



Connecting Organizations for
Regional Disease Surveillance

Digital health information and data collection at the community level in cross-border areas

Final Implementation Report Mekong Basin Disease Surveillance (MBDS)

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Abstract

With its six member Networks, Connecting Organisations for Regional Disease Surveillance (CORDS – www.cordsnetwork.org) aims to contain outbreaks at the source and keep communities safe from the spread of infectious diseases in animals and humans. One of its strategies is to promote innovations that strengthen event based surveillance (EBS) at community level. Supported by a grant from The Rockefeller Foundation, and a collaboration with Ending Pandemics, the CORDS member Networks have started to assess EBS systems and practices, with a focus on cross-border sites in selected countries in Sub-Saharan Africa, Southeast Asia, the Middle East and Southeast Europe. The purpose of which is to share current information on current collection methods of human and animal health events in relation to EBS, identify areas of improvement and share best practices.

This was a descriptive project that uses a standardised assessment tool (the INP Surveillance Evaluation Tool) in web and paper-based formats. The tool was developed with the input of the six CORDS Networks and includes both quantitative and qualitative questions. The primary focus was to apply the tool within selected countries (2-3) and sites (cross-border/cross-island) at national, district and community levels within countries in each Network. Supplementary data collection methods of structured interviews with key stakeholders, a desk review of documents and observations of surveillance systems were also used to obtain information required for the assessment. The types of systems assessed within this project included digital and other alert systems, and both pilot and national systems. The assessment captured information on the quality of data and systems, with a focus on the quality of current practices and capturing best practices in the Networks.

This project focuses on the assessment of event based surveillance systems and the use of digital tools to generate data. The assessment identifies gaps and acts as a roadmap for improvement of these systems. Access to such data will contribute towards shortening the time to detect and time to respond to an outbreak and provided important information on current systems and practices of data collection in relation to event based surveillance. The work of this project is intended to add direct value by strengthening countries within CORDS networks' ability to meet the wider global health security agenda and ability to meet IHR.

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List of abbreviations

ALERT	Albania Electronic Reporting Tool
APEIR	Asia Partnership on Emerging Infectious Diseases Research
CORDS	Connecting Organisations for Regional Disease Surveillance
DODRES	Disease Outbreak Detection and Response in East and Southern Africa
EAIDSNet	East African Integrated Disease Surveillance Network
EBS	Event Based Surveillance
EWAR	Early Warning and Response
IIS	Immunisation Information System
JEE	Joint External Evaluation
OIE	World Organisation for Animal Health
PHEIC	Public Health Emergency of International Concern
PODD	Participatory One Health Disease Detection project
SACIDS	The Southern African Centre for Infectious Disease Surveillance
SARS	Severe Acute Respiratory Syndrome
SECID	Southeast European Center for Surveillance and Control of Infectious Diseases
IBS	Indicator Based Surveillance
IDIS	Infectious Disease Information System
IHR	International Health Regulations
INP	InterNetwork Project
MBDS	Mekong Basin Disease Surveillance
MECIDS	Middle East Consortium on Infectious Disease Surveillance
WHO	World Health Organization

Key definitions

	Definition
Action thresholds	The critical number of cases (or indicator, proportion, rate, etc.) that is used to sound an early warning, launch an investigation at the start of an epidemic and prepare to respond to the epidemic.
Acute public health event	Any event that represents an immediate threat to human health and requires prompt action (investigation and implementation of mitigation and/or control measures) to protect vulnerable populations. This term includes events that have not yet led to disease in humans but have the potential to cause disease, such as the manifestation of infectious agents or contaminants in animals, food, water, manufactured products, or the environment, or direct or indirect consequences of natural disasters, accidents, conflicts, or disruption or critical infrastructure.
Alert	Information communicated to health actors, partners or stakeholder communities, and the public to help inform about, prevent the spread of, and /or control an acute public health event.
Cross-border region	A cross-border region is a territorial entity that is made of several local or regional authorities that are co-located yet belong to different nation states.
Early warning system	A communicable disease surveillance and response system designed to detect as early as possible any departure from the usual or normally-observed frequency or phenomenon.
Epidemic	The occurrence in a community or region of cases of an illness, specific health-related behaviour, or other health-related events clearly in excess of normal expectancy. The community or region and the period in which the cases occur are specified precisely. The number of cases indicating the presence of an epidemic varies according to the agent, size and type of population exposed, previous experience or lack of exposure to the disease, and time and place of occurrence.
Event	The International Health Regulations define an event as “a manifestation of disease or occurrence that creates a potential for disease ... which can include events that are infectious, zoonotic, food safety, chemical, radiological or nuclear in origin and whether transmitted by persons, vectors, animals, goods/food or through the environment. In the context of event based surveillance, an event is a signal (data or information relevant to an acute public health event) that has been verified
Event based surveillance	Event based surveillance is the organised and rapid capture of information about events that are a potential risk to public health. This information can be rumours and other ad-hoc reports transmitted through formal channels (i.e. established routine reporting systems) and informal channels (i.e. media, health workers and non-governmental organisations reports
Indicator	1. A quantitative or qualitative variable that allows the verification of changes (OECD-DAC/RBM, 2000). 1. Quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor (OECD). 3. Variable that helps to measure change, directly or indirectly (Tafwik A.M. Khoja, 2002). 4. Information in a consistent format that points to a current status or need for action (Wideman Comparative Glossary of Project Management, V.3.1)

National IHR Focal Point	The national centre designated by each State Party, which shall be accessible at all times for communication and liaison with WHO IHR Contact Points, and which shall be responsible for the implementation, coordination, reporting, and notification of potential public health emergencies of international concern to WHO under the IHR.
Notification	This is the formalised mandatory communication process through which reportable diseases events are communicated within national or international surveillance systems.
Priority diseases	These are diseases/conditions that have been identified to be of important/major public health importance.
Public health emergency of international concern (PHEIC)	This is defined by the IHR as “an extraordinary event which is determined, as provided in these Regulations, (i) to constitute a public health risk to other States through the international spread of disease and (ii) to potentially require a coordinated international response.
Reporting	The process by which acute public health events and health risks are brought to the knowledge of the health authorities
Response	Any public health action triggered following the detection of a public health risk or acute public health event, including investigation, monitoring, prevention, mitigation, and/or control measures
Signal	Data or information collected from any surveillance source and determined by the epidemic intelligence process to represent a report of a potential acute public health event or public health risk. Once verified, a signal becomes an “event”.
Surveillance	The systematic ongoing collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary.
Verification	An essential step of the epidemic intelligence process that consists of confirming the reality (authenticity and conformity) of a signal and characterising the nature of the event by actively cross-checking the validity of the information using reliable sources.

Source: WHO 2014 [1], WHO 2019 [2]

1 Overview

1.1 Rationale and public health justification

Cross-border disease transmission has been identified as a key challenge for the prevention and control of disease outbreaks, particularly infectious diseases. These areas remain particularly vulnerable and at risk due to a variety of factors including variations in surveillance structures and national guidelines [3] [4]. Recent multinational disease outbreaks including the 2014-2016 Ebola virus disease epidemic in Liberia, Guinea and Sierra Leone, which was the largest recorded Ebola outbreak, resulting in over 28,000 reported cases and over 11,000 deaths highlights the vulnerability of cross-border areas [5]. Within weeks of the first Ebola case in a remote area of Guinea, the epidemic had spread across land borders to Liberia and Sierra Leone, with a further limited number of cases spreading to Senegal and Mali, and through air travel to Nigeria, Spain and the United States [6]. Other epidemic prone diseases have also caused international concern including Severe Acute Respiratory Syndrome (SARS) and Avian Influenza. Other emerging diseases, for example Marburg haemorrhagic fever and Nipah virus also pose major threats to public health and global public health security [7].

Globally, approximately 60% of all human diseases are thought to be of zoonotic origin, and up to 75% of all newly emerging diseases [8]. The revised International Health Regulations (IHR) of 2007 represent an international framework for strengthening and maintaining the capacities of early detection and response. It is a legally binding agreement among 196 States Parties, including the Member States of the World Health Organisation. It defines the obligations of Member States and the WHO, to identify, report and when possible, contain all public health events that may constitute a “public health emergency of international concern”. The revised IHR recognises that public health incidents can pose threats *beyond national borders* and that Member States bear a responsibility to the global community to identify, report and when possible, contain public health threats before they become “public health emergencies of international concern”. The IHR and related policy guidance suggest that countries build capacities for early warning and response functions through the integration of systems for indicator and event based surveillance [9].

Against this background, a necessary first step shall be to assess the events reporting mechanisms and structures that exist not only within cross-border areas, but nationally and within countries and identifying strategies to strengthening disease surveillance capacities at all levels. The digital era offers great opportunity to use and apply digital tools, for example, smartphones to strengthen disease surveillance activities.

There is increasing evidence that use of mobile devices to support medical and public health practice (mHealth) can improve health outcomes in low-income settings [10-13], due to the low cost of roll-out, mobility of devices, ease of use and flexible deployment compared with other methods e.g. computers. The portability of mobile phones in terms of their “always on” status and ability to instantaneously transmit data anywhere where there is a functioning mobile phone or wifi network enables greater reach than computers and wired internet. mHealth applications have the potential to reach rural populations with low levels of income and literacy [14], and to reduce time to collect data, distance travelled to collect and return information and the cost of information delivery [10, 11, 15, 16].

1.1.1 CORDS experience

The Connecting Organisation for Regional Disease Surveillance (CORDS) is a non-government organisation comprised of six international networks working in 28 countries. CORDS works to reduce and prevent the spread of infectious diseases by sharing information between surveillance systems globally. Its vision is a world united against disease. Early detection is vitally important in preventing the spread of infectious disease. Collective expertise of the six member Networks and their close relationship with local communities facilitate timely detection and response to outbreaks.

Committed to a one-health approach, CORDS recognises that the health of humans is closely connected to the health of animals and the environment and aims to fill gaps in global surveillance communities. It moves useful information amongst disease surveillance experts in different continents through following four strategic objectives of:

1. Improving capacity
2. Advancing One Health
3. Building Sustainable Networks
4. Promoting Innovation

Over the past five years, CORDS has connected surveillance experts from three continents, six regional networks and 28 countries to reduce and prevent the spread of infectious diseases by facilitating the sharing of useful information among them. Listening closely to network member interests, needs, and knowledge, making relevant connections across the regions, and designing opportunities for members to connect and co-create around areas of shared interest and expertise has been critical for building trust and maintaining relationships across networks.

1.1.2 The CORDS InterNetwork Project

The CORDS InterNetwork Project (INP) is a cross network project including all the six member networks. Conceptualised in November 2017 during a Board Meeting in Bali, and funded by The Rockefeller Foundation, the project builds on the strengths of the Networks and previous projects undertaken but is the first Network wide project. The ultimate goal of the project is to enable the real-time detection of, and response to, One Health priorities, in order to strengthen health and security among local communities in cross-border areas. The first phase of this project is an assessment of the practices and systems of event based surveillance with a particular focus on digital tools used for this surveillance.

Based on the experience of the CORDS Networks – the SACIDS/EAIDSNET DODRES and Afyadata digital projects in East Africa; the MBDS cross-border event based surveillance project in the Mekong Basin, PODD in Thailand, SECID's platforms (ALERT, IIS, IDIS) in South Eastern Europe – CORDS Network chairs agreed during the November Board meeting, to develop a new pilot project on digital event information and data collection at the community-level to enable real-time detection of, and response to, One Health priorities, in order to strengthen health and security among local communities in cross-border areas.

It is anticipated that community mobile participatory surveillance and access to digital actionable data will improve epidemiologic intelligence, preparedness and response capacities at community and

regional levels and shorten the time to detect and time to respond to an outbreak. This project will add direct value by strengthening countries within CORDS networks' ability to meet IHR and contribute to filling JEE's identified gaps. The health data collected will feed national platforms and WHO/OIE surveillance systems.

This project focuses on the assessment of systems and process that focus on the organised and rapid capture of information about events that are a potential risk to public health using mainly unstructured sources of information through event based surveillance [17], with a focus on a One Health approach. The focus on event based surveillance as opposed to indicator based surveillance is that indicator based surveillance focuses on the *routine* reporting of cases of diseases based on notifiable disease surveillance systems, sentinel surveillance and laboratory based surveillance, which are commonly health care facility based and rely on weekly and monthly reporting. It is well established the early detection and timely reporting of outbreaks and important public health events is critical, however indicator based surveillance systems often fail in this regard, and are not suited to rare, but high impact outbreaks, emerging disease and unknown diseases. Given that event based surveillance systems rely on immediate reporting and use non-routine sources of reporting and these forms of reporting are particularly important at community level, the focus of this project is on this form of surveillance system.

1.2 Early warning and response

The International Health Regulations is a commitment made from State Parties to detect all events that are a potential risk to public health as promptly as possible whilst also responding to them immediately. The capacity to fulfil this commitment is known as Early Warning and Response (EWAR). This response is embedded in the national surveillance system and requires skilled human resources, financial and equipment resources, high levels of coordination and collaboration and commendable political commitment. Early warning response (EWAR) allows for the earlier detection of acute public health events, in turn allowing for an earlier and more effective response against acute public health events. This reduces the impact that these events have on health and results for the need of fewer resources in the response. Furthermore, EWAR results in the population having a greater trust in the health system and respects the commitments of the IHR (2005) [1].

1.2.1 Detection

The detection of raw data and information relies on two main processes, the systematic and regular data transmission through indicator based surveillance (IBS). Systematic and regular data transmission relies on a pre-defined list of data with a specified structure for specific diseases and conditions. Data reporting occurs at regular time intervals, for example, on a weekly or monthly basis. Usual surveillance data generated by a countries national health system can also be included within this data type, although additional sources of data can also be used. These additional data sources are referred to as Event Based Surveillance (EBS). This includes rumours, informants in the social community and information from media outlets. These sources of data are unstructured and relevant to all public health events and are collected in an active manner. Through combining IBS and EBS the commitment of EWAR has the highest chance of being met as all public health threats should be able to be detected [1].

1.2.2 Triage

Triage, the crucial second step of EWAR, ensures that unnecessary information is not collected, in turn ensuring that the system is not overwhelmed and that only relevant threats are captured. To achieve this triage involves sorting data/ information into the categories of 'likely to be relevant' and 'not likely to be relevant'. Examples of actions taken during the triage step can include data analysis on data obtained from the National Health (IBS) to detect abnormalities in morbidity/ mortality figures and the removal of duplicated events when considering additional surveillance data sources (EBS) [1].

1.2.3 Verification

Following triage, verification ensures that signals detected through the previous steps of EWAR are realistic. This involves contacting the source of the information, the collection of additional information and cross checking all information with reliable sources. Through the completion of these actions the nature of the event can be characterised, and the pertinence of the threat verified. Verification hence ensures that only genuine public health events are considered during EWAR [1].

1.2.4 Risk assessment

After an event has been verified (in the verification stage of EWAR) as a legitimate risk to public health, the magnitude of this risk and the populations most susceptible to the risk need to be identified. Through the completion of hazard, exposure and context assessments a good gauge of the potential impact that an event can have on public health can be achieved allowing for the identification of the most appropriate control measures [1].

1.2.5 Response

In order for the commitment of EWAR to be met and the impact of actuate public health events to be minimised, responses against these events must be timely, tailored and effective. In order to achieve an adapted response at a local, national, or international level, a preliminary investigative stage and the implementation of control measures must occur. This investigative stage involves the conformation of all diagnosis and the analysis of additionally collected information. Through the collection of more information it may be possible to iteratively improve and refine the risk assessment. Control measures used can involve case management, immunisation, infection control and contact tracing [1].

1.2.6 Communication

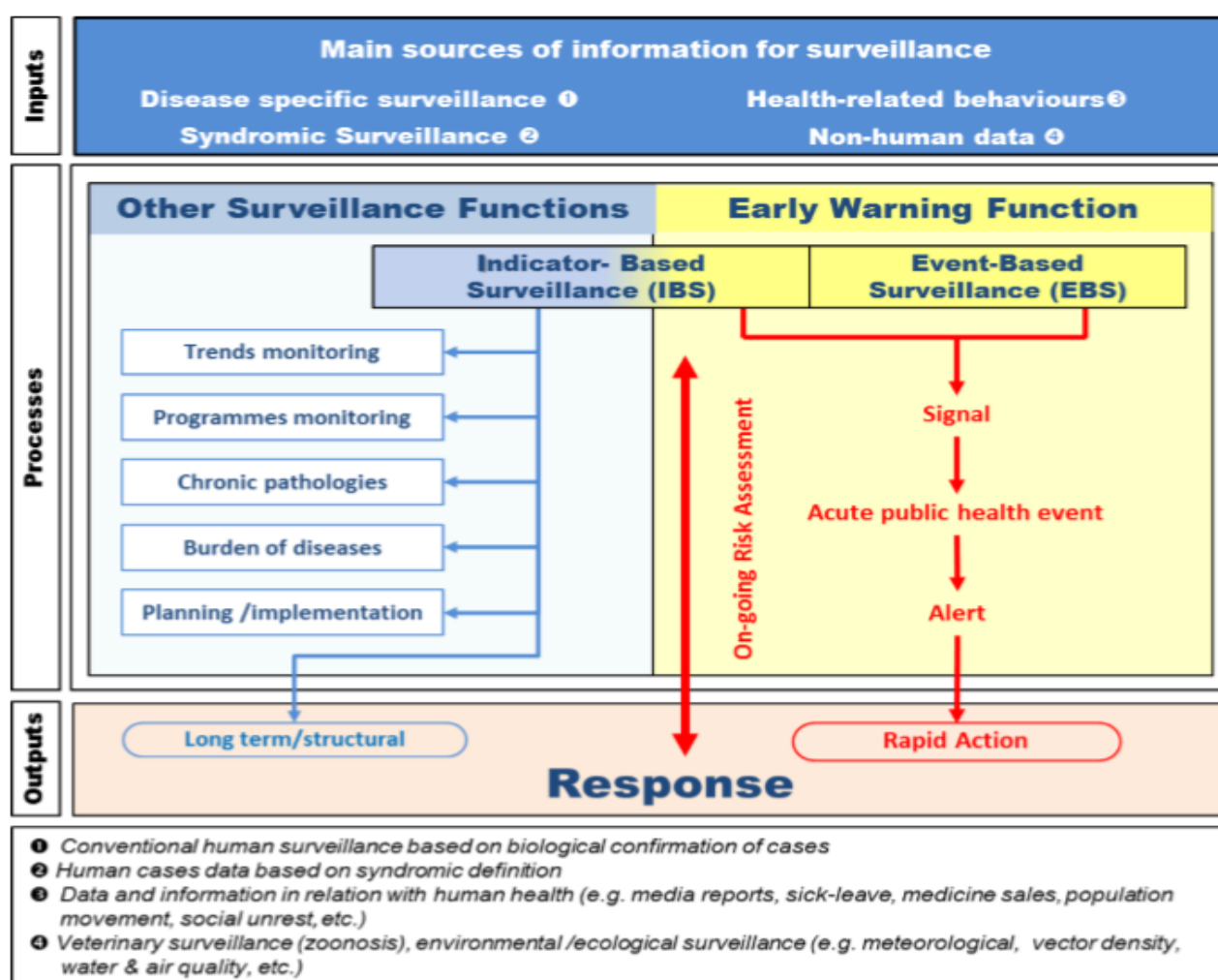
Without communication occurring between partners it is not possible to coordinate an effective response to an acute public health event. In order for efficient communication to be achieved, national lists containing relevant individuals and their subsequent contact details should be collated and made available. Additionally, ad-hoc feedback, newsletters and bulletins can be used to inform relevant individuals of up-to-date information.

Furthermore, communication between professionals and the public is also of a great importance. This increases the levels of trust and cooperation between public health bodies/ officials and the general public. Social mobilisation and communication through media outlets can be critical in obtaining the required level of communication between the general public and health professionals. Communication across sectors and countries is also vitally important [1].

1.3 Event Based Surveillance

Event based surveillance (EBS) is a key component of early warning and response systems and is one of the two main types of surveillance used to identify and track infectious diseases and other public health events [REF]. While indicator based surveillance (IBS) involves reports of specific diseases from healthcare providers and is typically a more structured and traditional process, EBS relies on unstructured reports, stories, rumours and other information on events that could pose a serious risk to public health.

Figure 1: Overview of all hazard public health surveillance and response functions



Source: WHO 2014 [1]

Table 1: Comparison of key attributes and components of event based versus indicator based surveillance		
	Event based	Indicator based
Definitions	Broad definitions, such as ‘a cluster of deaths in the same village during the same period’ can be used to help guide reporting. Event based definitions are more sensitive than those used in indicator based surveillance.	Diseases and syndromes have a corresponding case definition, more specific than the definitions used in event- based surveillance. These definitions may include one/ all of the following: <ul style="list-style-type: none"> • Clinical presentation • Characteristics of people affected • Laboratory criteria
Timeliness	All events should be reported to the system immediately.	Data is continuously reported at given time intervals: normally each week or each month. Delays are often present between case

		<p>identification and when the aggregated data is reported to the system by a health facility (even in the case of electronic reporting).</p> <p>Specific diseases and symptoms may be immediately notifiable</p>
Data/Information	Format of the data is not pre-defined and as much information is collected for each event as possible. In an attempt to obtain key information (i.e., time place and person) designated staff assist with event confirmation and assessment.	For each disease/ syndrome data in a pre-defined format is aggregated. Data format is predefined and may include a breakdown of demographic variables and other variables (i.e. number of cases of 0-4 and > 5 years of age).
Reporting structure	<p>Reporting structure is loose, and reports are unstructured. These reports, used to capture the event information, can enter the system at any time. The format of these forms is sufficiently flexible to collect both qualitative and quantitative data.</p> <p>A unit/team is designated to triage, confirm and assess each reported event and trigger responses as it is deemed appropriate to do so.</p>	<p>Reporting structure is clearly defined. Reporting forms are used by reporting units to pass information through the system, often at predefined times (such as a specific day of the week/ week of the month). Zero reporting is often used.</p> <p>A unit/ team is designated to analyse the surveillance data at regular intervals.</p>
Reporting units	Reporting units are open, meaning the general public can report to the system. Sometimes these units are undefined.	Facility-based, closed.
Trigger for initial action	A report that is confirmed and assessed as a potential risk to public health.	Pre-defined thresholds.
Analysis	Rapid risk assessment.	Pre-defined intervals (weekly, monthly).
Response	Immediate, with the response to the event being built into the surveillance system.	<p>May be delayed as a result of the time taken to collect and analyse data.</p> <p>The response to an outbreak is built into the surveillance system (as with event based surveillance).</p>

Source: WHO 2008 [17]

2 Project Objectives

2.1 General objective

The overall objective of this project is to enable the real-time detection of, and respond to, One Health priorities, in order to strengthen health and security among local communities in cross-border areas.

2.2 Specific objectives

There are three specific objectives that focus broadly on the following areas:

1. To assess, in each Network, current event based surveillance systems and practices in human and animal health events from cross-border communities (includes pilot mobile projects)
2. To exchange best practices across and within regions and identify how to further empower communities and enhance cross-border health security
3. To develop a new follow-up project where best practices would be scaled up and replicated across different Networks in other regions of the world.

3 Methods

3.1 Overall project design

The overall design of this project is a mixed methods design employing the use of both quantitative and qualitative techniques to address the project's aims and objectives. The main approach of the project is descriptive in nature and is an information gathering exercise to assess event based surveillance in the context of selected countries in the six CORDS member Networks. The assessment focused on national, district (cross-border) and community levels with each Network. The project includes four phases as featured below.

Phase 1: Establishment of structures and process to oversee the project's delivery

This phase of the project was concerned with the establishment of structures and processes to oversee the delivery of the project through the development of a functional steering committee and technical working group.

Phase 2: Assessment of event based surveillance systems and practices in each Network

The focus of this phase was on the assessment within each Network of current event based surveillance systems and practices in human and animal health events from cross-border communities, including

in pilot mobile projects. The assessment performed in each network was based upon an agreed methodology and tools

Phase 3: Exchange of best practices across and within regions

The third phase of the project was the exchange of best practices across and within regions to identify how to further empower communities and enhance cross-border health security by improving digital community detection and response in different cross-border Network areas. This involved the identification of best practices and how to transfer them in other countries and regions. The two exchange visits and their outcomes (written report) and Internetwork meetings and their outcomes (meeting minutes) were documented.

Phase 4: Development of a new follow-up project

The last phase of this project focuses on the development of a follow-up project where best practices would be scaled-up and replicated across the different Networks in other regions of the world. The purpose of the follow-up project would be to scale-up digital event information and data collection at the community level. This project will be submitted to potential financial and technical partners.

This report focuses on Phase 2, the assessment of event based surveillance systems and practices in each Network and the implementation and results from each Network.

3.2 Methods (Network specific)

The methods used to collect the data required for the INP included structured interviews (single and group discussion), workshop, site visits and observations. Each method used can see more details as follows:

Structured interviews

For the MBDS INP assessment at national and cross-border level, structured interviews with key individuals were conducted. This method was used to administer the INP Surveillance Evaluation Tool. This process involved both group discussion and single interviews with key stakeholders who were identified to be interviewed as part of the assessment at each level. Following initial contact by the project team to conduct the interview, a two-person team comprised of the overall project manager and a data collector conducted the interview. This was typically conducted face-to-face, but where this was not possible, remote interviews were also conducted. During the face-to-face interview, a paper-version of the INP Surveillance Evaluation Tool was used. Interview participants received a copy of the tool prior to the interview, so that they were familiar with the topics and questions. During the interview, the project manager administered the tool and asked the questions that were relevant to the level of administration of the tool, e.g. if the interview was a national level interview then only the national level questions were asked. To complement this approach, and ensure that all the necessary information was collected during the interview, additional methods including reviewing of documents, extraction of data from existing paper-based/electronic or digital means were also used, in addition to observational methods e.g. demonstration of systems and processes

Site visits

The methods used for the assessment also included site visits. This was an essential component of the assessment and involved the project team visiting. We have done site visit at provincial level, the purpose of these sites visits was to conduct the assessment and administer the INP Surveillance Evaluation Tool on the identified individuals.

Workshop

A final workshop was conducted for “Inter Network Project (INP) Participants Meeting” held in Nakhon Phanom Province, Thailand on 21 January 2019. Officials from MBDS XB Lao P.D.R, Thailand, Vietnam and MBDS Secretariat participated in this meeting. The purpose of the workshop was to share the experiences, challenges of INP and discussed for future collaboration.



Figure2: Inter Network Project (INP) Participants Meeting

Observations

We just to observe their daily work routines in cross border level for surveillance data collection and reporting.

4 Network specific Assessment Implementation

This section of the report describes the implementation of the EBS assessment in each Network, and describes the project setting, including all of the assessment countries, the national level, cross-border and community level sites. It also includes the rationale for the selection of the sites and describes the project participants.

4.1 Project setting

Overview

The INP was conducted in Laos, Thailand and Vietnam and 3 cross-border sites in Laos, 3 cross border sites in Thailand and one cross border site in Vietnam.

In Laos, national level assessments using the INP Surveillance Evaluation Tool were conducted with the Ministry of Health. At the cross-border level, the INP assessment was conducted in the following Savannakhet, Khammouane and Vientiane Provinces.

In Thailand, national level assessments using the INP Surveillance Evaluation Tool were conducted with the Ministry of Health. At the cross-border level, the INP assessment was conducted in the following Mukdahan, Nakhon Panom and Nongkhai Provinces.

In Vietnam, national level assessments using the INP Surveillance Evaluation Tool were conducted with the Ministry of Health. At the cross-border level, the INP assessment was conducted in one province only is Quang Tri Province.

A full description of the countries, cross-border and community level sites is shown in Table 2 below.

Table 2: INP assessment sample sites		
Laos	Thailand	Vietnam
Cross-border site	Cross-border site	Cross-border site
Savannakhet Province	Mukdahan Province	Quang Tri Province
Vientiane Province	Nongkhai Province	
Khammouane Province	Nakhon Panom Province	



Figure 3: Map of MBDS INP assessment sites

4.2 Rationale for selection of countries and assessment sites

The countries included in the INP assessment are countries that comprise the Mekong Basin Disease Surveillance (MBDS), hence their inclusion. Within each country, Ministry of Health were involved for disease surveillance and control, including event based surveillance. The cross-border sites in each country were selected for inclusion as they are international border check points and some are special economic zones, which mean the daily cross border crossing is very active, they are share disease surveillance information between cross border sites. For the purposes of this assessment, cross-border sites at each side of the country border were included.

Overall, the INP conducted for Mekong Basin Disease Surveillance (MBDS) focused on following particular priority diseases for each site:

- Dengue fever
- Typhoid fever
- Measles
- Malaria

- Pneumonia
- Tuberculosis
- Rabies
- Other (Cholera, H1N1 and EBS)

The reason that these diseases were selected in MBDS INP according to MBDS cross border information exchange program.

4.3 Project participants and recruitment

The project participants for the INP assessment at national level included individuals representing:

- Ministry of Health, Laos
- Ministry of Public Health, Thailand and
- Ministry of Health, Vietnam.

For the cross-border level, individuals representing:

- Mukdahan Provincial Health Office, Thailand
- Nongkhai Provincial Health Office, Thailand
- Nakorn Phanom Provincial Health Office, Thailand
- Vientiane Health Department, Laos
- Savannakhet Health Department, Laos
- Khammouane Health Department, Laos
- Quang Tri Health Department, Vietnam

Summary table 3 below describes the roles of the individuals interviewed at each level.

At the each national level and cross-border level for each country, the INP Surveillance Evaluation Tool was applied to single and multiple individuals.

The participants included in this project who were interviewed were recruited by using email, Telephone, Skype and application line group.

Table 3: Summary of interviewed participants for the INP			
	Laos	Thailand	Vietnam
National	Director General of DCDC Chief of Surveillance Division	Veterinarian	Public Health
Cross-border	Chief of CDC Sector and MBDS Coordinator Communicable Disease Control and MBDS Coordinator	Disease Control Sector and MBDS Coordinator Communicable Disease Control and MBDS Coordinator	Deputy Director of Quang Tri Department of Health and MBDS Coordinator

	Deputy of Epidemiology and MBDS Coordinator	Public Health Technical Officer and MBDS Coordinator	
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5 Data collection

This section of the report describes the data collection process in each Network and describes project coordination, data collection team training, the data collection tool and implementation of the project.

5.1 Project coordination

The main focal person for the project was Ms. Jittra Thajeen, MBDS Secretariat to coordinate and oversee the INP project in all Laos (Savannakhet, Vientiane and Khammouane cross border sites), Thailand (Mukdahan, Nongkhai and Nakorn Phanom cross border sites) and Vietnam (Quang Tri cross border site) and act as the focal point between the project teams and the technical working group. Further details of the data collection team are shown in Table 4 below.

National level implementation

The overall implementation of the project in Laos by Dr. Viengsavanh Khitthiphong, Thailand by Dr. Teerasak Chuxnum and in Vietnam by Assoc. Prof. Nguyen Dang Vung. Overall, the implementation of the project in Laos, Thailand and Vietnam involved national surveillance data collection.

Cross-border level implementation

At the cross-border level

Laos:

Mr. Kolakanh PHICHITCHAY (Savannakhet)
Dr. Sisavath PHANADDA (Khammouane) and
Dr. Chanthalay Sayavong (Vientiane)

Thailand:

Mrs. Punchawee Sukbut (Mukdahan)
Mr. Danai Nawamat (Nakhon Panom) and
Mr. Thapon Tiawsirichaisakul (Nongkhai)

Vietnam:

Dr. Mai Nam (Quang Tri) were responsible for overseeing data collection for each cross-border site included in the assessment.

These individuals were then contacted via email/phone call/in-person visit and a suitable time arranged for the project team to visit the district health office. The project team spent 3 days within the district where the district health office is located and conducted the assessment. The following methods of structured interviews, document review and observation were conducted to collect the required information for the cross-border level for the INP Surveillance Evaluation Tool.

Table 4: Data collection team			
	Laos	Thailand	Vietnam
Overall coordination	Ms. Jittra Thajeen		
National	Dr. Viengsavanh Khitthiphong	Dr. Teerasak Chuxnum	Assoc. Prof. Nguyen Dang Vung
Cross-border	Mr. Kolakanh PHICHITCHAY, Savannakhet Province Dr. Sisavath PHANADDA, Khammouane Province Dr. Chanthalay Sayavong, Vientiane Province	Mrs. Punchawee Sukbut, Mukdahan Province Mr. Danai Nawamat, Nakhon Panom Province Mr. Thapon Tiawsirichaisakul, Nongkhai Province	Dr. Mai Nam, Quang Tri Province

5.2 Data collection team training

The main INP focal point were responsible for the liaising with the project teams for training. In Laos, Thailand and Vietnam, training on the INP was conducted from Project Coordinator to MBDS Cross Border Coordinators. All project team members were requested to join the training and attended. The session was a face-to-face session. MBDS has contacted the same mechanism in INP participated that 3 countries.

INP Surveillance Evaluation Tool training

The training on the use of the INP Surveillance Evaluation Tool involved participants were trained on the use of the paper-based of the tool during the main training session. This involved an introduction to the INP Surveillance Evaluation Tool through the demonstration of the tool in printed/electronic format. Each participant was then given a paper-based copy of the tool and the training facilitator then described the process of administration of the tool.

Paper-based version

For the paper-based version of the tool, printed copies of the INP Surveillance Evaluation Tool were given to participants. The training manual provided with the INP Surveillance Evaluation Tool was used to introduce the tool to project team. The session then involved an explanation of each section of the tool and how its administration. Participants were then asked to practice administration of the tool in small groups and the tool was then checked by the workshop facilitator. At the end of this session, a question and answer session was held whereby participants were able to discuss any concerns or questions that they had. Following this session, participants were then trained on how to enter the information directly into Jotform using the links provided by the CORDS Secretariat to the electronic version of the form.

Similarly, for the event log, the purpose of the event log was explained and its completion using the training manual slides. Each individual then practised completing an event log.

5.3 Data collection tool – INP Surveillance Evaluation Tool

In each of the INP countries included in the assessment, the decision was taken to use the paper-based version of the tool for the structured interviews with identified stakeholders at all levels. This approach was taken as due to the information collected by the tool, the web-based version would have been difficult to apply in an interview style setting. Therefore, the approach taken was during the structured interview, the country focal person administered the INP Surveillance Evaluation Tool through asking the interviewee each question and the answer categories and then recorded the answer given directly on to the paper-based version of the tool. This information was then checked at the end of the interview and any information that needed to be followed up on was recorded. Following the interview, the data from the paper-version of the tool was directly entered on to the web-based version by Project Coordinator.

The process of using the paper-based version of the tool was found to be the most effective as the use of the tool in this manner enabled the interviewer administering the tool to build a rapport with the interviewee, who at times provided answers to several questions using the interview style method of applying the tool.

The process of using the web-based version of the tool was found to be the most effective as the use of the tool.

6 Data Management

The data collected for the INP assessment was collected typically using the paper-based version of the tool was used in the Laos, Thailand and Vietnam, national and cross-border level.

Paper-based data management

MBDS Secretariat directly entering the information onto the web-based version of the tool using the links provided. This involved the entry of 10 assessment forms and these were at national and cross-border level. These forms were all checked prior to entry on the web-based system and this involved checking that each question had been completed and following up with those interviewed to clarify answers where needed, then entering onto the web-based version of the tool in Jotform.

Event log data

The general process for managing and cleaning the event log data were according to template supported by CORDS Secretariat.

7 Data Analysis

Following the data management of the collected data, the process of data analysis involved importing the data into Excel and SPSS. Data analysis was conducted by MBDS Secretariat. Data for all levels of the assessment were analysed. The analysis that was undertaken was guided by the type of question asked and a standard analysis was undertaken using the standard INP tables for human and animal health provided by the INP Project Manager. These tables determined the type of analysis to be undertaken. At a minimum, for most questions, simple descriptive and summary statistics were used to report frequency counts and percentages. Some figures given were actual figures and others were estimates. For the event log, data analysis followed a similar process and involved the use of the template provided to analyse the event log data. For the qualitative questions that collect contextual information for each section of the tool, the key themes identified from this information were presented. As this information was generally descriptive in nature, the key themes emerging were presented as part of the results.

8 Results

This section of the report describes the overall results of the INP and features the overall characteristics of the sample included in the assessment and then three sub-sections to include the national and cross-border level results. At the national level, the result presented firstly describe the findings from the national level standards and definitions questions and then all sub-sections feature results to questions on event based surveillance, sources of surveillance data, data collection tools, verification and response and lastly, intersectoral and cross-border surveillance.

8.1 Characteristics of the sample

A total of 10 were interviewed for the INP Surveillance Evaluation Assessment. This included 4 individuals in Laos, 4 individuals in Thailand and 2 individuals in Vietnam. Overall, a total of 10 individuals were initially contacted for recruitment into this project by the project team, but of those contacted to be included in the assessment, a total of 10 were involved in the project.

The total numbers of assessment forms completed were 10. This comprised one each for the national level in Laos, Thailand and Vietnam and 3 for the cross-border level in Laos, 3 for the cross-border level in Thailand and one for the cross-border in Vietnam.

Table 5: National level participants contacted and included

Laos		Thailand		Vietnam	
No. Contacted	No. included	No. Contacted	No. included	No. Contacted	No. included
1	1	1	1	1	1

Table 6: Cross-border level participants contacted and included

Laos						Thailand				Vietnam			
Savannakhet		Vientiane		Khammouane		Mukdahan		Nongkhai		Nakorn Phanom		Quang Tri	
No. Contacted	No. included	No. Contacted	No. included	No. Contacted	No. included	No. Contacted	No. included	No. Contacted	No. included	No. Contacted	No. included	No. Contacted	No. included
1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7: Summary of number of assessment forms completed

Laos		Thailand		Vietnam	
National	Cross-border	National	Cross-border	National	Cross-border
1	3	1	3	1	1

8.2 National level results

The findings in this section relate to the national level questions of the INP Surveillance Evaluation Tool including areas on national level standards and definitions for monitoring public health events and priority diseases, the existence of standard outbreak detection guidelines and standard operating procedures compatible with the IHR or other international guidelines. Other topics in this section include event based surveillance, sources of surveillance data, data collection tools, verification and response and intersectoral and cross-border surveillance.

8.2.1 National level standards and practices

In all 3 countries (Laos, Thailand and Vietnam) have the systems and processes were identified for monitoring public health events. Also have priority diseases are under surveillance (17 diseases in Laos, 88 diseases in Thailand and 42 diseases in Vietnam). Standard outbreak detection guidelines, defined action thresholds for selected indicator diseases were identified in 3 countries. The countries that had SOPs compatible with IHR or other international guidelines at national level were in Laos, Thailand and Vietnam.

Human health domain			
Table 8: National standards and definitions			
No.	Indicator name	Laos	Vietnam
2a	Systems and processes for monitoring public health events Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
2b	Availability of a list of priority events under surveillance Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
2c	Standard set of outbreak detection guidelines Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
2d	Existence of defined action thresholds for selected indicator diseases Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
2e	Existence of SOPs compatible with IHR or other international guidelines Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)

Animal health domain		
Table 9: National standard and definitions		
No.	Indicator name	Thailand
2a	Systems and processes for monitoring public health events Yes No Unknown Not applicable	 1 (100%) - (%) - (%) - (%)
2b	Availability of a list of priority events under surveillance Yes No Unknown Not applicable	 1 (100%) - (%) - (%) - (%)
2c	Standard set of outbreak detection guidelines Yes No Unknown Not applicable	 1 (100%) - (%) - (%) - (%)
2d	Existence of defined action thresholds for selected indicator diseases Yes No Unknown Not applicable	 1 (100%) - (%) - (%) - (%)
2e	Existence of SOPs compatible with IHR or other international guidelines Yes No Unknown Not applicable	 1 (100%) - (%) - (%) - (%)

8.2.2 National level event based surveillance

Event based surveillance (EBS) was conducted in Laos, Thailand and Vietnam. It is found that there are clear objectives for event based surveillance within the communicable disease surveillance system in all 3 countries. Standard operating procedures for event based surveillance were present in 3 countries, and an operational event based surveillance coordination unit existed in 3 countries and there are dedicated staff for coordinating event based surveillance. Event based surveillance related to a National Focal Point as defined by International Health Regulations (IHR) and included in IHR National Focal Point document are present in 3 countries. Centralised/standard or any other type of localised database in use to record information about disease events exist in Laos and Thailand.

Human health domain			
Table 10: National level Event Based Surveillance			
No.	Indicator name	Laos	Vietnam
3a	Event Based Surveillance (EBS) conducted within region/country? Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
3b	Existence of clear objectives for EBS within the communicable disease surveillance system Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
3c	Existence of Standard Operating Procedures for EBS Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
3d	Existence of an operational EBS coordination unit within region/country Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
3e	Existence of dedicated staff for coordinating EBS within the region/country Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
3f	Existence of EBS system that is related to a National Focal Point as defined by IHR and included in IHR Focal Point documents Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
3g	Existence of a centralised/standard/ or any type of database of localised database in use to record information about disease events Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	- (%) 1 (100%) - (%) - (%)

Animal health domain		
Table 11: National level Event Based Surveillance		
No.	Indicator name	Thailand
3a	Event Based Surveillance (EBS) conducted within region/country? Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
3b	Existence of clear objectives for EBS within the communicable disease surveillance system Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
3c	Existence of Standard Operating Procedures for EBS Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
3d	Existence of an operational EBS coordination unit within region/country Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
3e	Existence of dedicated staff for coordinating EBS within the region/country Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
3f	Existence of EBS system that is related to a National Focal Point as defined by IHR and included in IHR Focal Point documents Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
3g	Existence of a centralised/standard/ or any type of database of localised database in use to record information about disease events Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)

8.2.3 National level sources of surveillance data

The results of the assessment identified that in Laos, Thailand and Vietnam official reports of public health events exist, and in Laos, Thailand and Vietnam there are existence of a rumour log or database in use to record to record suspected PHE from information sources. The following forms of sources of public health reporting were identified the media, community and social media.

The assessment identified that the surveillance system in all 3 countries records novel/unexpected (signals) health events for immediate reporting. The sensitivity rating of the surveillance systems for detecting outbreaks were reported as optimum sensitivity in 3 countries.

There are standard operating procedures (SOPs) for the detection of signals during public health events exist in 3 countries.

Human health domain			
Table 12: National sources of surveillance data			
No.	Indicator name	Laos	Vietnam
4a	Existence of official reports of Public Health Events (PHE) Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
4b	Existence of a rumour log or database in use to record to record suspected PHE from information sources Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
4c	Existence of the following forms of public health reporting Media Community Blogs Social media None Other	1 (33.3%) 1 (33.3%) - (%) 1 (33.3%) - (%) - (%)	1 (25%) 1 (25%) 1 (25%) 1 (25%) - (%) - (%)
4d	Surveillance system records novel/unexpected (signals) health events for immediate reporting Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
4e	Sensitivity rating of the surveillance system for detecting outbreaks 1 = Not sensitive enough – Positive cases are frequently missed 2 3 = Optimum sensitivity 4 5 = Too sensitive – Frequent false positives	- (%) - (%) 1 (100%) - (%) - (%)	- (%) - (%) - (%) 1 (100%) - (%)
4f	Existence of SOPs for the detection of signals during events Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)

Animal health domain		
Table 13: National sources of surveillance data		
No.	Indicator name	Thailand
4a	Existence of official reports of Public Health Events (PHE) Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
4b	Existence of a rumour log or database in use to record to record suspected PHE from information sources Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
4c	Existence of the following forms of public health reporting Media Community Blogs Social media None Other	1 (25%) 1 (25%) - (%) 1 (25%) - (%) 1 (25%)
4d	Surveillance system records novel/unexpected (signals) health events for immediate reporting Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)
4e	Sensitivity rating of the surveillance system for detecting outbreaks 1 = Not sensitive enough – Positive cases are frequently missed 2 3 = Optimum sensitivity 4 5 = Too sensitive – Frequent false positives	- (%) - (%) - (%) 1 (100%) - (%)
4f	Existence of SOPs for the detection of signals during events Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)

8.2.4 National level data collection tools

Types of data collection systems

Laos and Thailand, digital and paper based systems are used, in Vietnam digital and other systems are used. For the Other system in Vietnam when they have an emergency case they able report by fax and email.

Digital systems

For the countries that use digital systems have been in place for 129 months in Laos, 80 months in Thailand and 72 months in Vietnam. In the past 12-month period this digital data surveillance system has failed to transmit data and/or receive data for 7 days in Laos, 1 day in Thailand and zero day in Vietnam. In the following countries Laos and Vietnam, the digital system records GPS/location data in relation to reported events and in Laos, Thailand and Vietnam, the digital system provides a mechanism which the data collector can send and receive information results, advice from the data centre/point of verification

For in all 3 countries, the digital system provides a mechanism through which data collectors can directly exchange information (e.g. a shared forum/messaging service/WhatsApp group) and in Laos and Vietnam, the digital system allows data to be extracted into a common format such as .xml/.csv/SQL.

And also in Laos and Vietnam, the digital system uses a standard set of definitions for disease classification, case identification (e.g. ICD-11, LOINC/SNOWMED CT etc.)

Human health domain			
Table 14: National level data collection tools			
No.	Indicator name	Laos	Vietnam
5a	Type of tools currently in use to collect disease surveillance data Digital system Paper based system Other	1 (50%) 1 (50%) - (%)	1 (50%) - (%) 1 (50%)
5b	Length of time digital system has been in use (in months)	129	72
5c	Number of days in the past 12 months that the digital system has not been in use (in days)	7	0
5d	Digital system records GPS/location mapping data in relation to reported events Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
5e	Digital system provides a mechanism which the data collector can send and receive information results, advice from the data centre/point of verification Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
5f	Digital system provides a mechanism through which data collectors can directly exchange information (e.g. a shared forum/messaging service/WhatsApp group) Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
5g	Digital system allows data to be extracted into a common format such as .xml/.csv/SQL Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
5h	Digital system uses a standard set of definitions for disease classification, case identification (e.g. ICD-11, LOINC/SNOMED CT etc.) Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)

Animal health domain		
Table 15: National level data collection tools		
No.	Indicator name	Thailand
5a	Type of tools currently in use to collect disease surveillance data Digital system Paper based system Other	 1 (50%) 1 (50%) - (%)
5b	Length of time digital system has been in use (in months)	80
5c	Number of days in the past 12 months that the digital system has not been is use (in days)	1
5d	Digital system records GPS/location mapping data in relation to reported events Yes No Unknown Not applicable	 - (%) 1 (100%) - (%) - (%)
5e	Digital system provides a mechanism which the data collector can send and receive information results, advice from the date centre/point of verification Yes No Unknown Not applicable	 1 (100%) - (%) - (%) - (%)
5f	Digital system provides a mechanism through which data collectors can directly exchange information (e.g. a shared forum/messaging service/WhatsApp group) Yes No Unknown Not applicable	 1 (100%) - (%) - (%) - (%)
5g	Digital system allows data to be extracted into a common format such as .xml/.csv/SQL Yes No Unknown Not applicable	 - (%) - (%) 1 (100%) - (%)
5h	Digital system uses a standard set of definitions for disease classification, case identification (e.g. ICD-11, LOINC/SNOWMED CT etc.) Yes No Unknown Not applicable	 - (%) 1 (100%) - (%) - (%)

8.2.5 National level verification and response

8.2.5.1 *Suspected outbreaks*

The total number (estimated or actual) of **suspected outbreaks detected by the disease surveillance systems** used in Laos (5), Thailand (2,050) and Vietnam (3) over the past 12 months respectively. The total number (estimated or actual) in Laos (3), Thailand (2,050) and Vietnam (3) of **suspected outbreaks** which were verified **within 48 hours** of detection by the disease surveillance system used in those countries **over** the past 12 months.

8.2.5.2 *Outbreaks of international concern*

The total number of (estimated or actual) **outbreaks of international concern** detected by the disease surveillance system over the past 12 months in Laos was 2, in Thailand was 126 and in Vietnam was zero. The total number (estimated or actual) of **outbreaks of international concern** which were reported to **the WHO within 24 hours** of detection that were detected by the disease surveillance system used in those countries were 3 in Laos and zero in Thailand and Vietnam respectively.

For the countries assessed, the total number of outbreaks where the observed **number of cases > threshold values** that were reported to the **next notification level within 48 hours of detection** through the country's disease surveillance system over the past 12 months was 2, 672 and 3 for the Laos, Thailand and Vietnam. The total number (estimated or actual) of **suspected outbreaks** detected by the disease surveillance system used in those country that were **laboratory confirmed** over the past 12 months was 2 in Laos, 640 in Thailand and 3 in Vietnam.

8.2.5.3 *Response and verification*

The total number of **suspected outbreaks** detected by the disease surveillance system over the past 12 months was 8 in Laos, 677 in Thailand and 3 in Vietnam. The total number of **epidemics** detected by the disease surveillance system over the past 12 months was 15, 677 and 3 for Laos, Thailand and Vietnam respectively. The total number of **epidemics (above the epidemic threshold)** detected by the disease surveillance system were **reported to the next notification level within 2 days** over the past 12 months was 10 in Laos, 677 in Thailand and 3 in Vietnam. A total of 45, 2,050 and zero **outbreaks** were **detected through event based surveillance** within Laos, Thailand and Vietnam over the last 12 months.

8.2.5.4 *Standard operating procedures and performance indicators*

Standard operating procedures (SOPs) for the collection/ transportation of samples were present in Laos and Vietnam. **Targets and/or performance indicators regarding the timeliness/ speed of the surveillance systems** are present in Laos, Thailand and Vietnam.

Human health domain			
Table 16: National level verification and response			
		Laos	Vietnam
No.	Indicator name		
7a	Total number (estimated or actual) of SUSPECTED outbreaks detected by the surveillance system in the past 12 months	5	3
7b	Total number (estimated or actual) of SUSPECTED outbreaks detected by the surveillance system in the past 12 months which were verified within 48 hours of detection	3	3
7c	Total number (estimated or actual) of outbreaks of International concern detected by the surveillance system in the past 12 months	2	0
7d	Total number (estimated or actual) of outbreaks of International concern that were reported to the WHO within 24 hours of detection in the past 12 months	3	0
7e	Total number (estimated or actual) of outbreaks (with observed no. of cases > threshold values) detected by your surveillance systems over the past 12 months which were reported to the next notification level within 48 hours of detection	2	3
7f	Total number (estimated or actual) of outbreaks detected by your surveillance systems over the past 12 months that were laboratory verified	2	3
7g	Total number (estimated or actual) of outbreaks detected by your surveillance systems over the past 12 months which received a response	8	3
7h	Total number (estimated or actual) of epidemics (above the epidemic threshold) detected by your surveillance systems in the past 12 months	15	3
7i	Total number (estimated or actual) of epidemics (above the epidemic threshold) detected by the surveillance systems in the past 12 months that were reported to the next notification level within 2 days	10	3
7j	Number of outbreaks detected by EBS in the past 12 months	45	0
7k	Existence of SOPs for the region/country of SOPs for the collection/transportation of samples Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)
7l	Existence of targets or performance indicators regarding the timeliness/speed of the surveillance systems (e.g. the time between detection and verification/verification and reporting) Yes No Unknown Not applicable	1 (100%) - (%) - (%) - (%)	1 (100%) - (%) - (%) - (%)

Animal health domain		
Table 17: National level verification and response		
No.	Indicator name	Thailand
7a	Total number (estimated or actual) of SUSPECTED outbreaks detected by the surveillance system in the past 12 months	2,050
7b	Total number (estimated or actual) of SUSPECTED outbreaks detected by the surveillance system in the past 12 months which were verified within 48 hours of detection	2,050
7c	Total number (estimated or actual) of outbreaks of International concern detected by the surveillance system in the past 12 months	126
7d	Total number (estimated or actual) of outbreaks of International concern that were reported to the WHO within 24 hours of detection in the past 12 months	0
7e	Total number (estimated or actual) of outbreaks (with observed no. of cases > threshold values) detected by your surveillance systems over the past 12 months which were reported to the next notification level within 48 hours of detection	672
7f	Total number (estimated or actual) of outbreaks detected by your surveillance systems over the past 12 months that were laboratory verified	640
7g	Total number (estimated or actual) of outbreaks detected by your surveillance systems over the past 12 months which received a response	677
7h	Total number (estimated or actual) of epidemics (above the epidemic threshold) detected by your surveillance systems in the past 12 months	677
7i	Total number (estimated or actual) of epidemics (above the epidemic threshold) detected by the surveillance systems in the past 12 months that were reported to the next notification level within 2 days	677
7j	Number of outbreaks detected by EBS in the past 12 months	2,050
7k	Existence of SOPs for the region/country of SOPs for the collection/transportation of samples Yes No Unknown Not applicable	 - (%) 1 (100%) - (%) - (%)
7l	Existence of targets or performance indicators regarding the timeliness/speed of the surveillance systems (e.g. the time between detection and verification/verification and reporting) Yes No Unknown Not applicable	 1 (100%) - (%) - (%) - (%)

8.2.6 National level intersectoral and cross-border surveillance

There were evidence of intersectoral collaboration within the disease surveillance system for Laos, Thailand and Vietnam and evidence of sharing relevant disease surveillance information between different sector in all 3 countries.

Human health domain			
Table 18: National level intersectoral and Cross-border surveillance			
No.	Indicator name	Laos	Vietnam
8a	Evidence of intersectoral collaboration within the disease surveillance systems of the region/country		
	Yes	1 (100%)	1 (100%)
	No	- (%)	- (%)
	Unknown	- (%)	- (%)
	Not applicable	- (%)	- (%)
8b	Evidence of a pattern of sharing relevant disease surveillance information between different sectors		
	Yes	1 (100%)	1 (100%)
	No	- (%)	- (%)
	Unknown	- (%)	- (%)
	Not applicable	- (%)	- (%)
8c	Surveillance system operates in a cross-border area		
	Yes	1 (100%)	- (%)
	No	- (%)	1 (100%)
	Unknown	- (%)	- (%)
	Not applicable	- (%)	- (%)

Animal health domain		
Table 19: National level intersectoral and Cross-border surveillance		
		Thailand
No.	Indicator name	
8a	Evidence of intersectoral collaboration within the disease surveillance systems of the region/country	
	Yes	1 (100%)
	No	- (%)
	Unknown	- (%)
	Not applicable	- (%)
8b	Evidence of a pattern of sharing relevant disease surveillance information between different sectors	
	Yes	1 (100%)
	No	- (%)
	Unknown	- (%)
	Not applicable	- (%)
8c	Surveillance system operates in a cross-border area	
	Yes	1 (100%)
	No	- (%)
	Unknown	- (%)
	Not applicable	- (%)

8.3 Cross-border level results

The findings in this section relate to the cross-border level results for questions in the INP Surveillance Evaluation Tool including areas on event based surveillance, sources of surveillance data, data collection tools, verification and response and intersectoral and cross-border surveillance.

8.3.1 Cross-border level event based surveillance

Event based surveillance was conducted in all 7 cross border sites (Laos: Savannakhet, Vientiane and Khammouane, Thailand: Mukdahan, Nongkhai and Nakorn Phanom and Vietnam: Quang Tri). The assessment identified that there were clear objectives for event based surveillance in place in the communicable disease surveillance system in the cross-border areas of all 7 cross border sites. Standard operating procedures for event based surveillance were present in 6 cross border sites except Quang Tri from Vietnam unknown, and an operational event based surveillance coordination unit existed in 6 cross border sites except Quang Tri from Vietnam not applicable. There were dedicated staff for coordinating event based surveillance in 6 cross border sites. Event based surveillance related to a National Focal Point as defined by International Health Regulations (IHR) and included in IHR National Focal Point document are present in 6 cross border sites except Quang Tri from Vietnam unknown. Centralised/standard or any other type of localised database in use to record information about disease events exist in the following cross-border sites: Savannakhet, Vientiane, Khammouane, Nongkhai and Nakorn Phanom.

For other comments or observations about the systems and processes currently being used for event based surveillance that are relevant to the results identified as follows:

Khammouane Province, Laos: The national level events are centralized and provincial coordinators could not see update and accurate information. They have suggested to have a database system available to officials at each levels.

Vientiane Province, Laos: They using situation with notification national disease program and after verified will be record at the Lao EWARN program.

Human health domain								
Table 20: Cross-border level event based surveillance								
No.	Indicator name	Laos			Thailand			Vietnam
		Savannakhet	Vientiane	Khammouane	Mukdahan	Nongkhai	Nakorn Phanom	Quang Tri
3a	Event Based Surveillance (EBS) conducted within region/country?							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
3b	Existence of clear objectives for EBS within the communicable disease surveillance System							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
3c	Existence of Standard Operating Procedures for EBS							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	- (%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	1 (100%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
3d	Existence of an operational EBS coordination unit within region/country							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	- (%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	1 (100%)
3e	Existence of dedicated staff for coordinating EBS within the region/country							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	- (%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	1 (100%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

3f	Existence of EBS system that is related to a National Focal Point as defined by IHR and included in IHR Focal Point documents							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	- (%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	1 (100%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
3g	Existence of a centralised/standard/ or any type of database of localised database in use to record information about disease events							
	Yes	1 (100%)	1 (100%)	1 (100%)	- (%)	1 (100%)	1 (100%)	- (%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	1 (100%)
	Unknown	- (%)	- (%)	- (%)	1 (100%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

8.3.2 Cross-border level sources of surveillance data

All 7 cross border sites have official reports of public health events, and in 6 cross border sites have a rumour log or database in use to record to record suspected PHE from information sources except Khammouane Province from Laos.

The assessment identified that the surveillance system in 6 cross border sites have immediate reporting. The sensitivity rating of the surveillance systems for detecting outbreaks was typically identifies as optimum sensitivity in Savannakhet, Vientiane and Nongkhai and Too sensitive (frequent false positives) in Khammouane, Mukdahan, Nakorn Phanom and Quang Tri.

There are standard operating procedures (SOPs) for the detection of signals during public health events exist in 6 cross border sites except Vientiane from Laos.

For other comments on the data sources, in Khammouane Province, Laos, they have got enough equipment and some staff need training.

Human health domain								
Table 21: Cross-border level sources of surveillance data								
No.	Indicator name	Laos			Thailand			Vietnam
		Savannakhet	Vientiane	Khammouane	Mukdahan	Nongkhai	Nakorn Phanom	Quang Tri
4a	Existence of official reports of Public Health Events (PHE)							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
4b	Existence of a rumour log or database in use to record to record suspected PHE from information sources							
	Yes	1 (100%)	1 (100%)	- (%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	1 (100%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
4c	Existence of the following forms of public health reporting							
	Media	1 (33.3%)	1 (33.3%)	1 (33.3%)	1 (33.3%)	1 (50%)	1 (33.3%)	1 (33.3%)
	Community	1 (33.3%)	1 (33.3%)	1 (33.3%)	1 (33.3%)	- (%)	1 (33.3%)	1 (33.3%)
	Blogs	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Social media	1 (33.3%)	1 (33.3%)	1 (33.3%)	1 (33.3%)	1 (50%)	1 (33.3%)	1 (33.3%)
	None	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Other	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
4d	Surveillance system records novel/unexpected (signals) health events for immediate reporting							
	Yes	1 (100%)	- (%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	1 (100%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
4e	Sensitivity rating of the surveillance system for detecting outbreaks							
	1 = Not sensitive enough – Positive cases are frequently missed	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	2	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	3 = Optimum sensitivity	1 (100%)	1 (100%)	- (%)	- (%)	1 (100%)	- (%)	- (%)
	4	- (%)	- (%)	1 (100%)	1 (100%)	- (%)	- (%)	1 (100%)
	5 = Too sensitive – Frequent false positives	- (%)	- (%)	- (%)	- (%)	- (%)	1 (100%)	- (%)
4f	Existence of SOPs for the detection of signals during events							
	Yes	1 (100%)	- (%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	1 (100%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

8.3.3 Cross-border level data collection tools

Types of data collection systems

The types of data collection systems identified in the cross-border areas are used in digital system and paper based system in all 7 cross border sites and Mukdahan Province from Thailand also have other system is the MSQ-Health website for 3 borders surveillance under concept “One Data One Province” in order to cooperation surveillance and control diseases.

Digital systems

For the cross-border areas digital systems for disease surveillance have been in place for 18 months in Khammouane, 24 months in Nakorn Phanom and Quang Tri, 60 months in Savannakhet and Mukdahan, 129 months in Vientiane and 288 months in Nongkhai respectively. In the past 12-month period this digital data surveillance system has failed to transmit data and/or receive data for zero, 1, 5 and 7 days. In the 5 cross border sites have the digital system records GPS/location data in relation to reported events and in all 7 cross border sites have the digital system provides a mechanism which the data collector can send and receive information results, advice from the data centre/point of verification.

In 6 cross border sites have the digital system provides a mechanism through which data collectors can directly exchange information (e.g. a shared forum/messaging service/WhatsApp group) except Nongkhai and 5 cross border sites have the digital system allows data to be extracted into a common format such as .xml/.csv/SQL except Khammouane and Mukdahan unknown.

In 6 cross border sites have the digital system uses a standard set of definitions for disease classification, case identification (e.g. ICD-11, LOINC/SNOWMED CT etc.) except Khammouane province.

Human health domain								
Table 22: Cross-border level data collection tools								
No.	Indicator name	Laos			Thailand			Vietnam
		Savannakhet	Vientiane	Khammouane	Mukdahan	Nongkhai	Nakorn Phanom	Quang Tri
5a	Type of tools currently in use to collect disease surveillance data							
	Digital system	1 (50%)	1 (50%)	1 (50%)	1 (33.3%)	1 (50%)	1 (50%)	1 (50%)
	Paper based system	1 (50%)	1 (50%)	1 (50%)	1 (33.3%)	1 (50%)	1 (50%)	1 (50%)
	Other	- (%)	- (%)	- (%)	1 (33.3%)	- (%)	- (%)	- (%)
5b	Length of time digital system has been in use (in months)	60	129	18	60	288	24	24
5c	Number of days in the past 12 months that the digital system has not been is use (in days)	0	7	1	0	0	5	0
5d	Digital system records GPS/location mapping data in relation to reported events							
	Yes	1 (100%)	- (%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	- (%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	1 (100%)
	Unknown	- (%)	1 (100%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
5e	Digital system provides a mechanism which the data collector can send and receive information results, advice from the date centre/point of verification							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
5f	Digital system provides a mechanism through which data collectors can directly exchange information (e.g. a shared forum/messaging service/WhatsApp group)							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	- (%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	1 (100%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

5g	Digital system allows data to be extracted into a common format such as .xml/.csv/SQL							
	Yes	1 (100%)	1 (100%)	- (%)	- (%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	1 (100%)	1 (100%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
5h	Digital system uses a standard set of definitions for disease classification, case identification (e.g. ICD-11, LOINC/SNOMED CT etc.)							
	Yes	1 (100%)	1 (100%)	- (%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	1 (100%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

8.3.4 Cross-border level verification and response

8.3.4.1 Suspected outbreaks

The total number (estimated or actual) of **suspected outbreaks detected by the disease surveillance systems** used over the past 12 months was 3 (Savannakhet, Khammouane and Mukdahan), 7 (Nongkhai), 10 (Nakorn Phanom), 30 (Vientiane) and 70 (Quang Tri) respectively. The total number (estimated or actual) of **suspected outbreaks** which were verified **within 48 hours** of detection by the disease surveillance system used in those countries **over** the past 12 months was 3 (Savannakhet, Khammouane and Mukdahan), 7 (Nongkhai), 10 (Nakorn Phanom), 20 (Vientiane) and 70 (Quang Tri) respectively.

8.3.4.2 Outbreaks of international concern

The total number of (estimated or actual) **outbreaks of international concern** detected by the disease surveillance system over the past 12 months in cross-border sites of Savannakhet and Mukdahan was 2 and zero in other cross-border sites. The total number (estimated or actual) of **outbreaks of international concern** which were reported to **the WHO within 24 hours** of detection that were detected by the disease surveillance system used in those cross-border areas are 2 in Savannakhet, 3 in Vientiane and zero in other cross border sites respectively.

For the cross-border areas assessed, the total number of outbreaks where the observed **number of cases > threshold values** that were reported to the **next notification level within 48 hours of detection** through the cross-border area's disease surveillance system over the past 12 months was 1 (Mukdahan), 3 (Savannakhet), 5 (Vientiane and Khammouane), 7 (Nongkhai), 10 (Nakorn Phanom) and 70 (Quang Tri). The total number (estimated or actual) of **suspected outbreaks** detected by the disease surveillance system used in those cross-border areas that were **laboratory confirmed** over the

past 12 months was 3 (Savannakhet), 4 (Mukdahan), 6 (Nongkhai), 10 (Nakorn Phanom), 30 (Vientiane), 31 (Khammouane) and 70 (Quang Tri) respectively.

8.3.4.3 Response and verification

The total number (estimated or actual) of **suspected outbreaks** detected by the disease surveillance system used in those cross-border areas that **received a response** over the past 12 months was 3 (Savannakhet and Mukdahan), 7 (Nongkhai), 8 (Khammouane and Nakorn Phanom), 30 (Vientiane) and 70 (Quang Tri). For epidemics, the total number (estimated or actual) of **epidemics (above the epidemic threshold)** detected by the disease surveillance system used in those cross-border areas that received a response over the past 12 months was 0 (Khammouane and Quang Tri), 3 (Savannakhet), 4 (Nongkhai), 5 (Vientiane and Nakorn Phanom) and 16 (Mukdahan). With respect to reporting, the total number (estimated or actual) of **epidemics (above the epidemic threshold)** detected by the disease surveillance system used in the cross-border areas assessed that were **reported to the next notification level within 2 days** over the past 12 months was 0, 2, 3 and 5. A total of 1, 2, 3, 5, 6 and 70 **outbreaks** were **detected through event based surveillance** within all 7 cross border sites over the last 12 months.

8.3.4.4 Standard operating procedures and performance indicators

Standard operating procedures (SOPs) for the collection/ transportation of samples were present in 7 cross border sites. **Targets and/or performance indicators regarding the timeliness/ speed of the surveillance systems** (Here, timeliness refers to the time between detection and verification, verification and reporting or other steps in the recording procedure) are present in all 7 cross border sites also.

8.3.4.5 General observations

Savannakhet Province from Laos need the Epidemiologist staff to get the training, workshop and TTX once a year.

Human health domain								
Table 23: Cross-border level verification and response								
No.	Indicator name	Laos			Thailand			Vietnam
		Savannakhet	Vientiane	Khammouane	Mukdahan	Nongkhai	Nakorn Phanom	Quang Tri
7a	Total number (estimated or actual) of SUSPECTED outbreaks detected by the surveillance system in the past 12 months	3	30	3	3	7	10	70
7b	Total number (estimated or actual) of SUSPECTED outbreaks detected by the surveillance system in the past 12 months which were verified within 48 hours of detection	3	20	3	3	7	10	70
7c	Total number (estimated or actual) of outbreaks of International concern detected by the surveillance system in the past 12 months	2	0	0	2	0	0	0
7d	Total number (estimated or actual) of outbreaks of International concern that were reported to the WHO within 24 hours of detection in the past 12 months	2	3	0	0	0	0	0
7e	Total number (estimated or actual) of outbreaks (with observed no. of cases > threshold values) detected by your surveillance systems over the past 12 months which were reported to the next notification level within 48 hours of detection	3	5	5	1	7	10	70
7f	Total number (estimated or actual) of outbreaks detected by your surveillance systems over the past 12 months that were laboratory verified	3	30	31	4	6	10	70

7g	Total number (estimated or actual) of outbreaks detected by your surveillance systems over the past 12 months which received a response	3	30	8	3	7	8	70
7h	Total number (estimated or actual) of epidemics (above the epidemic threshold) detected by your surveillance systems in the past 12 months	3	5	0	16	4	5	0
7i	Total number (estimated or actual) of epidemics (above the epidemic threshold) detected by the surveillance systems in the past 12 months that were reported to the next notification level within 2 days	3	5	0	2	0	5	0
7j	Number of outbreaks detected by EBS in the past 12 months	3	5	6	2	1	2	70
7k	Existence of SOPs for the region/country of SOPs for the collection/transportation of samples							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
7l	Existence of targets or performance indicators regarding the timeliness/speed of the surveillance systems (e.g. the time between detection and verification/verification and reporting)							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

8.3.5 Cross-border level intersectoral and cross-border surveillance

The result at the cross-border level for intersectoral and cross-border surveillance found that there was evidence of intersectoral collaboration within the disease surveillance system for Laos, Thailand and Vietnam. There was evidence of sharing relevant disease surveillance information between different sectors in 6 cross border sites except Khammouane Province from Laos and all 7 cross border sites, the surveillance systems operate in a cross-border area.

In 6 cross border sites except Savannakhet Province from Laos, there are existence of capacity within the region/country for coordinated cross-border activity in relation to outbreaks, epidemics, events etc. Established frameworks or standard protocols for intercountry/cross-border collaboration relating to disease surveillance exist in the 7 cross border sites.

The specific countries that cross-border sites share their border with were Laos, Thailand and Vietnam.

There is existence of a legal/policy authority for cross-border exchange of disease surveillance data within the 7 cross border sites and also there is existence of an established pattern in the cross-border area of routinely sharing relevant disease surveillance data and information with neighbouring countries.

Human health domain								
Table 24: Cross-border level intersectoral and Cross-border surveillance								
No.	Indicator name	Laos			Thailand			Vietnam
		Savannakhet	Vientiane	Khammouane	Mukdahan	Nongkhai	Nakorn Phanom	Quang Tri
8a	Evidence of intersectoral collaboration within the disease surveillance systems of the region/country							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
8b	Evidence of a pattern of sharing relevant disease surveillance information between different sectors							
	Yes	1 (100%)	1 (100%)	- (%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	1 (100%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
8c	Surveillance system operates in a cross-border area							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

8d	Names of specific countries that the surveillance system shares a Cross-border with	Thailand and Vietnam	Thailand	Thailand	Laos	Laos	Laos	Laos
8e	Existence of an established framework/standard protocol within the country/region for intercountry/Cross-border collaboration relating to disease surveillance							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
8f	Existence of capacity within the region/country for coordinated cross-border activity in relation to outbreaks, epidemics, events etc							
	Yes	- (%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	1 (100%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
8g	Existence of a legal/policy authority for Cross-border exchange of disease surveillance data within the region/country							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
8h	Existence of an established pattern in the region/country of routinely sharing relevant disease surveillance data and information with neighbouring countries							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

The estimated total number of cross-border meetings involving in all 7 cross border sites planned in the past 12 months during 2 times to 6 times and the estimated total number of cross-border meetings planned in the past 12 months which subsequently took place during 2 times to 8 times. And also all 7

cross border sites have existence of an established pattern of effective country and cross-border communications during outbreaks.

For the any additional comments regarding the intersectional/ cross-border coordination in the relation to disease surveillance within the cross-border areas as follow:

Suggest to conduct frequent intersectoral cross border coordination. joint outbreak investigation and joint training at border areas

Human health domain								
Table 25: Cross-border level intersectoral and Cross-border surveillance (continue)								
No.	Indicator name	Laos			Thailand			Vietnam
		Savannakhet	Vientiane	Khammouane	Mukdahan	Nongkhai	Nakorn Phanom	Quang Tri
8i	Estimated total number of Cross-border meetings involving your region/country planned in the past 12 months	6	5	2	4	3	2	2
8j	Estimated total number of Cross-border meetings involving your region/country planned in the past 12 months which subsequently took place	8	5	2	4	3	2	2
8k	Existence of an established pattern of effective country and cross-border communications during outbreaks							
	Yes	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
	No	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Unknown	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)
	Not applicable	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)	- (%)

8.4 Best practices

8.4.1 Best practices in Event Based Surveillance in national level

- All MBDS member countries are implementing EBS according to WHO guidelines and Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSED III)

8.4.2 Best practices at the cross-border and community level

- Established collaboration platform since 2005
- Early detection and prompt response (national and regional)

- Cross border joint outbreak investigation and table top exercise (simulation exercise)
- Capacity building
- Multi-sectoral Team (One Health in sub-national level)
- Team work, share communicate, exchange
- Regular meeting among MBDS XB




8.4.3 Data collection tools and digital practices

- All disease surveillance mechanism in MBDS are managed by Ministries of Health from 6 member countries. There are 6 health systems, political structures and languages but English language is using for information sharing.

8.4.4 Verification and response

- MBDS XB information sharing are approved by MBDS senior health officials with prioritized diseases, format and frequency.
- Verification process are under national and sub-national disease surveillance system

8.4.5 Community level involvement in EBS

- MBDS is sharing official disease surveillance information according to agreement among 6 member countries senior health officials.
- Surveillance report from community  Rural Health Center  District Health Office  Provincial Health Office
- MBDS XB information sharing are under Official reporting mechanism

9 Discussion

- MBDS is practicing Cross Border information sharing since 2005 and INP is good opportunity for sharing with other CORDS networks.
- Collecting / sharing from very limited areas / places and limited representing from network and MBDS would like to learn from other networks practice.
- All MBDS Cross Border information sharing are prioritized by all member countries senior officials
- Project sustainability issue and challenges in collaboration with WHO, FAO and OIE at Cross Border level as silo system from partners

9.1 Limitations of the study

- Availability of the interviewees
- Language difficulty due to technicality of the INP tool
- Need sometime for verification, especially while waiting Lab results National level laboratory.

10 Recommendations

The project activities are successfully carried out at MBDS national and cross border areas.

- MBDS would like to apply outcome from INP for effective and applicable for national and sub-national level stakeholders
- MBDS would like to suggest to identify achievement, usefulness and cost benefit for INP in both national and sub-national level before project expansion.

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12 Appendices

National and cross border level data collection systems in Laos

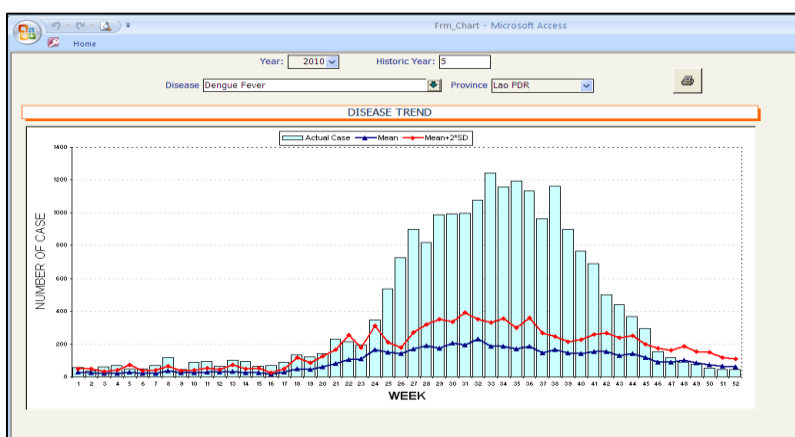
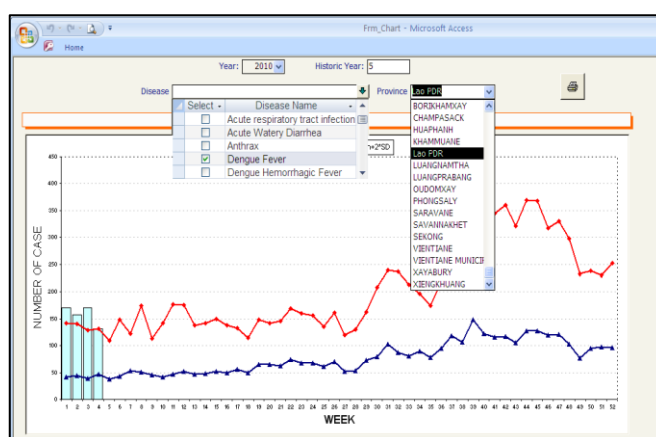
Every district health department will report the number of case by paper based to provincial health department. Provincial health department will fill up those information into **LaoEwarn data base**. LaoEwarn data can be analyzed and mapping for events.

District Health Information Software2 (DHIS2) also implemented in Lao P.D.R

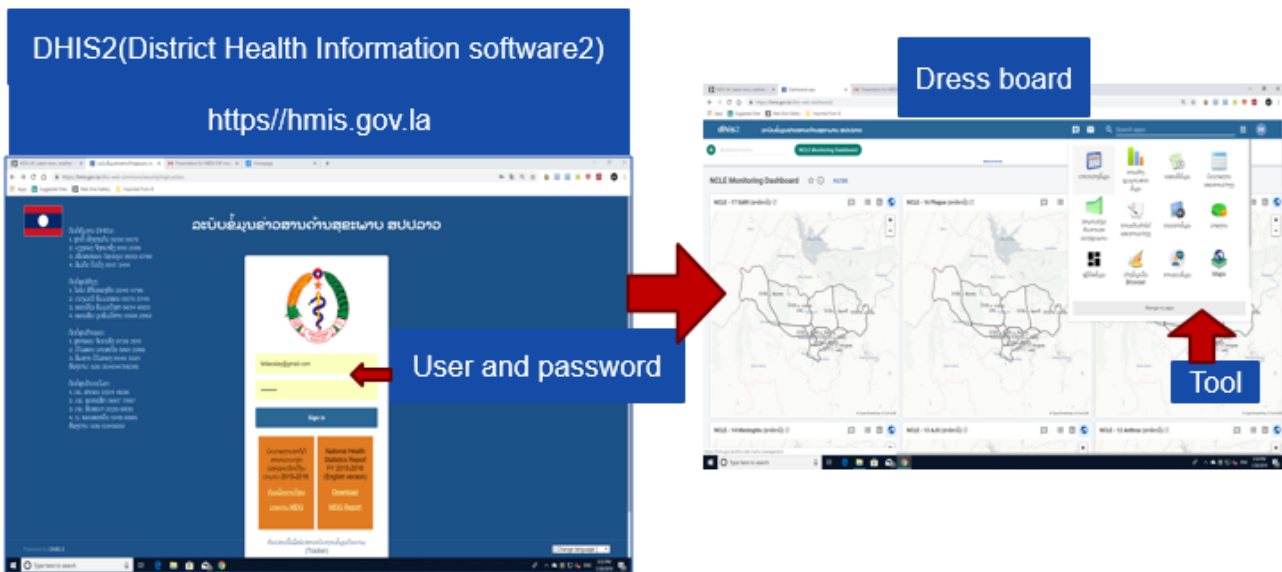
Some MBDS cross border sites are using MBDS EBS application for informal reporting

LaoEwarn systems in Laos

Data entry



DHIS2 systems in Laos



National and cross border level data collection systems in Thailand

Event based program in Thailand: Epidemiology Center of provincial level will verify the information for consideration the event compatibility with the criteria of investigation, record in event based surveillance program and monitoring each cases until the diseases controlling completeness.

And also Thailand have **R506 Program**: This program use in health centers, hospital, district health office for record the information of patients in health service with 61 diseases that report from health center or hospital to district level, provincial level, regional level and national level.

Mukdahan Province (Thailand) – Savannakhet Province (Laos) – Quang Tri Province (Vietnam) development the **website (MSQ-Health)** for 3 borders surveillance under concept "One Data One Province" in order to cooperation surveillance and control diseases.

Event-Based Program in Thailand

ระบบแจ้งข่าวการระบาด สำหรับ จังหวัด

เข้าสู่ระบบ

ชื่อผู้ใช้

รหัสผ่าน

ตกลง →

ลืมชื่อผู้ใช้ / รหัสผ่าน?

← → ↻ ⓘ ไม่ปลอดภัย | www.boeoc.moph.go.th/eventbase_prov/calendar/prov/

ระบบตรวจเฝ้าระวังการระบาด สำหรับจังหวัด
 Eventbase Notification For Province
 MOPH ปฏิทินแจ้งข่าวการระบาด ผลตรวจทางห้องปฏิบัติการ สรุปรายงานการระบาด War Room ออกจากระบบ
 สำนักงานสาธารณสุข จ.หนองคาย » ปฏิทินแจ้งข่าวการระบาด

ปฏิทิน

ก่อน พฤศจิกายน 2561 ถัดไป

อาทิตย์/SUN	จันทร์/MON	อังคาร/TUE	พุธ/WED	พฤหัสบดี/THU	ศุกร์/FRI	เสาร์/SAT
				๑	๒	๓
๔	๕	๖	๗	๘	๙	๑๐
๑๑	๑๒	๑๓	๑๔	๑๕	๑๖ Food Poisoning (unknown) หนองคาย PHO	๑๗
๑๘	๑๙	๒๐	๒๑	๒๒	๒๓	๒๔
๒๕	๒๖	๒๗	๒๘	๒๙	๓๐	

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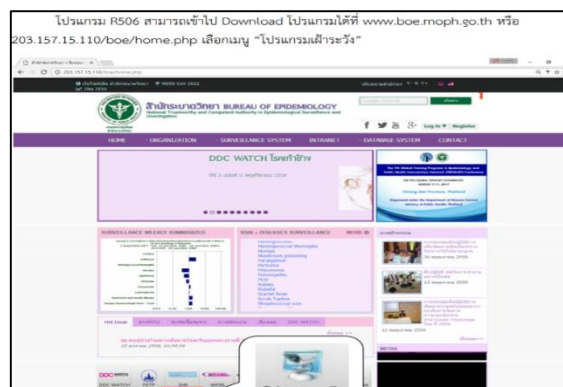
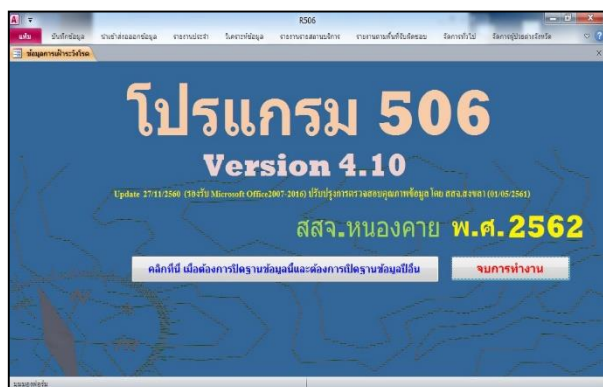
← → ↻ ⓘ ไม่ปลอดภัย | www.boeoc.moph.go.th/eventbase_prov/event/showevent/event_id/1528/

ระบบตรวจเฝ้าระวังการระบาด สำหรับจังหวัด
 Eventbase Notification For Province
 MOPH ปฏิทินแจ้งข่าวการระบาด ผลตรวจทางห้องปฏิบัติการ สรุปรายงานการระบาด War Room ออกจากระบบ
 สำนักงานสาธารณสุข จ.หนองคาย » ข้อมูลการแจ้งข่าวการระบาด

ข้อมูลการแจ้งข่าว สืบจากที่ 46 หมายเลขแจ้งข่าว สสจ. หนองคาย จังหวัด หนองคาย ประเภท -	วันรับแจ้งข่าว 16/11/2018 หมายเลขแจ้งเหตุ 8 สาเหตุ สสโร	ผู้แจ้งข่าว ศีรพร พรหมศิริ สถานเกิดเหตุการณ์ ตลาดนัด ตำบล สรรพยา
ข้อมูลผู้ป่วย ผู้ป่วยรวม 10 ผู้ป่วยที่ไปรักษาพยาบาล - วันเริ่มป่วยรายแรก 16/11/2018 มีผู้ป่วยตายแล้ว -	ผู้ป่วยนอก 3 ผู้เสียชีวิต 0 วันประกาศโรคแรก 16/11/2018 ส่งตัวอย่าง ส่ง	ผู้ป่วยใน 7 ผู้ติดเชื้อไม่มีการ - วันเริ่มสอบสวนโรค 16/11/2018
ข้อมูลโรค การวินิจฉัยโรค สงสัย ชนิดของเชื้อ -	โรค/ภัย/เหตุการณ์ผิดปกติ Food Poisoning (unknown)	
ข้อมูลการสอบสวนโรค วันที่ออกสอบสวน 2018-11-16 รายชื่อทีมสอบสวน นางสาวศิริพร พรหมศิริ นายประวีตร จันทพา นายปรณัฐ อินทแก้ว	วันสิ้นสุดการสอบสวน - ผู้ควบคุมทีมสอบสวน ศีรพร พรหมศิริ	

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R506 Program systems in Thailand



ICD10 **แบบบันทึกรายงาน 506** E0 15715 E1 22

โรค D.H.F. shock, dengue orotype Serotype 1

ชื่อ นามสกุล HN

ผู้ปกครอง

เพศ อายุ ปี เดือน

สัญชาติ อาชีพ

บ้านเลขที่ ซอย ถนน

จังหวัด ปัตตานี อำเภอ ตำบล หมู่

โนน/เลขเขต ชั้น

โรงเรียน

วันเริ่มป่วย 16/12/2559 วันรับรักษา 16/12/2559 รักษาที่ สถานบริการ

ประเภทผู้ป่วย ผลการรักษา

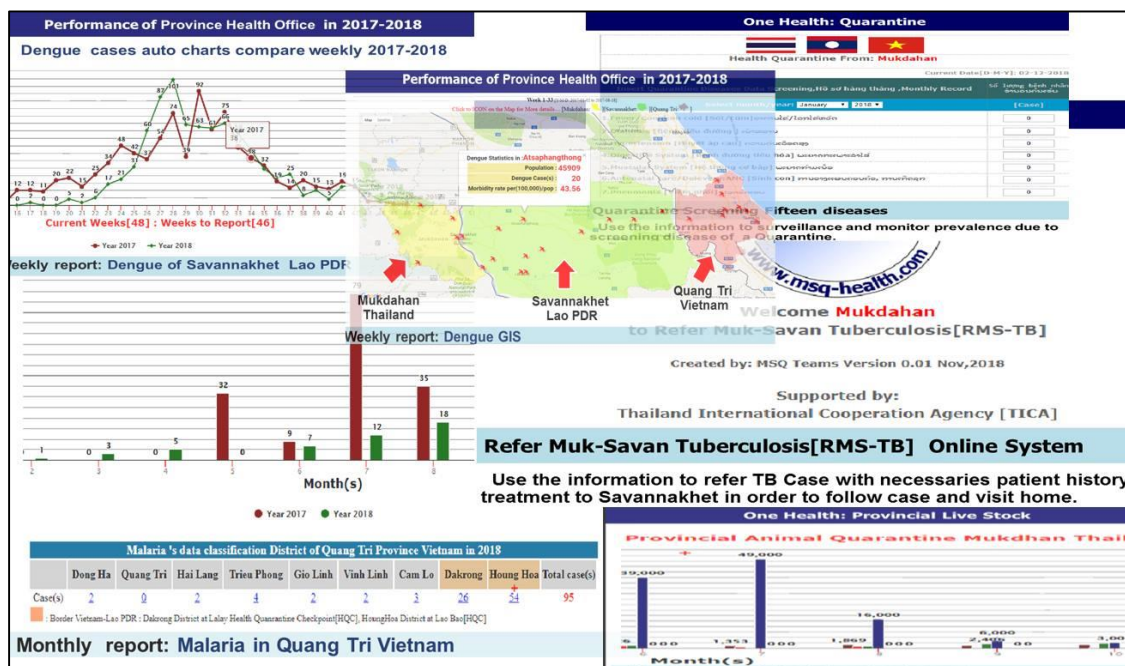
วันที่เขียนรายงาน 16/12/2559 วันที่รับรายงาน 16/12/2559

เลือกการตาม เลือกวันที่ เลือกอำเภอ เลือกตำบล

ทะเบียนของกรมการสาธารณสุขอำเภอที่รายงานข้อมูล จ.หนองคาย พ.ศ. 2562

E0	E1	โรค	ชื่อผู้ป่วย	ที่อยู่	พิกัด	วันเริ่มป่วย	วันรับรักษา	วันเขียน
2	136	Dengue	กนกพร ชื่นชัย	416 ม. 07 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	4302107	15/01/2562	16/01/2562	17/01/2562
3	51	Dengue	กมลณี อ่อนศรี	43 ม. 09 หมู่ 10 อ.ท่าบ่อ จ.หนองคาย	43080409	01/01/2562	01/01/2562	08/01/2562
4	149	Dengue	กมลพร นามะ	152 ม. 11 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43140311	13/01/2562	13/01/2562	17/01/2562
5	204	Dengue	กมลพร ชื่นชัย	195 ม. 05 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43150405	18/01/2562	18/01/2562	22/01/2562
6	5	Dengue	กมลพร ชื่นชัย	292 ม. 15 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43160416	02/01/2562	02/01/2562	03/01/2562
7	73	Dengue	กมลพร ชื่นชัย	42 ม. 01 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43050901	14/01/2562	14/01/2562	15/01/2562
8	60	Dengue	กมลพร ชื่นชัย	44/1 ม. 06 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43052106	07/01/2562	07/01/2562	09/01/2562
10	167	Dengue	กมลพร ชื่นชัย	92 ม. 20 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43050120	16/01/2562	17/01/2562	21/01/2562
11	98	Dengue	กมลพร ชื่นชัย	16 ม. 03 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43050303	14/01/2562	15/01/2562	16/01/2562
12	181	Dengue	กมลพร ชื่นชัย	66 ม. 08 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43050208	16/01/2562	17/01/2562	21/01/2562
13	84	Dengue	กมลพร ชื่นชัย	56 ม. 05 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43051303	12/01/2562	12/01/2562	15/01/2562
14	162	Dengue	กมลพร ชื่นชัย	34 ม. 06 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43080106	16/01/2562	16/01/2562	18/01/2562
15	57	Dengue	กมลพร ชื่นชัย	81 ม. 09 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43050409	07/01/2562	07/01/2562	09/01/2562
16	41	Dengue	กมลพร ชื่นชัย	71 ม. 01 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43160401	03/01/2562	03/01/2562	04/01/2562
17	97	Dengue	กมลพร ชื่นชัย	20 ม. 15 ซ.ราชดำเนิน อ.ท่าบ่อ จ.หนองคาย	43150415	14/01/2562	14/01/2562	15/01/2562

MSQ-Health website



Please see the details for system at www.msq-health.com

National and cross border level data collection systems in Vietnam

Medical units in the province (from the provincial level to the commune level) perform reporting on cases of suspected / infected infectious diseases to examine and treat at health facilities and suspected cases of community-detected disease on the software system reporting infectious diseases via the internet.

From the information and data of the medical units reporting online to the software system reporting infectious diseases, the software system will process and provide data and disease maps by province, districts and communes.

Systems reporting in Vietnam

