Meeting Report

Indicator-Based Surveillance and Risk Assessment of Public Health Events in the Western Pacific Region

7–9 June 2010
Kuala Lumpur, Malaysia
WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC

REPORT

MEETING ON INDICATOR-BASED SURVEILLANCE AND RISK ASSESSMENT OF PUBLIC HEALTH EVENTS IN THE WESTERN PACIFIC REGION

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Convened by:
WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC

Not for sale

Printed and distributed by:
World Health Organization
Regional Office for the Western Pacific
Manila, Philippines

August 2010
NOTE

The views expressed in this report are those of the participants in the Meeting on Indicator-based Surveillance Systems and Risk Assessment of Public Health Events in the Western Pacific Region and do not necessarily reflect the policies of the Organization.

This report has been prepared by the World Health Organization Regional Office for the Western Pacific for governments of Members States in the Region and for those who participated in the Meeting on Indicator-based Surveillance Systems and Risk Assessment of Public Health Events in the Western Pacific Region, which was held in Kuala Lumpur, Malaysia, from 7 to 9 June 2010.
The Meeting on Indicator-based surveillance and risk assessment of public health events in the Western Pacific Region was held in Kuala Lumpur, Malaysia, from 7-9 June 2010.

The meeting was attended by 20 participants from eight Member States, including Brunei Darussalam, Cambodia, the Lao People’s Democratic Republic, Malaysia, Papua New Guinea, the Philippines, Singapore and Viet Nam; two temporary advisers from the University of Malaya Medical Centre and the European Centre for Disease Prevention and Control, and one observer from the National Environment Agency, Singapore; and 16 WHO Secretariat members.

The objectives of the meeting were:

(1) to share examples and lessons learnt, particularly in dengue surveillance, from within the Region and best practices from other regions;

(2) to develop a regional indicator-based surveillance workplan and to identify priority activities; and

(3) to identify steps in developing national and subnational risk-assessment capacity as a core component of the surveillance system.

The meeting consisted of five plenary sessions, each followed by small group discussions. The first session outlined best practice and ongoing challenges for indicator-based surveillance (IBS) systems, while the second looked at how information and communication technology (ICT) can assist surveillance systems and summarized considerations to be taken into account when implementing an ICT solution. The third and fourth sessions focused on dengue surveillance and risk assessment, respectively. In the fifth session, the potential for a regional surveillance system was discussed.

In their conclusions, the participants identified the importance of:

(1) revisiting the recommendations of recent reviews;
(2) where appropriate, undertaking focused evaluations of IBS systems;
(3) implementing the results of the evaluation and undertaking key activities to strengthen IBS systems;
(4) including ICT in country surveillance strategies;
(5) looking at ways to strengthen current national surveillance systems before starting new initiatives;
(6) ensuring development of a ‘business case’ for implementation of tools;
(7) where appropriate, assessing current dengue system in terms of sustainability and effectiveness and implementing recommendations;
(8) assessing the impact of the revised clinical case classification; and
(9) using dengue as a ‘pathfinder’;
(10) developing national and subnational risk-assessment capacity;
(11) carrying out risk-assessment training sessions at the national and subnational level, integrating the approach into current training courses wherever possible; and
(12) using the risk-assessment approach to strengthen links with other key departments and agencies, such as animal health, chemical and toxicology.
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Communicable diseases – epidemiology--Sentinel surveillance-- Dengue – epidemiology
Risk Assessment--Information Technology-- Western Pacific
1. INTRODUCTION

The Asia Pacific Strategy for Emerging Diseases (APSED) aims to ensure that "all countries and areas of the Asia Pacific region have the minimum capacity for epidemic alert and response by 2010". Under APSED, the approach to surveillance and response focuses on the development of three interrelated systems: indicator-based surveillance, event-based surveillance and rapid response.

The 2009 Technical Advisory Group (TAG) for Emerging Infectious Diseases recommended that, in 2010, the focus should be on strengthening indicator-based surveillance systems. The TAG also recommended that: “dengue surveillance, an important part of disease-control programmes, should be used to illustrate the strengths and weaknesses of indicator-based surveillance systems and to provide a practical example upon which recommendations and future systems development can be based”.

The Meeting on Indicator-based Surveillance and Risk Assessment of Public Health Events in the Western Pacific Region, held in Kuala Lumpur, Malaysia, from 7 to 9 June 2010, provided an opportunity for Member States to discuss the strengthening of national indicator-based surveillance (IBS) systems and the building of risk-assessment capacity in line with APSED.

The meeting was attended by 20 participants from eight Member States, including Brunei Darussalam, Cambodia, the Lao People’s Democratic Republic, Malaysia, Papua New Guinea, the Philippines, Singapore and Viet Nam. There were two temporary advisers from the University of Malaya Medical Centre and the European Centre for Disease Prevention and Control, and one observer from the National Environment Agency, Singapore. The WHO Secretariat consisted of 16 representatives from WHO Headquarters, the Western Pacific Regional Office and country offices, including Cambodia, China, the Lao People’s Democratic Republic, Malaysia, the Philippines and Viet Nam.

The meeting consisted of five plenary sessions, each followed by small group discussions.

1.1 Objectives

The objective of the meeting were:

1. to share examples and lessons learnt, particularly in dengue surveillance, from within the Region and best practices from other regions;
2. to develop a regional indicator-based surveillance workplan and to identify priority activities; and
3. to identify steps in developing national and subnational risk-assessment capacity as a core component of the surveillance system.
1.2 Opening remarks

On behalf of Dr Shin Young-Soo, WHO Regional Director for the Western Pacific, Dr Corinne Capuano welcomed participants and thanked the Ministry of Health, Malaysia, for hosting the meeting.

Surveillance and response is one of the critical programme areas under the Asia Pacific Strategy for Emerging Diseases (APSED). APSED’s approach encompasses the development of three interrelated systems linked together by the risk-assessment process. The focus of the meeting would be on strengthening IBS systems and risk-assessment capacity.

IBS systems are an essential part of the ongoing monitoring of key regional and outbreak-prone diseases. However, despite progress in developing such systems, improvements are still needed. Challenges include the timeliness and accuracy of reporting, overly complex systems, limited use of risk assessment, and poor feedback of surveillance information to stakeholders.

On the basis of recommendations made by the biregional Technical Advisory Group for Emerging Infectious Diseases in 2009, dengue surveillance would be used as a practical example to illustrate the strengths and weaknesses of IBS systems. The hope was that, by the end of the meeting, each of the countries represented would have drafted a country workplan to drive the development of their IBS system. The development of a regional WHO workplan would also enable WHO to better support the surveillance activities of Member States.

2. PROCEEDINGS

2.1 Session 1. Indicator-based surveillance: best practice and ongoing challenges

Chairpersons: Dr Tee Ah Sian, Director, Division of Combating Communicable Diseases, WHO Regional Office for the Western Pacific, and Dr Babatunde Olowokure, Epidemiologist and Team Leader, Communicable Disease and Response, Office of the WHO Representative in Viet Nam

Dr Tee outlined the current APSED and the development of a new strategy to continue work into the future. The current strategy encompasses three core areas of work: general capacity-building for emerging diseases; pandemic preparedness; and the minimum core capacity requirements of the International Health Regulations (IHR) 2005. IHR (2005) provides a global framework for collective action, emphasizing the need for strong national systems, and WHO’s role in collaboration to strengthen international response.

APSED identifies five core areas of work: surveillance and response, laboratory, infection control, zoonoses and risk communication. The common-indicator assessment carried out in the first half of 2010 showed significant progress in each of those areas, but not all countries had achieved minimum core capacity.
Evaluation activities show that APSED is a useful framework for strengthening capacity to detect, assess, prevent and respond to infectious diseases. A new strategy, building on existing work, is currently under development in consultation with Member States. Emerging infectious diseases are still identified as a major issue, and the scope will be expanded to include other public health threats.

2.1.2 Surveillance systems across the region aimed at detecting emerging diseases and outbreaks

Ms Amy Cawthorne, WHO Epidemiologist, and Ms Hannah Lewis, Epidemiologist, Office of the WHO Representative in the Lao People’s Democratic Republic

Ms Cawthorne and Ms Lewis explained that APSED’s approach to surveillance and response calls for the establishment of three interlinked systems — indicator-based surveillance, event-based surveillance and response. Much effort has focused on establishing and strengthening event-based systems, which are relatively new. Indicator-based surveillance systems have been in operation for much longer, but there is an ongoing need to strengthen those systems. Challenges include long lists of diseases/syndromes under surveillance, complicated reporting systems, duplicate or complicated definitions and limited feedback from system to stakeholders.

In the lead up to the meeting, information had been collected from Member States to develop IBS system profiles, presented in a draft booklet for use during the meeting. That process had enabled countries to reflect on their own systems and compare them with those of other countries.

For most countries, the main objective of the primary IBS system is rapid outbreak detection. Other objectives include monitoring disease trends over time, strengthening public health prevention and control programmes, and informing public health policy. The total number of conditions included in those countries profiles ranges from 14 (Cambodia) to 58 (Brunei Darussalam), with conditions including outbreak-prone diseases, diseases with available vaccinations, sexually transmitted infections, foodborne illness, country-specific diseases, and diseases under elimination. There are many similarities between countries as regards case definitions and lists of notifiable diseases.

A range of reporting methods, structures and timelines were used, and data were fed back via a variety of modes, with the frequency of reports ranging from weekly to annually. A number of countries had recently conducted evaluations of their IBS systems: Common themes emerging included the need for more training, improved data analysis and increased feedback, and the use of standardized case definitions.

Most similarities between countries were observed in surveillance for influenza-like illness (ILI), which provides valuable and comparable information across the Region.

2.1.3 Examples of good practice and ongoing challenges: analysing indicator-based surveillance data
Dr Chin-Kei Lee, Medical Epidemiologist, Office of the WHO Representative in China

Dr Lee outlined the IBS system in China on behalf of the China Centers for Disease Control (CDCs).
Notifiable infectious disease reporting systems were established in China in the 1950s and electronic methods were introduced in the 1980s. Following SARS, efforts to strengthen the surveillance system led to the introduction of case-based surveillance data and real-time reporting using web-based methods. As of 2008, CDCs at all levels were using the systems, along with 97% of county-level hospitals and 82% of township-level health centres. The system captures information on 39 notifiable diseases in three categories and can be accessed by CDCs at all levels.

An early warning system, called the China Infectious Disease Alert and Response System (CIDARS), has also been developed to reduce the workload involved in data analysis and assist in the objective identification of potential outbreaks. CIDARS automatically analyses data using a combination of fix-value detection methods, temporal methods based on comparison with a historical baseline (moving percentile method) and spatial methods. When an aberration is detected, an SMS is generated and sent to officers at the county level CDC for verification and field investigation if required.

Positive characteristics of the system include its simplicity, timeliness and sensitivity. It has achieved high geographical coverage, with standard operating procedures for aberration detection and response.

Challenges include the number of false positives generated by the system, with a need to improve the algorithms used to detect aberrations. It is important that these are flexible in order to meet the needs of different diseases and areas. Maintenance of the system also presents logistical challenges.

2.1.4 Examples of good practice and ongoing challenges: the Lao People’s Democratic Republic
Ms Bouaphan Khamphaphonghane, National Center for Laboratory and Epidemiology, Ministry of Health, Lao People’s Democratic Republic

Key accomplishments in disease surveillance in the Lao People’s Democratic Republic include the introduction of the Early Warning Alert and Response Network (EWARN) in 2007; the creation of an integrated monthly report, which brings together information from the different surveillance systems; the establishment of ILI virological surveillance in three provinces; and the expansion of the Early Warning Outbreak Recognition System (EWORS) in seven provinces. A field epidemiology training programme has also been developed and this provides assistance in data analysis, training and problem-solving IT issues.

The EWARN system collects aggregate data on 19 notifiable diseases. Alerts are automatically generated at the central level and then verified at the provincial level.

Challenges for IBS include ensuring the sustainability of projects underway and coordinating and prioritizing donor-driven activities. Human resources are limited, and laboratory capacity lacking, especially at the district and provincial levels. There is also a need to assess the impact of training and to improve communication of disease-outbreak information.

The workplan for 2010 includes formalizing a national surveillance and response policy, and reviewing and improving case definitions for the 19 notifiable diseases. There are plans to extend ILI virological surveillance to other sites, provide full-time IT support for EWARN, improve integration of EWARN and EWORS, and continue production of the integrated monthly surveillance report.
2.1.5 Examples of good practice and ongoing challenges: Malaysia
Dr Norhizan Ismail, Head of surveillance sector, Ministry of Health, Malaysia

Malaysia’s notifiable diseases surveillance system currently covers 27 infectious diseases. It has moved from the manual system used prior to 2000, to an online client server database that enabled data sharing at the state level, to an online web-based centralized database in 2006 called E-notification.

Gaps in the current system include system congestion resulting from an increased number of users, technical issues and record duplication. As a result, the system is now being reviewed and both the database and the application architecture will be restructured. The system will be web-based, with an offline mode for notification input. It will enable better integration with other systems and networking with private hospitals and clinics. One lesson learnt from the previous system is the advantages and disadvantages of in-house development versus tendering, as there is a need for continuous technical assistance.

2.1.6 Keeping it simple: developing sustainable surveillance systems
Ms Hannah Lewis, Epidemiologist, Office of the WHO Representative in the Lao People’s Democratic Republic

Limited funding and a shortage of human resources are often barriers to effective surveillance and response. There is a need to keep surveillance systems simple, as that makes them more sustainable. Work to improve systems should build on existing systems rather than creating new ones.

Surveillance systems need to have a solid surveillance framework/structure that includes a strategy; laws or policies for reporting and response; and formalized coordination mechanisms. Political commitment is key. A surveillance system should also have clearly stated objectives and a reasonable and limited list of diseases under surveillance.

Improving data management includes ensuring the consistency, completeness and quality of data. Data analysis should be conducted and used at every level, with timely feedback essential.

Support functions should be improved, with surveillance manuals available at as many levels as possible. Training can be made more sustainable by using methods such as integrating with laboratory and clinical staff, training of trainers, ensuring local backup is available by training more than one person, standardizing training materials, and using field epidemiology training to help build capacity.

Simple ways to start integrating systems include joint feedback reports, joint assessment, coordinated activities and training sessions, and locating systems together.

2.1.7 Session 1 questions and discussion

The restructuring within the Western Pacific Regional Office was discussed, with food safety and emergency and humanitarian response being combined with communicable disease surveillance and response. The acute response component of each of these work areas is similar.

There was some discussion about the large variation in the number of notifiable diseases and how diseases can be prioritized. There are a number of tools that can be used, but looking at system objectives is very important. Although there is
much diversity, there is also a lot of commonality and the possibility of agreeing on criteria for notifiable diseases within the region was suggested. Considering priority diseases for surveillance also presents an opportunity to identify which diseases are useful to monitor across borders.

The sensitivity of the CIDAR system (China) was discussed. At the national level, there are approximately two to three signals each week, and this is manageable. Work is underway to reduce the number of false-positive alerts in the future.

There was also discussion about the spatial analysis conducted by CIDAR. This is still being piloted. The main principle is that analysis is not limited to county-level boundaries, but is based on the geographical location of cases. This facilitates detection of clusters that might otherwise be missed, such as those occurring in a limited geographical area within a county or across county borders.

It was noted that the experience in both Malaysia and the Lao People’s Democratic Republic highlighted the need for sustainable IT systems, with the allocation of sufficient resources to provide back-up and ongoing support.

The importance of capturing the wealth of data from private clinics/hospitals and universities in Malaysia was discussed. This will be considered in the upgrade of the IBS system, but needs to be done in stages. In the Philippines, participation of private hospitals in surveillance systems is achieved through strong policy incentives.

The need to avoid dependence on a single source of data was also emphasized. In Papua New Guinea, 85% of the population lives in rural areas without access to the hospital system. Recent outbreaks have highlighted the need for systems that capture information at the district level.

2.1.8 Feedback from group work

Feedback from each of the group work sessions is attached at Annex 1.

2.1.9 Group work questions and discussion

The point was made that any evaluation/attempt to improve a surveillance system needs to take into consideration what has happened already. While some countries have already had extensive reviews, recommendations have not always been implemented. Spending too much time and energy on evaluation can exhaust people so that there is not much motivation left over to implement. There is a need to balance the extent of the review with what may need to be done afterwards. There is also a need to set a time-frame for evaluation, as otherwise it can become open-ended as key players and objectives evolve.
Session 2: Information communication technology: current status and future opportunities in communicable disease surveillance and response

Chairperson: Dr Andrea Ammon, Head of Surveillance Unit, European Centre for Disease Prevention and Control

2.2.1 Introduction to ICT tools.
Mr Philippe Veltsos, WHO Systems Analyst

WHO can assist country and regional offices by providing information about ICT tools, such as lists of features, standards and functionalities, but the Organization is not able to recommend or endorse specific products.

ICT tools have the potential to improve aspects of IBS systems, including timeliness, flexibility and complexity. However, they are only a means to an end. Before embarking on an ICT solution, it is important to consider concepts such as return on investment, which varies during different phases of implementation, and total cost of ownership, which incorporates many hidden costs, such as training, security, licensing and maintenance. Developing a business case can ensure that informed decisions are made with full awareness of the facts.

The simplest technological solution is likely to be the most appropriate and sustainable, but capacity development and training components need to be included in all ICT initiatives.

Workflow and process mapping can be used to determine how components of a surveillance system may be redesigned to enable improvements with ICT tools. There is a wide range of tools available, and the area is constantly evolving. Any solution must also consider adaptability to new ICT developments.

It is also necessary to have a contingency plan for events such as a failure of ICT infrastructure, interrupted electricity supply, viruses and security incidents.

2.2.2 Carrying out an IT infrastructure assessment: Cambodia example
Mr Vanra Ieng, IT Specialist for Surveillance, Office of the WHO Representative in Cambodia

There are four levels in the Cambodian surveillance system, with hospitals and health centres reporting up through operational districts and provincial health departments to the Ministry of Health. An ICT assessment was conducted at each level. At the lowest level there is no power supply, but limited phone coverage.

The CamEWARN was piloted in four provinces in 2006 and has since been rolled out at the national level and in all provinces. It is a desktop application using an access database, and is used to collect and analyse information on 12 diseases on a weekly basis. Data reporting can be done using a remote SMS system that feeds into computers at the provincial level that can receive/forward the SMS. A similar system is used for ILI sentinel surveillance sites.

The use of ICT has improved the timeliness of data collection from the lowest level up to the national level. More data are captured at each level and those data are analysed more quickly, enabling faster response and more timely feedback.

Challenges include hardware and software failures, and limited human resources with ICT capacity. The system has also highlighted the need for better collaboration with the private sector.
Before designing ICT tools, it was recommended that a number of factors be considered including: the existing ICT infrastructure; the ICT skills of the users; data flow; the cost, including installation and maintenance; flexibility; compatibility with the national HIS; and any weak points in the existing system that need to be improved.

2.2.3 SMS use in CamEWARN: challenges and lessons learnt  
Dr Sovann Ly, Deputy Director, Department of Communicable Disease Control, Ministry of Health, Cambodia

In Cambodia, mobile phones have been used as an ICT solution to overcome various issues, including limited Internet connectivity and limited staff time. At the same time, there is relatively good mobile phone coverage and low-cost SMS. SMS is now used to send IBS data for CamEWARN and ILI; primary reporting of abnormal events and outbreaks; and sharing of information and guidelines. Geo-chat is used to disseminate information to Cambodia’s 1200 rapid response teams. This is a way of sending information to a lot of people simultaneously while only being charged for one SMS, but is not good for sensitive data.

The strengths of the system are that it is simple and convenient, and does not place a large time-burden on staff. The challenges have been that some staff are not familiar with the use of SMS, there is not full coverage, and the cost of sending data can be high.

2.2.4 Session 2 questions and discussion

The issue was raised that it would be helpful for developing countries to have checklists to help make decisions about the appropriateness of implementing an ICT solution.

Cambodia was asked about the cost of its SMS surveillance system. Although initial costs were expensive (with the cost of phones included), ongoing costs are lower, as SMS are inexpensive in Cambodia. The system still receives financial support from WHO.

2.3 Session 3. Dengue surveillance: current challenges and future direction

Chairperson: by Dr Norhizan Ismail, Head of surveillance sector, Ministry of Health, Malaysia

2.3.1 Overview of dengue in the Western Pacific Region and activity updates regarding dengue surveillance  
Dr Vu Diep, Technical Officer for Dengue, WHO Regional Office for the Western Pacific

Most countries in the Western Pacific Region are affected by dengue, Malaysia, the Philippines and Viet Nam being the most heavily affected. Data for 2010 are not available from many countries at the regional level.

The Asia-Pacific Dengue Strategic Plan (2008-2015) has six components, including dengue disease surveillance. Regional surveillance has improved with the revitalization of the regional dengue database in 2009. There are now 29 countries reporting quarterly through WHO country offices, country websites and other reporting systems. Trends and situation analyses are presented on the WHO website.
Data include cases and deaths for all countries, plus additional information in the most affected countries. However, there is often a long time-lag for data collection.

Regional dengue training workshops have also been organized in partnership with the Government of Singapore, concentrating on laboratory-testing techniques and vector surveillance. The first training session was conducted in 2009 and the second in September 2010.

At the Regional Dengue Programme Managers meeting in Viet Nam, global dengue guidelines with new dengue classifications were introduced, and dengue surveillance was discussed. A number of actions were proposed, including adoption of the new case classifications, supported by training and advocacy.

2.3.2 New dengue classifications and the impact on surveillance
Dr Lucy Lum, Professor, Faculty of Medicine, University of Malaya

It is important for all stakeholders, including clinicians, to understand the motivation for notification: whether it is about outbreak control or disease surveillance.

Dengue is a very dynamic disease and patients typically pass through three phases. Depending on the stage at which the patient presents to the clinician, case classification can differ. Diagnoses of dengue fever vs dengue haemorrhagic fever on the ground is difficult, and studies have found that only 1 in 10 adults and 1 in 2 paediatric patients are classified correctly. Clinicians are also not concerned about the accuracy of classification if there is no bearing on clinical management.

The DENO study (2006) aimed to collect evidence to refine dengue case classification and refine the guidelines for triage and management by the identification of key warning signs of severe disease.

The revised recommendations use a binary classification system: dengue vs severe dengue based on clinical parameters. Warning signs for sever dengue are also described and, if they are identified, strict observation and medical intervention is required.

It is likely that there is underreporting of dengue through surveillance systems. To improve the quality of data, attention should be paid to the human aspects of surveillance systems; the qualitative aspects of data such as coverage, source, day of illness at notification; and the health-seeking behaviour of the community.

2.3.3 Dengue surveillance: current challenges and future options
Dr Nima Asgari, Public Health Specialist, Office of the WHO Representative in Cambodia

Dengue surveillance is quite advanced in many countries. However, while dengue is becoming a bigger issue as urbanization increases, resources are becoming more scarce. Dengue could be used as an example of how to use routine IBS systems for management of disease-specific issues. Looking at the purpose of each component of surveillance — indicator-based, event-based, laboratory — can help in assessing the adequacy of current surveillance systems. A number of models for dengue surveillance, with options for the integration of enhanced and routine data collection, were described.
The purpose of national surveillance systems can include the identification of outbreaks in a timely manner, the collection of epidemiological data and analysis of trends, collection of serological data, and the assessment of appropriate responses. Laboratory data can be used for diagnosis and treatment, to collect more accurate information on seasonality and geographical spread of the disease, and to identify dominant serological sub-types and plan for the future.

2.3.4 Session 3 questions and discussion

The impact of the change in clinical case classifications on surveillance systems was discussed. The point was made that, as the new classifications give a better indication of severity, it makes sense to change surveillance classifications. However, this needs to happen slowly, and surveillance staff need to work closely with staff rolling out the clinical training. Changes in case definitions also need to take country capacity into consideration.

2.4 Session 4. Risk assessment: developing national and subnational risk-assessment capacity

Chairperson: Dr Takeshi Kasai, Coordinator, Health Security and Emergencies and Regional Adviser in Communicable Disease Surveillance and Response, WHO Regional Office for the Western Pacific

2.4.1 Methodology for risk assessment

Ms Erica Garcia, WHO Technical Officer

Risk assessment is part of the risk-management process, supporting decision-making by evaluating the probability and consequences of injury and illness arising from a potential threat. Risk assessment can be used to predict and plan for risks, in daily surveillance and response work, in outbreak situations, to compare the likelihood of success of prevention and control measures and their unintended consequences, and to make defensible, scientific and reproducible decisions for the management of risks and uncertainty.

There are three components for which such factors as what can go wrong, why, the consequences and the likelihood should be considered: hazard assessment, exposure assessment and vulnerability assessment. Many risk matrices have been developed and can be used to assess risk systematically. It is also important to set a baseline against which control measures can be assessed, e.g. what are the possible consequences and likelihood of an adverse public health outcome if nothing is done.

Risk assessments are a systematic process that requires people with the right mix of disciplines, expertise and decision-making power, as well as the information and processes to identify and fill gaps in knowledge. Procedures to communicate risk are also needed, as well as systems for monitoring and evaluating the decisions made.
2.4.2 Using risk assessment during outbreak investigations.

Amy Cawthorne, WHO Epidemiologist

Ms Cawthorne gave examples of the application of risk assessments during outbreak investigations. Outbreak investigations are often frantic and high pressure, and there is never enough information. Risk assessments are conducted at many stages during an investigation, but these are often not systematic, are influenced by personal experience and expertise, and are not formally documented.

When reports of an outbreak are first received, decisions need to be made based on information that is often vague, incomplete and uncertain. Initial risk assessments can help identify the need for response, and the size and speed of any response. Decisions also need to made about control and prevention methods as soon as investigators get to the field, and risk assessments can help assess and prioritize various measures.

A good risk assessment involves multiple risk matrices, as different groups within the population may have different levels of risk. The experiences shared highlighted the importance of having the right people in the room when conducting a risk assessment to ensure that as many factors as possible are considered.

It was recommended that risk assessments should be included in summary reports and in daily situation reports for bigger events. They are also helpful in communicating the level of risk, level of uncertainty and rationale for decision-making to relevant authorities in the field, and to the public.

2.5 Session 5: Regional surveillance

Chairperson: Dr Nima Asgari-Jirhandeh, Public Health Specialist, Communicable Disease Surveillance and Response, Office of the WHO Representative in Cambodia

2.5.1 European regional surveillance activity

Dr Andrea Ammon, Head of Surveillance Unit, European Centre for Disease Prevention and Control

Dr Ammon spoke about the European Surveillance System (TESSy) currently being established by the European Centre for Disease Control and Prevention (ECDC). The vision is that the database will be a one-stop shop for submission and retrieval of data regarding infectious diseases in the European Union.

The process began with external evaluations of existing disease-surveillance networks and decisions about which networks would be transferred to ECDC. A long-term surveillance strategy (2007-2013) was developed, and new case definitions agreed in consultation with Member States.

Principles for data-sharing include, standardization of data, and agreement that all data be uploaded by Member States and there be limited access to data, with consent from Member States required prior to publication. There are 47 diseases currently under surveillance.

The support provided to Member States includes a helpdesk, onsite training and online workshops. Country visits are planned.
It is important that the ICT team is situated within the surveillance unit. The regional surveillance system is supported by legislation. It improves the comparability of data; provides public health evidence to policy-makers; improves the detection, monitoring and reporting of international outbreaks; and supports the strengthening of national surveillance systems.

2.5.2 The Pacific Public Health Surveillance Network (PPHSN) – updates

Mr Berry Ropa, National Surveillance Office, Department of Health, Papua New Guinea

Mr Ropa described recent developments relating to the Pacific Public Health Surveillance Network (PPHSN) — a voluntary network of countries, territories and institutions/organizations dedicated to the promotion of public health surveillance and response. In March 2010, the group met to share updates on recent developments, discuss an early warning system in the Pacific, and discuss the International Health Regulations and APSED.

At the meeting, it was agreed that syndromic surveillance should be used to strengthen the early warning functions of existing disease surveillance systems. The importance of engaging clinicians was emphasized, and well as timely review of reports and timely responses. It was also agreed that Pacific island countries and territories would use the same case definitions as much as possible, and core case definitions were agreed for acute fever and rash; diarrhoea; influenza-like illness; prolonged fever; and unusual event. Sharing of national surveillance bulletins within PPHSN was encouraged.

Other issues discussed included the need to include public health surveillance and syndromic surveillance in medical and nursing school curricula; the need for field epidemiology training, with in-country mentoring; and the need to strengthen LanNet and EpiNet.

2.5.3 Session 5 questions and discussion

The legal basis for the various regional surveillance systems was discussed. Prior to the establishment of TESSy in the EU, participation in the various disease networks was voluntary. Now there is legislation to support the system, with Member States responsible for maintaining their national systems. The ECDC has a mandate to support Member States in developing those systems. The point was made that starting with a voluntary process enabled countries to discover a way of working together.

2.5.4 Session 5 group feedback

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<th>Establish regional surveillance system?</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed views about establishing a regional surveillance system as a number of networks are already in existence.</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diseases/syndromes</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
</table>
The discussion in Group 4 focused on whether or not a regional surveillance system was necessary, and the need to consider whether existing systems are functional and whether or not additional information is needed.

During the plenary session, the primary purpose of a regional surveillance system was discussed. Would it provide an early warning function, or be about data collation and sharing? The view was expressed that an early warning function was of more value to Member States, and that data-sharing may already be achieved through other systems. The point was made that Member States should make full use of existing systems, such as IHR, before embarking on a new system. The need to review existing systems and networks was also emphasized.

<table>
<thead>
<tr>
<th>Standardize case definitions?</th>
<th>Yes</th>
<th>Yes, based on WHO recommendations.</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>Aggregate data at subnational level.</td>
<td>Aggregate data at national level.</td>
<td>National and subnational (proximity to border important).</td>
</tr>
<tr>
<td>Timing</td>
<td>Weekly</td>
<td>Monthly</td>
<td>Weekly</td>
</tr>
<tr>
<td>ICT infrastructure needed</td>
<td>Yes</td>
<td>Yes – hardware, software, dedicated personnel, etc.</td>
<td>Yes</td>
</tr>
<tr>
<td>Principles</td>
<td>Secure website, official data, MS data ownership, regional publication after clearance from Member States.</td>
<td>Smart partnership and cooperation, but with the respect for autonomy (MoU with clear terms of reference).</td>
<td>Basic data available on website, WHO-mediated, to be agreed by Member States.</td>
</tr>
</tbody>
</table>

3. CONCLUSIONS

In their conclusions, the participants identified the importance of:

Session 1:

(1) revisiting the recommendations of recent reviews;
(2) where appropriate, undertaking focused evaluations of IBS systems; and
(3) implementing the results of the evaluation and undertaking key activities to strengthen IBS systems.

Session 2:

(4) including ICT in country surveillance strategies:
- ensuring new initiatives are aligned with country surveillance roadmap/policy;
(5) looking at ways to strengthen current national surveillance systems before starting new initiatives:
- ensuring ICT systems are able to meet needs of the surveillance system; and
- ensuring ICT systems are sustainable, and can be maintained; and
ensuring development of a ‘business case’ for implementation of tools (ICT solution proposed should be put through a rigorous analysis including cost effectiveness, sustainability, development, technical support, etc.).

Session 3:

7) where appropriate, assessing current dengue system in terms of sustainability and effectiveness and implementing recommendations;

8) assessing the impact of the revised clinical case classification; and

9) using dengue as a ‘pathfinder’
   • for evaluations, training, advanced analysis/mapping, etc.

Session 4:

10) developing national and subnational risk-assessment capacity;

11) carrying out risk-assessment training sessions at the national and subnational level, integrating the approach into current training courses wherever possible; and

12) using the risk-assessment approach to strengthen links with other key departments and agencies, such as animal health, chemical and toxicology.
## ANNEX 1: Country Feedback

### Session 1: Evaluation

<table>
<thead>
<tr>
<th>Country</th>
<th>Evaluation activities (if applicable)</th>
<th>Type of evaluation, objectives</th>
<th>Actions for improvement (if review conducted / can already identify)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei Darussalam</td>
<td>No evaluation yet. Discussions twice each year.</td>
<td>SWOT analysis. Objectives: to enhance the quality of the system to make it sustainable and user-friendly. Review through in-house workshop, with support from external consultants.</td>
<td>Improve the timeliness of reporting.</td>
</tr>
<tr>
<td>Cambodia</td>
<td>CamEWARN: 2008 and 2010. Dengue: 2004</td>
<td>Number of conditions, case definitions, sensitivities, involvement of the private sector, laboratory contributions to surveillance.</td>
<td>For CamEWARN, still need to review list of conditions. For dengue, need to develop standard operating procedures. Consider expansion of surveillance to other diseases, including non-communicable diseases.</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>EWARN evaluated in 2005. Some recommendations from the review have been implemented, but no workplan has been developed. APSED workplan to strengthen IBS.</td>
<td>Focused evaluation to identify strengths and weaknesses, assist in integrating duplicate systems (EWARN and EWORS), and help develop recommendations in line with APSED. Epidemiological staff from neighbouring countries included in the review team (creates an opportunity to learn lessons).</td>
<td>Review of priority diseases and case definitions. Moving the Lao EWARN and EWORS systems closer together, and ad-hoc training of central staff.</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Last evaluation in 2004. A workplan for development of the system is available.</td>
<td>Focused surveillance evaluation for ILI, sari and syndromic surveillance, with review/assessment of existing information and knowledge for HIV/AIDS, TB, dengue, etc.</td>
<td>From last review: strengthen EBS, sensitization of the private sector, develop EWARS advocacy materials, restructure hospital-based syndromic surveillance to structure as event-capture surveillance, and strengthen linkages with other surveillance systems.</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>Annual reviews since 2008. Common Indicator Assessment under APSED.</td>
<td>Full evaluation or focused evaluation, depending on feasibility. Objectives: to identify strengths and weaknesses, identify training needs and review disease list.</td>
<td>First step is making the system functional. Agree on priority diseases/conditions to be monitored. Modify national legislation and develop a national strategy. Increase awareness of reporting requirements/process among physicians.</td>
</tr>
<tr>
<td>Philippines</td>
<td>Evaluated in 2006. Workplan developed.</td>
<td>Focused surveillance evaluation as the system was only recently established and it is too early to evaluate it. Objective: to extend the use of surveillance data in planning, decision-making and policy development.</td>
<td>2006 evaluation: need to integrate fragmented surveillance systems, enhance core capacity for surveillance and response at the local level.</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>N/A</td>
<td>Focus on one to two areas and a limited number of diseases. Objective: to identify weaknesses and improve systems and support mechanisms. How: retrospective survey, gold-standard indicators and questionnaires, with involvement of field epidemiology training programmes.</td>
<td>Strengthen external surveillance of regional and global situations and enhance local surveillance by expanding disease-specific programmes.</td>
</tr>
<tr>
<td>Singapore</td>
<td>Evaluated in 2008 (two years after implementation). Workplan developed.</td>
<td>Focused evaluation. Objective: to determine the efficiency and effectiveness of the system in terms of outbreak detection and response (focus on EID).</td>
<td>Upgrade ICT surveillance system, develop new regulations and conduct training in system operation.</td>
</tr>
<tr>
<td>Country</td>
<td>Current ICT system and resources</td>
<td>Actions</td>
<td></td>
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<tr>
<td>--------------------------------------------------</td>
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<tr>
<td>Cambodia</td>
<td>CamEWARN – SMS.</td>
<td>Dengue sentinel surveillance — improve data reporting system — borrow system from CamEWARN. Need ICT staff at least at provincial level / EPI staff trained in ICT.</td>
<td></td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>Access database for LaoEWARN Limited. General IT support from WHO. Reliance on support from Cambodia.</td>
<td>Enforce the use of one operating system. Develop policy for sharing Internet access.</td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>A range of tools are used to notify (fax, phone, email), and all cases are entered in an electronic database. There is an IT infrastructure from national to district level. A national ICT policy is in place. The Ministry of Health also has ICT policy for development of databases etc.</td>
<td>How to optimize current tools — good connectivity. Work out which other tools suit stakeholders in order to optimize participation. Integrate systems — eg. Integrate the hospital system with the e-notification system.</td>
<td></td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>The current system relies on manual notification. Interested in simple ICT system, possibly SMS, for reliable and timely reporting. There are a number of IT companies. Generally low IT knowledge. There is no IT person in the surveillance unit, a small unit in the Ministry of Health.</td>
<td>Appoint an ICT person to support surveillance.</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>There are computers down to provincial level and trained IT personnel at the provincial, regional and national levels. Support for local infrastructure is lacking.</td>
<td>Develop policies and guidelines for a web-based system. Develop a national strategy for implementation of the web-based system. Transfer technology down to the lowest level.</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>Web-based.</td>
<td>Refine current use.</td>
<td></td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Changed to web-based reporting system in 2010 – phase 1 complete in 47 provinces; next phase will be to role out to district level.</td>
<td>Develop a workplan for training sessions at the provincial and district levels, and for maintenance of the web-based system. Integrate hospital reporting with public health surveillance.</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Is current system effective/ sustainable?</td>
<td>What improvements or changes should be made to ensure that dengue surveillance meets its objectives?</td>
<td>Can dengue be used as a pathfinder to improve national surveillance systems?</td>
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<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>No specific dengue surveillance system. Notifiable disease.</td>
<td>Review surveillance case definition, improve data collection.</td>
<td>Yes — dengue has a short incubation period so it can be used to train in rapid response. Established laboratory systems.</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Dengue one condition in early warning system. Also have sentinel surveillance.</td>
<td>Need to improve the sentinel surveillance system — currently only paediatric hospitals. Revise or add more sentinel sites. Use ILI as model.</td>
<td>N/A</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>Sustainable: Dengue surveillance is already aligned with the IBS system.</td>
<td>Mostly clinical case definition with a few laboratory confirmations. Data from community (EBS) included in some provinces. Increase the number of laboratory-confirmed cases. Aim to train provinces in mapping as this is closer to response.</td>
<td>Already used as a pathfinder. Will be used as an example in GIS training.</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Objective of surveillance is early detection. Effective: 85% notified within 24 hours of diagnosis. Sustainable: yes, commitment at various levels.</td>
<td>Need to increase coverage and retrain health staff, including improving risk-communication/behaviour-change communication.</td>
<td>Yes, could be used as a pathfinder for eight other diseases requiring notification within 24 hours, but less relevant for diseases for which early warning is not an objective of surveillance. Review/evaluation needed with regard to early-warning indicators for notification.</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>No surveillance system, but studies and imported cases in Australia suggest dengue is an issue.</td>
<td>Work together with vectorborne disease control programme. Discuss case classification. Consider dengue surveillance in upcoming review.</td>
<td>N/A</td>
</tr>
<tr>
<td>Philippines</td>
<td>Effective: detects outbreaks and clusters of cases. Alert and epidemic threshold already established. Sustainable: support at local and national levels as awareness is high.</td>
<td>Adopt new WHO case definition, complement with vector surveillance, enhance the serological component, and enhance data analysis at the hospital level.</td>
<td>Not at country level — already integrated into PIDSR. Possibly at regional/international level.</td>
</tr>
<tr>
<td>Singapore</td>
<td>In place &gt;10 years — effective. Now expanding the scope.</td>
<td>Review surveillance case definition, improve data collection.</td>
<td>Yes — dengue has a short incubation period so it can be used to train in rapid response. Established laboratory systems.</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Objective: early warning. Two types of surveillance.</td>
<td>Current system is not timely (serological surveillance). Need to improve sample size for virus isolation (cost implication).</td>
<td>Yes</td>
</tr>
<tr>
<td>Session 4: Summary of key actions</td>
<td></td>
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<td>----------------------------------</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>IBS</td>
<td>ICT</td>
<td>Dengue</td>
</tr>
<tr>
<td><strong>Brunei Darussalam</strong></td>
<td>Review IBS. Enhance system to improve quality and user-friendliness.</td>
<td>After review, consider transition to web-based system.</td>
<td>Incorporate in the IBS system. Also entomological surveillance.</td>
</tr>
<tr>
<td><strong>Cambodia</strong></td>
<td>Conduct a consultation workshop to review the list of diseases and case definitions. Include laboratory data in surveillance. Train clinicians.</td>
<td>Develop key actions. Extend ICT tools to lower levels.</td>
<td></td>
</tr>
<tr>
<td><strong>Lao</strong></td>
<td>Review case definitions. Incorporate EWARN and EWORS in one system.</td>
<td>Standardize the use of software for the ICT programme. Develop a surveillance strategy, including ICT. Strengthen the links between IBS and EBS.</td>
<td>Establish mapping and GIS at the provincial level.</td>
</tr>
<tr>
<td><strong>Malaysia</strong></td>
<td>Review the list of notifiable diseases/timeliness of reporting/case definitions. Strengthen the involvement of private practitioners.</td>
<td>Improve coverage and determine ICT tools for widest engagement (private practitioners).</td>
<td></td>
</tr>
<tr>
<td><strong>Papua New Guinea</strong></td>
<td>Evaluate the surveillance system. Develop a national surveillance strategy and review national legislation. Finalize syndromes for EWARS and consider private health facilities for reporting.</td>
<td>Conduct IT assessment. Continue EWARS development using SMS. Support the development of national ICT policy. Consider including ICT staff in the surveillance unit and collaborate with the new ICT Advisor. Consider sharing data with national laboratories.</td>
<td>Consult with the vector programme on needs. Include in the laboratory strategy. Discuss case classification with stakeholders. Consider in national HIS, early warning system (consider in surveillance evaluation).</td>
</tr>
<tr>
<td><strong>Philippines</strong></td>
<td>Develop web-based surveillance-management policies and guidelines. Enhance IBS at the local level. Enhance the capacity of the laboratory network at all levels.</td>
<td>Develop a web-based system (ideal).</td>
<td>Strengthen links with climate data.</td>
</tr>
<tr>
<td><strong>Singapore</strong></td>
<td>Conduct focused surveillance evaluation (1 year).</td>
<td>Continuous enhancement, especially serotyping, genotyping (already under way).</td>
<td>Establish risk-based surveillance.</td>
</tr>
<tr>
<td><strong>Viet Nam</strong></td>
<td>Conduct evaluation.</td>
<td>Move to a web-based system. Pilot in 10 provinces with plans to roll-out across the country by 2015.</td>
<td></td>
</tr>
</tbody>
</table>
PROGRAMME OF ACTIVITIES

Day 1 - Monday, 7 June 2010

08:00 – 08:30  Registration

08:30 – 09:00  Opening session and welcome remarks
Welcome remarks  
  Dr Corrine Capuano  
  WHO Representative in Brunei Darussalam, Malaysia and Singapore
Meeting Objectives  
  Ms Amy Cawthorne

Session 1 - Indicator Based surveillance: Best practice and ongoing challenges  
Chair:  Dato’ Dr Tee Ah Sian and Dr Babatunde Olowokure

09:00 – 09:30  Beyond APSED  
  Dato’ Dr Tee Ah Sian

09:30 – 09:45  Introduction to the Session  
  Ms Hannah Lewis

09:45 – 10:15  Surveillance systems across the region aimed at detecting emerging diseases and outbreaks  
  Ms Amy Cawthorne  
  Ms Hannah Lewis

10:15 – 10:30  Group photo

10:30 – 10:45  Coffee break

10:45 – 11:05  Examples of good practice and ongoing challenges:  
  Analysing indicator-based surveillance data  
  Dr Chin-Kei Lee

11:05 – 11:25  Examples of good practice and ongoing challenges:  
  Lao PDR  
  Ms Bouaphan Khamphaphongphane
11:25 – 11:45  Examples of good practice and ongoing challenges:  Malaysia
11:45 – 12:15  Group Work A
12:15 – 13:15  Lunch
13:15 – 13:45  Group work B
13:45 – 14:45  Plenary
14:45 – 15:05  Coffee break
15:05 – 15:35  Learning from evaluation
15:35 – 15:50  Keeping it simple:  developing sustainable surveillance systems
   Ms Hannah Lewis
15:45 – 16:45  Group work 2
16:45 – 17:30  Plenary
19:00  Cocktail reception

Day 2 - Tuesday, 8 June 2010

Session 2 - ICT tools for surveillance
Chair:  Dr Andrea Ammon
08:30 – 08:40  Introduction to the session
   Mr Alex Rosewell
08:40 – 09:10  Introduction to ICT tools
   Mr Philippe Veltsos
09:10 – 09:30  Carrying out an IT infrastructure assessment: Cambodia example
   Mr Vanra Ieng
09:30 – 09:50  SMS use in CAMEWARN:  Challenges and lessons learnt
   Dr Sovann Ly
09:50 – 10:10  Coffee break
10:10 – 11:15  Group work
11:15 – 12:00  Plenary: Country feedback:
   4 minutes (3 slides) per country
12:00 – 13:00  Lunch
Session 3 - Dengue Surveillance
Chair: Malaysia

13:00 – 13:10 Introduction to the session
Ms Amy Cawthorne

13:10 – 13:40 The importance of Dengue in the region and the outcome of the Viet Nam meeting and Singapore surveillance training
Dr Vu Diep

13:40 – 14:10 The new Dengue classification and the implications for surveillance
Dr Lucy Lum

14:10 – 14:40 Dengue surveillance: current challenges and future options
Dr Nima Asgari-Jirhandeh

14:40 – 15:00 Coffee break

15:00 – 16:15 Group work

16:15 – 17:30 Plenary: country feedback:
4 minutes (3 slides) per country

Day 3 – Wednesday, 9 June 2010

Session 4 - Regional Surveillance
Chair:  Dato’ Dr Tee Ah Sian and Dr Nima Asgari-Jirhandeh

08:30 – 08:50 Introduction to Regional Surveillance
Dr Chin-Kei Lee

08:50 – 09:25 European regional surveillance activity
Dr Andrea Ammon

09:25 – 09:40 Regional surveillance in the Pacific: feedback from the Auckland meeting
Dr Berry Ropa

09:40 – 10:00 Coffee break

10:00 – 11:15 Group work

11:15 – 12:00 Plenary group feedback:
15 minutes (7 slides) per group

12:00 – 13:00 Lunch
Session 5 - Risk Assessment
Chair: Dr Takeshi Kasai

13:00 – 13:10  Introduction to the session
   Ms Amy Cawthorne

13:10 – 13:40  Introduction to Risk Assessment
   Ms Erica Garcia

13:40 – 14:10  Using Risk Assessment during outbreak investigations
   Ms Amy Cawthorne

14:10 – 15:00  Country Group work

15:00 – 15:15  Coffee break

15:15 – 16:30  Plenary Country feedback:
   6 minutes (3 slides) per country

16:30 – 17:00  Closing
1. PARTICIPANTS

BRUNEI DARUSSALAM

Mr Muhammad Faisal Ahmad, Public Health Officer, Disease Control Division, Environmental Health Services, Department of Health Services, Ministry of Health, Commonwealth Drive, BE 3910.
Tel. no.: (673) 238 2023.  Fax no.: (673) 238 2755.
E-mail: Muhammad.faisal.ahmad@gmail.com

Mr Kamaludin Mohammad Yassin, Senior Health Officer, Environmental Health Division, Environmental Health Services, Ministry of Health, Commonwealth Drive, BE 3910.
Tel. no.: (673) 874 4334.  Fax no.: (673) 238 1854.
E-mail: kamalina_1@hotmail.com

CAMBODIA

Mr Sok Samnang, IT Staff, Surveillance Bureau, Communicable Disease Control Department, Ministry of Health, # 151-153 Kampuchea Krom Avenue, Phnom Penh.
Tel no.: (855) 1273 8394.
Fax no.: (855) 2388 2317.
E-mail: samnang_lati@yahoo.com

Dr Huy Rekol, Chief, Epidemiological Surveillance and Research Unit, and Vice Chief, National Dengue Control Program, National Center for Parasitology, Entomology and Malaria Control, # 372 Monivong Boulevard Chamkarmon, Phnom Penh.
Tel. No.: (855) 1282 9481.
Fax No: (855) 2399 6202.  E-mail: rekohl@cnm.gov.kh; kolhuy@yahoo.com

Dr Ly Sovann, Deputy Director, Department of Communicable Disease Control, Ministry of Health, # 151-153 Kampuchea Krom Avenue, Phnom Penh.
Tel no.: (855) 1282 5424.
Fax no.: (855) 880 441.  E-mail: sovann_ly@online.com.kh
THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

Ms Bouaphan Khamphaphonghane, Acting Chief, Epidemiology Division, National Centre for Laboratory and Epidemiology, Km 3, Thadeua Road, Vientiane Capital.
Tel no.: (856) 2135 3503. Fax no.: (856) 2135 0209.
E-mail: ncle@laotel.com, k_bouaphanh@hotmail.com

Dr Boupnone Sidavong, Chief of Entomology Section, The Centre of Malariology, Parasitology and Entomology, Department of Livestock and Fisheries, Vientiane Capital.
Tel no.: (856) 2121 4040. Fax no.: (856) 2121 8131.

Dr Phengta Vongphrachanh, Director, National Centre for Laboratory and Epidemiology, Ministry of Health, Km 3, Thadeua Road, Vientiane Capital.
Tel no.: (856) 2131 2351. Fax no.: (856) 2135 0209.
E-mail: v.phengta@gmail.com

MALAYSIA

Dr Norhizan Ismail, Head of Surveillance Sector, Disease Control Division, Ministry of Health Malaysia, Level 4, Block E 10, Parcel E, Federal Government Administrative Centre, 62590 Putrajaya.
Tel. No.: (603) 8883 4269. Fax No.: (603) 8888 6271.
E-mail: drnorhizan@moh.gov.my

Dr Wan Noraini Wan Mohamed Noor, Senior Principal Assistant Director, Disease Control Division, Ministry of Health Malaysia, Level 4, Block E 10, Parcel C, Federal Government Administrative Complex, 62590 Putrajaya.
Tel. No.: (603) 1922 02637. Fax No.: (603) 8888 6127.
E-mail: drwnoraini@moh.gov.my

Dr Rose Nani Mudin, Senior Principal Assistant Director (Dengue), Vector-Borne Disease Sector, Disease Control Division, Ministry of Health Malaysia, Level 4, Block E 10, Parcel E, Federal Government Administrative Complex, 62590 Putrajaya.
Tel. No.: (603) 8883 4263. Fax No.: (603) 8888 6215.
E-mail: drrose@moh.gov.my

PHILIPPINES

Dr Marlow Niñal, Medical Officer VII, National Epidemiology Center, Department of Health, Manila.
Tel no.: (632) 743 8301 ext. 1901. Fax no.: (632) 743 8301 ext. 1906.
E-mail: marlow_ninal@yahoo.com

Dr Alah Baby Vingno, Chief, RESU – MS III, Center for Health Development XII, ARMM Compound, Cotabato City.
Tel no.: (6364) 421 8053 / 2196.
Fax no.: (6364) 421 2373. E-mail: vingno_md@yahoo.com

Dr Jessie Glen Alonsabe, Medical Specialist III, Department of Health, Center for Health Development – Western Visayas, Mandurriao, Iloilo City.
Tel. no.: (6333) 331 0402. E-mail: glen_alonsabe@yahoo.com
PAPUA NEW GUINEA

Mr Berry Ropa, National Surveillance Officer,
Department of Health, P.O. Box 807, Waigani, National Capital District. Tel no.: (675) 301 3730.
Fax no.: (675) 323 6171. E-mail: berry_ropa@health.gov.pg

Mr Edilson Yano, Paediatric Surveillance Officer,
Department of Health, P.O. Box 807, Waigani, National Capital District. Tel no.: (675) 301 3730.
Fax no.: (675) 325 1175. E-mail: edilson_yano@health.gov.pg

SINGAPORE

Ms Pei Pei Chan, Senior Public Health Officer,
Ministry of Health, 16 College Road S169854, Singapore.
Tel. no.: (65) 6325 8599. Fax no.: (65) 6325 4679.
E-mail: chan_pei_pei@moh.gov.sg

VIET NAM

Dr Nguyen Trong Toan, Secretary of National Program for Dengue Control in Southern Viet Nam, Public Health Department, Pasteur Institute Ho Chi Minh City, 167 Pasteur, District 3, Ho Chi Minh City.
Tel no.: (848) 3824 3334. Fax no.: (848) 3824 3334.
E-mail: trongtoan@pasteur-hcm.org.vn

Mr Le Trung Kien, Communicable Disease Expert,
General Department of Preventive Medicine and Environment, Ministry of Health, 135 Nui Trui Lane, Ba Dinh District, Ha Noi. Tel no.: (844) 3845 6255. Fax no.: (844) 3736 6241.
E-mail: giadinhkien@gmail.com

Dr Hoang Minh Duc, Vice Head Entomology and Zoology Department, National Institute of Hygiene and Epidemiology No. 1 Yersin Street, Ha Noi. Tel no.: (844) 3972 8009.
Fax no.: (844) 3972 8010. E-mail: duchmvn@yahoo.com

2. TEMPORARY ADVISERS

Professor Lucy Chai See Lum, Principal Scientist (Animal Biosecurity), Professor, Department of Paediatrics, Faculty of Medicine, University of Malay Medical Centre, 50603 Kuala Lumpur, Malaysia.
Tel no.: (603) 7949 2065. Fax no.: (603) 7955 6114. E-mail: lumcs@ummc.edu.my, lucylum@gmail.com

Mr Alexander Rosewell, Epidemiologist, Communicable Disease Surveillance and Response,
World Health Organization, 4th Floor, AOP1 Centre, Waigani Drive, Port Moresby, Papua New Guinea.
Tel. No.: (675) 325 7827 Ext. 82420. Fax No.: (675) 325 0568. E-mail: rosewella@wpro.who.int

Dr Andrea Ammon, Head of Surveillance Unit, European Centre for Disease Prevention and Control,
Tomtebodav. 11A, SE-17183, Stockholm, Sweden. Tel. No.: (468) 5860 1410. Fax No.: (468) 5860 1297
E-mail: andrea.ammon@ecdc.europa.eu
3. OBSERVER

SINGAPORE

Ms Grace Yap, Research Officer, Environmental Health Institute, National Environment Agency, Singapore, 11 Biopolis Way, #06-05/08, Singapore 138667. Tel. no.: (656) 771 9131. Fax no.: (656) 777 8029. E-mail: grace_yap@nea.gov.sg

4. SECRETARIAT

Dato' Dr Tee Ah Sian, Director, Division of Combating Communicable Diseases, World Health Organization, Regional Office for the Western Pacific, P.O. Box 2932, 1000 Manila, Philippines. Tel. No.: (632) 528 9701. Fax No.: (632) 521 1036. E-mail: teea@wpro.who.int

Dr Takeshi Kasai (Responsible Officer), Coordinator, Health Security and Emergencies and Regional Adviser, Communicable Disease Surveillance and Response, World Health Organization Regional Office for the Western Pacific, P.O. Box 2932, 1000 Manila, Philippines. Tel no.: (632) 528 9730. Fax no.: (632) 521 1036. E-mail: kasait@wpro.who.int

Dr Tamano Matsui, Medical Officer (FETP Coordinator), Communicable Disease Surveillance and Response, World Health Organization Regional Office for the Western Pacific, P.O. Box 2932, 1000 Manila, Philippines. Tel no.: (632) 528 9828. Fax no.: (632) 521 1036. E-mail: matsuit@wpro.who.int

Dr Diep Thi Bich Vu, Technical Officer (Dengue), Malaria, other Vectorborne and Parasitic Diseases (MVP), World Health Organization Regional Office for the Western Pacific, P.O. Box 2932, 1000 Manila, Philippines. Tel no.: (632) 528 9760. Fax no.: (632) 521 1036. E-mail: vud@wpro.who.int

Dr Nima Asgari-Jirhandeh, Public Health Specialist, Communicable Disease Surveillance and Response Office of the WHO Representative in Cambodia, No 177-179 corner Pasteur (51) and 254, Phnom Penh, Cambodia. Tel No.: (855) 2321 6610. Fax No.: (855) 2321 6211. E-mail: asgarin@wpro.who.int

Dr Vanra Ieng, SSA (IT Specialist for Surveillance), Communicable Disease Surveillance and Response Office of the WHO Representative in Cambodia, No 177-179 corner Pasteur (51) and 254, Phnom Penh, Cambodia. Tel No.: (855) 2321 6610. Fax No.: (855) 2321 6211. E-mail: iengv@wpro.who.int

Dr Chin Kei Lee, Team Leader/Medical Epidemiologist, Communicable Disease Surveillance and Response, Office of the WHO Representative in the People's Republic of China, 401 Dongwai Diplomatic Office Building, 23, Dongzhimenwai Dajie, Chaoyang District, Beijing 1000600, China. Tel No.: (8610) 6532 7189 ext 81249. Fax No.: (8610) 6532 2359. E-mail: leec@wpro.who.int

Ms Hannah Lewis, Epidemiologist, Communicable Disease Surveillance and Response, Office of the WHO Representative in Lao People's Democratic Republic, 125 Saphanthong Rd, Unit 5 Ban Saphangthongtai, Sisattanak District, Vientiane Capital, Lao People's Democratic Republic. Tel no.: (856) 2135 3904 Ext. 81841. Fax no.: (856) 2135 3905. E-mail: lewish@wpro.who.int

Dr Harpal Singh, National Professional Officer, Office of the WHO Representative in Malaysia, 1st Floor, Wisma UN, Block C, Komplek Pejabat, Damansara, Jalan Dungun, Damansara Heights, 50490 Kuala Lumpur, Malaysia. Tel. No.: (603) 2093 9908. Fax No.: (603) 2093 7446. E-mail: singhh@wpro.who.int
Dr Maria Nerissa Dominguez, National Professional Officer (Communicable Diseases), Communicable Disease Surveillance and Response, Office of the WHO Representative in the Philippines, World Health Organization, National Tuberculosis Centre Building, Second Floor, Bldg 9, Department of Health, San Lazaro Hospital Compound, Sta. Cruz, Manila, Philippines.
Tel no.: (632) 528 9766. Fax no.: (632) 731 3914. E-mail: dominguezm@wpro.who.int.

Dr Babatunde Olowokure, Epidemiologist and Team Leader, Communicable Disease Surveillance and Response, Office of the WHO Representative in Viet Nam, 63 Tran Hung Dao Street, Hoan Kiem District, Ha Noi, Viet Nam. Tel. no.: (844) 943 3734. Fax no.: (844) 943 3740. E-mail: olowokureb@wpro.who.int.

Ms Amy Cawthorne, Epidemiologist, Risk Assessment and Decision Support, Global Alert and Response Department, World Health Organization, 20, Avenue Appia-CH 1211, Geneva, Switzerland. E-mail: cawthornea@wpro.who.int

Mr Philippe Veltsos, Systems Analyst, Health Technical Systems, World Health Organization, 20, Avenue Appia-CH 1211, Geneva, Switzerland. Tel. no.: (4122) 791 1982. Fax no.: (4122) 791 3111. E-mail: veltsosp@who.int.

Ms Erica Garcia, Technical Officer, Alert and Response Operations, Epidemic and Pandemic Alert and Response, World Health Organization, 20, Avenue Appia-CH 1211, Geneva, Switzerland. Tel. no.: (4122) 791 5880. Fax no.: (4122) 791 0746. E-mail: garciaer@who.int.

Mr Armand Bejtullahu, Technical Officer, Alert and Response Operations, World Health Organization, 20, Avenue Appia-CH 1211, Geneva, Switzerland. Tel. no.: (4122) 791 5544. Fax no.: (4122) 791 0746. E-mail: bejtullahua@who.int.