedures was implemented *before the secondary spread has occurred*.

Frequency

Records are maintained continuously. Reporting at the national level is done quarterly. The national level reports the indicator annually.

Considerations

The challenge in measuring this indicator is in identifying an index case. Furthermore, investigation forms may not be complete, thereby underestimating the quality of the response.

Revision History

First published June 2007 as indicator 4.2.4. Revised in current edition.

Last revised September 2008

4.3.500 Average Number of Days from the Time of a Suspect Highly Pathogenic Avian Influenza Outbreak in Poultry to the Start of Response Action That Follows the National Standard Operating Procedures

Core Indicator

Definitions

Average number of days from the time of a suspect HPAI outbreak in poultry to the start of a response action that follows the national SOPs (which may include culling, movement control, appropriate disposal of carcasses, disinfection, and possibly ring vaccination in the area surrounding the outbreak). Response actions may vary from country to country but should be based on OIE/FAO standards and be consistent with national policy as articulated in the "National AI Prevention and Containment Plan" (or its equivalent).

Numerator: Sum of the number of days between the time when HPAI is suspected as the cause of poultry outbreaks and government response action(s)

Denominator: Total number of confirmed H5 or H5N1 outbreaks that resulted in government action(s)

Measurement Tools

Administrative and surveillance records at the ministry of agriculture

What It Measures

When it is suspected that HPAI is the cause of a poultry disease outbreak in an area, a number of control activities need to be carried out to contain the disease before it spreads. Control activities could include culling, appropriate disposal of carcasses, and ring vaccination in the area surrounding the outbreak. This indicator measures the speed and efficiency with which appropriate response actions were taken once HPAI is the suspected cause of poultry deaths.

How to Measure It

Review the records maintained at the ministry of agriculture and at laboratories to determine the date of report of suspected HPAI outbreak and the date when a response action was initiated to carry out appropriate control activities, and calculate the average number of days.

Frequency

Records are maintained continuously. Reporting at the national level is done quarterly. The national level reports the indicator annually.

Considerations

The calculation of this indicator will depend on the quality of the records maintained at the ministry of agriculture. While an average (or mean) is easy to calculate, its major disadvantage as the measurement of an indicator is that it is affected by extremely high or low values (outliers). Capturing the range (minimum, maximum) of days along with the average would assist countries in understanding the variation in scenarios.

Alternatively, program managers and evaluators may wish to calculate the median value instead of the mean. Median is a value in an ordered set of values below and above which there is an equal number of values or is the arithmetic mean of the two middle values if there is no one middle number.[62] To calculate the median value, calculate the number of days from report of HPAI as the suspected cause of a poultry disease outbreak to a response action for each instance, and find the middle number. If the number of instances is an even number (i.e., there are two middle numbers), take the middle pair of numbers and calculate the mean of the two numbers to obtain the median number.

A major advantage of the median is that an extreme value would not affect the median value. However, if there were many data points from which to calculate the median value, the calculation would be time consuming. Furthermore, if any of the values around the middle of the distribution alters even slightly, then the median would be affected (versus the average, which is less affected by the change in values around the middle of the distribution).

Revision History

First published June 2007 as indicator 4.2.5. Revised in current edition.

Last revised September 2008

[62] www.webster.com

4.3.600 Proportion of Confirmed Highly Pathogenic Avian Influenza Outbreaks in Poultry That Include an Epidemiological Investigation

Additional Indicator

Definitions

Proportion of confirmed HPAI outbreaks in poultry in a reporting period that includes an epidemiological investigation during the reporting period.

Numerator: Number of confirmed HPAI outbreaks in poultry during the past three months that included an epidemiological investigation of the disease in birds during the reporting period

Denominator: Total number of confirmed HPAI outbreaks in poultry during the past three months during the reporting period

- Confirmation means either laboratory confirmation or a positive rapid test diagnosis for HPAI virus in poultry having clinical symptoms consistent with HPAI.
- Definition of outbreaks varies by country. It should be defined in the SOPs.
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

According to international guidelines, countries should respond with an epidemiological investigation as soon as HPAI is confirmed to be the cause of a poultry disease in an area. This measures the extent to which epidemiological investigation following an outbreak was carried out within a reporting period (e.g., three months).

Measurement Tools

Administrative and outbreak investigation records at the ministry of agriculture

How to Measure It

Both the numerator and the denominator of this indicator are obtained by reviewing the records maintained at the ministry of agriculture and at laboratories.

Frequency

This indicator should be measured on a regular basis (e.g., every three months).

Considerations

The calculation of this indicator will depend on the quality of the records maintained at the ministry of agriculture and laboratories. In reality, many countries are responding immediately with an epidemiological investigation rather than waiting for a confirmation that the poultry disease detected was caused by HPAI.

Revision History

First published June 2007 as indicator 4.2.6. Revised in current edition.

Last revised September 2008

4.3.700 Average Number of Days from the Onset of a Suspected Highly Pathogenic Avian Influenza Outbreak in Poultry or Wild Birds to the Collection of Biological Specimens for Highly Pathogenic Avian Influenza Diagnosis

Additional Indicator

Definitions

Average number of days from the onset of a suspected HPAI outbreak in poultry or wild birds to the collection of biological specimens for HPAI diagnosis during the reporting period.

Disaggregation: Poultry versus wild birds

- Laboratory testing may be either within the country or outside the country if internal lab capacity is weak.
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator provides an assessment of how rapidly biological specimens are collected for testing after a possible HPAI outbreak is detected. It measures how efficiently biological specimens are collected for laboratory testing as part of response actions after a suspected HPAI outbreak and is not a measure of laboratory capacity.

Measurement Tools

No tool exists.

Investigation forms for suspected HPAI outbreak in poultry or wild birds, which records date of outbreak onset and date biological specimen was collected for laboratory testing

How to Measure It

Review the investigation forms for suspected HPAI outbreak in birds and obtain dates of outbreak and the collection of biological specimen to calculate the average number of days.

Frequency

Suspected HPAI outbreak in birds investigation forms should be submitted continuously at the national level. The frequency with which the information for this indicator should be extracted and reported depends on the frequency of investigations. If there are many investigations, the indicator should be reported frequently (monthly/quarterly); if there are a limited number of investigations, then the indicator should be reported less frequently (quarterly/annually).

Considerations

While an average (or mean) value is easy to calculate, its major disadvantage as the measurement of an indicator is that it is affected by extremely high or low values (i.e., outliers). Capturing the range (minimum, maximum) of days along with the average would assist countries in understanding the variation in scenarios.

Alternatively, program managers and evaluators may wish to calculate the median value instead of the mean. Median is a value in an ordered set of values below and above which there is an equal number of values or is the arithmetic mean of the two middle values if there is no one middle number.[63] To calculate the median value for this indicator, calculate the number of days from the time a suspected HPAI outbreak is detected to the collection of biological specimens for HPAI diagnosis for each instance, and find the middle number. If the number of instances is an even number (i.e., there are two middle numbers), take the middle pair of numbers and calculate the mean of the two numbers to obtain the median number. Long median value may be due to delay in initiating an investigation or due to slowness in conducting the investigation. A major advantage of the median is that an extreme value would not affect the median value. However, if there were many data points from which to calculate the median value, the calculation would be time consuming. Furthermore, if any of the values around the middle of the distribution alters even slightly, then the median would be affected (versus the average, which is less affected by the change in values around the middle of the distribution).

A challenge in measuring this indicator is the difficulty in ascertaining the timing of the onset of a suspected HPAI outbreak in poultry or wild birds, which is often not known. The limitation of this indicator is that it does not measure if the specimen is actually sent to the laboratory and how long it takes the specimen to arrive at the laboratory.

Revision History

First published June 2007 as indicator 4.2.7. Revised in current edition.

Last revised September 2008

[63] www.webster.com

4.4 Biosecurity

4.4.100 Total Number of Sector 1 and 2 Producers Trained in Biosecurity Concepts and Measures

Additional Indicator

Definitions

Total number of sector 1 and 2 producers trained on biosecurity concepts and measures during the reporting period.

Disaggregation: Trainee: sex, primary work location (specific district or province name)

What It Measures

This indicator tracks the number of sector 1 and 2 producers trained on biosecurity concepts and measures.

Measurement Tools

Training attendance records

How to Measure It

Review training attendance records at the ministry of agriculture or its departments.

Frequency

Training information is collected continuously and reported at the national level at the end of the reporting period.

Considerations

This indicator provides a crude assessment of whether a program/project is meeting its target or is making progress over time in terms of improving sector 1 and 2 producers' knowledge of biosecurity concepts and measures. A major limitation of this indicator is that it provides no measurement of whether the training enhanced the trainees' knowledge and skills to ensure biosecurity on sector 1 and 2 farms. An assessment of biosecurity measures implemented at sector 1 and 2 farms requires direct observation at these farms. Program managers and evaluators interested in monitoring the proportion of sector 1 and 2 producers implementing biosecurity measures may calculate this indicator by obtaining the list of all sector 1 and 2 producers in the country and conducting direct observation at the farms (see indicator 4.4.200).

Revision History

First published June 2007 as indicator 4.3.1. Revised in current edition.

Last revised September 2008

4.4.200 Proportion of Sector 1 and 2 Farms That Meet Biosecurity Recommendation/Guidelines Appropriate to the Sector

Additional Indicator

Definitions

Proportion of farms in a country that are implementing sector-specific biosecurity measures appropriate to the sector.

Numerator: Number of sector 1 and 2 farms in a country that are implementing national biosecurity standards

Denominator: Total number of sector 1 and 2 farms in a country

Disaggregation: Sector; region

What It Measures

This indicator measures the extent to which farms in a country are implementing biosecurity measures according to national biosecurity standards.

Measurement Tools

- Visits to commercial poultry farms
- Evidence of annual certification from poultry biosecurity auditors
- Recommended biosecurity measures at sector 1 and 2 farms include:[64]
    - Place barriers between farms and their outside environments.
    - Control movement of people, animals, and inanimate objects entering and leaving farms
    - Restrict farming of multiple species.
    - Limit or eliminate raising and transporting of poultry with other birds and animals.
    - Chicken feces should be used only as fertilizers or as livestock feed after appropriate treatment.
    - Restrict multiage poultry farms, and, where possible, operate on an "all-in, all-out" basis.

[64] FAO/OIE/WHO. (2005). *FAO/OIE/WHO Consultation on Avian Influenza and Human Health: Risk Reduction Measures in Producing, Marketing, and Living with Animals in Asia.* Retrieved March 2007, from http://www.fao.org/ag/AGAinfo/subjects/documents/ai/concmalaysia.pdf. (See recommendation numbers 24–27 for recommended biosecurity measures at sector 1, 2, and 3 farms.)

How to Measure It

Use a checklist of national biosecurity standards for sector 1 and 2 farms to assess whether the measures are being practiced.

More information on global biosecurity standards can be found in the Terrestrial Animal Health Code (2007) section on biosecurity, which can be found at http://www.oie.int/eng/normes/mcode/en_chapitre_3.4.1.htm.

Frequency

Monitoring visits to commercial poultry farms may be carried out on a regular basis (e.g., every 6–12 months) and more frequently in high-risk areas.

Considerations

Given that lists of sector 1 and 2 farms are generally available in countries, measurement of this indicator is fairly straightforward and effortless. However, in countries where the share of sector 1 and 2 farms in the agriculture sector is small (e.g., less than 20 percent), measurement of this indicator by itself does not provide a measure of how secure poultry farms are in the country.

Revision History

First published June 2007 as indicator 4.3.2. Revised in current edition.

Last revised September 2008

4.4.300 Total Number of Animal Health Workers Trained in Biosecurity Concepts and Measures

Additional Indicator

Definitions

Total number of animal health workers trained on biosecurity concepts and measures during the reporting period.

Disaggregation: Trainee: administrative level (community, facility, district, province, national), affiliation (government, private sector, NGO), sex, primary work location (specific district or province name)

What It Measures

In many of the countries in the region, the vast majority of the farms are in sectors 3 and 4. Given the risk and concern of biosecurity breaches, particularly at sector 3 farms, improving knowledge among farm owners and ensuring that biosecurity measures are in place at sector 3 and 4 farms are crucial. However, it is difficult to accurately identify all sector 3 and 4 farm owners in a country and to assess whether biosecurity measures are implemented at each farm.

Animal health workers are in contact with sector 3 and 4 farmers at the community level, and through them the information regarding biosecurity concepts and measures is imparted. Training programs are being implemented for animal health workers in a number of countries. This indicator tracks the number of animal health workers trained in biosecurity concepts and measures.

Measurement Tools

Training attendance records

How to Measure It

Review training attendance records at the ministry of agriculture or its departments.

Frequency

Training information is collected continuously and reported at the national level at the end of the reporting period.

Considerations

This indicator provides a crude assessment of whether a program/project is meeting its target or is making progress over time in terms of building the knowledge base of animal health workers who are in contact with sector 3 and 4 farm owners on the topic of biosecurity measures. However, this indicator by itself does not provide a measure of whether the content of the training provided is communicated to sector 3 and 4 farm owners. Animal health workers' performance assessment requires direct observation at the work site to observe what and how well biosecurity concepts and measures are communicated to sector 3 and 4 farm owners.

Furthermore, this indicator does not measure the geographical coverage provided by trained animal health workers. Countries may want to adopt an indicator that specifies the proportion of subnational units that have an animal health worker trained on biosecurity concepts and measures.

It is important to monitor and evaluate knowledge and practices pertaining to biosecurity concepts and measures among sector 3 and 4 farm owners. Estimates can be obtained by conducting surveys among sector 3 and 4 farm owners. Readers are referred to chapter 6 of this document for further information on this topic. Readers may also refer to the biosecurity checklist for sector 3 farms below to assess farms.[65]

Revision History

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Last revised September 2008

[65] Prepared by FAO, shared by Abt Associates, obtained March 2007.

Checklist of Biosecurity for Sector 3 Farms

No.	Item	Assessment
1	**Location of Farm and General Information**	
1a	Name of farmer/owner	
1b	Number of people living on farm	
1c	Name of community	
1d	Address	
1e	Farm area specifications	Inside densely habitated area/rural area with some habitation/isolated area/distance to the nearest farm
1f	Age of farm	
1g	Other activities on farm	Trading/hatching/business/selling meat/eggs
1h	Last visit of veterinarian to farm (with reason for the visit)	
1i	Sell live birds	Sell live birds (y/n); estimate number per animal species per year; sell birds on local market (y/n) or to traders (y/n)
1j	Manure deposit	On far or outside (if on farm, any measure taken to prevent spreading to environment/contact with other animals)
2	**Entrance to Farm**	
2a	Proper fencing	
2b	Proper closable gate(s)	
2c	Pavement	E.g., concrete, tarmac, stones
2d	Sign present on outside of gate	E.g., no free entrance for visitors; ring bell
2e	Sign present to: change boots, clothes, wash hands BEFORE and AFTER	
2f	Presence of free-ranging animals near the farm	Specify species and estimate numbers.
3	**Farm Composition**	
3a	Farming animal species present	E.g., chickens, ducks, pigs, goats, cows, donkeys
3b	Farm purpose of animals	E.g., egg production, for consumption of hatching, meat type, breeding animals, labor animals, pets
3c	Number(s) of animals on farm	For each animal species, numbers present and farm capacity available
3d	Age(s) of present animals	For each animal species and breed present
3e	Origin of different species	E.g., if different breeds or ages present
4	**Farmyard**	
4a	General impression	Clean/can do better/big mess
4b	Storage manure	Present or not (if present, specify location, storage conditions, and coverage/floor type)

No.	Item	Assessment
4c	Free-ranging animals and pets present	State animal species and estimate numbers.
4d	Pets have access to farm houses.	
4e	Visible signs related to biosecurity	
4f	Ponds	Pond present on or near farm; use pond for ducks or other reason, pond fenced adequately, accessible for other wild animals and farms.
4g	Paddy fields	Access present to rice paddy fields.

Checklist of Biosecurity for Sector 3 Farms continued

Housing

Farm Houses	Animal Species Present	No. of Animals for Each Species	Age(s) of Animals	Concrete Floor (y/n)	Wall (stone/wood/wire)	General Quality of Housing G/I/B	Feeding and Water G/I/B	Footbath at Entrance of House (y/n)	Chemical in Footbath	Adequate Living Environment for Animals (more details)
1										
2										
3										

No.	Item	Assessment
6	**Animal Care**	
6a	Feed	Buys commercial feed or prepares own (if commercial, during whole production cycle or partly)
6b	Water	What water source for animals (e.g., pond, own well, community network)
6c	Newly arrived animals	Quarantined used for newly arrived birds (y/n); if yes, give details and arguments.
6d	Allows mix-up of different ages	Yes/no
6e	Allows mix-up of different species	Yes/no (note: mix-up may be usual farm practice)
6f	Contacts with other animal species	Allow other animal species inside/outside poultry houses
6g	Improvement of farming`	Where does farmer retrieve information from for his farm to improve farming?
6h	Disposal of dead birds	What does farmer do with dead birds found in the flock?
6i	Actions on sick birds	What action (and when) does farmer take for sick animals; does he get help from veterinarian or local veterinary worker?
6j	Pests	Evidence of pests (e.g., insects, rodents)? What measures are taken to control pests?
6k	Cleaning and disinfection	What actions does farmer take after birds are sold or slaughtered to prepare for next flock? How many times a year does the farmer clean/disinfect?
6l	Litter disposal	What and when does farmer move litter from farm to land?
6m	Contact with commercial companies	What contacts with commercial companies (feed/animals/selling eggs, advice)?
6n	All-in, all-out system	Farmer has all-in, all-out system (i.e., one age, one species, and one origin of animals) (y/n).
7	**Animal Health**	
7a	HPAI	Farmer informed on dangers of new outbreaks (y/n) Where to get information on HPAI? What precautionary measures were implemented on his farm for HPAI? Informed on dangers of different animal species on farm (y/n); does he comply and in what way? When were the animals vaccinated on his farm (only HPAI)/how many animals?

No.	Item	Assessment
		Opinion recontrol of HPAI Did farmer suffer losses due to HPAI outbreaks in the last three years? Is farmer willing to improve on HPAI precautionary measures?
7b	Other disease	What other poultry diseases did farmer experience?
7c	Hatching	Where do/did new birds come from? Own hatching/village/traders/commercial companies (name)? If farmer is hatching, what precautionary measures does he take before, during, and after hatching? How many eggs per hatch/how many hatches per year? Hatches chicken and ducks for own farm or also for others? Can farmer mention diseases that go from parent flock to newly hatched animals? What action to prevent this?
7d	Disease prevention	What prophylactic medication is given? Who advises farmer on disease and prevention? Who provides boots or clothes; if not why not? Does farmer wash hands before or after contact with poultry; does he use soap? Do (can) visitors wash hands before or after visiting the farm (with/without soap)? What visitors are allowed to come into contact with farmer's animals? What visitors are NOT allowed to come into contact with farmer's animals?
7e	Curative treatments	Does he (or veterinarian) apply disinfectant on farm or near it? If yes, what chemical and concentration used? Measures present to avoid contact with wild birds What curative treatments were given? How often and for how many animals? Who will help farmer on this subject?
8	**Awareness—Farmer**	
8a	Farmer asked you	Reasons to enter farm (y/n) If earlier visits to other farms were made (y/n) If precautionary measures were used (y/n)
8b	Farmer provided	(Clean) boots or farm clothing to wear during visit (y/n) Good quality information (y/n) Used precautionary measures himself before entering different houses (y/n)
8c	Farmer allowed	To enter poultry houses without precautionary measures (y/n)

4.4.400 Proportion of Targeted Markets That Are Practicing Biosecurity According to Best Practices

Core Indicator

Definitions

Proportion of targeted markets that are implementing biosecurity measures according to best practices during the reporting period.

Numerator: Number of targeted markets in a country that are implementing biosecurity measures according to best practices during the reporting period

Denominator: Total number of targeted markets in a country

- Targeted markets are defined as markets that are 1) considered at high risk because of either the presence of risk factors (including selling of live poultry and slaughtering of poultry in an open environment) or the previous experience of outbreaks occurring at the sites or 2) defined by donors or their partners as their intervention sites.
- Best practices are defined as measures recommended by FAO/OIE/WHO (see the items on the checklist under Measurement Tools and the following reference).[66]

Disaggregation: Type of market

What It Measures

Reducing the risk of a HPAI outbreak can be achieved by 1) modifying farming practices to limit viral spread and 2) improving hygiene and animal management and handling practices at markets where poultry is sold. This indicator measures the extent to which biosecurity measures are being implemented at targeted markets.

Not all countries in the region have projects targeting markets. This indicator is a core indicator for countries where there are projects with markets as intervention sites to improve biosecurity.

[66] FAO/OIE/WHO. (2005). *FAO/OIE/WHO Consultation on Avian Influenza and Human Health: Risk Reduction Measures in Producing, Marketing, and Living with Animals in Asia*. Retrieved March 2007, from http://www.fao.org/ag/AGAinfo/subjects/documents/ai/concmalaysia.pdf. (See recommendation number 28.)

Measurement Tools

No tool exists.

Checklist of biosecurity measures at markets that includes the following:[67]

- *Implement measures to reduce the risk of fecal contamination of roads and the area around markets when cages and poultry are transported to the market and off-loaded.*
- *Separate species into different cages at markets.*
- *Monitor birds in the market to assess their health or disease status.*
- *Separate the poultry-selling area from other areas of the market.*
- *Empty market of all animals on a regular basis for a defined period for cleaning and disinfection.*
- *Establish facilities and structures for cleaning and disinfection of transport cages before they are taken back to farms.*
- *Do not accept sick birds into the market.*
- *Allow only one-way movement from farm to market to slaughterhouse; no return of birds to farms.*

How to Measure It

Review the list of targeted markets maintained at the ministry of agriculture and its departments and carry out on-site visits for evidence of the implementation of biosecurity measures at the markets.

Frequency

Given the risk of HPAI infection at market sites, the assessment should be carried out frequently until biosecurity measures are in place.

Considerations

There is a considerable amount of recognition regarding the importance of improving biosecurity at markets to reduce the risk of spread of HPAI, and resources have been mobilized to improve the environment.

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[67] FAO/OIE/WHO. (2005). *FAO/OIE/WHO Consultation on Avian Influenza and Human Health: Risk Reduction Measures in Producing, Marketing, and Living with Animals in Asia.* Retrieved March 2007, from http://www.fao.org/ag/AGAinfo/subjects/documents/ai/concmalaysia.pdf. (See recommendation number 28.)

Given the evolving nature and the epidemiology of the disease, the knowledge regarding best practices may change over time, affecting what is included in the numerator of the indicator. When using this indicator to track changes over time, program managers and evaluators should be clear about the definition of the indicator at the time of each assessment.

Revision History

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4.5 Sample Submission and Laboratory Capacity

4.5.100 Total Number of People Trained in Laboratory Diagnosis for Highly Pathogenic Avian Influenza

Core Indicator

Definitions

Number of people trained in the field of laboratory diagnosis for HPAI during the reporting period.

Disaggregation: Trainee: administrative level (community, facility, district, province, national), affiliation (government, private sector, NGO), sex, primary work location (specific district or province name)

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator tracks the number of people trained in laboratory diagnosis for HPAI.

Measurement Tools

Training attendance

How to Measure It

Measurement of this indicator requires a review of training records at the ministry of agriculture.

Frequency

Training logs are maintained continuously. Reporting at the national level is done quarterly. The national level reports the number annually.

Considerations

The number of people trained is only one indication of human capacity to conduct laboratory diagnosis for poultry disease. The people trained must then be placed in positions to conduct the laboratory diagnoses and their distribution must be appropriate to cover all poultry-disease-diagnosing laboratories. Training is only one component in the capacity to conduct any function. A person also needs the materials, motivation, and authority to perform a task. Furthermore, to measure a trained individual's competencies on the job, observation of performance/skills on site is required, which may not always be possible.

Furthermore, this indicator does not measure the geographical coverage provided by trained individuals. Countries may want to adopt an indicator that specifies the proportion of subnational units that have an individual trained in the laboratory diagnosis for HPAI.

Revision History

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4.5.200 Existence of an Inter-Laboratory Quality Assurance System for Highly Pathogenic Avian Influenza

Core Indicator

Definitions

Existence of an inter-laboratory quality assurance system for HPAI.

An inter-laboratory quality assurance system exists if:

- National quality assurance guidelines have been disseminated to all laboratories.
- Personnel from all laboratories have been trained on the guidelines.
- Quality assurance systems are functioning in all laboratories.
- Supervision is taking place.

Yes: There is evidence that all elements are in place.

No: There is evidence that one or more of the elements are not in place. “No” answers should be qualified with what element is not present.

What It Measures

Ideally, all laboratories should achieve an acceptable level of accuracy and consistency in the assays that they perform, according to national SOPs. This indicator measures the extent to which an inter-laboratory quality assurance system is being implemented in the laboratories, either nationally or, for countries with only one laboratory, with international reference laboratories.

Measurement Tools

No tool exists.

Laboratory quality assurance system checklist that itemizes the components in the categories listed above

How to Measure It

In order to measure this indicator, there needs to be a list of all the laboratories in the country, and all these laboratories need to be assessed. The laboratory quality assurance system checklist can be used as part of routine supervisory visits or as part of a facility survey in which all laboratories are visited.

Frequency

The frequency of assessment depends on the variability expected (if quality assurance is being gradually phased in, then change can be expected in frequent assessments) and on the method of assessment (if supervisory visits are used, the frequency would be greater than if laboratory assessment is conducted).

Considerations

As defined, this indicator only measures if the system exists. It does not measure the quality or effectiveness of the system. Given the strictness of the elements required, it may be that a "yes" for this indicator is never achieved. Consider two alternative indicators: Existence of a Plan for a National Inter-Laboratory Quality Assurance System and Proportion of Laboratories Meeting Inter-Laboratory Quality Assurance System Standards.

Revision History

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4.5.300 National Laboratory Adheres to Biosafety Guidelines

Core Indicator

Definitions

A national laboratory collecting and processing biological specimens either for on-site HPAI testing or for sending out for testing meets minimum biosafety standards according to FAO's Guiding Principles for Laboratories.

Yes: There is evidence that a national lab that collects and processes biological specimens for HPAI testing adheres to biosafety guidelines.

No: There is no evidence that a national lab that collects and processes biological specimens for HPAI testing adheres to biosafety guidelines. "No" answers should be qualified with which element is not present.

What It Measures

- FAO's Guiding Principles for Laboratories sets out minimum requirements for national laboratories, which includes biosafety guidelines. This indicator measures the extent to which a country has a national laboratory with capacity to process biomedical (whether human or animal) specimens safely. Safely processed specimens reduce the risk of pathogen transmission.
- If resources are available, subnational labs should be encouraged to reach the national lab requirement level. Laboratories include national and subnational reference laboratories, private and public laboratories, and veterinarian and hospital laboratories (which process human specimens).

Measurement Tools

No tool exists.

- *FAO's Guiding Principles for Laboratories/Biosafety Guidelines*
- *Checklist of biosafety features used during on-site assessment of laboratory. SPA*[68] *has questions related to the minimum set of laboratory infection prevention standards and the following standard indicator:*

[68] For more information on Service Provision Assessment, go to http://www.cpc.unc.edu/measure/publications/html/ms-02-09-tool06.html.

Facility laboratory meets minimum standards for infection prevention and laboratory diagnostics	• Facility has a laboratory where: i) Infection control conditions are present. ii) The laboratory meets minimum infrastructure requirements. iii) There is at least one laboratory qualified (country-specific definition may vary by level of facility; laboratory assistant may be accepted) staff who has received in-service/preservice training related to the work during the previous 12 months. iv) Lab has functioning microscope and glass slides. • Infection control conditions: Soap and running water, sharps box, latex gloves, and chlorine-based disinfectant are present in all assessed laboratories within the facility. • Minimum infrastructure conditions: All laboratory rooms have doors and windows that are not broken and can be locked, the counters and room are reasonably clean (using the question described in notes), and there are no used/unprotected sharps visible.

How to Measure It

In order to measure this indicator, the laboratory biosafety assessment checklist can be used as part of routine supervisory visits or as part of a facility survey in which all laboratories are visited. If a sample of laboratories is assessed, then the wording of the indicator needs to be changed to “Number of Laboratories in Country That Were Assessed and That Meet Biosafety Guidelines” or “Proportion of Assessed Laboratories That Meet Biosafety Guidelines.”

Frequency

If supervisory visits are a source of information, this should be collected and reported in line with the frequency of visits. If a national facility survey in which all laboratories are assessed is used, then the survey should be done every three to five years.

Considerations

If biosafety standards exist, then laboratories that process biological specimens can be assessed against those standards. It is assumed that laboratories adhering to biosafety standards are less likely to spread pathogens (including non-influenza pathogens).

Among the limitations of this indicator are its cross-sectional nature and the cost of assessing all laboratories. Since the assessment is done at a point in time, there may be lapses in standards that occur unrecognized. These lapses may result in pathogen transmission. Depending on how many laboratories process biological specimens, the exercise to gather the information for this indicator will be costly.

Revision History

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4.5.400 Number of Laboratories That Have the Capacity to Undertake the Range of Highly Pathogenic Avian Influenza Diagnostic Tests

Core Indicator

Definitions

Total number of laboratories that have different capacity levels to undertake HPAI diagnostic tests.

Disaggregation: Level of diagnostic capacity

- Factors determining laboratory capacity to carry out testing include:
  - Testing equipment and supplies
  - Biosafety facility
  - Documented testing protocols/procedures
  - Documented quality assurance protocols/procedures
  - Trained staff
  - Mechanism for logging in and tracking specimens, results and notification (e.g., a computerized system, using bar codes)
  - Participation in an external quality assurance/quality control (QA/QC) program.

Levels of diagnostic capacity are:

- Having a biosafety level (BSL) 3 facility with capacity for virus isolation and/or real-time real-time polymerase chain reaction (PCR) and participating in an external QA/QC program
- Having a BSL-3 facility with capacity for virus isolation and/or PCR but not participating in an external QA/QC program
- Having a BSL-2 facility and/or biosafety cabinet class 2 with capacity for virus isolation/real-time PCR/conventional PCR and participating in an external QA/QC program
- Having a BSL-2 facility and/or biosafety cabinet class 2 with capacity for virus isolation/real-time PCR/conventional PCR but not participating in an external QA/QC program
- No biosafety cabinet class 2 or no capacity for PCR

What It Measures

According to the FAO Guiding Principles for Laboratories, each country should have a national laboratory with the capacity to undertake the recommended range of HPAI diagnostic tests. This indicator measures the extent to which the country has laboratories to carry out the recommended range of HPAI diagnostic tests effectively to prevent and control HPAI in poultry and wild birds.[69] FAO's recommendations are:

Laboratory Designation	Recommended Minimum Capability	Ideal Additional Capability
Subnational level	Serology by HI if vaccination is used Rapid antigen detection test (IFAT or commercial antigen detection kit) Facilities for conducting postmortem examination	Virus isolation Histopathology Gene sequence detection by PCR or RRT PCR C-ELISA for serology on waterfowl
National level	Virus isolation with HA typing for H5, H7, and H9 Serology for H5 by HI Facilities for conducting postmortem examination Rapid antigen detection test (IFAT or commercial antigen detection kit)	Neuraminidase typing Histopathology and immunohistochemistry Additional ELISA serology RT PCR for H5, N1, and M specific gene sequences (RRT PCR for H5, N1, and M specific gene sequences)
Regional network level	System to accept samples from national laboratories in network Virus isolation with full H and N sub-typing capability RT and RRT PCR for H5 and N1 HI and C-ELISA for serology Capacity to produce HI reagents. Access to gene sequence and analysis capability Training facility	Capability to conduct QA program and proficiency testing
OIE/FAO reference laboratory	System to accept samples Virus isolation with full H and N sub-typing capability RT and RRT PCR HI and NI serology and ELISA for serology Gene sequencing IVPI testing (P3) Live bird studies (P3) Reagent production Capability to conduct QA and proficiency testing Training facility	

[69] For the recommended range of HPAI diagnostic tests, see FAO. (2004). *Guiding principles for highly pathogenic avian influenza surveillance and diagnostic networks in Asia.* Retrieved March 2007, from http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/Guiding percent20principles.pdf.

Measurement Tools

No tool exists.

Laboratory HPAI testing capacity checklist that itemizes the components in the categories listed above or a laboratory facility survey adapted for HPAI

How to Measure It

A laboratory assessment of a national laboratory that claims to do HPAI testing needs to be conducted in order to verify that the laboratory has the capacity to do the testing. The checklist could also be incorporated into routine supervisory visits.

Frequency

The frequency of assessment depends on the number of laboratories that need to be assessed (more laboratories would be assessed less frequently) and the variability expected (if stockouts of reagents are expected or if staff turnover and training is frequent, then assessment would be more frequent).

Considerations

A country may decide to have only one reference lab at the national level or one reference lab for each subnational region.

This indicator does not give an indication of the appropriateness of the geographical location (or, in countries where there are multiple labs, the geographical distribution of laboratories) or the accuracy of testing.

Revision History

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4.5.500 Existence of a Mechanism to Ship Highly Pathogenic Avian Influenza Specimens to Reference/International Laboratories

Core Indicator

Definitions

Existence of a system to ship HPAI specimens to reference or international laboratories

Elements of the system include:

- Infrastructure
- Certified personnel
- Documented procedure
- Shipping material.

Yes: There is evidence that all elements are in place.

No: There is evidence that one or more of the elements are not in place. "No" answers should be qualified with the element that is not present.

What It Measures

It is crucial that countries where laboratories with the capacity to undertake the diagnosis of specimens collected from birds suspected of HPAI infection do not exist have a system in place to not only collect samples in-country but also to be able to ship the samples to reference laboratories in the region or international laboratories for further characterization of the virus. This indicator measures a country's capability to access external laboratory resources in order to respond to an HPAI outbreak.

Measurement Tool

No tool exists.

HPAI specimen shipping checklist

How to Measure It

Measurement of this indicator requires a review of a system or an infrastructure available in a country to determine whether the country has all the elements required to ship HPAI specimens to reference/international laboratories.

Frequency

Annually

Considerations

This indicator does not capture the speed or efficiency with which HPAI specimens are collected and shipped to reference/international laboratories.

Revision History

First published June 2007 as indicator 4.4.5. Revised in current edition.

Last revised September 2008

4.5.600 Proportion of Isolates That Require Further Characterization per FAO Guidelines/Criteria for Which Specimens Were Sent to the Reference/International Laboratories for Further Characterization During the Reporting Period

Additional Indicator

Definitions

Proportion of isolates that require further characterization per FAO guidelines/criteria for which specimens were sent to the reference/international laboratories for further characterization during the reporting period.

Numerator: Number of isolates that require further characterization per FAO guidelines/criteria for which specimens were sent to the reference/international laboratories for further characterization

Denominator: Number of isolates that require further characterization per FAO guidelines/criteria

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

It is crucial that countries where laboratories with the capacity to undertake diagnosis of specimens collected from birds suspected of HPAI infection do not exist have access to reference laboratories in the region or international laboratories that are able to determine the characterization of the virus. Tracking the number of specimens sent to reference or international laboratories will provide an indication of a country's capability to respond to an HPAI outbreak.

Measurement Tools

- Logbooks and records maintained at laboratories at the ministry of agriculture in countries
- Logbooks and records maintained at reference/international laboratories

How to Measure It

A review of logbooks and records maintained at laboratories in country, at the ministry of agriculture, and at reference/international laboratories is required to determine the number of specimens sent and the timing of when the specimens were sent to reference/international laboratories for further characterization during a specified period.

Frequency

Every three months

Considerations

Tracking the number of specimens sent to reference or international laboratories provides an indication of a country's capability to respond to HPAI outbreak and evidence for Indicator 4.5.500, Existence of a Mechanism to Ship HPAI Specimens to Reference/International Laboratories. The measurement of this indicator should always be 100 percent.

However, if the total number of specimens collected in a country remains unknown (due to poor record keeping, lack of local laboratory capacity and resources, etc.), tracking this indicator alone is not sufficient to establish that a country has the capacity to send specimens to reference or international laboratories.

Furthermore, governments may be reluctant to send specimens to reference or international laboratories for further characterization given the possible political consequences.

Revision History

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Last revised September 2008

4.5.700 Average Number of Days between Receipt of Biological Specimen in Laboratory for Highly Pathogenic Avian Influenza Testing and Sending of the Results to the Requester

Additional Indicator

Definitions

Average number of days between receipt of biological specimen in laboratory for HPAI testing and sending of the results to the requester during the reporting period.

Disaggregation: Type of testing

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator measures the speed with which laboratories process a biological specimen for HPAI testing.

Measurement Tool

No tool exists.

A standard reporting form is needed to record and submit laboratory test results at the national level. The form should contain an item on the type of test used to allow calculation by type of testing.

How to Measure It

Review records maintained at each laboratory to examine the dates when specimens were received and results were sent to the requester in order to calculate the average number of days.

Measurements at each laboratory can be used to calculate a national median.

Frequency

Frequency of reporting depends on the number of HPAI tests done (the more done, the more frequently it should be reported), the frequency of laboratory reporting at the national level on other issues, the variability expected (the more variability, the more frequent), and the expected rapidity of response (the more rapid, the more frequent).

Considerations

The strength of this indicator is that it gives an indication of laboratory performance. In this case, the process should take a standard amount of time, which can be used as a benchmark. That standard amount of time would include the allowable time for batching of specimens (the time allowed to hold a specimen until a threshold number of specimens is reached). Laboratories that fall outside of that time benchmark can be singled out for further investigation. While this indicator provides a measure of laboratory capacity, it should be noted that the amount of time required for the process varies by which type of HPAI testing is implemented.

While an average (or mean) value is easy to calculate, its major disadvantage as the measurement of an indicator is that it is affected by extremely high or low values (outliers). Capturing the range (minimum, maximum) of days along with the average would assist countries in understanding the variation in scenarios. Alternatively, program managers and evaluators may wish to calculate the median value instead of the mean.

Median is a value in an ordered set of values below and above which there is an equal number of values or the arithmetic mean of the two middle values if there is no one middle number.[70] To calculate the median value, calculate the number of days from the time when specimens were received and results were sent to the requester, and find the middle number. If the number of instances is an even number (i.e., there are two middle numbers), take the middle pair of numbers and calculate the mean of the two numbers to obtain the median number.

A major advantage of the median is that an extreme value would not affect the median value. However, if there were many data points from which to calculate the median value, the calculation would be time consuming. Furthermore, if any of the values around the middle of the distribution alters even slightly, then the median would be affected (versus the average, which is less affected by a change in values around the middle of the distribution).

The limitation of this particular indicator is that the mean (or median) number of days a specimen spends in the laboratory is not epidemiologically useful. What is more relevant for decision making is the time from when a specimen is obtained to the time the result is returned.

Revision History

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Last revised September 2008

[70] www.webster.com

4.5.800 Proportion of Biological Samples from Suspected Cases of Highly Pathogenic Avian Influenza That Are Received at Designated Laboratories of Sufficient Quality to Be Tested

Additional Indicator

Definition

The proportion of biological samples from suspected cases of HPAI that are received at designated laboratories and are of sufficient quality to be tested.

Numerator: The number of biological samples from suspected cases of HPAI that are received at designated laboratories and are of sufficient quality to be tested

Denominator: The total number of biological samples from suspected cases of HPAI that are received at designated laboratories

Sufficient quality to be tested means that the sample could be tested and a result was obtained either confirming or disproving HPAI.

What It Measures

Many individual countries have established protocols and SOPs on how to collect biological samples. This indicator measures the extent to which the established procedures for collecting specimens are being followed. It enables the program to measure the quality of the collection system for samples of HPAI.

Measurement Tools

Policy documents, logbooks, lab records, shipping documents

How to Measure It

Data from logbooks and lab records should be checked, and preferably some form of quality assurance sampling could be used to verify logbook data.

Frequency

Quarterly if cases are frequent, as the number of samples would increase. Semiannually if there are fewer cases in the country.

Considerations

This indicator will capture the general extent to which procedures for collection are followed but would not show specifically where the shortfalls occurred. A special study or system audit would be required to pinpoint the weak links in the system and design improvements.

Revision History

First published September 2008.

Last revised September 2008

4.5.900 Proportion of Biological Samples of Suspected Cases of Highly Pathogenic Avian Influenza Received at Designated Laboratories with Appropriate Biohazard Packaging

Additional Indicator

Definition

The proportion of biological samples of suspected cases of HPAI that are received at designated laboratories with appropriate biohazard packaging.

Numerator: The number of biological samples of suspected cases of HPAI that are received at designated laboratories with appropriate biohazard packaging

Denominator: The total number of biological samples of HPAI that are received at designated laboratories

Many individual countries have established protocols on how to ship biological samples. Any reporting should explicitly state what standards are being followed, and the same set of standards should be used each time this indicator is calculated.

What It Measures

This indicator measures the extent to which designated laboratories are following established biosafety procedures for shipping specimens. It enables the program to measure the quality of its biosafety implementation.

Measurement Tools

Policy documents, logbooks, lab records, shipping documents

How to Measure It

Data from logbooks and lab records should be checked, and preferably some form of quality assurance sampling could be used to verify logbook data.

Frequency

Quarterly if cases are frequent, as the number of samples would increase. Semiannually or annually if there are fewer cases in the country.

Considerations

This indicator will capture the general extent to which procedures for shipping are followed but would not show specifically where the shortfalls occurred. A special study or system audit would be required to pinpoint the weak links in the system and design improvements.

Revision History

First published September 2008.

Last revised September 2008

4.5.1000 Planned Highly Pathogenic Avian Influenza Tests Conducted

Additional Indicator

Definition

Proportion of planned HPAI tests that were conducted during the reporting period.

Numerator: Number of HPAI tests conducted during a reporting period

Denominator: Number of HPAI tests planned during a reporting period

Disaggregation: Type of HPAI test, source of test (animal, outbreak or not), type of laboratory

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator measures whether laboratories are meeting HPAI testing targets. Planned targets should be set to reflect HPAI testing for routine surveillance, for potential animal outbreaks, and for animal tests that would be performed in the event of human disease symptoms that trigger an investigation, including HPAI testing.

Measurement tools

No tool exists.

The source of the numerator is the routine (monthly/quarterly) HPAI testing reports that are sent to the national level.

The source of the denominator would be laboratory workplans and targets and/or HPAI program workplans and targets.

How to Measure It

Compare actual HPAI testing numbers to target numbers.

Frequency

The frequency of reporting on this indicator depends on the frequency of reporting (monthly/quarterly) and the period that the target covers (monthly/quarterly/yearly) and on the rapidity of response needed for very low proportions (triggering an investigation into why) or very high proportions (triggering a potential shortage of HPAI testing materials).

Considerations

If targets are set properly, this indicator can give an indication as to whether the surveillance system is working and laboratory capacity is adequate to process samples. A low proportion could trigger an investigation into why the surveillance system is not sending specimens for testing. High proportions can indicate that there is over-testing, an outbreak, or inappropriate targets and can signal a need for early ordering of supplies. This indicator is only as good as the reporting system through which laboratories report at the national level and as good as the targets that are set.

Revision History

First published June 2007 as indicator 4.4.8. Revised in current edition.

Last revised September 2008

4.5.1100 Proportion of Investigations of Suspected Highly Pathogenic Avian Influenza Outbreaks in Birds That Are Supported by Laboratory Tests

Core Indicator

Definitions

Proportion of investigations of suspected HPAI outbreaks in birds that are supported by laboratory tests during the reporting period.

Numerator: Number of investigations of suspected HPAI outbreaks in birds that had laboratory HPAI testing during the reporting period

Denominator: Number of investigations of suspected HPAI outbreaks in birds during the reporting period

- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

Correct identification of HPAI during a suspected outbreak in birds is one factor in limiting the prevalence of HPAI in birds. This indicator measures whether HPAI testing was carried out during such an outbreak investigation.

Measurement Tools

No tool exists.

Outbreak investigation form for suspected HPAI outbreak in birds

How to Measure It

Review the outbreak investigation form for suspected HPAI outbreak in birds to extract the numerator and denominator.

Frequency

Suspected HPAI outbreak in birds investigation forms should be submitted continuously at the national level. The frequency with which the information for this indicator should be extracted and reported depends on the frequency of investigations. If there are many investigations, the indicator should be reported frequently (monthly/quarterly); if there are a limited number of investigations, then less frequently (quarterly/annually).

Considerations

The strength of this indicator is that it measures the completeness of an outbreak investigation and that it can be used to monitor the completeness of those investigations. If investigations are not complete, areas of investigation are whether the investigation team collected a biological specimen for testing, whether the specimen reached the laboratory, and whether the laboratory tested the specimen.

The validity of this indicator is limited if investigations are not conducted or if investigation forms are not submitted at the national level.

Revision History

First published June 2007 as indicator 4.4.9. Revised in current edition.

Last revised September 2008

4.6 Vaccination

4.6.100 Total Number of People Trained in Vaccination for Highly Pathogenic Avian Influenza in Poultry

Additional Indicator

Definitions

Number of people trained in implementing appropriate vaccination SOPs for HPAI control in poultry during a reporting period.

Disaggregation: Trainee: administrative level (community, facility, district, province, national), affiliation (government, private sector, NGO), sex, primary work location (specific district or province name)

What It Measures

This indicator is applicable only for countries with a vaccination policy in place. It tracks the number of people trained in vaccinating poultry to control transmission of HPAI in poultry.

Measurement Tools

Training attendance records

How to Measure It

Review training attendance records at the ministry of agriculture and its departments.

Frequency

Training information is collected continuously and is reported at the national level at the end of the reporting period.

Considerations

This indicator provides a crude assessment of whether a program/project is meeting its target or is making progress over time in terms of building the capacity of professionals working in the field of poultry vaccination. However, this indicator by itself does not provide a measure of whether the content of the training provided meets the national mandate and the changing nature of the disease. Furthermore, the unit of measurement is not uniform in that one trainee may have attended a course for one day and another may have attended a course for three months.

A major limitation of this indicator is that it provides no measurement of whether the training enhanced the trainees' skills and performance. Trainees' performance assessment requires direct observation at the work site.

Furthermore, this indicator does not measure the geographical coverage provided by trained individuals. Countries may want to adopt an indicator that specifies the proportion of subnational units that have an individual trained in vaccination for HPAI in poultry.

Revision History

First published June 2007 as indicator 4.5.1. Revised in current edition.

Last revised September 2008

4.6.200 Existence of a Comprehensive Vaccination Program for Highly Pathogenic Avian Influenza in Poultry

Additional Indicator

Definitions

The existence of a comprehensive vaccination program for HPAI in poultry using vaccines of known quality and efficacy.

Yes: Program exists and is meeting annual bird vaccination targets.
No: Vaccination program does not exist or is not functioning.

What It Measures

This indicator is applicable only for countries with a vaccination policy in place. It measures whether a country has a comprehensive vaccination program for HPAI in poultry to respond to and control bird-to-bird transmission of HPAI.

Measurement Tools

No tool exists.

Checklist of comprehensive vaccination program, including:

- *Vaccines*
- *Storage facilities*
- *Equipment*
- *Trained personnel to administer vaccines and maintain a record of coverage.*

How to Measure It

Review vaccination program documents if a vaccination program exists. Documents should be reviewed for evidence that birds are being vaccinated with an appropriate vaccine and that vaccination targets are being met.

Frequency

This indicator should be measured annually until a comprehensive vaccination program is found to exist.

Considerations

This indicator does not measure how well the vaccination program is being implemented or how well the program is reaching the high-risk areas. Indicator 4.6.400 provides a measure of whether the vaccination program in a country is being assessed for its effectiveness.

Revision History

First published June 2007 as indicator 4.5.2. Revised in current edition.

Last revised September 2008

4.6.300 Existence of a Regulatory Measure for a Comprehensive Vaccination Program in a Country

Additional Indicator

Definitions

The existence of a regulatory measure for a comprehensive vaccination program for HPAI in poultry.

Yes: Regulatory measure exists.
No: Regulatory measure does not exist.

What It Measures

This indicator is applicable only for countries with a vaccination policy in place. It measures whether a country has a regulatory measure in place to monitor a comprehensive vaccination program for HPAI in poultry to respond to and control bird-to-bird transmission of HPAI.

Measurement Tools

No tool exists.

- *Checklist of a regulatory measure includes:*
  - *Vaccine manufacturing and quality control to ensure compliance with international standards*[71]
  - *Appropriate vaccines and administration methods*
  - *Handling of vaccines during storage, delivery, and preparation*
  - *Vaccination implemented by trained vaccinators*
  - *Monitoring vaccine performance.*

How to Measure It

Review vaccination program documents for evidence that a regulatory measure for a comprehensive vaccination program exists in a country.

[71] FAO/OIE/WHO. (2005). *FAO/OIE/WHO Consultation on Avian Influenza and Human Health: Risk Reduction Measures in Producing, Marketing, and Living with Animals in Asia.* Retrieved March 2007, from http://www.fao.org/ag/AGAinfo/subjects/documents/ai/concmalaysia.pdf. For more details on international standards, see the *OIE Manual of Standards for Diagnostic Tests and Vaccines*.

Frequency

This indicator should be measured annually until a regulatory measure for a comprehensive vaccination program is found to exist.

Considerations

This indicator does not measure how well a vaccination program is being regulated or being implemented. It merely measures whether a country has a regulatory measure that includes items that are crucial for an effective implementation of a comprehensive vaccination program.

Revision History

First published June 2007 as indicator 4.5.3. Revised in current edition.

Last revised September 2008

4.6.400 Vaccination Program for Highly Pathogenic Avian Influenza in Poultry Assessed

Additional Indicator

Definitions

Country undertakes assessment of its comprehensive vaccination program for HPAI in poultry.

Yes: Program is assessed for its serological and/or virological effectiveness.
No: Program is not assessed for its serological and/or virological effectiveness.

- Frequency of the assessment may be defined by a national vaccination policy.

What It Measures

This indicator is applicable only for countries with a vaccination policy in place. Vaccination programs are monitored serologically and/or virologically to ensure their effectiveness in maintaining an adequate level of flock protection. In order to be effective, vaccination programs need to respond to the changing nature of and increase in knowledge about the disease. This indicator measures whether a country undertakes an assessment of the effectiveness of its comprehensive vaccination program for HPAI in poultry on a regular basis as determined by the country's vaccination policy.

Measurement Tools

No tool exists.

- *Vaccination program document*
- *Surveillance records.*

How to Measure It

Review vaccination program documents against poultry disease surveillance records for evidence of the implementation of an assessment.

Frequency

This indicator should be measured annually to ascertain whether an assessment of the effectiveness of vaccine programs is found to be carried out on a regular basis. If the assessment is not carried out on a regular basis, the indicator should be measured semiannually to monitor the progress.

Considerations

Measurement of this indicator by itself does not provide decision makers and program managers with the information necessary to improve the quality of a country's vaccination program. A follow-up investigation is required to determine the coverage of vaccination programs and level of flock protection. These measurements may not be practical or feasible.

Revision History

First published June 2007 as indicator 4.5.4. Revised in current edition.

Last revised September 2008

4.7 Compensation Program

4.7.100 Compensation Is Provided in a Timely Manner for Any Poultry or Other Property Destroyed as Part of a Highly Pathogenic Avian Influenza Control Campaign

Core Indicator

Definitions

Average number of days for compensation to be received.

Numerator: Sum of the days between 1) when authorities destroy birds and property (bird destruction event) and 2) when owners and other affected individuals receive compensation

Denominator: Number of bird destruction events qualified for compensation during a reporting period

Average = Numerator/Denominator

- Compensation may be monetary or in-kind, depending on a country's policy/national compensation plan.
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

Also consider: Proportion of bird destruction events that qualify for compensation in which the owners and other affected individuals receive compensation within two weeks (or other reasonable period)

What It Measures

This indicator measures the timeliness with which farmers and other affected individuals receive compensation for poultry or other property destroyed as part of a disease control campaign.

Measurement Tool

No tool exists.

Follow-up survey of owners and other affected individuals to determine when they received compensation

How to Measure It

Measurement of this indicator requires a survey of owners and other affected individuals to determine when they received compensation for the damage.

Frequency

Surveys can be conducted within a period after which a person should receive compensation but not so long after that time that recall is affected. The frequency with which the average should be calculated depends on the frequency of compensation. The minimum reporting should be annually, but quarterly or monthly may be considered.

Considerations

This indicator does not indicate whether the compensation provided represents a fair market value for the poultry or other property destroyed. Furthermore, validity of the measurement is subject to recall bias, particularly if a follow-up survey of owners and affected individuals is not conducted shortly after the individuals should have received compensation.

Revision History

First published June 2007 as indicator 4.6.1. Revised in current edition.

Last revised September 2008

4.7.200 Compensation Provided Is in Accordance with the National Compensation Plan for Poultry or Other Property Destroyed as Part of a Highly Pathogenic Avian Influenza Control Campaign

Core Indicator

Definitions

Proportion of bird destruction events for which compensation was provided in accordance with the national compensation plan.

Numerator: Number of bird destruction events that qualify for compensation for which compensation was provided in accordance with the national compensation plan during the reporting period

Denominator: Number of bird destruction events that qualify for compensation during the reporting period

- Compensation may be monetary or in-kind, depending on a country's policy/national compensation plan.

What It Measures

This indicator measures whether compensation was provided to the farmer or other impacted individuals who expected to receive compensation (monetary or in-kind) in the amount stipulated in the national compensation plan for poultry or other property destroyed as part of a disease-control campaign. The level of compensation may differ by type of farm. For example, in Laos, villagers (small-scale farm owners) were compensated at 100 percent of the market price, and state farm owners were compensated at 50 percent of the market price.

Measurement Tool

No tool exists.

Review bird destruction event administrative records.

How to Measure It

Review bird destruction event administrative records to determine the number of bird destruction events that qualify for compensation in which owners and other affected individuals receive compensation in accordance with the national compensation plan (numerator) and the number of bird destruction events that qualify for compensation (denominator).

Frequency

Frequency of reviewing bird destruction event administrative records to calculate the value of this indicator depends on the frequency of bird destruction events. If frequent events, conduct review and report indicator frequently.

Considerations

This indicator does not measure whether the compensation was delivered on time or whether the compensation plan represents a fair market value. Nor does it measure whether the owner and other affected individuals actually received the compensation. Readers may refer to indicator 4.7.100 for the measurement of timely receipt of compensation by affected individuals.

Revision History

First published June 2007 as indicator 4.7.2. Revised in current edition.

Last revised September 2008

4.8 Control of Transborder Transmission of Highly Pathogenic Avian Influenza

4.8.100 Number of People at Border Checkpoints Trained in Border Biosecurity and Transborder Transmission

Core Indicator

Definitions

Total number of people at border checkpoints trained in border biosecurity concepts and trans-border transmission during the reporting period.

Disaggregation: Trainee: administrative level (community, facility, district, province, national), sex, location of border checkpoints

- *People at border checkpoints* include police officers, inspectors, and other officials at border checkpoints.

What It Measures

To effectively control transborder transmission of HPAI through trade and movement of poultry, the following two elements need to be in place: 1) people at border checkpoints with sufficient knowledge to carry out biosecurity measures (including quarantine, culling, and disposal of poultry that has been transported illegally) and 2) infrastructure that enables appropriate biosecurity measures to be implemented at border checkpoints. Combined with indicator 4.8.200, this indicator measures the first element.

Measurement Tools

Training attendance records

How to Measure It

Review training attendance records at the ministry of agriculture or its departments as well as at the ministry of justice and its departments.

Frequency

Training information is collected continuously and reported at the national level at the end of the reporting period.

Considerations

This indicator provides a crude assessment of whether a program/project is meeting its target or is making progress over time in terms of building the capacity of professionals working at border checkpoints to control transborder transmission of HPAI effectively. However, this indicator alone does not provide a measure of whether the content of the training provided meets the national mandate. Furthermore, the unit of measurement is not uniform in that one trainee may have attended a course for one day and another may have attended a course for three months. A major limitation of this indicator is that it provides no measurement of whether the training enhanced the trainees' skills and performance. Trainees' performance assessment requires direct observation at border checkpoints.

Countries may want to adopt an indicator that measures the number of border checkpoints that have an individual trained in border biosecurity and transborder transmission.

Revision History

First published June 2007 as indicator 4.7.1. Revised in current edition.

Last revised September 2008

4.8.200 Existence of Inspector Teams at Border Checkpoints to Monitor Transborder Poultry Movement

Core Indicator

Definitions

Existence of inspector teams at every border checkpoint to monitor transborder legal and illegal movement of poultry and carry out appropriate quarantine measures.

Yes: Inspector teams at border checkpoints who monitor transborder poultry movement and carry out appropriate quarantine measures are in place at *every* checkpoint on the border.

No: Inspector teams at border checkpoints who monitor transborder poultry movement and carry out appropriate quarantine measures are not in place at every checkpoint on the border.

- *Inspector teams* include police officers, inspectors, and other officials at border checkpoints.

What It Measures

To effectively control transborder transmission of HPAI through trade and movement of poultry, the following two elements need to be in place: 1) people at border checkpoints with sufficient knowledge to carry out biosecurity measures (including quarantine, culling, and disposal of poultry that has been transported illegally) and 2) infrastructure that enables appropriate biosecurity measures to be implemented at border checkpoints. Combined with indicator 4.8.100, this indicator measures the first element.

Measurement Tools

- Administrative records at the ministry of agriculture and its departments, as well as at the ministry of justice and its departments
- Site visits.

How to Measure It

Review administrative records at the ministry of agriculture or its departments as well as at the ministry of justice and its departments.

Frequency

This indicator should be measured at least every six months until the existence of inspector teams at every border checkpoint is verified.

Considerations

Measurement of this indicator alone does not provide performance assessments of the inspector teams at border checkpoints. Program managers and evaluators need to undertake site visits to observe whether inspector teams at border checkpoints are implementing biosecurity measures in accordance with the national SOPs and international guidelines on border biosecurity.

It would be meaningful to measure the number of days from the time birds that were transported illegally into a country have been caught at border checkpoints to the time they were culled and disposed of. However, given the constraints in the field (e.g., securing personnel to carry out the task and the ground in which to bury the birds), the procedure is not expected to take place immediately.

It should also be noted that staff on the border in some countries are not appropriately equipped, such as with PPEs. Measurement of this indicator alone does not provide an assessment of whether the personnel at border checkpoints are properly equipped for the task.

Revision History

First published June 2007 as indicator 4.7.2. Revised in current edition.

Last revised September 2008

4.8.300 Existence of Infrastructure to Wash and Spray Vehicles for Disinfection at Border Checkpoints

Core Indicator

Definitions

Existence of infrastructure to wash and spray vehicles for disinfection at every border checkpoint in a country.

Yes: Infrastructure to wash and spray vehicles for disinfection is in place at *every* checkpoint on the border.

No: Infrastructure to wash and spray vehicles for disinfection is not in place at every checkpoint on the border.

What It Measures

To effectively control transborder transmission of HPAI through trade and movement of poultry, the following two elements need to be in place: 1) people at border checkpoints with sufficient knowledge to carry out biosecurity measures and 2) infrastructure that enables appropriate biosecurity measures to be implemented at border checkpoints. This indicator measures the second element. Vehicle disinfection generally involves 1) washing wheels, wheel arches, underbody, and covers on vehicle (i.e., vehicle surfaces), 2) washing trailer/area where poultry are transported, and 3) spraying vehicles with disinfectants with known efficacy.[72]

Measurement Tools

- Administrative records maintained at the ministry of agriculture and its departments
- Site visits.

How to Measure It

Review administrative records maintained at the ministry of agriculture and its departments for evidence of infrastructure to wash and spray vehicles for disinfection at every border checkpoint in a country, combined with regular on-site visits.

Frequency

This indicator should be measured at least every six months until the existence of infrastructure to wash and spray vehicles for disinfection at every border checkpoint is verified.

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[72] DAHS. (2006). *Prevention and Control of Avian Influenza Series—No. 3*. Retrieved March 2007, from http://www.thepoultrysite.com/articles/522/dahs-prevention-and-control-of-avian-influenza-series-no-3.

Considerations

Measurement of this indicator alone is not sufficient to determine whether washing and spraying of vehicles with disinfectants is being carried out at border checkpoints. Program managers and evaluators need to undertake site visits to determine whether vehicle disinfection is carried out at border checkpoints.

Revision History

First published June 2007 as indicator 4.7.3. Revised in current edition.

Last revised September 2008

4.9 Research

4.9.100 Number of Special Studies Conducted

Additional Indicator

Definitions

Number of special studies related to animal health conducted during the reporting period.[73]

Disaggregation: Type of study, status of study (designed, piloted, in progress, completed)

- *Special studies* are assessments carried out by a national program that are outside the routine monitoring of program activities and are for special purposes relevant to the program and its informational needs (e.g., vaccine efficacy study and other OR).
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator measures the number of instances in which special studies related to animal health are carried out to inform and guide decision making in order to 1) improve program effectiveness and/or 2) develop model programs that can be scaled up or replicated.

Measurement Tools

Program records and documents, study reports, or other outputs of OR studies

How to Measure It

Review program records and documents and a list of study reports or other outputs OR studies maintained by the national program, and count the number of special studies that have been conducted during the reporting period.

For a study to be counted in the indicator there must be an evidence of national program managers' and/or staff's involvement or participation in the study. Participation can range from full implementation of a study by the national program with limited external assistance to study efforts for which key study elements (e.g., development of a study design, development of instruments, data collection, analysis, report writing) are contracted out to researchers or institutions external to the program.

[73] This indicator was adapted from the relevant indicators presented in Bertrand, J., Magnani, R., & Rutenberg, N. (1994). *Handbook of Indicators for Family Planning Program Evaluation*. The Evaluation Project (pp. 93–94).

Frequency

This indicator should be measured annually to determine the number of special studies related to animal health that are conducted in a country.

Considerations

This indicator provides a crude measure of instances in which special studies related to animal health were conducted to inform and guide decision making in order to affect policies and improve program effectiveness. Measurement of this indicator alone does not provide an assessment of the quality of the studies carried out or whether the studies achieved the intended purposes (e.g., affected policies; led to reorientation of the other program components and in particular BCC programs; led to development of model programs, scaling up of existing programs, or replication of programs in another context).

Furthermore, for special studies to be relevant and responsive to the national program, a high level of participation or involvement on the part of national program managers and staff is desirable.

Revision History

First published June 2007 as indicator 4.8.1. Revised in current edition.

Last revised September 2008

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CHAPTER 5: RAPID RESPONSE TO CONTAIN HUMAN INFECTION WITH H5N1 VIRUS AT AN EARLY STAGE (HUMAN HEALTH)

Introduction

Human infection with novel influenza viruses is rare, but there is concern that one of the current HPAI animal strains, H5N1, has the potential to become the cause of the next influenza pandemic since it has already shown the ability to infect and cause severe disease in humans. Containing sporadic cases of human infection with H5N1 virus as they emerge might safeguard against the development of a pandemic strain of influenza. Measures to contain human infection with H5N1 virus center on rapid and effective clinical management and investigation of suspected cases of human infection with H5N1 virus.

The indicators in this chapter allow program managers to monitor the quality and effectiveness of the rapid response to human infection with H5N1 virus. While specific to the H5N1 virus, these indicators can easily be adapted to account for the prevention and control of other novel influenza viruses.[74] The indicators are associated with the activities that support or constitute the rapid response: 1) impact, 2) surveillance, 3) case confirmation, 4) clinical case management, 5) infection control, 6) rapid response and containment, and 7) special studies. Key issues regarding these activities are addressed below. Each activity description also provide details on how the indicators could be adapted to address the prevention, response, and control of other novel influenza viruses.

Human infection with H5N1 virus is rare, and current systems for identifying, confirming, treating, and containing the disease are still in the early stages of development, with variations across countries. The entering-into-force of the International Health Regulations (2005) in June 2007 is a significant step towards the implementation of national systems for immediate notification of new influenza viruses. However, it will take time to develop such systems. Considering this, the indicators in this chapter attempt to address the reality of the current response while aiming to strengthen systems to prepare for a pandemic by setting the standards for which to strive.

The indicators in this chapter are divided into the following seven sections:

Impact

It is essential for countries to track the numbers of cases of human infection with H5N1 virus and deaths as both a measure of the outcome of intervention efforts and a method to monitor the possibility of a pandemic. A rapid increase in the number of cases or deaths might signal the occurrence of an epidemic or possible pandemic. Indicators to monitor the existence of clusters of infection with H5N1 are included in section 5.1 because the detection of clusters

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[74] See the Notes on the Disease Terminology Used in this Guide section for a description of novel influenza viruses.

might indicate an increase in human-to-human transmission of human infection with H5N1 virus.

Human Infection with H5N1 Virus Surveillance

Human infection with H5N1 virus is rare, and many countries have not integrated the disease into the routine surveillance system.[75] The indicators in section 5.2 address what types of surveillance activities can occur within this context. For example, it is essential for countries to have an immediate notification system for human infection with H5N1 virus and human capacity to monitor the response to the disease appropriately. The indicators in this section also address the effectiveness of the response to a suspected case of human infection with H5N1 virus at different levels of the surveillance system (clinical, administrative, and epidemiological investigation). These indicators can easily be adapted to account for surveillance of other novel influenza viruses because surveillance for H5N1 in humans is similar to surveillance for all novel influenza viruses.

Case Confirmation of Human Infection with H5N1 Virus

A high-quality laboratory confirmation system is essential for a rapid response system for human infection with H5N1 virus. Laboratories must have the capacity to confirm or disprove suspected human infection with H5N1 virus. Measures to ensure quality collection of samples and appropriate biohazard packaging should be in place. Some of these measures might already exist for other infectious diseases and could be integrated into the overall surveillance system for human infection for H5N1 virus as well as other novel influenza viruses. Indicators in section 5.3 address lab capacity, timeliness, and quality of the laboratories.

Clinical Management

The indicators in section 5.4 address the management of human infection with H5N1 virus both at a clinical level and at a facility level. They measure whether trained clinical staff exist within facilities, whether facilities are equipped with the proper systems to ensure that care for human infection with H5N1 virus can be carried out appropriately, and whether SOPs for clinical management are being followed. To adapt these indicators to address clinical management of novel influenza viruses other than H5N1, it would be important to review international clinical management standards for differences by viral subtype and incorporate these differences into the adapted indicators.

Infection Control

Improving infection control in health care facilities is essential for managing sporadic cases of human infection with H5N1 virus and for pandemic preparedness. Because infection control generally occurs prior to lab confirmation, infection control would be similar for all novel

[75] At the time this report was prepared, a number of countries in the SE Asia region were tracking cases of influenza-like illness or severe respiratory pneumonia. This tracking would capture people who report to facilities with symptoms of human infection with H5N1 virus.

influenza viruses; therefore, these indicators can be readily adapted for infection control of novel influenza viruses. The indicators in section 5.5 measure whether facilities are meeting infection control standards, such as whether there are trained personnel to carry out infection control procedures.

Rapid Response and Containment

Section 5.6 measures the efficacy of the surveillance system to mobilize human resources to respond to an outbreak of human infection with H5N1 virus and to conduct the appropriate investigation. Similar measures would be required for all novel influenza viruses; therefore, these indicators can be readily adapted to include other novel influenza viruses. Trained personnel, the existence of rapid response teams, the timeliness of the response, and the geographic coverage of the rapid response teams are addressed in section 5.6.

Research

As the rapid response to human infection with H5N1 virus is strengthened, countries might consider conducting special studies, such as health facility studies or other research regarding human infection with H5N1 virus. Special studies give a broader picture of the effectiveness/quality of the response in order to guide decision making.

Measurement Tools and Data Sources

The primary measurement tool for the indicators in this section of the guide is a human infection with H5N1 virus case form. This form is intended to serve several purposes, including immediate notification of a suspected case and documentation for case investigation, disease surveillance, and program monitoring. This form, which originates from a health facility, would record the following elements of a suspected case of human infection with H5N1 virus: patient symptoms and care-seeking behavior, diagnosis and clinical management, laboratory results confirming or disproving human infection with H5N1 virus, and information from epidemiologic investigation and containment procedures. Many countries track these pieces of information by using different forms; however, countries should strive to consolidate information into one form to improve the M&E of the response. In addition, many countries do not analyze information related to suspected cases; however, countries should strive to include suspected cases in the surveillance system as it improves.

Other measurement tools outlined in this section include checklists that outline national or international standards, training logs, administrative records, clinic registers, patient charts, laboratory reports, shipping documents, and health facility surveys.

Methodological Challenges

Systems for detecting and reporting human infection with H5N1 virus are in the early stages of development. This proves problematic for measuring the indicators in this section of the guide. For example, there might be confusion on the case definition of human infection with H5N1 virus because countries do not always follow the WHO definition. Because the current knowledge base for risk factors for and clinical management of human infection with H5N1 virus is limited, international standards are still under development as of the publication of this guide. Therefore, many of the indicators use national standards as the basis for evaluation, which makes it difficult to compare measurements across countries.

In addition, suspected cases that die before lab confirmation, are not confirmed through laboratory testing, or turn out negative through lab diagnosis might not be reported into the surveillance system. However, both confirmed and suspected cases are measured in this section because countries should strive to include these cases as systems are strengthened over time.

Selection of Indicators

In developing this guide, we have applied the principle of adapting, where possible, indicators that have already demonstrated their utility and feasibility in other health domains. Selected indicators from this section have been adapted from *A Guide for Monitoring and Evaluating Child Health Programs* (Gage, A. J., Ali, D. & Suzuki, C. 2005), the *Compendium of Indicators for Monitoring and Evaluating National Tuberculosis Programs* (WHO), and the *Service Provision Assessment* (MEASURE-DHS). In terms of measurement techniques and considerations, these indicators might remain true to the original specifications. However, the unique nature of human infection with H5N1 virus limited our ability to adapt and apply indicators that were developed and validated in other areas of public health. Thus, most of the indicators in this chapter were developed through a consultative process, with significant input from the technical working group members, technical experts, and program managers in countries of the region representing government ministries and organizations working to limit human infection with H5N1 virus. The quality aspects of these indicators have been determined based on WHO guidelines and recommendations from technical experts. Document reviews of existing surveillance, laboratory, and clinical systems that respond to human infection with H5N1 virus assisted in the development of the indicators as well.

Many of the indicators listed in this chapter are the indicators currently used to monitor programs in the region. However, the indicators in this chapter do not constitute a comprehensive set of indicators for monitoring and evaluating programs that aim to limit human infection with H5N1 virus.

The indicators listed in this chapter are as follows:

5.1 Impact

5.1.100 Confirmed Cases of Human Infection with H5N1 Virus (Core Indicator)

5.1.200 Deaths via Human Infection with H5N1 Virus (Core Indicator)

5.1.300 Human Infection with H5N1 Virus Case Fatality Rate (Core Indicator)

5.1.400 Clusters of Human Infection with H5N1 Virus (Core Indicator)

5.2 Surveillance of Human Infection with H5N1 Virus

5.2.100 Immediate Notification System to Monitor and Respond to Human Infection with H5N1 Virus According to National Standard Operating Procedure(s) (Core Indicator)

5.2.200 Total Number of People Trained in Surveillance for Human Infection with H5N1 Virus (Additional Indicator)

5.2.300 Proportion of Cases of Human Infection with H5N1 Virus with Recommended Epidemiological Investigation per Standard Operating Procedure(s) (Core Indicator)

5.2.400 Proportion of Cases of Human Infection with H5N1 Virus That Had Case-Based Data Collected According to National Standard Operating Procedure(s) (Core Indicator)

5.2.500 Proportion of Suspected Cases of Human Infection with H5N1 Virus Reported to the Appropriate Authorities within 48 Hours of Contact with a Health Facility (Core Indicator)

5.3 Case Confirmation

5.3.100 Proportion of Suspected Cases of Human Infection with H5N1 Virus with Laboratory Diagnosis (Core Indicator)

5.3.200 Average Number of Days between Presentation to a Health Facility of a Suspected Case of Human Infection with H5N1 Virus to Receipt of a Biological Specimen at a Designated Laboratory (Core Indicator)

5.3.300 Average Number of Days from Receipt of Clinical Samples from Suspect Cases of Human Infection with H5N1 Virus to Either Confirmation or Ruling Out of Human Infection with H5N1 Virus per National Standard Operating Procedure(s) (Core Indicator)

5.3.400 Existence of a Laboratory Quality Assurance System for Human Infection with H5N1 Virus (Additional Indicator)

5.3.500 Proportion of Biological Samples from Suspected Cases of Human Infection with H5N1Virus That Are Received at Designated Laboratories of Sufficient Quality to Be Tested (Additional Indicator)

5.3.600 Proportion of Biological Samples of Suspected Cases of Human Infection with H5N1 Virus Received at Designated Laboratories with Appropriate Biohazard Packaging (Additional Indicator)

5.4 Clinical Management

5.4.100 Total Number of Clinicians Trained in Clinical Treatment of Human Infection with H5N1 Virus According to National Treatment Standard Operating Procedure(s) during the Reporting Period (Additional Indicator)

5.4.200 Proportion of Cases of Human Infection with H5N1 Virus with Recommended Clinical Management Response per National Standard Operating Procedure(s) (Core Indicator)

5.4.300 Proportion of Health Care Facilities That Provide Care and Treatment for Human Infection with H5N1 Virus (Additional Indicator)

5.4.400 Proportion of Health Workers Who Can Correctly Identify Symptoms of Human Infection with H5N1 Virus (Additional Indicator)

5.5 Infection Control for Human Infection with H5N1 Virus

5.5.100 Total Number of People Trained in Infection Control of Human Infection with H5N1 Virus According to National Treatment Standard Operating Procedure(s) during the Reporting Period (Additional Indicator)

5.6 Rapid Response to Human Infection with H5N1 Virus

5.6.100 Total Number of People Trained in Human Infection with H5N1 Virus Rapid Response and Containment Measures during the Reporting Period (Additional Indicator)

5.6.200 Existence of a National Rapid Response Team for Human Infection with H5N1 Virus That Meets National Criteria (Core Indicator)

5.6.300 Proportion of Subnational Units That Have a Rapid Response Team That Meets National Criteria (Core Indicator)

5.6.400 Average Number of Days from Notification of a Case of Human Infection with H5N1 Virus to the Deployment of a Rapid Response Team for Epidemiologic Investigation and Containment per National Standard Operating Procedure(s) (Core Indicator)

5.7 Special Studies

5.7.100 Number of Special Studies Conducted (Additional Indicator)

The following table maps the indicators presented in this chapter to the logic model shown in chapter 2.

Table 4.

Rapid Response to Contain Human Infection With H5N1 Virus at an Early Stage (Human Health)		
Element	**Logic Model Description**	**Relevant Indicators**
IMPACT	Reduced risk of influenza pandemic of avian origin	5.1.100 Confirmed Cases of Human Infection with H5N1 Virus 5.1.200 Deaths via Human Infection with H5N1 Virus 5.1.300 Human Infection with H5N1 Virus Case Fatality Rate 5.1.400 Clusters of Human Infection with H5N1 Virus
OUTCOME	Rapid response to contain human infection with H5N1 virus at an early stage	5.2.300 Proportion of Cases of Human Infection with H5N1 Virus with Recommended Epidemiological Investigation per Standard Operating Procedure(s) 5.2.400 Proportion of Cases of Human Infection with H5N1 Virus That Had Case-Based Data Collected According to National Standard Operating Procedure(s) 5.2.500 Proportion of Suspected Cases of Human Infection with H5N1 Virus Reported to the Appropriate Authorities within 48 Hours of Contact with a Health Facility 5.3.100 Proportion of Suspected Cases of Human Infection with H5N1 Virus with Laboratory Diagnosis 5.4.200 Proportion of Cases of Human Infection with H5N1 Virus with Recommended Clinical Management Response per National Standard Operating Procedure(s)
OUTPUT	Functional immediate notification system	5.2.100 Immediate Notification System to Monitor and Respond to Human Infection with H5N1 Virus According to National Standard Operating Procedure(s)
	Network of laboratories with human infection with HPAI diagnostic capacities	
	Case management of human infection with HPAI	
	Standard infection control for human infection with HPAI	

Rapid Response to Contain Human Infection With H5N1 Virus at an Early Stage (Human Health)			
Element	**Logic Model Description**	**Relevant Indicators**	
OUTPUT	Timely deployment of rapid response teams	5.6.400	Average Number of Days from Notification of a Case of Human Infection with H5N1 Virus to the Deployment of a Rapid Response Team for Epidemiologic Investigation and Containment per National Standard Operating Procedure(s)
PROCESS	Improve identification and clinical management of cases of human infection with HPAI		
	Improve confirmation of cases of human infection with HPAI	5.3.200	Average Number of Days between Presentation to a Health Facility of a Suspected Case of Human Infection with H5N1 Virus to Receipt of a Biological Specimen at a Designated Laboratory
		5.3.300	Average Number of Days from Receipt of Clinical Samples from Suspect Cases of Human Infection with H5N1 Virus to Either Confirmation or Ruling Out of Human Infection with H5N1 Virus per National Standard Operating Procedure(s)
		5.3.500	Proportion of Biological Samples from Suspected Cases of Human Infection with H5N1 Virus That Are Received at Designated Laboratories of Sufficient Quality to Be Tested
		5.3.600	Proportion of Biological Samples of Suspected Cases of Human Infection with H5N1 Virus Received at Designated Laboratories with Appropriate Biohazard Packaging
	Develop national capacity for immediate notification and rapid response		

Rapid Response to Contain Human Infection With H5N1 Virus at an Early Stage (Human Health)			
Element	**Logic Model Description**	**Relevant Indicators**	
PROCESS	Train laboratory, clinical, surveillance, and rapid response staff	5.2.200	Total Number of People Trained in Surveillance for Human Infection with H5N1 Virus
		5.4.100	Total Number of Clinicians Trained in Clinical Treatment of Human Infection with H5N1 Virus According to National Treatment Standard Operating Procedure(s) during the Reporting Period
		5.5.100	Total Number of People Trained in Infection Control of Human Infection with H5N1 Virus According to National Treatment Standard Operating Procedure(s) during the Reporting Period
		5.6.100	Total Number of People Trained in Human Infection with H5N1 Virus Rapid Response and Containment Measures during the Reporting Period
INPUT	Personnel, equipment, supplies, and TA for surveillance, response, and laboratories	5.3.400	Existence of a Laboratory Quality Assurance System for Human Infection with H5N1
		5.6.200	Existence of a National Rapid Response Team for Human Infection with H5N1 Virus That Meets National Criteria
		5.6.300	Proportion of Subnational Units That Have a Rapid Response Team That Meets National Criteria
	Plan for surveillance of and response to human infection with HPAI		
	Personnel, equipment, supplies, and TA for clinical response	5.4.300	Proportion of Health Care Facilities That Provide Care and Treatment for Human Infection with H5N1 Virus
		5.4.400	Proportion of Health Workers Who Can Correctly Identify Symptoms of Human Infection with H5N1 Virus
	Special studies	5.7.100	Number of Special Studies Conducted

RAPID RESPONSE TO CONTAIN HUMAN INFECTION WITH H5N1 VIRUS AT AN EARLY STAGE (HUMAN HEALTH)

5.1 Impact

5.1.100 Confirmed Cases of Human Infection with H5N1 Virus

Core Indicator

Definitions

The total number of confirmed cases of human infection with H5N1 virus in the population during the reporting period.

Disaggregation: Geographic area, sex, and age

Measurement of this indicator should follow the definition of a confirmed case of human infection with H5N1 virus as established by WHO.

What It Measures

The number of confirmed cases of human infection with H5N1 virus measures the number of cases of human infection with H5N1 virus confirmed with laboratory diagnosis. A rapid increase in the number of confirmed cases of human infection with H5N1 virus might signal the occurrence of an epidemic (with potential for pandemic spread).

Measurement Tools

No tool exists.

Human infection with H5N1 virus case form

How to Measure It

Extract information on diagnosis, notification, investigation, and laboratory confirmation from the human infection with H5N1 virus case form. Because only confirmed cases are used in this indicator, a laboratory diagnosis has to be conducted to earn that designation.

Frequency

Human infection with H5N1 virus case forms are completed by the appropriate authorities continuously as they occur. The forms are submitted to the national authority through the reporting hierarchy. The frequency of reporting should be in line with national and international reporting standards for the disease.

Considerations

The accuracy of this indicator depends on the ability to notify the appropriate authorities of cases of human infection with H5N1 virus, on the appropriate authorities conducting the investigation, on receiving an accurate laboratory diagnosis for confirmed cases, and on reporting the investigation in a timely manner to the national authority.

When interpreting this indicator, there might be confusion about the case definition of confirmed human infection with H5N1 virus. This might be because of changes in the virology of the disease or confusion with other types of influenza. Therefore, the number can be affected by errors in diagnosis or by confusion about the case definition.

In the absence of a facility-based surveillance system where human infection with H5N1 case investigation forms are completed, laboratories might be used to identify confirmed cases (with data quality assurances that sick individuals with multiple tests are not being counted multiple times).

This indicator is difficult to compare across countries because it uses a number rather than a rate to track incidence. Countries differ significantly in their population; therefore, an increased number might be related to an increased population size. Similarly, an increase in number in a single country over time might be related to an increase in population over that same period. However, at present, human cases attributable to human infection with H5N1 are extremely rare, and any rate indicator using the entire population as the denominator is therefore going to be too small to measure. If the disease transforms into a pandemic, then a rate indicator (incidence rate) becomes more appropriate. However, it is important to note that in the event of a pandemic, it will be difficult to calculate rates for lab-confirmed cases due to the need for immediate response and limited human resources. Incidence rates can be calculated from collected samples after the immediate need for response and containment has been met.

Revision History

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5.1.200 Deaths via Human Infection with H5N1 Virus

Core Indicator

Definitions

Total number of confirmed deaths from human infection with H5N1 virus in the population during the reporting period.

What It Measures

This indicator measures deaths from human infection with H5N1. Measurement of deaths from human infection with H5N1 is important for many reasons: 1) evaluating mortality from human infection with H5N1 over time, 2) evaluating health interventions aimed at reducing mortality from human infection with H5N1, 3) triggering further investigation into deaths in order to identify ways to reduce unnecessary deaths, 4) facilitating research of the factors associated with mortality from human infection with H5N1, and 5) raising concern for pandemic implications if deaths reach a certain level.

Measurement Tools

No tool exists.

Human infection with H5N1 case form

How to Measure It

Extract information on diagnosis, notification, investigation, laboratory confirmation, and death from the human infection with H5N1 case form. Because only confirmed cases are used in this indicator, a laboratory diagnosis has to be conducted to earn that designation. Use the WHO standard case definition for a confirmed case of human infection with H5N1.

Frequency

Human infection with H5N1 virus case forms are completed by the appropriate authorities continuously as they occur. The forms are submitted to the national authority through the reporting hierarchy. The frequency of reporting should be in line with national and international reporting standards for the disease.

Considerations

Mortality is an index of the severity of a disease from a clinical and public health standpoint. When interpreting this indicator, the following limitations should be considered: 1) mortality might appear to increase if detection and diagnosis improve, even if there is no change in actual incidence or mortality from human infection with H5N1 virus, 2) apparent mortality might change (increase or decrease) because of confusion about or changes to the case definition of human infection with H5N1 virus, changes in the virology of the disease, or confusion with other types of influenza, and 3) mortality might be under-reported because of under-diagnosis of human infection with H5N1 virus or problems in the reporting system.

This indicator is difficult to compare across countries because it uses a number rather than a rate to track mortality. Countries differ significantly in their population; therefore, an increased number might be related to an increased population size. Similarly, an increase in number in a single country over time might be related to an increase in population over that same period. However, at present, deaths attributable to human infection with H5N1 are extremely rare, and any rate indicator using the entire population as the denominator is therefore going to be too small to measure. If the disease transforms into a pandemic, then a rate indicator (mortality rate) becomes more appropriate. However, it is important to note that in the event of a pandemic, it will be difficult to calculate rates for lab-confirmed deaths due to the need for immediate response and limited human resources. Mortality rates can be calculated from collected samples after the immediate need for response and containment has been met.

Revision History

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5.1.300 Human Infection with H5N1 Virus Case Fatality Rate

Core Indicator

Definitions

Percentage of persons diagnosed as having confirmed human infection with H5N1 virus who die from human infection with H5N1 virus during the reporting period.

Numerator: Total number of deaths of persons diagnosed with confirmed human infection with H5N1 virus during the reporting period

Denominator: Total number of persons diagnosed with confirmed human infection with H5N1 virus during the reporting period

Human infection with H5N1 virus case fatality rate (CFR) = Numerator/Denominator x 100 percent

Disaggregation: Geographic area, health facility type, individual health facility, age, and sex

Measurement of this indicator should follow the definition of a confirmed case of human infection with H5N1 virus as established by WHO.

What It Measures

CFR is a measure of the severity of the illness. Early medical intervention and improved clinical management might improve the outcome of persons diagnosed with human infection with H5N1 virus and a decrease in CFR might be observed. Increases in CFR might indicate 1) a trend in later medical intervention, 2) a decrease in the quality of clinical management, or 3) the introduction of a more virulent, new, or drug-resistant virus.

If there are a lot of cases, CFRs calculated for individual health facilities can be used to compare the quality of care among health facilities, with the caveat that the population's health status and health-seeking behavior affects the severity of illness of the people that frequent the health facility. For example, health facilities in poorer areas might see more severe illnesses than health facilities in richer areas. Higher-level health facilities (especially referral hospitals) will see more severe illnesses.

Measurement Tools

No tool exists.

Human infection with H5N1 virus case form

How to Measure It

Extract information on diagnosis, notification, investigation, laboratory confirmation, and death from the human infection with H5N1 virus case form. Because only confirmed cases are used in this indicator, a laboratory diagnosis has to be conducted to earn that designation.

Frequency

Human infection with H5N1 virus case forms are completed by the appropriate authorities continuously as they occur. The forms are submitted to the national authority through the reporting hierarchy.

The frequency of reporting should be in line with national and international reporting standards for the disease.

Considerations

The accuracy of this indicator depends on the ability to identify cases of human infection with H5N1 virus, to notify the appropriate authorities, to conduct the investigation, to receive an accurate laboratory diagnosis, and to report the investigation in a timely manner to the national authorities.

When interpreting this indicator, there might be confusion about the case definition of human infection with H5N1 virus. This might be because of changes in the virology of the disease or because of confusion with other types of influenza. Therefore, the numerator and denominator can be as affected by errors in diagnosis or confusion about the case definition.

In the absence of a facility-based surveillance system where human infection with H5N1 virus case forms are completed, laboratories might be used to identify confirmed cases (with data quality assurances that sick individuals with multiple tests are not being counted multiple times).

Revision History

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5.1.400 Clusters of Human Infection with H5N1 Virus

Core Indicator

Definition

The total number of clusters of human infection with H5N1 virus during the reporting period.

Cluster is defined as two or more cases of individuals with disease onset within two weeks in the same defined geographic area, in which at least one individual has confirmed infection with H5N1 virus and the other individuals meet the WHO case criteria for a suspected case of human infection with H5N1 virus.[76]

Disaggregation: Geographic area, size

Measurement of this indicator should follow the definition of a confirmed case of human infection with H5N1 virus as established by WHO.

What It Measures

Clusters indicate a possible improvement in the virus's ability to transmit efficiently and sustainably between humans. WHO has identified the appearance and size of clusters as a key element in the definition of pandemic alert phases.[77] An increase in the number and size of clusters could signal the need for a reevaluation of the current pandemic phase.

Measurement Tools

Human infection with H5N1 virus case form

How to Measure It

Extract information on diagnosis, notification, investigation, and laboratory confirmation from the human infection with H5N1 virus case form. Because there must be at least one confirmed case for this indicator, a laboratory diagnosis has to be conducted to earn that designation.

Frequency

Human infection with H5N1 virus case forms are completed by the appropriate authorities continuously as they occur. The forms are submitted to the national authority through the reporting hierarchy. Frequency of reporting should be in line with international and national guidelines.

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[76] This definition is adapted for HPAI from the more generic definition of cluster provided in the WHO *Global Influenza Preparedness Plan,* WHO, Geneva, 2005.
[77] Ibid.

Considerations

The accuracy of this indicator is dependent on the ability to notify the appropriate authorities of cases of human infection with H5N1 virus, for the appropriate authorities to conduct the investigation, to receive an accurate laboratory diagnosis for confirmed cases, and to report the investigation in a timely manner to the national authority.

At the time of the development of this guide, there is no standard global definition for a cluster of human infection with H5N1 virus. If new guidelines are released, this indicator should be adapted to those international guidelines.

Revision History

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5.2 Surveillance of Human Infection with H5N1 Virus

5.2.100 Immediate Notification System to Monitor and Respond to Human Infection with H5N1 Virus According to National Standard Operating Procedures

Core Indicator

Definition

The immediate notification system monitors and responds to human infection with H5N1 virus. The notification system can either be part of an existing notification system or be an independent system specifically for human infection with H5N1 virus. In order to be useful for rapid containment of human infection with H5N1 virus, the system must have:

- A policy of 24-hour case notification after a suspected case of human infection with H5N1 virus presents to the health facility
- A case-reporting form for human infection with H5N1 virus
- A national data repository of standard case information for all suspected and confirmed cases of human infection with H5N1 virus.

Yes: Country has an immediate notification system that meets the criteria defined above.

No: Country has an immediate notification system, but it does not meet the criteria defined above.

OR

Country does not have an immediate notification system that monitors H5N1 virus but does monitor other infectious diseases.

OR

Country does not have an immediate notification system.

What It Measures

This indicator measures the existence of an immediate notification system to monitor human infection for H5N1 virus specifically, which is a necessary precursor to detect suspected cases of human infection with H5N1 virus.

Measurement Tools

No tool exists.

Checklist for immediate notification system of human infection with H5N1 virus that captures the elements listed above.

How to Measure It

Review of national documentation and reports against the checklist for immediate notification system for human infection with H5N1 virus.

Frequency

This indicator might be measured semiannually before an immediate notification system for human infection with H5N1 virus has been developed. Following the development of the immediate notification system, this indicator should be reviewed annually to determine whether updates to the system are needed.

Considerations

This indicator does not measure the system's functioning, coverage, completeness, or accuracy.

Revision History

First published June 2007 as indicator 5.2.1. Revised in current edition.

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5.2.200 Total Number of People Trained in Surveillance for Human Infection with H5N1 Virus during the Reporting Period

Additional Indicator

Definition

Number of people trained in surveillance for human infection with H5N1 virus.

Disaggregation: administrative level (community, facility, district, province, national), topic, sex, affiliation (NGO, private sector, community members), geographic area

Surveillance training includes monitoring for human infection with H5N1 virus, case notification, case investigation, lab confirmation, analysis, and information use.

What It Measures

This indicator tracks the number of people trained in surveillance specifically for human infection with H5N1 virus.

Measurement Tools

No tool exists.

Organizations responsible for training should maintain training logs or a database and submit a training report to the organization responsible for overseeing and coordinating the training at the end of the reporting period. The training report would include information on:

- *Title of training*
- *Venue, date, and total hours of training*
- *Topic (which could be forced into predetermined categories)*
- *Number and cadre of people trained.*

How to Measure It

A training database is maintained at the national level. Organizations responsible for human infection with H5N1 virus training are required to submit training data upon completion of a training session.

Frequency

Training information is collected continuously and reported to the national level at the end of the reporting period.

Considerations

There is a potential for double-counting individuals if multiple organizations are conducting training programs and individuals attend more than one training. Double-counting might also occur if a person attends a training program more than once during the reporting period. This indicator does not measure the geographical coverage provided by trained individuals. Countries might want to adopt an indicator that specifies the proportion of subnational units that have an individual trained in surveillance of human infection with H5N1 virus.

Revision History

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5.2.300 Proportion of Cases of Human Infection with H5N1 Virus with Recommended Epidemiological Investigation per National Standard Operating Procedure(s)

Core Indicator

Definition

Proportion of cases of human infection with H5N1 virus with recommended epidemiological investigation per national SOPs during the reporting period.

Numerator: Number of cases of human infection with H5N1 virus with recommended epidemiologic investigation per national SOPs during the reporting period

Denominator: Total number of cases of human infection with H5N1 virus in a given period

- The epidemiologic investigation SOPs should be defined at the national level, and subnational teams should be trained on their implementation.
- Per national SOPs: Current international recommendations for investigation of human infection with H5N1 virus include the following elements: establishment of a multidisciplinary investigation team, confirmation of diagnosis, interview with case patient and visit to patient's home, contact tracing, active case-finding, specimen collection, visit to health facility, initiating enhanced surveillance, initiating associated animal investigations, implementing control measures, data analysis, and notification of authorities.[78] Governments should keep these recommendations in mind when developing their own national guidelines.
- Cases: Depending on the national SOPs, this indicator can be calculated using either suspected or confirmed cases. Suspected cases should be included in the reporting system for human infection with H5N1 virus, and countries should strive for this as their surveillance system for human infection with H5N1 virus is strengthened.

What It Measures

This indicator measures the extent and quality of the epidemiological response to an outbreak of human infection with H5N1 virus.

Measurement Tools

No tool exists.

- *Human infection with H5N1 virus case form*

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[78] WHO. *WHO guidelines for investigation of human cases of avian influenza A(H5N1)*. Geneva. January 2007. Accessed February 2008.

- Review of provincial, district, and health facility records and records of epidemiological investigations at the subnational or national level

How to Measure It

The data should be collected from the appropriate health facility records and outbreak investigation reports and should be reviewed for adherence to national SOPs for an epidemiological investigation. Where cases were not appropriately investigated, local health authorities can directly intervene to improve coordination between the facilities and the investigative teams.

Frequency

When there are cases of human infection with H5N1 virus at a facility, these data should be reviewed on a quarterly basis at the clinical and subnational level for performance improvement. At the national aggregate level, semiannual reporting might be sufficient.

Considerations

This indicator measures the coordination between the clinical response and the epidemiologic investigation, and it allows routine review and performance improvement. However, it does not measure the timeliness of the epidemiological response, which is covered by other indicators in this set.

Revision History

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5.2.400 Proportion of Cases of Human Infection with H5N1 Virus That Had Case-Based Data Collected According to National Standard Operating Procedure(s)

Core Indicator

Definition

Proportion of cases of human infection with H5N1 virus selected, for which case-based data were collected per national SOPs.

Numerator: Number of cases of human infection with H5N1 virus that had case-based data collected during the reporting period

Denominator: Total number of cases of human infection with H5N1 virus in the same period

- Case-based data: WHO recommends a case report form for human infection with H5N1 virus. This form should be used to report case-based data about individual cases of human infection with H5N1 virus. These forms can be completed manually at a health facility, via a national hotline, or electronically through an Internet-based direct reporting system.
- Cases: Depending on the national SOPs, this indicator can be calculated using either suspected or confirmed cases. Suspected cases should be included in the reporting system for human infection with H5N1 virus, and countries should strive for this as their surveillance system for human infection with H5N1 virus is strengthened.

What It Measures

This indicator measures the extent to which case-based data are collected for human infection with H5N1 virus. The use of case-based forms ensures that the necessary information is documented for an appropriate investigation. It also helps to identify failures in the reporting system.

Measurement Tools

Administrative records (case-based reporting forms such as the human infection with H5N1 virus case form), databases, clinic registers, or patient charts

How to Measure It

Measurement of this indicator requires a review of surveillance reports. The case-based data form must be completed manually at a health facility or at a national hotline headquarters and sent to the appropriate authorities within 24 hours after the initial verbal report is made. For an Internet-based reporting system, case-based forms should be sent automatically to the appropriate authorities. A case-based form for human infection with H5N1 virus includes the following elements:

- Reporting details
- Demographic details
- Signs and symptoms
- History of admission to hospital (if completed at the health facility)
- Travel history
- Occupational exposure
- History of exposure to the animal population
- History of exposure to human cases
- Laboratory investigation results (if completed at the health facility)
- Prophylaxis against influenza (if completed at the health facility)
- Final disposition (if completed at the health facility)
- Case classification (if completed at the health facility).

(Based on WHO Template for Case Report Form for Influenza A/H5)

Frequency

Semiannually

Considerations

This indicator requires that health staff or staff at a national hotline understand the case definition of human infection with H5N1 virus and that the forms are available. The indicator is most useful when the case-based reports are fully completed. This indicator does not measure the timeliness of the reports.

Revision History

First published June 2007 as indicator 5.2.4. Revised in current edition.

Last revised September 2008

5.2.500 Proportion of Suspected Cases of Human Infection with H5N1 Virus Reported to the Appropriate Authorities within 48 Hours of Contact with a Health Facility

Core Indicator

Definitions

Proportion of suspected cases of human infection with H5N1 virus reported to the appropriate authorities within 48 hours of contact with a health facility.

Numerator: Number of suspected cases of human infection with H5N1 virus reported to the appropriate authorities within 48 hours of contact with a health facility

Denominator: Total number of suspected cases of human infection with H5N1 virus reported to the appropriate authorities

Disaggregation: 24 hours, 48 hours

- *Appropriate authorities* are those charged with deploying the rapid response teams, defined in the national SOPs.
- Suspected cases: Measurement of this indicator should follow the definition of a suspected case of human infection with H5N1 virus as established by WHO.

What It Measures

This indicator measures the extent to and timeliness of which suspected human infection with H5N1 virus cases are being reported to the appropriate authorities. It documents the time delay between presentation and notification. Early diagnosis or clinical suspicion and early notification are essential to facilitate a prompt investigation and response to contain an outbreak. It should be considered that 48 hours might not be appropriate for a complete human health response. Twenty-four hours might be more appropriate, especially if human infection with H5N1 virus reaches a pandemic phase.

Measurement Tools

No tool exists.

Human infection with H5N1 virus case form

How to Measure It

This indicator is measured by noting the duration between presentation to the health facility and notification of the appropriate authorities as documented on the human infection with H5N1 virus case report.

Frequency

This indicator can be measured quarterly or semiannually depending on the number of cases reported.

Considerations

This indicator relies on the completeness of case reporting; the date of presentation and date of notification must be recorded. Poor results for this indicator might indicate that there are delays in diagnosis or delays in reporting. It should be noted as well that suspected cases that turn out to be negative at the health facility level might not be reported to the appropriate authorities and therefore might not be captured in this indicator.

Revision History

First published June 2007 as indicator 5.2.5. Revised in current edition.

Last revised September 2008

5.3 Case Confirmation

5.3.100 Proportion of Suspected Cases of Human Infection with H5N1 Virus with Laboratory Diagnosis

Core Indicator

Definition

Proportion of suspected cases of human infection with H5N1 virus with laboratory results (confirming or disproving human infection with H5N1 virus). The notification and laboratory diagnosis should be consistent with national SOPs.

Numerator: Number of suspected cases of human infection with H5N1 virus with laboratory results

Denominator: Total number of suspected cases of human infection with H5N1 virus reported

What It Measures

This indicator measures the extent to which laboratory testing is used to support or confirm suspected cases. In order to perform this surveillance function, a qualified laboratory network needs to be in place and functional.

Measurement Tools

No tool exists.

Human infection with H5N1 virus case form

How to Measure It

Systematic review of human infection with H5N1 virus case forms to determine whether laboratory testing was done

Frequency

This indicator can be measured quarterly or semiannually depending on the number of cases reported.

Considerations

This indicator is a good measurement of the use of laboratory confirmation to support clinical management and surveillance efforts. However, it is not a good measurement of the timeliness of the lab response following a clinical diagnosis of a suspected case. This indicator assumes that health facility staff know the case definition of suspected human infection with H5N1 virus. It also assumes that the specimens are of sufficient quality to be tested. If the total number of suspected cases is underestimated, the assessment of the extent of laboratory confirmation might be overestimated. It should be noted as well that suspected cases that are not confirmed at the health facility level, cases that turn out to be negative, and people who die of human infection with H5N1 virus without seeking care might not be reported to the appropriate authorities and therefore might not be captured in this indicator.

Revision History

First published June 2007 as indicator 5.3.1. Revised in current edition.

Last revised September 2008

5.3.200 Average Number of Days between Presentation to a Health Facility of a Suspected Case of Human Infection with H5N1 Virus to Receipt of a Biological Specimen at a Designated Laboratory

Core Indicator

Definition

Average number of days from an individual appearing at a health facility/treatment center with human infection with H5N1 virus to receipt of a biological specimen at a designated laboratory.

What It Measures

This indicator measures the speed and efficiency with which samples are collected and sent to a designated laboratory. It documents the time delay between presentation and receipt of biological specimens. Early diagnosis or clinical suspicion and laboratory diagnosis are essential to facilitate a prompt investigation and response to contain an outbreak.

Measurement Tools

No tool exists.

- *Human infection with H5N1 virus case forms*
- Laboratory reports.

How to Measure It

Systematic review of human infection with H5N1 virus case report forms and laboratory reports should allow the calculation of this simple average.

Frequency

This indicator can be measured quarterly or semiannually depending on the number of cases reported.

Considerations

The calculation of this indicator will depend on the quality of the record-keeping systems in that date of presentation and date of receipt of sample are noted at the health facilities and laboratories.

While an average (or mean) value is easy to calculate, its major disadvantage as the measurement for an indicator is that it is affected by extremely high or low values (i.e., outliers). Capturing the range (minimum, maximum) of days along with the average would assist countries in understanding the variation in scenarios.

Alternatively, program managers and evaluators might wish to calculate the median value instead of the mean. Median is a value in an ordered set of values below and above which there is an equal number of values or is the arithmetic mean of the two middle values if there is no one middle number.[79] To calculate the median value for this indicator, calculate the number of days between presentation to a health facility of a suspected case of human infection with H5N1 virus to receipt of a biological specimen at a designated laboratory for each instance, and find the middle number. If the number of instances is an even number (i.e., there are two middle numbers), take the middle pair of numbers and calculate the mean of the two numbers to obtain the median number. Long median value might be because of delay in initiating an investigation or because of slowness in conducting the investigation. A major advantage of the median is that an extreme value would not affect the median value. However, if there were many data points from which to calculate the median value, the calculation would be time consuming. Furthermore, if any of the values around the middle of the distribution alters even slightly, then the median would be affected (versus the average, which is less affected by the change in values around the middle of the distribution).

Revision History

First published June 2007 as indicator 5.3.2. Revised in current edition.

Last revised September 2008

[79] www.webster.com

5.3.300 Average Number of Days from Receipt of Clinical Samples from Suspect Cases of Human Infection with H5N1 Virus to Either Confirmation or Ruling Out of Human Infection with H5N1 Virus per National Standard Operating Procedure(s)

Core Indicator

Definition

Average number of days from receipt of clinical samples at the laboratory level from suspected cases of human infection with H5N1 virus to either confirmation or ruling out of human infection with H5N1 virus.

Disaggregation: Type of test, laboratory

What It Measures

This indicator measures the speed and efficiency with which samples are processed once received for testing.

Measurement Tools

No tool exists.

- *Human infection with H5N1 virus case forms*
- Laboratory reports.

How to Measure It

Systematic review of human infection with H5N1 virus case report forms and laboratory reports should allow the calculation of this simple average.

Frequency

This indicator can be measured quarterly or semiannually depending on the number of cases reported.

Considerations

The calculation of this indicator will depend on the quality of the record-keeping systems at the health facilities and laboratories. It should also be noted that the different levels (subnational, national, international) might process different types of tests for samples according to national SOPs. The indicator can be disaggregated by type of test to capture the different levels.

While an average (or mean) value is easy to calculate, its major disadvantage as the measurement for an indicator is that it is affected by extremely high or low values (i.e., outliers). Capturing the range (minimum, maximum) of days along with the average would assist countries in understanding the variation in scenarios.

Alternatively, program managers and evaluators might wish to calculate the median value instead of the mean. Median is a value in an ordered set of values below and above which there is an equal number of values or is the arithmetic mean of the two middle values if there is no one middle number.[80] To calculate the median value for this indicator, calculate the number of days from receipt of clinical samples from suspected cases of human infection with H5N1 virus to either confirmation or ruling out of human infection with H5N1 virus for each instance, and find the middle number. If the number of instances is an even number (i.e., there are two middle numbers), take the middle pair of numbers and calculate the mean of the two numbers to obtain the median number. Long median value might be because of delay in initiating an investigation or because of slowness in conducting the investigation. A major advantage of the median is that an extreme value would not affect the median value. However, if there were many data points from which to calculate the median value, the calculation would be time consuming. Furthermore, if any of the values around the middle of the distribution alters even slightly, then the median would be affected (versus the average, which is less affected by the change in values around the middle of the distribution).

Revision History

First published June 2007 as indicator 5.3.3. Revised in current edition.

Last revised September 2008

[80] www.webster.com

5.3.400 Existence of a Laboratory Quality Assurance System for Human Infection with H5N1 Virus

Additional Indicator

Definitions

An inter-laboratory quality assurance system exists if:

- National quality assurance guidelines have been disseminated to all laboratories.
- Personnel from all laboratories have been trained on the guidelines.
- Quality assurance systems are functioning in all laboratories.
- Supervision is taking place.

Yes: Country has a quality assurance system with all the elements in place.

No: Country has a quality assurance system, but it does not meet the criteria defined above. List missing elements.

OR

Country does not have a quality assurance system.

What It Measures

Ideally, all laboratories should achieve acceptable accuracy and consistency in the assays that they perform, according to national SOPs. This indicator measures the extent to which an inter-laboratory quality assurance system is being implemented in the laboratories, either nationally or, for countries with only one laboratory, with international reference laboratories.

Measurement Tools

No tool exists.

Laboratory quality assurance system checklist that itemizes the components in the categories listed above

How to Measure It

In order to measure this indicator, there needs to be a list of all laboratories in the country, and all these laboratories need to be assessed. The laboratory quality assurance system checklist can be used as part of routine supervisory visits or as part of a facility survey in which all laboratories are visited.

Frequency

The frequency of assessment depends on the variability expected (if quality assurance is being gradually phased in, then change can be expected in frequent assessments) and on the method of assessment (if supervisory visits are used, then frequency would be greater than if laboratory assessment is conducted).

Considerations

As defined, this indicator only measures whether the system exists. It does not measure the quality or effectiveness of the system. Given the strictness of the elements required, it might be that a “yes” for this indicator is never achieved. Consider two alternative indicators: Existence of a Plan for a National Inter-Laboratory Quality Assurance System and Proportion of Laboratories Meeting Inter-Laboratory Quality Assurance System Standards.

Revision History

First published June 2007 as indicator 5.3.4. Revised in current edition.

Last revised September 2008

5.3.500 Proportion of Biological Samples from Suspected Cases of Human Infection with H5N1 Virus That Are Received at Designated Laboratories of Sufficient Quality to Be Tested

Additional Indicator

Definition

The proportion of biological samples from suspected cases of human infection with H5N1 virus that are received at designated laboratories and are of sufficient quality to be tested.

Numerator: The number of biological samples from suspected cases of human infection with H5N1 virus that are received at designated laboratories and are of sufficient quality to be tested

Denominator: The total number of biological samples from suspected cases of human infection with H5N1 virus that are received at designated laboratories

Sufficient quality to be tested means that the sample could be tested, and a result was obtained either confirming or disproving human infection with H5N1 virus.

What It Measures

Many individual countries have established protocols and SOPs on how to collect biological samples. This indicator measures the extent to which the established procedures for collecting specimens are being followed. It enables the program to measure the quality of the collection system for samples of suspected human infection with H5N1 virus.

Measurement Tools

Policy documents, logbooks, lab records, shipping documents

How to Measure It

Data from logbooks and lab records should be checked, and preferably some form of quality assurance sampling could be used to verify logbook data.

Frequency

Quarterly if cases are frequent, as the number of samples would increase. Semiannually if there are fewer cases in the country.

Considerations

This indicator will capture the general extent to which procedures for collection are followed but would not show specifically where the shortfalls occurred. A special study or system audit would be required to pinpoint the weak links in the system and design improvements.

Revision History

First published June 2007 as indicator 5.3.5. Revised in current edition.

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5.3.600 Proportion of Biological Samples of Suspected Cases of Human Infection with H5N1 Virus Received at Designated Laboratories with Appropriate Biohazard Packaging

Additional Indicator

Definition

The proportion of biological samples of suspected cases of human infection with H5N1 virus that are received at designated laboratories with appropriate biohazard packaging.

Numerator: The number of biological samples of suspected cases of human infection with H5N1 virus that are received at designated laboratories with appropriate biohazard packaging

Denominator: The total number of biological samples of human infection with H5N1 virus that are received at designated laboratories

Both WHO and many individual countries have established protocols for how to ship biological samples. This indicator could use either set of standards, but any reporting should explicitly state which standards are being followed, and the same set of standards should be used each time this indicator is calculated.

What It Measures

This indicator measures the extent to which designated laboratories are following established biosafety procedures for shipping specimens. It enables the program to measure the quality of its biosafety implementation.

Measurement Tools

Policy documents, logbooks, lab records, shipping documents

How to Measure It

Data from logbooks and lab records should be checked, and preferably some form of quality assurance sampling could be used to verify logbook data.

Frequency

Quarterly if cases are frequent, as the number of samples would increase. Semiannually or annually if there are fewer cases in the country.

Considerations

This indicator will capture the general extent to which procedures for shipping are followed but would not show specifically where the shortfalls occurred. A special study or system audit would be required to pinpoint the weak links in the system and design improvements.

Revision History

First published June 2007 as indicator 5.3.6. Revised in current edition.

Last revised September 2008

5.4 Clinical Management

5.4.100 Total Number of Clinicians Trained in Clinical Treatment of Human Infection with H5N1 Virus According to National Treatment Standard Operating Procedure(s) during the Reporting Period

Additional Indicator

Definition

Number of clinicians trained in clinical treatment of human infection with H5N1 virus during the reporting period disaggregated by sector, type of clinician (e.g., doctors, nurses), level of the health care system (e.g., community, district, province, national), geographic area, and sex.

According to national treatment SOPs means that the training topics will be determined by nationally established SOPs for clinical treatment of human infection with H5N1 virus.

What It Measures

This indicator quantifies the human resources that are trained in the clinical treatment of human infection with H5N1 virus. For planning purposes, it is important to assess the resources available to address a potential outbreak effectively. To prepare for a pandemic, it is vital to know not only what facilities and equipment are available, but also what training and human resources exist. Only with this information can health systems meet the potential needs of the population concerned.

Measurement Tools

Review of post-training surveys and/or course evaluation forms and training records

How to Measure It

This indicator can be calculated by reviewing training records in each facility or health district. However, if such records do not exist, a survey of facilities can be carried out. A random sample of health care providers in these facilities should be asked what training they might have received in treatment and containment for human infection with H5N1 virus and whether they have been trained according to the indicator definition.

Frequency

Training information is collected continuously and reported to the national level at the end of the reporting period.

Considerations

This indicator is useful in that it tracks the number of clinicians trained in clinical treatment for human infection with H5N1 virus over time. It attempts to document increasing capacity to respond to a potential outbreak. This indicator does not measure the geographical coverage provided by trained individuals. Countries might want to adopt an indicator that specifies the proportion of subnational units that have clinicians trained in clinical treatment for human infection with H5N1. No conclusion should be drawn regarding quality because this is affected by the practices employed rather than by the existence of trained personnel. In addition, staffing levels might be a problem for effective implementation of training. It should not be expected that all clinicians in countries would have been trained nor even that a high percentage of those who could be trained will have been trained. The indicator should be interpreted in relation to the number and nature of human infection with H5N1 virus cases in particular countries.

Revision History

First published June 2007 as indicator 5.4.1. Revised in current edition.

Last revised September 2008

5.4.200 Proportion of Cases of Human Infection with H5N1 Virus with Recommended Clinical Management Response per National Standard Operating Procedure(s)

Core Indicator

Definition

Proportion of cases of human infection with H5N1 virus with recommended clinical management response per national SOPs over the reporting period.

Numerator: Number of cases of human infection with H5N1 virus with recommended clinical management response per national guidelines during the reporting period

Denominator: Total number of cases of human infection with H5N1 virus in a given period

- The clinical management SOPs should be defined at the national level, and clinical staff should have been trained on their implementation.
- Cases: Depending on the national SOPs, this indicator can be calculated using either suspected or confirmed cases. Suspected cases should be included in the reporting system for human infection with H5N1 virus, and countries should strive for this as their surveillance system for human infection with H5N1 virus is strengthened.

What It Measures

This indicator measures the extent and quality of the clinical management response to cases of human infection with H5N1 virus.

Measurement Tools

No tool exists.

- *Human infection with H5N1 virus case form*
- Review of provincial, district, and health facility records and patient cards.

How to Measure It

The data should be collected from the appropriate health facility records and reviewed for adherence to national standards for clinical management. Where discrepancies exist, the clinical manager or other supervisor can directly intervene to improve outcomes at the individual facility level while at the same time submitting data for national aggregation.

Frequency

These data should be reviewed on a quarterly basis at the clinic level (when there are cases of human infection with H5N1 virus at the facility) for performance improvement. At the national aggregate level, semiannual or annual reporting might be sufficient.

Considerations

This indicator measures the quality of clinical case management for human infection with H5N1 virus and allows routine review and performance improvement. It does not, however, measure the timeliness of the response, which is also important for good clinical management.

Revision History

First published June 2007 as indicator 5.4.2. Revised in current edition.

Last revised September 2008

5.4.300 Proportion of Health Care Facilities That Provide Care and Treatment for Human Infection with H5N1 Virus

Additional Indicator

Definition

Proportion of health facilities that provide care and treatment for human infection with H5N1 virus.

Numerator: Number of health facilities that provide care and treatment for human infection with H5N1 virus

Denominator: Total number of health facilities surveyed

Care and treatment for human infection with H5N1 virus includes:

- Visibly posted guidelines for clinical treatment of human infection with H5N1 virus
- At least one provider who has had training in clinical management of H5N1 virus in the past year
- Existence of basic supplies: ventilators, PPE
- Existence of an isolation/containment room.

Health care facilities can be hospitals, clinics, and outpatient posts. All elements of care and treatment listed above must be present in order for a health facility to be considered as providing care and treatment.

What It Measures

This indicator measures whether health care facilities have the necessary elements to provide care and treatment of human infection with H5N1 virus. This indicator potentially can expose gaps at the health facility level in delivering care and treatment services effectively as well as measure the capacity of the health care system to withstand a possible surge in cases of human infection with H5N1 virus or pandemic influenza.

Measurement Tools

No tool exists.

Checklist of standards for care and treatment of human infection with H5N1 virus or a health facility survey adapted for human infection with H5N1 virus

How to Measure It

This indicator is measured by examining (direct observation) the care and treatment practices of facilities during a facility survey or supervisory visit.

Frequency

Annually if supervisory; less frequent if facility survey.

Considerations

This indicator can help governments track progress in terms of improving care and treatment services at the health facility level. It does not, however, reflect the geographical distribution or access of the population to health facilities that have basic care and treatment. In addition, this indicator does not directly assess whether health facilities meet national standards for care and treatment of human infection with H5N1 virus.

Because the current knowledge base for human infection with H5N1 virus is limited, international standards are still under development at the time of the publication of this guide. As new standards are released, this indicator should be updated. However, this presents difficulties in tracking progress over time.

Revision History

First published June 2007 as indicator 5.4.3. Revised in current edition.

Last revised September 2008

5.4.400 Proportion of Health Workers Who Can Correctly Identify Symptoms of Human Infection with H5N1 Virus

Additional Indicator

Definitions

Numerator: Number of health workers interviewed who can identify symptoms of human infection with H5N1 virus (unprompted)

Denominator: Number of health workers interviewed

Disaggregation: Geographical area, sex, age, and type of health worker

- Symptoms should be based on the country case definition.
- Health workers can include doctors, nurses, community health workers, pharmacists, lab technicians, and health facility administrators.

What It Measures

The percent of health workers who can properly identify symptoms of human infection with H5N1 virus gives an indication of whether key facts about human infection with H5N1 virus are reaching health workers, who are a critical population in responding to cases of human infection with H5N1 virus effectively, and whether these facts are being incorporated into their fund of knowledge.

Measurement Tool

No tool exists.

Health facility survey adapted for human infection with H5N1 virus

How to Measure It

This indicator is measured by surveying a representative sample of health workers.

Frequency

Annually

Considerations

As the efforts to train health workers in responding to human infection with H5N1 virus intensify, program managers and evaluators might be interested in tracking changes in this indicator to determine how well the training programs are reaching the crucial population.

The current state of knowledge on what constitutes clear symptoms of human infection with H5N1 virus is limited. This indicator will depend on accurate determination by international technical agencies on what the symptoms of human infection with H5N1 virus are before this indicator can be accurately defined and measured.

Revision History

First published June 2007 as indicator 5.4.5. Revised in current edition.

Last revised September 2008

5.5 Infection Control for Human Infection with H5N1 Virus

5.5.100 Total Number of People Trained in Infection Control of Human Infection with H5N1 Virus According to National Treatment Standard Operating Procedure(s) during the Reporting Period

Additional Indicator

Definition

Number of people trained in infection control of human infection with H5N1 virus during the reporting period.

Disaggregation: Sector: government (including village health workers or equivalent), NGO, private sector, community members (including village health volunteers), type of trainee, level of the health care system (e.g., community, district, province, national, etc.), sex, training topic, geographic area

Trained in infection control of human infection with H5N1 virus means receiving training that covers topics in standard and respiratory infection control precautions, respiratory hygiene/cough etiquette, early recognition and reporting of cases of human infection with H5N1 virus, isolation precautions for suspected and confirmed cases of human infection with H5N1 virus, measures to reduce nosocomial human infection with H5N1 virus transmission, specimen collection/transport/handling within health care facilities, family member/visitor recommendations, patient transport within health care facilities, pre-hospital care, waste disposal, handling dishes and linen, environmental cleaning and disinfection, and handling patient care equipment.

Not every person needs to be trained in all of the topics above, but the people should receive training in those areas relevant to their own responsibilities and to the setting in which they practice. This should be determined by nationally established SOPs.

What It Measures

This indicator quantifies the human resources that are trained in the control of human infection with H5N1 virus. For planning purposes, it is important to assess the resources available to address a potential outbreak effectively. To prepare for a pandemic, it is vital to know not only what facilities and equipment are available but also what training and human resources exist. Only with this information can health systems meet the potential needs of the population concerned.

Measurement Tools

Review of post-training surveys and/or course evaluation forms and training records

How to Measure It

This indicator can be calculated on the basis of a review of training records in each facility or health district. However, if such records do not exist, a survey of facilities can be carried out. A random sample of health care providers in these facilities should be asked what training they might have received in the control of human infection with H5N1 virus and whether they have been trained according to the indicator definition.

Frequency

Training information is collected continuously and reported to the national level at the end of the reporting period.

Considerations

This indicator is useful in that it tracks the number of people trained in the control of human infection with H5N1 virus over time. It attempts to document increasing capacity to respond to a potential outbreak. This indicator does not measure the geographical coverage provided by trained individuals. Countries might want to adopt an indicator that specifies the proportion of subnational units that have an individual trained in infection control of human infection with H5N1 virus.

No conclusion should be drawn regarding quality because this is affected by the practices employed rather than by the existence of trained personnel. In addition, staffing levels might be a problem for the effective implementation of training. It should not be expected that all health care workers in countries would have been trained nor even that a high percentage of those who could be trained will have been trained. The indicator should be interpreted in relation to the number and nature of human infection with H5N1 virus cases in particular countries.

Revision History

First published June 2007 as indicator 5.5.1. Revised in current edition.

Last revised September 2008

5.6 Rapid Response to Human Cases of Infection with H5N1 Virus

5.6.100 Total Number of People Trained in Rapid Response and Containment Measures for Human Infection with H5N1 Virus during the Reporting Period

Additional Indicator

Definition

Number of people trained in rapid response and containment measures for human infection with H5N1 virus during the reporting period.

Disaggregation: Sector: government (including village health workers or equivalent), NGO, private sector, community members (including village health volunteers), type of trainee, level of the health care system (e.g., community, district, province, national, etc.), sex, training topic, geographic area

Rapid response and containment measures might vary depending on national standards and protocols. For the purposes of measuring this indicator, the national standards should be used in determining what constitutes appropriate SOPs for rapid response and containment.

What It Measures

This indicator quantifies the human resources that are trained in rapid response to and containment of human infection with H5N1 virus. For planning purposes, it is important to assess the resources available to address a potential outbreak effectively. To prepare for a pandemic, it is vital to know not only what facilities and equipment are available, but also what training and human resources exist. Only with this information can health systems meet the potential needs of the population concerned.

Measurement Tools

Organizations responsible for training maintain training logs or a database and submit a training report to the organization responsible for overseeing and coordinating the training at the end of the reporting period. The training report would include information on:

- *Title of training*
- *Venue, date, total hours of training*
- *Topic (which could be forced into predetermined categories)*
- *Number and cadre of people trained.*

How to Measure It

A training database is maintained at the national level. Organizations responsible for training for rapid response to and containment of human infection with H5N1 virus are required to submit training data upon completion of a training session.

Frequency

Training information is collected continuously and reported to the national level at the end of the reporting period.

Considerations

This indicator does not measure the geographical coverage provided by trained individuals. Countries might want to adopt an indicator that specifies the proportion of subnational units that have an individual trained in human infection with H5N1 virus rapid response and containment.

There is potential for double-counting individuals if multiple organizations are conducting training programs and individuals attend more than one training. Double-counting might also occur if a person attends a training program more than once during the reporting period.

Revision History

First published June 2007 as indicator 5.6.1. Revised in current edition.

Last revised September 2008

5.6.200 Existence of a National Rapid Response Team for Human Infection with H5N1 Virus That Meets National Criteria

Core Indicator

Definition

Yes: Country has a national rapid response team that meets criteria defined in the national preparedness plan or other documents.

No: Country has a national rapid response team, but it does not meet the criteria defined in the national preparedness plan or other documents. List missing elements.

OR

Country does not have a national rapid response team.

The criteria for the establishment of a team should be defined in national guidelines and should include types of competencies expected (e.g., epidemiologist, clinician, laboratory technician, infection control, risk communications).

What It Measures

This indicator assesses the availability of human resources at the national level to respond to an outbreak of human infection with H5N1 virus.

Measurement Tools

Policy documents and team logbooks

How to Measure It

Review human resource documents containing evidence of an established rapid response team.

Frequency

Semiannually or annually

Considerations

This indicator measures the availability of human resources at the national level to respond immediately to an outbreak of human infection with H5N1 virus. However, it does not measure whether the team has been trained to respond appropriately at the investigation site or whether the team has the capability or resources to respond in a timely fashion. It also does not assess the number of people needed in an investigation team to respond appropriately to an outbreak.

Revision History

First published June 2007 as indicator 5.6.2. Revised in current edition.

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5.6.300 Proportion of Subnational Units That Have a Rapid Response Team That Meets National Criteria

Core Indicator

Definition

Proportion of subnational units with a rapid response team that meets national criteria according to the national preparedness plan or other appropriate documents.

Numerator: Number of subnational units with a rapid response team that meets national criteria

Denominator: Total number of subnational units

The criteria for the establishment of a team should be defined in national guidelines and include types of competencies expected (e.g., epidemiologist, clinician, laboratory technician, infection control, risk communications).

What It Measures

This indicator assesses the availability of human resources for rapid response at the subnational level and the coverage of those services that the teams provide.

Measurement Tools

Provincial/district documents and logbooks, ministry of health, or HPAI coordinating body records

How to Measure It

Review human resource documents containing evidence of an established rapid response team. Validation can be done through site visits or contacts with local authorities.

Frequency

Semiannually or annually

Considerations

This indicator measures the availability and coverage of human resources to respond to an outbreak of human infection with H5N1 virus. However, it does not measure whether the team has been trained to respond appropriately at the investigation site or whether the team has the capability or resources to respond in a timely fashion. It also does not assess the number of people needed in an investigation team to respond appropriately to an outbreak. In addition, not every country might have rapid response teams at the subnational unit. However, it is recommended that countries work to place rapid response teams at subnational units as the response to human infection with H5N1 virus is strengthened.

Revision History

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5.6.400 Average Number of Days from Notification of a Case of Human Infection with H5N1 Virus to the Deployment of a Rapid Response Team for Epidemiological Investigation and Containment per National SOPs

Core Indicator

Definition

The average number of days from notification of a case of human infection with H5N1 virus to the deployment of a rapid response team for epidemiological investigation and containment according to national policy. The average is defined as the total number of days between notification of a case and rapid response divided by the total number of cases that resulted in rapid response.

Current international recommendations for investigation of human infection with H5N1 virus include the following elements: establishment of a multidisciplinary investigation team, confirmation of diagnosis, interview with case patient and visit to patient's home, contact tracing, active case-finding, specimen collection, visit to health facility, initiating enhanced surveillance, initiating associated animal investigations, implementing control measures, data analysis, and notification of authorities.[81] Governments should keep these recommendations in mind when developing their own national guidelines.

Cases: Depending on the national SOPs, this indicator can be calculated using either suspected or confirmed cases. Suspected cases should be included in the reporting system for human infection with H5N1 virus, and countries should strive for this as their surveillance system for human infection with H5N1 virus is strengthened.

What It Measures

This indicator measures the timeliness of the response to an outbreak of human infection with H5N1 virus in order to prevent further spread of the virus. It is a good indicator of whether the notification system is working properly to facilitate an appropriate response in a timely manner. Ultimately, this indicator can be used as a monitoring tool to assess progress toward rapidly responding to reported events of human infection with H5N1 virus.

Measurement Tools

- Human infection with H5N1 virus case form
- District/provincial/national logs and databases.

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[81] WHO. *WHO guidelines for investigation of human cases of avian influenza A(H5N1).* Geneva. January 2007. Accessed February 2008.

How to Measure It

Measurement of this indicator requires records indicating exact dates of notification of a case of human infection with H5N1 virus and the subsequent time and date of a response from the investigative team. This information is compiled over a period in order for an average to be calculated.

Frequency

The frequency with which extraction of information and calculation of the indicator is done is dependent on the number of cases observed. If there are many cases, quarterly calculation might be considered; if there are few cases, consider annual calculation.

Considerations

While an average (or mean) value is easy to calculate, its major disadvantage as the measurement for an indicator is that it is affected by extremely high or low values (i.e., outliers). Capturing the range (minimum, maximum) of days along with the average would assist countries in understanding the variation in scenarios.

Alternatively, program managers and evaluators might wish to calculate the median value instead of the mean. Median is a value in an ordered set of values below and above which there is an equal number of values or is the arithmetic mean of the two middle values if there is no one middle number.[82] To calculate the median value for this indicator, calculate the number of days from notification of a case of human infection with H5N1 virus to the deployment of a rapid response team for epidemiologic investigation and containment for each instance, and find the middle number. If the number of instances is an even number (i.e., there are two middle numbers), take the middle pair of numbers and calculate the mean of the two numbers to obtain the median number. Long median value might be because of delay in initiating an investigation or because of slowness in conducting the investigation. A major advantage of the median is that an extreme value would not affect the median value. However, if there were many data points from which to calculate the median value, the calculation would be time consuming. Furthermore, if any of the values around the middle of the distribution alters even slightly, then the median would be affected (versus the average, which is less affected by the change in values around the middle of the distribution).

This indicator measures the speed at which a rapid response team takes action during an outbreak of human infection with H5N1 virus; however, it does not measure the quality of the investigation. This indicator can be used to monitor the efficiency of the surveillance system to mobilize human resources to respond to events of human infection with H5N1 virus.

[82] www.webster.com

Revision History

First published June 2007 as indicator 5.6.4. Revised in current edition.

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5.7 Special Studies

5.7.100 Number of Special Studies Conducted

Additional Indicator

Definitions

Number of special studies related to human infection with H5N1 virus conducted during the reporting period.[83]

- Special studies are assessments carried out by a national program that are outside the routine monitoring of program activities and are for special purposes relevant to the program and its informational needs (e.g., vaccine efficacy study and other OR).
- Reporting period might vary depending on a country's reporting period or donors' reporting requirements.

Disaggregation: Type of study, status of study (designed, piloted, in progress, completed)

What It Measures

This indicator measures the number of instances in which special studies related to human health are carried out to inform and guide decision making in order to 1) improve program effectiveness and/or 2) develop model programs that can be scaled up or replicated.

This indicator also measures the extent to which countries impacted by the disease are generating the necessary knowledge base for the global community to develop evidenced-based strategies, technical guidelines, and SOPs.

Measurement Tool

Program records and documents and study reports or other outputs of OR studies

How to Measure It

Review program records and documents and a list of study reports or other outputs of OR studies maintained by the national program, and count the number of special studies that have been conducted during the reporting period.

For a study to be counted in the indicator, there must be an evidence of national program managers' and/or staff's involvement or participation in the study. Participation can range from full implementation of a study by the national program with limited external assistance to study efforts for which key study elements (e.g., development of a study design, development of

[83] This indicator was adapted from the relevant indicators presented in Bertrand J., Magnani R., and Rutenberg N., *Handbook of Indicators for Family Planning Program Evaluation,* The Evaluation Project, pp. 93–94.

instruments, data collection, analysis, report writing) are contracted out to researchers or institutions external to the program.

Frequency

This indicator should be measured annually to determine the number of special studies related to human infection with H5N1 virus that are conducted in a country.

Considerations

This indicator provides a crude measure of instances in which special studies related to human health were conducted to inform and guide decision making in order to affect policies and improve program effectiveness. Measurement of this indicator alone does not provide an assessment of the quality of the studies carried out or whether the studies achieved the intended purposes (e.g., affected policies; led to reorientation of the other program components and in particular BCC programs; led to development of model programs, scaling up of existing programs, or replication of programs in another context).

Furthermore, for special studies to be relevant and responsive to the national program, a high level of participation or involvement on the part of national program managers and staff is desirable.

Revision History

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References

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WHO. (2004). *WHO guidelines for global surveillance of influenza A/H5.* Accessed February 2008 at http://www.who.int/csr/disease/avian_influenza/guidelines/globalsurveillance.pdf.

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CHAPTER 6: REDUCED RISK OF HPAI TRANSMISSION ASSOCIATED WITH HUMAN BEHAVIOR (BEHAVIOR CHANGE COMMUNICATION)

Introduction

Risk reduction through BCC is an integral part of a comprehensive HPAI preparedness strategy. Behaviors associated with increased risk of HPAI transmission can only be modified through accurate information and awareness among the population. BCC programs are designed to influence knowledge, attitudes, and behaviors related to HPAI with the goal of preventing the adverse effects of an HPAI outbreak.

BCC programs can be implemented through a variety of channels, including mass media (television, billboards, radio, leaflets), interpersonal communication (one-on-one sessions, group presentations), and community mobilization. Often BCC campaigns use a mixture of these methods in order to increase the effectiveness of the messaging.

This chapter presents outcome (changed behaviors), output (increased knowledge, increased exposure and coverage), process (training), and input (special studies). All three channels described above can be used to achieve the results measured by the indicators in this section.

In order to efficiently control outbreaks of HPAI and limit risk of human infection, aggressive BCC campaigns should be implemented with the goal of behavior change within the general population. According to responses to KAP surveys currently in the field as well as other studies, it seems that the level of knowledge about HPAI is fairly high.[84] However, perception of risk remains a major issue, and unless this perception changes, it remains uncertain whether the knowledge of appropriate protective behaviors will be translated into practice. There is also less awareness of specific behaviors that should be practiced to reduce the risk of HPAI transmission.[85] Furthermore, more evidence is required to determine whether elevating risk perception would truly lead to behavior change or whether other factors such as social/peer influence play a greater role in behavior change in some situations. BCC is a key area in addressing these challenges.

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[84] Responses to AED AI-KAP survey, Vietnam. See also Takeuchi, M. "Avian influenza risk communication, Thailand" [letter]. *Emerging Infectious Diseases.* 2006 July Accessed March 2007 from http://www.cdc.gov/ncidod/EID/vol12no07/06-0277.htm.

[85] AED. *Southeast Asia Outreach Messages to Reach Family Poultry Farmers.* Available at http://www.avianflu.aed.org/asia.htm.

Indicators related to emergency communication planning are covered in chapter 3. The indicators in this section are BCC-related indicators and are divided into the following eight main areas:

Appropriate Protective Behaviors Practiced

This section pertains to the practice of appropriate behaviors. This is the ultimate goal of BCC, and the indicators in this section measure whether individuals are practicing the behaviors that are the focus of BCC campaigns. Indicators in this section assess whether appropriate behaviors for reducing the risk of bird-to-bird and bird-to-human transmission of HPAI viruses are being practiced.

Improved Care-Seeking Behaviors

This section pertains to improved care-seeking behaviors. The indicator in this section measures whether knowledge of appropriate procedures for seeking treatment for HPAI is being put into practice. This indicator might be difficult to measure currently.

Improved Knowledge of HPAI Risk to Poultry and Preventive Measures

This section pertains to improved knowledge of HPAI risk to poultry. Indicators in this section measure whether poultry farmers and other members of the poultry supply and distribution chain know about the risk of HPAI and the methods to prevent it. This section focuses primarily on the risk of bird-to-bird transmission. Increasing knowledge of the risk is a key first step toward behavior change.

Improved Knowledge of HPAI Risk to Humans and Preventive Measures

This section pertains to improved knowledge of HPAI risk to humans and preventive measures. Indicators in this section measure whether the general population and/or target groups are aware of the risk of HPAI and of methods to prevent it. This section focuses primarily on the risk of bird-to-human transmission of HPAI viruses. Increasing knowledge of the risk of HPAI transmission and behaviors to mitigate it is a key first step toward behavior change.

Exposure to and Coverage of HPAI BCC Campaigns

An appropriate number of people must be exposed to a BCC campaign before it has any impact on the general population. The indicators in this section relate to coverage of BCC campaigns in the general population and estimates of the reach of those campaigns. These indicators assess how broadly the behavior change messages are being disseminated among target groups and within the general population.

Human Capacity for HPAI BCC

Another component of a successful BCC campaign is a set of skilled workers who have the expertise and capacity to carry out BCC. The indicators in this section relate to human capacity to carry out BCC campaigns: the number of individuals trained, their knowledge of HPAI transmission, and information as to whether the right people are being trained. Because the community agents described in this section will be relied on to provide accurate information about HPAI to others in their village or district, the knowledge targets set for them in the indicators is high (75 percent).

Multisectoral Coordination

To have a national BCC campaign, there must be coordination among the various government and nongovernment stakeholders. This section pertains to multisectoral coordination in developing and maintaining HPAI BCC campaigns, which is crucial to ensuring that BCC is implemented and coordinated effectively. The wide range of potential communication efforts necessitates some kind of central coordinating group that can ensure that key messages are developed and that audiences are targeted appropriately with input from all sectors involved in the behavior change effort. Frequently, different groups are responsible for different aspects of a campaign or messaging; it is important to make sure that the various participants in BCC efforts remain focused on the priority messages and do not duplicate the efforts of other partners. The indicator also measures whether various key groups are represented appropriately, ensuring that a range of viewpoints is taken into account when formulating BCC strategies.

Research

This section pertains to research in the area of reducing the risk of transmission of HPAI. As HPAI BCC campaigns are developed, it may become clear that targeted research is needed in specific areas to improve the effectiveness of the campaigns. Special studies give a broader picture of the effectiveness/quality of the response to guide decision making.

Challenges in M&E of HPAI BCC Programs

Several factors make M&E of HPAI BCC programs particularly challenging. One major factor is the newness of the disease. Relatively little time has elapsed since the threat of H5N1 was first recognized, meaning that there has been little time to research the most effective approaches to achieve behavior change. Thus, although this section contains indicators pertaining to knowledge of key behaviors and their practice, there are no indicators pertaining to other aspects of the "ideation" phase, such as attitude or emotional response. As BCC programs on this subject mature, we expect that more information on these aspects of BCC will be available and will be incorporated into future revisions to this guide. There has also been relatively little time for BCC programs to be implemented and for behavior change to occur.

As HPAI BCC programs mature, it will be important to ensure that BCC campaign strategies are evidence based. Campaign planners should analyze KAP survey data to 1) identify gaps and reassess the focus of the campaign accordingly, 2) assess audience motivations and design appropriate messages, and 3) identify channels to reach the audience most effectively. This edition of the guide does not include an indicator to measure these specific steps.

Another concern is ensuring that campaigns target and agencies monitor the correct unit of intervention. For example, some campaigns are focusing on ensuring that areas where chickens are kept are fenced appropriately. While individual respondents may report that they are aware of and implement correct fencing practices, if other members of their village do not, the communications effort may still not be effective in preventing the spread of HPAI. It may be useful to ask some questions at a collective level in order to better measure community response to the risk of HPAI.

Measurement Tools/Data Sources

The indicators discussed in this chapter rely on several potential and existing data sources. These include a checklist of functioning national working groups to be used in conjunction with working group documents; training logs and reports; HPAI-specific KAP surveys; communications materials inventories, radio and television station audience records, and distribution lists; and/or standardized reporting forms.

The most common tool is a KAP survey. To be effective, KAP surveys are usually conducted at baseline (before the planned programmatic intervention), then at intervals during and after the intervention. KAP survey instruments can be adapted to monitor the results of program interventions and provide valuable data for monitoring and evaluating progress on these indicators. Several donor agencies and implementing partners working in the region either have conducted or are planning to conduct such surveys.

Throughout this chapter, we have referred specifically to the KAP surveys conducted in SE Asia by Academy for Educational Development (AED), which have provided wording for many of the sample questions included in the indicators. These surveys have been administered to backyard farmers in several countries but have not been administered to the other target audiences described in this section (such as the general population, community agents, and other individuals in the poultry supply and distribution chain).

Selection of Indicators

In developing this guide, we have applied the principle of adapting, where possible, indicators that have already demonstrated their utility and feasibility in other health domains. Several indicators from this section have been adapted from the *Compendium of Indicators for Evaluating Reproductive Health Programs* (Bertrand & Escudero, 2002). In terms of measurement techniques and considerations, these indicators remain true to the original specifications. However, the unique nature of the HPAI programs limited our ability to adapt and apply indicators that were developed and validated in other areas of public health. Thus, most of the indicators in this chapter were developed through a consultative process, with significant input from the technical working group members, technical experts, and program managers in countries of the region representing government ministries and organizations working to reduce the risk of HPAI transmission.

Many of the indicators listed in this chapter are the indicators that are currently used to monitor programs in the region. However, the indicators presented in this chapter do not constitute a comprehensive set of indicators for monitoring and evaluating programs that aim to reduce the risk of HPAI transmission.

The indicators in this chapter are as follows:

6.1 Appropriate Protective Behaviors Practiced

6.1.100 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Report Practicing Four Behaviors to Decrease the Risk of Highly Pathogenic Avian Influenza Infection to Their Poultry (Core Indicator)

6.1.200 Proportion of People Interviewed Who State That They Practice at Least Three Behaviors to Protect Themselves and Their Families from Transmission of H5N1 Virus (Core Indicator)

6.2 Improved Care-Seeking Behaviors

6.2.100 Proportion of Suspected Cases of Human Infection with H5N1 Virus Seeking Treatment within 48 Hours of Fever Onset (Additional Indicator)

6.3 Improved Knowledge of Highly Pathogenic Avian Influenza Risk to Poultry and Preventive Measures

6.3.100 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can Correctly Cite the Key Characteristics of Highly Pathogenic Avian Influenza Outbreaks in Poultry (Core Indicator)

6.3.200 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know at Least Two Mechanisms for the Transmission of Highly Pathogenic Avian Influenza to Poultry (Core Indicator)

6.3.300 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can List Four Ways to Protect Their Poultry from Highly Pathogenic Avian Influenza (Core Indicator)

6.3.400 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know to Report an Outbreak of Highly Pathogenic Avian Influenza Immediately (Core Indicator)

6.3.500 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know to Whom to Report an Outbreak of Highly Pathogenic Avian Influenza (Core Indicator)

6.3.600 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know That Apparently Asymptomatic Ducks Can Transmit Highly Pathogenic Avian Influenza (Additional Indicator)

6.4 Improved Knowledge of Highly Pathogenic Avian Influenza Risk to Humans and Preventive Measures

6.4.100 Proportion of People Interviewed Who Know That Humans Can Become Infected with H5N1 Virus (Core Indicator)

6.4.200 Proportion of People Interviewed Who Know the Symptoms of Human Infection with H5N1 Virus (Additional Indicator)

6.4.300 Proportion of People Interviewed Who Know That H5N1 Virus Can Be Transmitted to Humans from Birds (Core Indicator)

6.4.400 Proportion of People Interviewed Who Know That Individuals with Possible Infection with H5N1 Virus Should Report to Health Facilities (Additional Indicator)

6.4.500 Proportion of People Interviewed Who Can List Three Ways to Protect Themselves and Their Families from Transmission of H5N1 Virus (Core Indicator)

6.5 Exposure to and Coverage of Highly Pathogenic Avian Influenza Behavior Change Communication Campaigns

6.5.100 Estimated Number of People Reached with Highly Pathogenic Avian Influenza-Related Messages through Mass Media during a Reporting Period (Additional Indicator)

6.5.200 Estimated Number of People Reached with Highly Pathogenic Avian Influenza-Related Messages through Interpersonal Communication and Community Outreach Activities during a Reporting Period (Additional Indicator)

6.5.300 Proportion of People Surveyed Who Have Been Exposed to Highly Pathogenic Avian Influenza-Related Messages through Mass Media (Core Indicator)

6.5.400 Proportion of People Surveyed Who Have Been Exposed to Highly Pathogenic Avian Influenza-Related Messages through Interpersonal Communication/Community Outreach Activities (Core Indicator)

6.6 Human Capacity for Highly Pathogenic Avian Influenza Behavior Change Communication

6.6.100 Number of People Trained in Highly Pathogenic Avian Influenza Behavior Change Communication (Additional Indicator)

6.6.200 Proportion of Community Agents Surveyed Who Can Correctly Cite (> 75 percent) Ways to Prevent Bird-to-Bird Transmission of Highly Pathogenic Avian Influenza (Core Indicator)

6.6.300 Proportion of Community Agents Surveyed Who Can Correctly Cite (> 75 percent) Ways to Prevent Bird-to-Human Transmission of H5N1 Virus (Core Indicator)

6.6.400 Proportion of People Interviewed Who Feel Comfortable Seeking Information from Specific Types of Community Agents (Additional Indicator)

6.6.500 Proportion of People Interviewed Who Have Sought Information from Specific Types of Community Agents (Additional Indicator)

6.7 Multisectoral Coordination

6.7.100 Multisectoral Coordination of National Highly Pathogenic Avian Influenza Behavior Change Communication Programs (Core Indicator)

6.8 Research

6.8.100 Number of Special Studies Conducted (Additional Indicator)

The following table maps the indicators presented in this chapter to the logic model shown in chapter 2.

Table 5.

Reduced Risk of HPAI Transmission Associated with Human Behavior (Behavior Change Communication)			
Element	**Logic Model Description**	**Relevant Indicators**	
OUTCOME	Reduced risk of HPAI transmission associated with human behavior	6.1.100	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Report Practicing Four Behaviors to Decrease the Risk of Highly Pathogenic Avian Influenza Infection to Their Poultry
		6.1.200	Proportion of People Interviewed Who State That They Practice at Least Three Behaviors to Protect Themselves and Their Families from Transmission of H5N1 Virus
		6.2.100	Proportion of Suspected Cases of Human Infection with H5N1 Virus Seeking Treatment within 48 Hours of Fever Onset
OUTPUT	Improved knowledge of HPAI/H5N1 risk and preventive measures	6.3.100	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can Correctly Cite the Key Characteristics of Highly Pathogenic Avian Influenza Outbreaks in Poultry
		6.3.200	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know at Least Two Mechanisms for the Transmission of Highly Pathogenic Avian Influenza to Poultry
		6.3.300	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can List Four Ways to Protect Their Poultry from Highly Pathogenic Avian Influenza
		6.3.400	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know to Report an Outbreak of Highly Pathogenic Avian Influenza Immediately
		6.3.500	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know to Whom to Report an Outbreak of Highly Pathogenic Avian Influenza
		6.3.600	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know That Apparently Asymptomatic Ducks Can Transmit Highly Pathogenic Avian Influenza

Reduced Risk of HPAI Transmission Associated with Human Behavior (Behavior Change Communication)		
Element	**Logic Model Description**	**Relevant Indicators**
OUTPUT		6.4.100 Proportion of People Interviewed Who Know That Humans Can Become Infected with H5N1 Virus 6.4.200 Proportion of People Interviewed Who Know the Symptoms of Human Infection with H5N1 Virus 6.4.300 Proportion of People Interviewed Who Know That H5N1 Virus Can Be Transmitted to Humans from Birds 6.4.400 Proportion of People Interviewed Who Know That Individuals with Possible Infection With H5N1 Virus Should Report to Health Facilities 6.4.500 Proportion of People Interviewed Who Can List Three Ways to Protect Themselves and Their Families from Transmission of H5N1 Virus
	Coverage of HPAI/H5N1 BCC activities	6.5.100 Estimated Number of People Reached with Highly Pathogenic Avian Influenza-Related Messages through Mass Media during a Reporting Period 6.5.200 Estimated Number of People Reached with Highly Pathogenic Avian Influenza-Related Messages through Interpersonal Communication and Community Outreach Activities during a Reporting Period
	Exposure to HPAI BCC activities	6.5.300 Proportion of People Surveyed Who Have Been Exposed to Highly Pathogenic Avian Influenza-Related Messages through Mass Media 6.5.400 Proportion of People Surveyed Who Have Been Exposed to Highly Pathogenic Avian Influenza-Related Messages through Interpersonal Communication/Community Outreach Activities

Reduced Risk of HPAI Transmission Associated with Human Behavior (Behavior Change Communication)		
Element	**Logic Model Description**	**Relevant Indicators**
PROCESS	Build capacity to communicate HPAI BCC messages.	6.6.100 Number of People Trained in Highly Pathogenic Avian Influenza Behavior Change Communication 6.6.200 Proportion of Community Agents Surveyed Who Can Correctly Cite (> 75 percent) Ways to Prevent Bird-to-Bird Transmission of Highly Pathogenic Avian Influenza 6.6.300 Proportion of Community Agents Surveyed Who Can Correctly Cite (> 75 percent) Ways to Prevent Bird-to-Human Transmission of H5N1 Virus 6.6.400 Proportion of People Interviewed Who Feel Comfortable Seeking Information from Specific Types of Community Agents 6.6.500 Proportion of People Interviewed Who Have Sought Information from Specific Types of Community Agents
	Develop HPAI BCC messages in line with targeted audiences.	
	Coordinate government, donors, and NGOs around HPAI BCC communication messages.	6.7.100 Multisectoral Coordination of National Highly Pathogenic Avian Influenza Behavior Change Communication Programs
INPUT	Personnel and TA for BCC	
	BCC plan for HPAI communications	

Reduced Risk of HPAI Transmission Associated with Human Behavior (Behavior Change Communication)		
Element	**Logic Model Description**	**Relevant Indicators**
INPUT	HPAI BCC working group	
	Special studies	6.8.100 Number of Special Studies Conducted

RISK REDUCTION OF HPAI TRANSMISSION (BEHAVIOR CHANGE COMMUNICATION)

6.1 Appropriate Protective Behaviors Practiced

6.1.100 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Report Practicing Four Behaviors to Decrease the Risk of Highly Pathogenic Avian Influenza Infection to Their Poultry

Core Indicator

Definitions

Numerator: Number of individuals in the poultry supply and distribution chain interviewed who answer the question, "What are you/your family currently doing to protect your poultry from getting AI up until this time?" with four unprompted correct answers (as defined locally and consistent with Indicator 6.3.300, Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can List Four Ways to Protect Their Poultry From Highly Pathogenic Avian Influenza)

Denominator: Number of individuals in the poultry supply and distribution chain interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, sex, age, and occupation category

- Individuals in the poultry supply and distribution chain are backyard farm workers or commercial farm workers; poultry transporters; poultry vendors; and others involved in the raising, transportation, and selling of poultry.

What It Measures

This indicator indicates whether communication about HPAI personal prevention measures is being translated into appropriate behavior.

Measurement Tools

- For backyard farmers: AED AI-KAP survey

- For other sectors of the poultry supply and distribution chain: A measurement tool does not exist. An HPAI-KAP survey can be administered.

How to Measure It

This indicator is measured by asking the questions mentioned above on an HPAI-KAP survey administered to individuals in the poultry supply and distribution chain.

Frequency

Annually

Considerations

This indicator is an attempt to verify whether knowledge as reported in Indicator 6.3.300, Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can List Four Ways to Protect Their Poultry From Highly Pathogenic Avian Influenza, is being translated into practice. However, the practice of appropriate protective behaviors may not result from HPAI-prevention communications.

The validity of this indicator is weakened by self-reported behavior, as respondents may feel obliged to give what they know/perceive to be the correct answer, which may not reflect true practice. Evaluators may wish to use an observation checklist on selected respondents to determine whether they are actually practicing the reported behaviors.

It is important to note that not all of the behaviors cited are equally important for decreasing the risk of HPAI infection in poultry. Moreover, local contexts can influence which behaviors are critical to decreasing risk. It is therefore critical that the measurement tool for this indicator be tied to the national BCC strategy. For additional analysis, it may be useful to identify the frequencies with which the key behaviors cited concur with the national BCC strategy or, in the absence of a stated national BCC policy, international technical recommendations.

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6.1.200 Proportion of People Interviewed Who State That They Practice at Least Three Behaviors to Protect Themselves and Their Families from H5N1 Virus[86]

Core Indicator

Definitions

Numerator: Number of people interviewed who answer the question, "What are you/your family currently doing to protect you and your family from getting AI up until this time?" with at least three unprompted correct answers (as defined locally and consistent with Indicator 6.4.500, Proportion of People Interviewed Who Can List Three Ways to Protect Themselves and Their Families from Transmission of H5N1 Virus)

Denominator: Number of people interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, sex, age, and occupation category

What It Measures

The proportion of people interviewed who state that they practice at least three behaviors to protect themselves from H5N1 virus indicates whether communication about HPAI personal prevention measures is being translated into appropriate behavior.

Measurement Tools

No tool exists.

HPAI-KAP survey administered to a nationally representative or targeted population

How to Measure It

This indicator is measured by asking the questions mentioned above on a HPAI-KAP survey administered to a representative sample of the population or a specific target population.

Frequency

Annually

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[86] Consider as an alternative: "Percent of People Interviewed/Observed Who Report/Are Observed to/and Demonstrate That Poultry is Handled, Prepared, and Consumed Safely (as Defined Locally)" from WHO/FAO/UNICEF ad hoc meeting on behavioral interventions for avian influenza risk reduction, 14–16 March 2006, Geneva: Proposed outcomes and indicators.

Considerations

This indicator is an attempt to verify whether knowledge as reported in Indicator 6.4.500, Proportion of People Interviewed Who Can List Three Ways to Protect Themselves and Their Families from Transmission of H5N1 Virus, is being translated into practice. However, practice of appropriate protective behaviors may not result from HPAI prevention communications.

The validity of this indicator is weakened by self-reported behavior, as respondents may feel obliged to give what they know/perceive to be the correct answer, which may not reflect true practices. Evaluators may wish to use an observation checklist on selected respondents to determine whether they are actually practicing the reported behaviors.

It is important to note that not all of the behaviors cited are equally important for protecting people and their families from H5N1. Moreover, local contexts can influence which behaviors are critical to providing protection. It is therefore critical that the measurement tool for this indicator be tied to the national BCC strategy. For additional analysis, it may be useful to identify the frequencies with which the key behaviors cited concur with the national BCC strategy or, in the absence of a stated national BCC policy, international technical recommendations.

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6.2 Improved Care-Seeking Behaviors

6.2.100 Proportion of Suspected Cases of Human Infection with H5N1 Virus Seeking Treatment within 48 Hours of Fever Onset[87]

Additional Indicator

Definitions

Numerator: Number of suspected cases of human infection with H5N1 virus seeking treatment within 48 hours of fever onset in a given period

Denominator: Number of suspected cases of human infection with H5N1 virus who sought treatment for fever, acute respiratory infection, or pneumonia

Proportion = Numerator/Denominator

What It Measures

This indicator measures whether the communication message to seek treatment within 48 hours of the onset of acute respiratory symptoms, fever, and exposure to poultry is being translated into appropriate behavior.

Measurement Tools

No tool exists.

Human infection with H5N1 virus case form

How to Measure It

Data should be gathered from human influenza case investigation forms.

Frequency

Case reports should be made continuously as cases arise and are aggregated and reported for the month, the quarter, and the year. Results for this indicator should be aggregated monthly, quarterly, and annually.

Considerations

This indicator is linked to Indicator 6.4.400, Proportion of People Interviewed Who Know That Individuals with Possible Highly Pathogenic Avian Influenza Should Report to Health Facilities,

[87] WHO/FAO/UNICEF ad hoc meeting on behavioral interventions for avian influenza risk reduction, 14–16 March 2006, Geneva: Proposed outcomes and indicators.

and indicates whether knowledge is being translated into practice. The results of this indicator may be falsely positive if the majority of people with HPAI symptoms are not seeking treatment.

Revision History

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Last revised September 2008

6.3 Improved Knowledge of Highly Pathogenic Avian Influenza Risk to Poultry and Preventive Measures

6.3.100 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can Correctly Cite the Key Characteristics of Highly Pathogenic Avian Influenza Outbreak in Poultry

Core Indicator

Definitions

Numerator: Number of individuals in the poultry supply and distribution chain who correctly answer the questions, "Please tell me . . . when looking for symptoms of illness in poultry—chickens—how can you tell?" and "Please tell me . . . when looking for symptoms of illness in poultry—ducks—how can you tell?"

Denominator: Total number of individuals in the poultry supply and distribution chain interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, occupation, age of worker, sex of worker, and sector of poultry supply and distribution chain

- Individuals in the poultry supply and distribution chain are backyard farm workers or commercial farm workers; poultry transporters; poultry vendors; and others involved in the raising, transportation, and selling of poultry.

What It Measures

The proportion of individuals in the poultry supply and distribution chain who can correctly cite the key characteristics of AI outbreak in poultry indicates whether communication on HPAI facts is reaching the target audience and is being incorporated into their fund of knowledge.

An example of a correct answer used in a recent KAP survey is "sudden death in large numbers," but to be considered correct, answers should be tailored to the national BCC strategy and reflect international standards.

Measurement Tools

- For backyard farms: AED AI-KAP survey
- For other sectors of the poultry supply and distribution chain: A measurement tool does not exist. An HPAI-KAP survey can be administered.

How to Measure It

This indicator is measured by asking the questions that are mentioned above on an HPAI-KAP survey administered to individuals in the poultry supply and distribution chain.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from a program's communication plans but from other sources of information (e.g., media reports not associated with the program or neighbors).

Revision History

First published June 2007 as indicator 6.4.1. Revised in current edition.

Last revised September 2008

6.3.200 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know at Least Two Mechanisms for the Transmission of Highly Pathogenic Avian Influenza to Poultry

Core Indicator

Definitions

Numerator: Number of individuals in the poultry supply and distribution chain who correctly answer the question, "How can AI be spread among poultry/birds?"

Denominator: Number of individuals in the poultry supply and distribution chain interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, occupation, age of worker, sex of worker, and sector of poultry supply and distribution chain

- Individuals in the poultry supply and distribution chain are backyard farm workers or commercial farm workers; poultry transporters; poultry vendors; and others involved in the raising, transportation, and selling of poultry.

What It Measures

The proportion of individuals in the poultry supply and distribution chain who know at least two mechanisms for the transmission of HPAI to poultry indicates whether communication on HPAI facts is reaching individuals in the poultry supply and distribution chain and is being incorporated into their fund of knowledge.

Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy and reflect international standards.

- Contact with another infected/sick birds
- Contact with infected manure
- Contact with other contaminated environment or feed
- Contact with virus brought in by people's clothing or footwear.

Measurement Tools

- For backyard farmers: AED AI-KAP survey, responses to question under Definitions
- For other individuals in the poultry supply and distribution chain: A measurement tool does not exist. An HPAI-KAP survey can be administered.

How to Measure It

This indicator is measured by asking the questions mentioned above on an HPAI-KAP survey administered to individuals in the poultry supply and distribution chain.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from a program's communication plans but from other sources of information (e.g., media reports not associated with the program or neighbors).

Revision History

First published June 2007 as indicator 6.4.2. Revised in current edition.

Last revised September 2008

6.3.300 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can List Four Ways to Protect Their Poultry from Highly Pathogenic Avian Influenza

Core Indicator

Definitions

Numerator: Number of individuals in the poultry supply and distribution chain interviewed who give four unprompted correct answers to the question, “What can you/your family do to protect your poultry from getting AI? Any other things you think you could do to protect your poultry?”

OR

Number of individuals in the poultry supply and distribution chain interviewed who give four unprompted correct answers to the question, “Can you tell me four things one can do to protect poultry from getting AI?”

Denominator: Number of individuals in the poultry supply and distribution chain interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, occupation, age of worker, sex of worker, and sector of poultry supply and distribution chain

- Individuals in the poultry supply and distribution chain are backyard farm workers or commercial farm workers; poultry transporters; poultry vendors; and others involved in the raising, transportation, and selling of poultry.

What It Measures

The proportion of individuals in the poultry supply and distribution chain who can list four ways to protect their poultry from AI indicates whether communication on HPAI facts is reaching individuals in the poultry supply and distribution chain and whether it is being incorporated into their fund of knowledge.

Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy, reflect international standards, and be appropriate for the sector of individuals in the poultry supply and distribution chain interviewed:

- Vaccinate poultry against AI (only if in national policy).
- Keep poultry in good condition (access to clean water and adequate food/housing).
- Keep poultry in a protected environment (enclosed building/fenced area).

- Separate the chickens from the ducks.
- Keep all poultry brought to the farm separate from other poultry for at least two weeks.
- Wash hands with soap before and after taking care of poultry and other animals.
- Change clothes/shoes/sandals when coming from another farm or market.
- Control entry to the farm (e.g., do not let middlemen enter the farmyard, keep visitors away from poultry).
- Store manure from another farm for at least three weeks.

Measurement Tools

- For backyard farms: AED AI-KAP survey
- For other sectors of the poultry supply and distribution chain: A measurement tool does not exist. An HPAI-KAP Survey can be administered.

How to Measure It

This indicator is measured by asking the questions that are mentioned above on an HPAI-KAP survey administered to individuals in the poultry supply and distribution chain.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from the program's communication plans but from other sources of information (e.g., media reports not associated with the program or neighbors).

The AED KAP survey question attempts to measure both knowledge and behavior, so the proportion of respondents able to name four ways to protect their poultry may not correspond to the proportion actually practicing them. However, answers to the question for this indicator can be correlated to the answers for Indicator 6.1.100, Proportion of Individuals in the Poultry Supply and Distribution Chain Who Report Practicing Four Behaviors to Decrease the Risk of Highly Pathogenic Avian Influenza Infection to Their Poultry.

This indicator is appropriate for measuring knowledge of HPAI among the general population. When evaluating a campaign that addresses only some of the correct behaviors, evaluators may choose to modify this question to measure knowledge of these specific behaviors only.

It is important to note that not all the behaviors cited are equally important for protecting poultry from HPAI. Moreover, local contexts can influence which behaviors are critical to decreasing risk. It is therefore critical that the measurement tool for this indicator be tied to the national BCC strategy. For additional analysis, it may be useful to identify the frequencies with which the key behaviors cited concur with the national BCC strategy or, in the absence of a stated national BCC policy, international technical recommendations.

Revision History

First published June 2007 as indicator 6.4.3. Revised in current edition.

Last revised September 2008

6.3.400 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know to Report an Outbreak of Highly Pathogenic Avian Influenza Immediately

Core Indicator

Definitions

Numerator: Number of individuals in the poultry supply and distribution chain interviewed who give correct answers to the question, "How soon should a suspected HPAI outbreak be reported?" (Correct answer: Immediately)

Denominator: Number of individuals in the poultry supply and distribution chain interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, occupation, age, sex, sector of the poultry supply and distribution chain

- Individuals in the poultry supply and distribution chain are backyard farm workers or commercial farm workers; poultry transporters; poultry vendors; and others involved in the raising, transportation, and selling of poultry.
- A suspected HPAI outbreak is the sudden death of birds in large numbers.

What It Measures

When there is a mass die-off of poultry, an HPAI case should be suspected and reported immediately to the appropriate authorities. The proportion of individuals in the poultry supply and distribution chain who know when to report a case indicates whether communication on HPAI facts is reaching individuals in the poultry supply and distribution chain and is being incorporated into their fund of knowledge.

Measurement Tools

No tool exists.

An HPAI-KAP survey can be administered.

How to Measure It

This indicator is measured by asking the question mentioned above on an HPAI-KAP survey administered to individuals in the poultry supply and distribution chain.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from the program's communication plans but from other sources of information (e.g., media reports not associated with the program or neighbors).

Another limitation is that the knowledge of proper behavior does not necessarily translate into practice of that behavior. Reporting of mass die-off may be problematic for farmers who may fear culling and other damages as a result of their flock being suspected of infection. Given the sensitive nature of the question, evaluators may want to include a "sidebar" question to determine the likelihood of reporting (e.g., "How likely is it that your neighbor would report an HPAI outbreak?").

Revision History

First published June 2007 as indicator 6.4.4. Revised in current edition.

Last revised September 2008

6.3.500 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know to Whom to Report an Outbreak of Highly Pathogenic Avian Influenza

Core Indicator

Definitions

Numerator: Number of individuals in the poultry supply and distribution chain interviewed who give correct answers to the question, "To whom would you be most likely to report an outbreak of HPAI in your poultry?"

Denominator: Number of individuals in the poultry supply and distribution chain interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, occupation, age, sex, sector of the poultry supply and distribution chain

- Individuals in the poultry supply and distribution chain are backyard farm workers or commercial farm workers; poultry transporters; poultry vendors; and others involved in the raising, transportation, and selling of poultry.
- An HPAI suspected outbreak is the sudden death of birds in large numbers.

What It Measures

When there is a mass die-off of poultry, an HPAI case should be suspected and reported immediately to the appropriate authorities. The proportion of individuals in the poultry supply and distribution chain who know to whom to report an outbreak indicates whether communication on HPAI facts is reaching individuals in the poultry supply and distribution chain and is being incorporated into their fund of knowledge.

The correct answer to the question, "To whom would you be most likely to report an outbreak of AI in your poultry?" depends on the country, which should determine, for example, whether the correct answer is health worker, activator, political person (village leader), or animal health worker.

Measurement Tools

- For backyard farms: AED AI-KAP survey
- For other individuals in the poultry supply and distribution chain: A measurement tool does not exist. An HPAI-KAP survey can be administered.

How to Measure It

This indicator is measured by asking the question mentioned above on an HPAI-KAP survey administered to individuals in the poultry supply and distribution chain.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from the program's communication plans but from other sources of information (e.g., media reports not associated with program or neighbors).

Another limitation is that the knowledge of proper behavior does not necessarily translate into practice of that behavior. Reporting of mass die-off may be problematic for farmers who may fear culling and other damages as a result of their flock being suspected of infection. Given the sensitive nature of the question, evaluators may want to include a "sidebar" question to determine the likelihood of reporting (e.g., "How likely is it that your neighbor would report on HPAI outbreak?").

Revision History

First published June 2007 as indicator 6.4.4. Revised in current edition.

Last revised September 2008

6.3.600 Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know That Apparently Asymptomatic Ducks Can Transmit Highly Pathogenic Avian Influenza

Additional Indicator

Definitions

Numerator: Number of individuals in the poultry supply and distribution chain who correctly answer the question, "Can ducks spread AI even when they don't look sick?"

Denominator: Total number of individuals in the poultry supply and distribution chain interviewed

Proportion = Numerator/Denominator

- Individuals in the poultry supply and distribution chain are backyard farm workers or commercial farm workers; poultry transporters; poultry vendors; and others involved in the raising, transportation, and selling of poultry.

What It Measures

This indicator measures whether the individuals in the poultry supply and distribution chain are aware of the risk of ducks transmitting HPAI, even when the ducks appear to be asymptomatic.

Measurement Tools

- For backyard farmers: AED AI-KAP survey
- For other individuals in the poultry supply and distribution chain: A measurement tool does not exist. An HPAI-KAP survey can be administered.

How to Measure It

This indicator is measured by asking the questions mentioned above on an HPAI-KAP survey administered to individuals in the poultry supply and distribution chain.

Frequency

Annually

Considerations

Ducks serve as reservoir for HPAI, which has also been found in asymptomatic ducks (i.e., the virus can infect ducks asymptomatically). Asymptomatic ducks can infect backyard farms without being detected, thus posing a serious problem. This indicator is important in establishing the extent to which individuals in the poultry supply and distribution chain are aware of the potential risk associated with ducks. Communication campaigns may need to be intensified to inform individuals in the poultry supply and distribution chain of the risk that apparently asymptomatic ducks can transmit HPAI to other poultry, especially if the level of awareness is low.

Revision History

First published June 2007 as indicator 6.4.5. Revised in current edition.

Last revised September 2008

6.4 Improved Knowledge of Highly Pathogenic Avian Influenza Risk to Humans and Preventive Measures

6.4.100 Proportion of People Interviewed Who Know That Humans Can Become Infected with H5N1 Virus

Core Indicator

Definitions

Numerator: Number of people interviewed who answer "Yes" to the question, "Can humans get AI?"

Denominator: Number of people interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, sex, age, and occupation category

What It Measures

The proportion of people interviewed who know that humans can become infected with H5N1 virus indicates whether communication on HPAI facts is reaching the general population and is being incorporated into their fund of knowledge.

Measurement Tools

No tool exists.

HPAI-KAP survey administered to the general or a targeted population

How to Measure It

This indicator is measured by asking the questions mentioned above on an HPAI-KAP survey administered to a representative sample of the population or a specific target population.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from the program's communication plans but from other sources of information (e.g., media reports not associated with the program).

Revision History

First published June 2007 as indicator 6.5.1. Revised in current edition.

Last revised September 2008

6.4.200 Proportion of People Interviewed Who Know the Symptoms of Human Infection with H5N1 Virus

Additional Indicator

Definitions

Numerator: Number of people interviewed who give correct responses to the question, "What are the signs and symptoms of AI among humans?"

Denominator: Number of people interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, sex, age, and occupation category

What It Measures

The proportion of people interviewed who know the symptoms of human infection with H5N1 virus indicates whether communication on HPAI facts is reaching the general population and is being incorporated into their fund of knowledge.

Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy and reflect the WHO or country case definition:

- Difficult/fast breathing
- Fever
- Cough
- Muscle ache
- Sore throat.

Measurement Tools

No tool exists.

HPAI-KAP survey administered to the general or a targeted population

How to Measure It

This indicator is measured by asking the questions mentioned above on an HPAI-KAP survey administered to a representative sample of the population or a specific target population.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from the program's communication plans but from other sources of information (e.g., media reports not associated with the program).

According to the WHO case definition of influenza A(H5N1), although "most patients with H5N1 infection have presented with fever and lower respiratory complaints, the clinical spectrum is broad." There is also some variance in the symptoms that individuals with H5N1 virus present that may cause difficulties with assessing correct responses to this indicator.

Revision History

First published September 2008.

Last revised September 2008

6.4.300 Proportion of People Interviewed Who Know That H5N1 Virus Can Be Transmitted to Humans from Birds

Core Indicator

Definitions

Numerator: Number of people interviewed who correctly answered the question, "How can humans catch AI?"

Denominator: Number of people interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, sex, age, and occupation category

What It Measures

The proportion of people interviewed who know that H5N1 virus can be transmitted to humans from birds indicates whether communication on HPAI facts is reaching the general population and is being incorporated into their fund of knowledge.

Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy and reflect international standards.

- Contact with infected poultry or wild birds
- Contact with infected poultry or wild birds feces
- Eating undercooked infected poultry/eggs
- Eating raw poultry products (e.g., blood pudding).

Measurement Tools

No tool exists.

HPAI-KAP survey administered to the general or a targeted population

How to Measure It

This indicator is measured by asking the questions mentioned above on an HPAI-KAP survey administered to a representative sample of the population or a specific target population.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from the program's communication plans but from other sources of information (e.g., media reports not associated with the program).

Another limitation is that the knowledge of proper behavior does not necessarily translate into practice of that behavior.

Revision History

First published June 2007 as indicator 6.5.2. Revised in current edition.

Last revised September 2008

6.4.400 Proportion of People Interviewed Who Know That Individuals with Possible H5N1 Virus Should Report to Health Facilities

Additional Indicator

Definitions

Numerator: Number of people interviewed who correctly answer the question, "If you think someone has AI, what should you do?"

Denominator: Number of people interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, sex, age, and occupation category

- Definition of a possible H5N1 case is based on the country case definition.

What It Measures

The proportion of people interviewed who know that individuals with possible H5N1 virus should report to health facilities indicates whether communication on HPAI facts is reaching the general population and is being incorporated into their fund of knowledge.

Measurement Tools

No tool exists.

HPAI-KAP survey administered to a nationally representative sample or target population

How to Measure It

This indicator is measured by asking the questions mentioned above on an HPAI-KAP survey administered to a representative sample of the general population or a specific target population.

Frequency

Annually

Considerations

The primary limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from the program's communication plans but from other sources of information (e.g., media reports not associated with the program).

In addition, this indicator does not measure whether the people surveyed can correctly identify symptoms of human infection with H5N1 virus. Evaluators may consider adding a question to determine the proportion of respondents who know when a person should be suspected of being infected with HPAI virus.

Another limitation is that the knowledge of proper behavior does not necessarily translate into practice of that behavior. However, an indication of appropriate behavior is measured by Indicator 6.2.100, Proportion of Highly Pathogenic Avian Influenza Cases Seeking Treatment within 48 Hours of Fever Onset.

It is important to note that not all of the behaviors cited are equally important for protecting people and their families from H5N1. Moreover, local contexts can influence which behaviors are critical to providing protection. It is therefore critical that the measurement tool for this indicator be tied to the national BCC strategy. For additional analysis, it may be useful to identify the frequencies with which the key behaviors cited concur with the national BCC strategy or, in the absence of a stated national BCC policy, international technical recommendations.

Revision History

First published June 2007 as indicator 6.5.3. Revised in current edition.

Last revised September 2008

6.4.500 Proportion of People Interviewed Who Can List Three Ways to Protect Themselves and Their Families from Transmission of H5N1 Virus

Core Indicator

Definitions

Numerator: Number of people interviewed who responded correctly to the question, "What can you/your family do to protect you and your family from getting AI? Any other things you can do to protect you and your family from getting AI?"

OR

Number of people interviewed who respond correctly to the question, "Can you tell me three things one can do to protect oneself and one's family from getting AI?"

Denominator: Number of people interviewed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, sex, age, and occupation category

What It Measures

The proportion of people interviewed who can list three ways to protect themselves and their families from transmission of H5N1 virus indicates whether communication on HPAI facts is reaching the general population and is being incorporated into their fund of knowledge.

Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy and reflect international standards:

- Wash hands before and after taking care of poultry.
- Wash hands before handling/preparing food.
- Change and wash clothes after taking care of poultry.
- Do not let children handle poultry eggs.
- Do not let children touch and play with birds, feathers, or feces.
- Do not eat duck or goose blood pudding.
- Do not eat undercooked poultry and eggs.

- Do not eat birds that fall dead; bury or burn them instead.
- Do not let children touch sick or dead birds.

Measurement Tools

HPAI-KAP survey administered to the general or a target population

How to Measure It

This indicator is measured by asking the questions mentioned above on an HPAI-KAP survey administered to a representative sample of the population or a specific target population.

Frequency

Annually

Considerations

One limitation of this indicator is that the source of the knowledge is not known. Correct answers may not result from the program's communication plans but from other sources of information (e.g., media reports not associated with the program).

The survey question attempts to measure knowledge, so the proportion of respondents able to name three ways to protect their poultry may not correspond to the proportion actually practicing them. This indicator can be monitored with the indicator that measures actual behavior, Indicator 6.1.200, Proportion of People Interviewed Who State That They Practice at Least Three Behaviors to Protect Themselves and Their Families from H5N1 Virus, to assess whether knowledge is correlated with behavior at the population level.

This indicator measures the knowledge level in a general population. When evaluating a campaign that addresses only some of the correct behaviors, evaluators may choose to modify the question to determine knowledge of those specific behaviors. In addition, the indicator does not address the fact that it may be more important to know (and practice) some behaviors rather than others.

Revision History

First published June 2007 as indicator 6.5.4. Revised in current edition.

Last revised September 2008

6.5 Exposure to Highly Pathogenic Avian Influenza Behavior Change Communication

6.5.100 Estimated Number of People Reached with Highly Pathogenic Avian Influenza-Related Messages through Mass Media during a Reporting Period

Additional Indicator

Definition

Estimated number of people reached with HPAI-related messages through mass media during a reporting period.

Estimates are based on:

- Mass media: Estimated viewing/listening audience size. For TV and radio, reach is generally measured in terms of percentage based on a media plan, with numbers extrapolated based on estimated population size (number of households who watch TV).
- BCC posters/billboards: Estimated number of people who are exposed, through a measure of how many people pass the particular area or road within a given time frame
- Published BCC items: Number distributed to individuals.

Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

The effects of BCC strategies and programs may be measured at different stages of the sequence starting from dissemination of information leading to the target audience's behavior change. This indicator measures the first stage in the process: the extent to which HPAI-related messages are reaching the intended audience (i.e., size of the potential audience).

Measurement Tools

No tool exists.

Different methods of communication will have different methods for recording and tracking estimates of the number of people who are exposed to HPAI-related messages. Exposure can be measured in two ways:

1. *A standard reporting form can be used to report these estimates to the organization at the national level responsible for maintaining the information (i.e., the HPAI BCC Working Group). The reporting form should include:*
    - *Name of organization sponsoring message*

- *Topic of BCC message (with predetermined checklist)*
- *Type of BCC message (with predetermined checklist, such as TV, radio, or billboards)*
- *Duration of exposure (e.g., half-hour one-on-one conversation, two-minute commercial broadcast three times a day for two weeks)*
- *Estimated or actual number of people reached*
- *Type of people reached (with predetermined checklist: e.g., general population, farm workers, children). It is difficult to obtain information related to specific profiles of the people reached unless HPAI-related BCC messages are within a program that is targeted at certain groups (e.g., farmers, women).*
- *Gross rating points (GRP), also called target audience rating points, which is a single number measured by reach x frequency. For example, 15 percent reach x 10 spots = 150 GRP, which can be used to track progress and to compare with other campaigns.*

2. *If no reporting mechanism is established, communications materials inventories; radio or television station audience records; and distribution lists maintained by government offices, donors, and implementing partners can be reviewed to determine the approximate number of households reached.*

How to Measure It

This indicator is measured using the standard reporting form or, in the absence of a standard reporting mechanism, by reviewing the communications materials inventories; radio and television station audience records; and distribution lists maintained by government offices, donors, and implementing partners to determine the number of households reached.

Frequency

If a reporting mechanism is established, exposure information is collected continuously and reported at the national level every three months.

If there is no standard reporting mechanism, communications materials inventories, radio and television station audience records, and distribution lists should be reviewed as resources allow, but at least annually.

Considerations

Communications program managers and evaluators may be interested in knowing how well their communications programs are reaching the intended audience (e.g., number of people reached with pamphlets containing HPAI messages in a given month). Tracking the actual number of the target audience reached is a difficult task and requires continuous record-keeping. Actual reach can also be measured by implementing a recall survey. The indicator provides an *estimate* of the number of target audience members reached and will not be an actual number.

Revision History

First published June 2007 as indicator 6.3.1. Revised in current edition.

Last revised September 2008

6.5.200 Estimated Number of People Reached with Highly Pathogenic Avian Influenza-Related Messages through Interpersonal Communication and Community Outreach Activities during a Reporting Period

Additional Indicator

Definition

Estimated number of people reached with HPAI-related messages through interpersonal communication and outreach activities during a reporting period.

- Estimates are based on the number of people interacted with during interpersonal communication and outreach activities (including classroom presentations).
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

The effects of BCC strategies and programs may be measured at different stages of the sequence, starting from the dissemination of information leading to the target audience's behavior change. This indicator measures the first stage in the process: the extent to which HPAI-related messages are reaching the intended audience (i.e., size of the potential audience).

Measurement Tools

No tool exists.

Different methods of communication will have different methods for recording and tracking estimates of the number of people who are exposed to HPAI-related messages. Exposure can be measured in the following two ways:

1. *A standard reporting form can be used to report these estimates to the organization at the national level responsible for maintaining the information (i.e., the HPAI BCC Working Group). The reporting form should include the following:*
   - *Name of organization sponsoring message*
   - *Topic of BCC message (with predetermined checklist)*
   - *Type of BCC message (with predetermined checklist)*
   - *Duration of exposure (e.g., half-hour one-on-one conversation)*

- *Actual or estimated number of people reached*
- *Type of people reached (with predetermined checklist: e.g., general population, farm workers, children).*

2. *If no reporting mechanism is established, records of trainings and outreach activities maintained by government offices, donors, and implementing partners can be reviewed to determine the approximate number of households reached.*

How to Measure It

This indicator is measured using the standard reporting form or, in the absence of a standard reporting mechanism, by reviewing the records of training and outreach activities maintained by government offices, donors, and implementing partners to determine the number of households reached.

Frequency

If a reporting mechanism is established, exposure information is collected continuously and reported at the national level every three months.

If there is no standard reporting mechanism, records of trainings and outreach activities should be reviewed as resources allow but at least annually.

Considerations

Communications program managers and evaluators may be interested in knowing how well their communications programs are reaching the intended audience (e.g., number of community members outreach workers reached in a given month). Tracking the actual number of target audience members reached is a difficult task and requires continuous record-keeping, especially to track the size of the audience reached through interpersonal communication/community outreach activities. The indicator provides an *estimate* of the number of target audience members reached and will not be an actual number.

Revision History

First published June 2007 as indicator 6.3.2. Revised in current edition.

Last revised September 2008

6.5.300 Proportion of People Surveyed Who Have Been Exposed to Highly Pathogenic Avian Influenza-Related Messages through Mass Media

Core Indicator

Definitions

Numerator: Number of people surveyed who respond affirmatively to the question, "In the past three months, have you seen or heard any advertisement/announcement about avian influenza?"

Denominator: Total number of people surveyed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, occupation of respondent, source of message, and sex of respondent

What It Measures

The effects of communication strategies and programs may be measured at different stages of the sequence, starting from dissemination of information leading to the target audience's behavior change. This indicator measures the first stage in the process: the extent to which the intended audience is exposed to HPAI-related messages.

Measurement Tools

An HPAI-KAP survey used among the general or targeted population

How to Measure It

This indicator is measured by asking the question mentioned under Definitions.

Frequency

Annually

Considerations

Communications program managers and evaluators need to know to what extent the intended audience (e.g., poultry farmers) is exposed to the communications programs. It should be noted that exposure itself does not indicate whether the intended population understood and retained the information or whether the intended audience is practicing the recommended behavior. These are measured in the indicators under sections 6.1 and 6.2.

Measurement of this indicator is limited to exposure to billboards, posters, TV or radio ads and announcements. It may not capture HPAI messages integrated in soap operas and other vehicles. In addition, it may not include leaflets or other handouts if people do not perceive them to be advertisements or announcements. In order to broaden the scope of measurement, the question could be rephrased to, “In the past three months, have you seen or heard any messages on avian influenza through TV, radio, newspapers/magazines, leaflets, or posters/billboards? If yes, from which source?”

Programs responsible for specific campaigns may want to consider asking a question regarding audience exposure to those campaigns, more specifically, asking about exposure to a specific campaign logo or slogan. This can be done by adding a question to an existing KAP survey or by surveying a sample of the target population for the campaign.

Revision History

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6.5.400 Proportion of People Surveyed Who Have Been Exposed to HPAI-Related Messages through Interpersonal Communication/Community Outreach Activities

Core Indicator

Definitions

Numerator: Number of people surveyed who respond affirmatively to the question, "In the past three months, have you received any information on avian influenza through interpersonal communication/community outreach activities?" (Possible means of receiving this information are further defined under What It Measures.)

Denominator: Total number of people surveyed

Proportion = Numerator/Denominator

Disaggregation: Geographical area, occupation of respondent, source of message, and sex of respondent

What It Measures

The effects of communication strategies and programs may be measured at different stages of the sequence, starting from the dissemination of information leading to the target audience's behavior change. This indicator measures the first stage in the process: the extent to which the intended audience is exposed to HPAI-related messages.

Potential methods of or channels for receiving information about HPAI through interpersonal communication/community outreach activities include:

- Paravet or village animal health workers/vet
- Agricultural extension worker
- Loudspeakers
- People's Committee (Vietnam only)
- In some countries, also add:
    - Mass organization members (e.g., Women's Union)
    - Health education worker/health volunteers.

Measurement Tools

An HPAI-KAP survey used among the general or a targeted population

How to Measure It

This indicator is measured by asking the question mentioned under Definitions.

Frequency

Annually

Considerations

Communications program managers and evaluators need to know to what extent the intended audience (e.g., poultry farmers) is exposed to the communications programs. It should be noted that exposure itself does not indicate whether the intended population understood and retained the information or whether the intended audience is practicing the recommended behavior. These are measured in the indicators under sections 6.1 and 6.2.

Sources of information will vary by country and by campaign. In addition, programs responsible for specific campaigns may want to consider asking a question about audience exposure to those campaigns, more specifically, asking about exposure to a specific campaign logo or slogan. This can be done by adding a question to an existing KAP survey or by surveying a sample of the target population for the campaign.

Revision History

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6.6 Human Capacity for Highly Pathogenic Avian Influenza Behavior Change Communication

6.6.100 Number of People Trained in Highly Pathogenic Avian Influenza Behavior Change Communication

Additional Indicator

Definitions

Number of people trained in BCC related to HPAI during a reporting period.

Disaggregation: Type of training: campaign development versus message delivery

Trainee: administrative-level (community, facility, district, province, national), affiliation (government, private-sector, NGO), sex, primary work location (specific district or province name), type of work

Topic of training: animal health versus human health or prevention of bird-to-bird, bird-to-human, and/or human-to-human transmission

Location of training: district where the training takes place

- BCC training can be for developing BCC materials and strategies or for communicating BCC messages. Usually the number of frontline workers trained to deliver messages will far outweigh those trained in campaign development. Frontline workers can include community health workers, animal health workers, agricultural extension workers, and members of mass organizations.
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

What It Measures

This indicator measures efforts to build human capacity to develop and deliver HPAI-related BCC messages. Delivering these messages to targeted populations will increase knowledge about HPAI transmission. It is assumed that with this knowledge, the targeted population will reduce the risk of HPAI transmission.

Measurement Tools

No tool exists.

Quarterly training report from a training log maintained by organizations responsible for training. Quarterly training reports would be submitted to the organization responsible for *overseeing and coordinating BCC training (ministry of health or agriculture or BCC working group). The training report would include the following information:*

- *Title of training*
- *Venue, date, total hours of training*
- *Topic (which could be forced into predetermined categories)*
- *Number and cadre of people trained.*

How to Measure It

A training database (specific to HPAI BCC or generally to HPAI) is maintained at the national level. Organizations responsible for HPAI-related BCC training are required to submit training data upon completion of a training session.

Frequency

Training information is collected continuously and reported to the national level every three months.

Considerations

This indicator provides a crude assessment of whether a program/project is meeting its target or is making progress over time in terms of building the capacity of professionals working in the field of HPAI BCC. There are several potential limitations to the usefulness of this indicator. One is the potential for double-counting, meaning that the same individuals may receive several trainings or that they may be reported by different sponsors at the national level. In addition, data collectors must be sure to disaggregate by type of training in order to track the number of frontline workers trained versus those staff trained in campaign development because these trainings are very different. This indicator alone does not provide a measure of whether the content of the training provided is appropriate, given the changing nature of the disease and consequently the change in messages to be communicated. Furthermore, the unit of measurement is not uniform in that one trainee may have attended a course for one day, and another may have attended a course for three months.

A major limitation of this indicator is that it provides no measurement of whether the training enhanced the trainee's skills and performance. Trainees' performance assessment requires direct observation at the work site.

This indicator does not measure the geographical coverage provided by trained individuals. Countries may want to adopt an indicator that specifies the proportion of subnational units that have an individual trained in HPAI BCC.

Revision History

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6.6.200 Proportion of Community Agents Surveyed Who Can Correctly Cite (> 75 Percent) Ways to Prevent Bird-to-Bird Transmission of Highly Pathogenic Avian Influenza

Core Indicator

Definitions

Numerator: Number of community agents surveyed who give > 75 percent unprompted correct answers to the question, "What can a poultry farmer do to protect his/her poultry from getting AI?"

Denominator: Number of community agents surveyed

Proportion = Numerator/Denominator

Disaggregation: Geographic area, type of community agent, whether agent received specific HPAI BCC training, whether agent received HPAI general training, and sex of community agent

- Community agents are individuals responsible for HPAI prevention and response at the community level; they include agricultural extension workers, animal health workers, and community health workers.
- Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy and reflect international standards.

What It Measures

This indicator measures whether community agents are receiving correct information about HPAI prevention. It is assumed that with correct knowledge, the agents will behave appropriately and pass on correct knowledge to community members. Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy and reflect international standards.

- Vaccinate poultry against HPAI (only if part of national policy).
- Keep poultry in good condition (access to clean water and adequate food/housing).
- Keep poultry in a protected environment (enclosed building/fenced area).
- Separate the chickens from the ducks.

- Keep all poultry brought to the farm separate from other poultry for at least two weeks.
- Wash hand with soap before and after taking care of poultry and other animals.
- Change clothes/shoes/sandals when coming from another farm or market.
- Control entry to the farm (e.g., do not let middlemen enter the farmyard, keep visitors away from poultry).
- Do not buy manure from unknown sources in infected areas.

Measurement Tools

No tool exists.

HPAI-specific KAP survey used among community agents

How to Measure It

An HPAI-specific KAP survey can be conducted among community agents. This survey can be done in conjunction with a community HPAI-KAP or as a community agent-specific survey.

Frequency

Annually

Considerations

This indicator measures the extent to which community agents are getting correct information about prevention of bird-to-bird transmission of HPAI. It does not measure the source of this knowledge, whether the knowledge is retained, or whether the knowledge is incorporated into community agents' behavior or transferred (or conveyed) to the population.

It is important to note that not all the behaviors cited are equally important for protecting poultry from HPAI. Moreover, local contexts can influence which behaviors are critical to decreasing risk. It is therefore critical that the measurement tool for this indicator be tied to the national BCC strategy. For additional analysis, it may be useful to identify the frequencies with which the key behaviors cited concur with the national BCC strategy or, in the absence of a stated national BCC policy, international technical recommendations.

Revision History

First published June 2007 as indicator 6.2.2. Revised in current edition.

Last revised September 2008

6.6.300 Proportion of Community Agents Surveyed Who Can Correctly Cite (> 75 Percent) Ways to Prevent Bird-to-Human Transmission of H5N1 Virus

Core Indicator

Definitions

Numerator: Number of community agents surveyed who give > 75 percent unprompted correct answers to the question, "What can an individual do to protect himself/herself and his/her family from getting AI?"

Denominator: Number of community agents surveyed

Proportion = Numerator/Denominator

Disaggregation: Geographic area, type of community agent, whether agent received specific HPAI BCC training, whether agent received HPAI general training, and sex of community agent

- Community agents are individuals responsible for HPAI prevention and response at the community level; they include agricultural extension workers, animal health workers, and community health workers.
- Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy and reflect international standards.

What It Measures

This indicator measures whether community agents are receiving correct information about HPAI prevention. It is assumed that once the community agents obtain the correct knowledge, they will behave appropriately and pass on that knowledge to community members. Examples of correct answers used in a recent KAP survey of backyard farmers are listed below, but to be considered correct, answers should be tailored to the national BCC strategy and reflect international standards.

- Wash hands before and after taking care of poultry.
- Wash hands before handling/preparing food.
- Change and wash clothes after taking care of poultry.
- Do not let children handle poultry eggs.
- Do not let children touch and play with birds, feathers, or feces.

- Do not eat duck or goose blood pudding.
- Do not eat undercooked poultry and eggs.
- Do not eat birds that fall dead; bury or burn them instead.
- Do not let children touch sick or dead birds.

Measurement Tools

No tool exists.

HPAI-specific KAP survey used among community agents

How to Measure It

An HPAI-KAP survey can be conducted among community agents. It can be done in conjunction with a community HPAI-KAP or as a community agent-specific survey.

Frequency

Annually

Considerations

This indicator measures the extent to which community agents are getting correct information about prevention of bird-to-human transmission of H5N1 virus. It does not measure the source of this knowledge, whether the knowledge is retained, or whether the knowledge is incorporated into community agents' behavior or transferred (or conveyed) to the population.

It is important to note that not all of the behaviors cited are equally important for preventing bird-to-human transmission of H5N1 virus. Moreover, local contexts can influence which behaviors are critical to providing protection. It is therefore critical that the measurement tool for this indicator be tied to the national BCC strategy. For additional analysis, it may be useful to identify the frequencies with which the key behaviors cited concur with the national BCC strategy or, in the absence of a stated national BCC policy, international technical recommendations.

Revision History

First published June 2007 as indicator 6.2.3. Revised in current edition.

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6.6.400 Proportion of People Interviewed Who Feel Comfortable Seeking Information from Specific Types of Community Agents

Numerator: Number of people interviewed who answer "yes" to the question, "Please answer yes or no to the following question: Would you feel comfortable seeking information about AI from _________ (yes/no)?"

Denominator: Number of individuals interviewed

Proportion = Numerator/Denominator

Disaggregation: Type of community agent (e.g., agricultural extension worker, veterinarians, health care workers, village leaders), geographical area, age of interviewee, sex of interviewee, occupation of interviewee (if applicable, sector of the poultry supply and distribution chain)

- Community agents are individuals responsible for HPAI prevention and response at the community level; they include agricultural extension workers, animal health workers, and community health workers.

What It Measures

This indicator measures the extent to which individuals feel comfortable approaching specific types of community agents for information. Information on which community agents are considered more approachable by various populations will allow BCC campaigns to be targeted at those community agents who are most likely to be able to effect behavior change in the communities in which they work.

Measurement Tools

No tool exists.

HPAI-specific KAP survey used among the general or a targeted population

How to Measure It

This indicator is measured by asking the question mentioned under Definitions.

Frequency

Annually

Considerations

This indicator measures the extent to which individuals feel comfortable approaching specific types of community agents for information. The list of community worker types should be tied to activities to train targeted groups of community workers in BCC.

This indicator measures whether people would feel comfortable approaching a community agent for information about HPAI but does not measure whether individuals actually approach the community agents for information. Responses to this indicator can be correlated with responses to indicator 6.6.500 to provide a better idea of whether individuals actually approach community agents for information.

Revision History

First published September 2008.

Last revised September 2008

6.6.500 Proportion of People Interviewed Who Have Sought Information from Specific Types of Community Agents

Numerator: Number of people interviewed who answer "yes" to the question, "Please answer yes or no to the following questions: Have you gone to ________ for information about AI (yes/no)?"

Denominator: Number of individuals interviewed

Proportion = Numerator/Denominator

Disaggregation: Type of community agent (e.g., agricultural extension worker, veterinarians, health care workers, village leaders), geographical area of interviewee, sex of interviewee, occupation of interviewee (if applicable, sector of the poultry supply and distribution chain)

- Community agents are individuals responsible for HPAI prevention and response at the community level; they include agricultural extension workers, animal health workers, and community health workers.

What It Measures

This indicator measures the extent to which people are seeking information from identified types of community agents. Information on which community agents are being approached for information by various populations will allow BCC campaigns to be targeted at those community agents who are most likely to be able to effect behavior change in the communities in which they work.

Measurement Tools

No tool exists.

HPAI-specific KAP survey used among the general or a targeted population

How to Measure It

This indicator is measured by asking the question mentioned under Definitions.

Frequency

Annually

Considerations

This indicator measures the extent to which people are seeking information from identified types of community agents. The list of community worker types should be tied to activities to train targeted groups of community workers in BCC.

It should be noted that this indicator does not measure the quality of the information provided by the community agent, whether the interviewee understood and retained the information, or whether the interviewee is practicing the recommended behavior.

This indicator also does not measure the reasons why interviewees have not sought information from community agents; possible reasons could be that they were uncomfortable doing so or that there has been no need to seek such information. Some indication of whether responses are related to comfort level with approaching community agents for information may be gained by examining responses to indicator 6.6.400 in correlation with this indicator.

Revision History

First published September 2008.

Last revised September 2008

6.7 Multisectoral Coordination of Highly Pathogenic Avian Influenza Behavior Change Communication Programs

6.7.100 Multisectoral Coordination of National Highly Pathogenic Avian Influenza Behavior Change Communication Programs

Core Indicator

Definition

A national multisectoral HPAI BCC working group is responsible for BCC messages on HPAI. The group 1) develops and implements BCC plans and strategies for preventing, preparing for, and responding to HPAI outbreaks and 2) approves HPAI messages that are released to the public through campaign materials (i.e., reviews communications materials to ensure that they meet the criteria according to the national HPAI policies and that they are based on the findings of both communications and science/epidemiological research. The HPAI BCC working group:

- Has approved terms of reference
- Has convened four times in the previous year
- Has attendees who represent key organizations
- Is a component within the overall national HPAI prevention and control program.

Yes: The HPAI BCC working group exists and meets all four qualifications.
No: An HPAI BCC working group does not exist.

OR

An HPAI BCC working group exists but does not meet all four qualifications. State which qualification is lacking.

- A national HPAI BCC working group's authority should be defined in its terms of reference (or other document), which state the group's goals and objectives, roles, and responsibilities.
- A national HPAI BCC working group should meet at least quarterly and, therefore, have met four times within the year before the measurement.
- The HPAI BCC working group is a comprehensive group with stakeholders from all appropriate government agencies as well as representatives from UN agencies, bilateral or multilateral donors, and implementing partners. All stakeholders should be represented at each meeting

- The HPAI BCC working group is a component of the overall national HPAI prevention and control program. A representative of the HPAI BCC working group should also be a member of the overall national HPAI coordinating committee.

What It Measures

This indicator demonstrates national commitment to a comprehensive and multisectoral approach to HPAI BCC programs. In every country, various agencies are involved with HPAI BCC activities; these agencies may have little experience in working closely to implement joint programs. Ideally, all agencies implementing HPAI BCC activities should be coordinated through a national HPAI BCC working group or task force, and specific joint programs, for example, between the ministry of health and the ministry of agriculture, should be established.

Measurement Tools

No tool exists.

Checklist of qualifications for a functioning national HPAI BCC working group to review working group documents: terms of reference, membership rolls, meeting minutes. For example:

- *Today's date*
- *What is the actual name of the national HPAI BCC working group [terms of reference document]?*
- *Who from what organization serves as the secretariat (responsible for convening meetings, storing documents, and ensuring work is done) [possibly in terms of reference document]?*
- *Are there terms of reference? If so, state name of document and date of approval [terms of reference document].*
- *Were there four meetings of the national HPAI BCC working group within the year prior to the assessment? If so, what were the dates [meeting minutes]?*
- *Name the representatives from each stakeholder who is a member of the national HPAI BCC and indicate whether they attended the last meeting [membership rolls and meeting minutes].*

Stakeholder	Name	Attended Meeting of ______
Ministry of Agriculture		
Ministry of Health		
Ministry of Communication		
Other line ministries; please name		
Other line ministries; please name		

Stakeholder	Name	Attended Meeting of ______
Subnational representative		
Subnational representative		
WHO		
FAO		
UNICEF		
Other UN agency; please name		
USAID		
Japan assistance		
Other bilateral donor; please name		
Implementing partner; please name		
Implementing partner; please name		
Other; please name		

How to Measure It

This indicator is measured at the national level by reviewing official documents regarding the existence of a national HPAI BCC working group. Such documentation should include the goals and objectives of the working group (terms of reference), a list of activities carried out to date, minutes from working group meetings, and membership rolls. Evidence should be produced that the working group has met four times in the year prior to the reporting date.

Frequency

This indicator should be measured and reported annually.

Considerations

Even though this indicator defines a functioning HPAI BCC working group by the existence of terms of reference and evidence of a current meeting with attendance by members, the indicator does not assess the appropriateness of the national HPAI BCC working group's mandate as stated in the terms of reference, the degree to which the composition of the working group is appropriately representative, or whether it is effective in executing its mandate.

Neither does this indicator measure the magnitude or quality of the contribution of key agencies, so the true degree to which this is a multisectoral body is not known. Additionally, where the national HPAI plan has decentralized planning and implementation at the subnational level, there may be local organizations that are involved with HPAI BCC activities but are not represented at the central level, so their presence and coordination with other local actors should be considered.

Revision History

First published June 2007 as indicator 6.1.1. Revised in current edition.

Last revised September 2008

6.8 Research

6.8.100 Number of Special Studies Conducted

Additional Indicator

Definitions

Number of special studies related to BCC conducted during the reporting period.[88]

- Special studies are assessments carried out by a national program that are outside the routine monitoring of program activities and serve for special purposes relevant to the program and its informational needs (e.g., vaccine efficacy study and other OR).
- Reporting period may vary depending on a country's reporting period or donors' reporting requirements.

Disaggregation: Type of study, status of study (designed, piloted, in progress, completed)

What It Measures

This indicator measures the number of instances in which special studies related to BCC are carried out to inform and guide decision making in order to 1) improve program effectiveness and/or 2) develop model programs that can be scaled up or replicated.

This indicator also measures the extent to which countries affected by the disease are generating the necessary knowledge base for the global community to develop evidence-based strategies, technical guidelines, and SOPs.

Measurement Tools

Program records and documents and study reports or other outputs of OR studies

How to Measure It

Review program records and documents, a list of study reports, or other outputs of OR studies maintained by the national program, and count the number of special studies that have been conducted during the reporting period.

For a study to be counted in the indicator, there must be evidence of national program managers' and/or staff's involvement or participation in the study. Participation can range from full implementation of a study by the national program with limited external assistance to study efforts for which key study elements (e.g., development of a study design, development of

[88] This indicator was adapted from the relevant indicators presented in Bertrand J., Magnani R., and Rutenberg N., *Handbook of indicators for family planning program evaluation,* The Evaluation Project, pp. 93–94.

instruments, data collection, analysis, report writing) are contracted out to researchers or institutions external to the program.

Frequency

This indicator should be measured annually to determine the number of special studies related to BCC conducted in a country.

Considerations

This indicator provides a crude measure of instances when special studies related to BCC were conducted to inform and guide decision making in order to affect policies and improve program effectiveness. Measurement of this indicator alone does not provide an assessment of the quality of the studies carried out or whether the studies achieved the intended purposes (e.g., affected policies; led to reorientation of the other program components and in particular BCC programs; led to the development of model programs, scaling up of existing programs, or replication of programs in another context).

Furthermore, for special studies to be relevant and responsive to the national program, a high level of participation or involvement on the part of national program managers and staff is desirable.

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Appendix: Mapping Indicators to the Logic Model

Effective National Planning and Policy for HPAI Control and Pandemic Influenza Preparedness (National Planning and Policy)	Element	Logic Model Description	Relevant Indicators	
	OUTCOME	Effective national planning and policy for HPAI control and pandemic influenza preparedness		
	OUTPUT	Government leadership	3.2.500	Proportion of Financial Resources for National Highly Pathogenic Avian Influenza Prevention and Control Programs Committed by the National Government
			3.3.500	Proportion of Financial Resources for National Pandemic Preparedness and Response Committed by the National Government
			3.2.300	Existence of an Explicitly Defined and Trained Command and Control Structure for Highly Pathogenic Avian Influenza Response
			3.3.300	Existence of an Explicitly Defined and Trained Command and Control Structure for Pandemic Response
		Improved multisectoral coordination/collaboration at the international, regional, and national levels	3.1.100	Existence of Multisectoral Coordination of National Highly Pathogenic Avian Influenza Prevention and Control Programs
			3.1.200	Existence of Multisectoral Coordination of National Pandemic Preparedness and Response Programs
		National HPAI control plans, workplans, budgets	3.2.100	Existence of a National Multisectoral Highly Pathogenic Avian Influenza Prevention and Control Plan(s)
			3.2.200	Existence of National Highly Pathogenic Avian Influenza Prevention and Control Standard Operating Procedures
			3.2.400	Existence of National Highly Pathogenic Avian Influenza Prevention and Control Annual Workplan(s) and Budget

	Element	Logic Model Description	Relevant Indicators	
Effective National Planning and Policy for HPAI Control and Pandemic Influenza Preparedness (National Planning and Policy)	OUTPUT	National pandemic preparedness plans, workplans, budgets	3.3.100 3.3.200 3.3.400 3.3.700	Existence of a National Multisectoral Pandemic Preparedness and Response Plan(s) Existence of National Pandemic Preparedness and Response Standard Operating Procedures Existence of National Pandemic Preparedness and Response Annual Workplan(s) and Budget Existence of Key Messages Related to Human-to-Human Transmission during an Influenza Pandemic and Mechanisms for Their Dissemination
		Enabling legislative/regulatory environment	3.4.200	Change in National Legislative and Regulatory Frameworks to Support Highly Pathogenic Avian Influenza Prevention and Control Activities in a Given Country in Response to International Recommendations
	PROCESS	Develop and adopt national plans and SOPs for HPAI control and pandemic preparedness		
		Build government capacity to respond		
		Conduct simulation exercises for testing plans	3.2.600 3.3.600	Testing of National Highly Pathogenic Avian Influenza Prevention and Control Plan(s) by Simulation Exercises Testing of National Pandemic Preparedness and Response Plan(s) by Simulation Exercises
		Develop and adopt appropriate legislation/regulations for HPAI and pandemic preparedness activities		
	INPUT	Personnel and TA for plan/policy development		
		Financial resources for HPAI and pandemic preparedness activities		

	Element	Logic Model Description	Relevant Indicators	
National Planning and Policy	INPUT	Preparedness supplies stockpiled (e.g., PPEs, antivirals)		
		Special studies	3.4.100	Analysis of the Legislative and Regulatory Framework with Recommendations for Changes to Support Highly Pathogenic Avian Influenza Prevention and Control
			3.4.300	Existence of an Analysis of the Legislative and Regulatory Framework with Recommendations for Changes to Support Pandemic Preparedness and Response
			3.5.100	Existence of a National Research Agenda for Special Studies on Highly Pathogenic Avian Influenza
Limited Prevalence of HPAI in Birds (Animal Health)	OUTCOME	Limited prevalence of HPAI in birds	4.1.100	Number of Confirmed Highly Pathogenic Avian Influenza Events in Poultry and Wild Birds
	OUTPUT	Improved national and subnational capacity in HPAI surveillance	4.2.300	Proportion of Target Areas with Active Surveillance System for Highly Pathogenic Avian Influenza Virus Circulation Cases in Poultry
			4.2.400	Existence of Active Surveillance System for Highly Pathogenic Avian Influenza Virus Circulation Cases in Wild Birds
			4.2.500	Proportion of Target Areas with Active Surveillance Submitting Surveillance Reports for Highly Pathogenic Avian Influenza to the National Level According to Standard Operating Procedures
			4.2.600	Data Obtained from Active Surveillance System Analyzed, Published, and Disseminated
			4.2.700	Proportion of Reports on Suspected Outbreaks of Highly Pathogenic Avian Influenza Submitted According to the Standard Operating Procedures
		Improved national and subnational capacity in HPAI control	4.6.200	Existence of a Comprehensive Vaccination Program for Highly Pathogenic Avian Influenza in Poultry
			4.6.300	Existence of a Regulatory Measure for a Comprehensive Vaccination Program in a Country
			4.6.400	Vaccination Program for Highly Pathogenic Avian Influenza in Poultry Assessed

	Element	Logic Model Description	Relevant Indicators	
Limited Prevalence of HPAI in Birds (Animal Health)	**OUTPUT**	Rapid response to HPAI outbreaks in birds	4.2.800	Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks That Were Notified Before Secondary Spread Had Occurred
			4.2.900	Proportion of Highly Pathogenic Avian Influenza Outbreaks Reported to the Ministry of Agriculture That Are Reported to the World Organization for Animal Health
			4.3.200	Proportion of Target Areas That Have a Trained Rapid Response Team for Highly Pathogenic Avian Influenza
			4.3.300	Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks with Disease Response in Accordance with National Standard Operating Procedures
			4.3.400	Proportion of Suspected Highly Pathogenic Avian Influenza Outbreaks with Disease Response Before Secondary Spread Has Occurred
			4.3.500	Average Number of Days from the Time of a Suspect Highly Pathogenic Avian Influenza Outbreak in Poultry to the Start of Response Action That Follows the National Standard Operating Procedures
			4.3.600	Proportion of Confirmed Highly Pathogenic Avian Influenza Outbreaks in Poultry That Include an Epidemiological Investigation
			4.3.700	Average Number of Days from the Onset of a Suspected Highly Pathogenic Avian Influenza Outbreak in Poultry or Wild Birds to the Collection of Biological Specimens for Highly Pathogenic Avian Influenza Diagnosis

	Element	Logic Model Description	Relevant Indicators	
Limited Prevalence of HPAI in Birds (Animal Health)	OUTPUT	Network of laboratories with HPAI diagnostic capacity strengthened	4.5.200	Existence of an Inter-laboratory Quality Assurance System for Highly Pathogenic Avian Influenza
			4.5.300	National Laboratory Adheres to Biosafety Guidelines
			4.5.400	Number of Laboratories That Have the Capacity to Undertake the Range of Highly Pathogenic Avian Influenza Diagnostic Tests
			4.5.500	Existence of a Mechanism to Ship Highly Pathogenic Avian Influenza Specimens to Reference/International Laboratories
			4.5.600	Proportion of Isolates that Require Further Characterization per FAO Guidelines/Criteria for Which Specimens Were Sent to the Reference/International Laboratories for Further Characterization during the Reporting Period
			4.5.700	Average Number of Days between Receipt of Biological Specimen in Laboratory for Highly Pathogenic Avian Influenza Testing and Sending of the Results to the Requester
			4.5.800	Proportion of Biological Samples from Suspected Cases of Highly Pathogenic Avian Influenza That Are Received at Designated Laboratories of Sufficient Quality to Be Tested
			4.5.900	Proportion of Biological Samples of Suspected Cases of Highly Pathogenic Avian Influenza Received at Designated Laboratories with Appropriate Biohazard Packaging
			4.5.1000	Planned Highly Pathogenic Avian Influenza Tests Conducted
			4.5.1100	Proportion of Investigations of Suspected Highly Pathogenic Avian Influenza Outbreaks in Birds That Are Supported by Laboratory Tests
		Improved biosecurity in production, in markets, and at border checkpoints	4.4.200	Proportion of Sector 1 and 2 Farms That Meet Biosecurity Recommendation/Guidelines Appropriate to the Sector
			4.4.400	Proportion of Targeted Markets That Are Practicing Biosecurity According to Best Practices

	Element	Logic Model Description	Relevant Indicators	
Limited Prevalence of HPAI in Birds (Animal Health)	**OUTPUT**	Financial compensation for affected farmers	4.7.100	Compensation Is Provided in a Timely Manner for Any Poultry or Other Property Destroyed as Part of a Highly Pathogenic Avian Influenza Control Campaign
			4.7.200	Compensation Provided Is in Accordance with the National Compensation Plan for Poultry or Other Property Destroyed as Part of a Highly Pathogenic Avian Influenza Control Campaign
	PROCESS	Build capacity to detect and control HPAI	4.6.100	Total Number of People Trained in Vaccination for Highly Pathogenic Avian Influenza in Poultry
		Train surveillance, laboratory, and rapid response teams	4.2.100	Total Number of People Trained in Poultry Disease Surveillance
			4.2.200	Total Number of People Trained in Wild Bird Disease Surveillance
			4.3.100	Total Number of People Trained in Highly Pathogenic Avian Influenza Outbreak Response
			4.5.100	Total Number of People Trained in Laboratory Diagnosis for Highly Pathogenic Avian Influenza
		Improve biosecurity in production, in markets, and at border checkpoints	4.4.100	Total Number of Sector 1 and 2 Producers Trained in Biosecurity Concepts and Measures
			4.4.300	Total Number of Animal Health Workers Trained in Biosecurity Concepts and Measures
			4.8.100	Number of People at Border Checkpoints Trained in Border Biosecurity and Transborder Transmission
			4.8.200	Existence of Inspector Teams at Border Checkpoints to Monitor Transborder Poultry Movement
			4.8.300	Existence of Infrastructure to Wash and Spray Vehicles for Disinfection at Border Checkpoints
	INPUT	Personnel, equipment, supplies, and TA for surveillance, response, and laboratories		
		Special studies	4.9.100	Number of Special Studies Conducted

	Element	Logic Model Description	Relevant Indicators	
Rapid Response to Contain Human Infection with H5N1 Virus at an Early Stage (Human Health)	IMPACT	Reduced risk of influenza pandemic of avian origin	5.1.100	Confirmed Cases of Human Infection with H5N1 Virus
			5.1.200	Deaths via Human Infection with H5N1 Virus
			5.1.300	Human Infection with H5N1 Virus Case Fatality Rate
			5.1.400	Clusters of Human Infection with H5N1 Virus
	OUTCOME	Rapid response to contain human infection with H5N1 virus at an early stage	5.2.300	Proportion of Cases of Human Infection with H5N1 Virus with Recommended Epidemiological Investigation per Standard Operating Procedure(s)
			5.2.400	Proportion of Cases of Human Infection with H5N1 Virus That Had Case-Based Data Collected According to National Standard Operating Procedure(s)
			5.2.500	Proportion of Suspected Cases of Human Infection with H5N1 Virus Reported to the Appropriate Authorities within 48 Hours of Contact with a Health Facility
			5.3.100	Proportion of Suspected Cases of Human Infection with H5N1 Virus with Laboratory Diagnosis
			5.4.200	Proportion of Cases of Human Infection with H5N1 Virus with Recommended Clinical Management Response per National Standard Operating Procedure(s)
	OUTPUT	Functional immediate notification system	5.2.100	Immediate Notification System to Monitor and Respond to Human Infection with H5N1 Virus According to National Standard Operating Procedure(s)
		Network of laboratories with human infection with HPAI diagnostic capacities		
		Case management of human infection with HPAI		
		Standard infection control for human infection with HPAI		

	Element	Logic Model Description	Relevant Indicators	
Rapid Response to Contain Human Infection with H5N1 Virus at an Early Stage (Human Health)	OUTPUT	Timely deployment of rapid response teams	5.6.400	Average Number of Days from Notification of a Case of Human Infection with H5N1 Virus to the Deployment of a Rapid Response Team for Epidemiologic Investigation and Containment per National Standard Operating Procedure(s)
	PROCESS	Improve identification and clinical management of cases of human infection with HPAI		
		Improve confirmation of cases of human infection with HPAI	5.3.200	Average Number of Days between Presentation to a Health Facility of a Suspected Case of Human Infection with H5N1 Virus to Receipt of a Biological Specimen at a Designated Laboratory
			5.3.300	Average Number of Days from Receipt of Clinical Samples from Suspect Cases of Human Infection with H5N1 Virus to Either Confirmation or Ruling Out of Human Infection with H5N1 Virus per National Standard Operating Procedure(s)
			5.3.500	Proportion of Biological Samples from Suspected Cases of Human Infection with H5N1 Virus That Are Received at Designated Laboratories of Sufficient Quality to Be Tested
			5.3.600	Proportion of Biological Samples of Suspected Cases of Human Infection with H5N1 Virus Received at Designated Laboratories with Appropriate Biohazard Packaging
		Develop national capacity for immediate notification and rapid response		

	Element	Logic Model Description	Relevant Indicators	
Rapid Response to Contain Human Infection with H5N1 Virus at an Early Stage (Human Health)	**PROCESS**	Train laboratory, clinical, surveillance, and rapid response staff	5.2.200 5.4.100 5.5.100 5.6.100	Total Number of People Trained in Surveillance for Human Infection with H5N1 Virus Total Number of Clinicians Trained in Clinical Treatment of Human Infection with H5N1 Virus According to National Treatment Standard Operating Procedure(s) during the Reporting Period Total Number of People Trained in Infection Control of Human Infection with H5N1 Virus According to National Treatment Standard Operating Procedure(s) during the Reporting Period Total Number of People Trained in Human Infection with H5N1 Virus Rapid Response and Containment Measures during the Reporting Period
	INPUT	Personnel, equipment, supplies, and TA for surveillance, response, and laboratories	5.3.400 5.6.200 5.6.300	Existence of a Laboratory Quality Assurance System for Human Infection with H5N1 Existence of a National Rapid Response Team for Human Infection with H5N1 Virus That Meets National Criteria Proportion of Subnational Units That Have a Rapid Response Team That Meets National Criteria
		Plan for surveillance of and response to human infection with HPAI		
		Personnel, equipment, supplies, and TA for clinical response	5.4.300 5.4.400	Proportion of Health Care Facilities That Provide Care and Treatment for Human Infection with H5N1 Virus Proportion of Health Workers Who Can Correctly Identify Symptoms of Human Infection with H5N1 Virus
		Special studies	5.7.100	Number of Special Studies Conducted

	Element	Logic Model Description	Relevant Indicators	
Reduced Risk of HPAI Transmission Associated with Human Behavior (Behavior Change Communication)	OUTCOME	Reduced risk of HPAI transmission associated with human behavior	6.1.100	Proportion of Poultry Farm Workers Who Report Practicing Four Behaviors to Decrease the Risk of Highly Pathogenic Avian Influenza Infection to Their Poultry
			6.1.200	Proportion of People Interviewed Who State That They Practice at Least Three Behaviors to Protect Themselves and Their Families from Transmission of H5N1 Virus
			6.2.100	Proportion of Suspected Cases of Human Infection with H5N1 Virus Seeking Treatment within 48 Hours of Fever Onset
	OUTPUT	Improved knowledge of HPAI/H5N1 risk and preventive measures	6.3.100	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can Correctly Cite the Key Characteristics of Highly Pathogenic Avian Influenza Outbreaks in Poultry
			6.3.200	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know at Least Two Mechanisms for the Transmission of Highly Pathogenic Avian Influenza to Poultry
			6.3.300	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Can List Four Ways to Protect Their Poultry from Highly Pathogenic Avian Influenza
			6.3.400	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know to Report an Outbreak of Highly Pathogenic Avian Influenza Immediately
			6.3.500	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know to Whom to Report an Outbreak of Highly Pathogenic Avian Influenza
			6.3.600	Proportion of Individuals in the Poultry Supply and Distribution Chain Who Know That Apparently Asymptomatic Ducks Can Transmit Highly Pathogenic Avian Influenza
			6.4.100	Proportion of People Interviewed Who Know That Humans Can Become Infected with H5N1 Virus
			6.4.200	Proportion of People Interviewed Who Know the Symptoms of Human Infection with H5N1 Virus

	Element	Logic Model Description	Relevant Indicators	
Reduced Risk of HPAI Transmission Associated with Human Behavior (Behavior Change Communication)	OUTPUT		6.4.300	Proportion of People Interviewed Who Know That H5N1 Virus Can Be Transmitted to Humans from Birds
			6.4.400	Proportion of People Interviewed Who Know That Individuals with Possible Infection with H5N1 Virus Should Report to Health Facilities
			6.4.500	Proportion of People Interviewed Who Can List Three Ways to Protect Themselves and Their Families from Transmission of H5N1 Virus
		Coverage of HPAI/H5N1 BCC activities	6.5.100	Estimated Number of People Reached with Highly Pathogenic Avian Influenza-Related Messages Through Mass Media During a Reporting Period
			6.5.200	Estimated Number of People Reached with Highly Pathogenic Avian Influenza-Related Messages Through Interpersonal Communication and Community Outreach Activities During a Reporting Period
		Exposure to HPAI BCC activities	6.5.300	Proportion of People Surveyed Who Have Been Exposed to Highly Pathogenic Avian Influenza-Related Messages Through Mass Media
			6.5.400	Proportion of People Surveyed Who Have Been Exposed to Highly Pathogenic Avian Influenza-Related Messages Through Interpersonal Communication/Community Outreach Activities
	PROCESS	Build capacity to communicate HPAI BCC messages	6.6.100	Number of People Trained in Highly Pathogenic Avian Influenza Behavior Change Communication
			6.6.200	Proportion of Community Agents Surveyed Who Can Correctly Cite (> 75 Percent) Ways to Prevent Bird-to-Bird Transmission of Highly Pathogenic Avian Influenza
			6.6.300	Proportion of Community Agents Surveyed Who Can Correctly Cite (> 75 Percent) Ways to Prevent Bird-to-Human Transmission of H5N1 Virus
			6.6.400	Proportion of People Interviewed Who Feel Comfortable Seeking Information from Specific Types of Community Agents
			6.6.500	Proportion of People Interviewed Who Have Sought Information from Specific Types of Community Agents

	Element	Logic Model Description	Relevant Indicators	
Reduced Risk of HPAI Transmission Associated with Human Behavior (Behavior Change Communication)	PROCESS	Develop HPAI BCC messages in line with targeted audiences		
		Coordinate government, donors, and NGOs around HPAI BCC communication messages	6.7.100	Multisectoral Coordination of National Highly Pathogenic Avian Influenza Behavior Change Communication Programs
	INPUT	Personnel and TA for BCC		
		BCC plan for HPAI communications		
		HPAI BCC working group		
		Special studies	6.8.100	Number of Special Studies Conducted