Meeting Report

Laboratory Strengthening for Emerging Infectious Diseases in the Asia Pacific Region

Kuala Lumpur, Malaysia
19–21 October 2011
REPORT

MEETING ON LABORATORY STRENGTHENING FOR EMERGING INFECTIOUS DISEASES IN THE ASIA PACIFIC REGION

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NOTE

The views expressed in this report are those of the participants in the Meeting on Laboratory Strengthening for Emerging Infectious Diseases in the Asia 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 Member States in the Region and for those who participated in the Meeting on Laboratory Strengthening for Emerging Infectious Diseases in the Asia Pacific Region, which was held in Kuala Lumpur, Malaysia from 19 to 21 October 2011.
SUMMARY

Emerging infectious diseases pose a great risk to human health and health security. Under the International Health Regulations (2005), WHO and Member States are mandated to have in place capacities to prevent, detect, assess and respond to events that may constitute a public health emergency of international concern.

In May 2011, WHO and the Association of Southeast Asian Nations (ASEAN) drafted and agreed on a five-year laboratory workplan for emerging infectious diseases at an informal consultation in Manila. This workplan was prepared to spare Member States from being faced with parallel workplans. The First Meeting of the Asia Pacific Technical Advisory Group on the Asia Pacific Strategy for Emerging Diseases 2010 in July 2011 recommended WHO and Member States to continue building capacity in the area of laboratories.

The vision for laboratory strengthening for emerging infectious diseases is for countries and the region to have the capability to detect both known and unknown pathogens early in order to detect potential outbreaks capable of severe morbidity and mortality. The linchpin of this system is the public health diagnostic laboratory, with public health reference laboratories and national and regional networks supporting biosafety, external quality assurance and the reference function.

The Meeting on Laboratory Strengthening for Emerging Diseases in the Asia Pacific Region highlighted the potential benefits of the public health laboratory system and possible configurations of a public health laboratory system in countries. This meeting was one of the first steps in determining how to set about implementing the laboratory workplan. It was also an opportunity for participants to agree on the next steps towards establishing public health diagnostic laboratories in country, organizing regional external quality assurance for dengue, as well as determining which activities may be done in conjunction with animal health. Capacity-building in biosafety was highlighted.
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Keywords:
Laboratories – organization and administration / communicable disease control / communicable disease, Emerging – Prevention and control / Sentinel surveillance / Asia, Southeastern / Western Pacific
1. INTRODUCTION

The International Health Regulations (2005) mandates WHO and Member States to have in place capacities to prevent, detect, assess and respond to events that may constitute a public health emergency of international concern. An important component of early detection and response is having in place, timely and accurate public health laboratory services.

At a laboratory consultation convened by the World Health Organization (WHO) and the Association of Southeast Asian Nations (ASEAN) in May 2011, a joint five-year laboratory workplan for emerging infectious diseases was drafted to spare countries from dealing with two parallel laboratory workplans. The vision for laboratory strengthening for emerging infectious diseases focuses on countries having the capability to detect known pathogens and to identify unknown/novel pathogens. This vision will be achieved through public health diagnostic laboratories, with public health reference laboratories and national and regional networks supporting biosafety, external quality assurance (EQA) and reference functions.

1.1 Objectives

(1) To update participants on laboratory and related activities;

(2) To discuss the implementation plan for strengthening public health laboratories over the next five years; and

(3) To agree on recommendations and follow-up actions.

1.2 Opening remarks

Dr Corinne Capuano, WHO Representative for Brunei Darussalam, Malaysia and Singapore

The opening remarks of Dr Shin Young-soo, WHO Regional Director for the Western Pacific, were delivered by Dr Corinne Capuano, WHO Representative for Brunei Darussalam, Malaysia and Singapore.

Dr Capuano welcomed participants to the Meeting on Laboratory Strengthening for Emerging Infectious Diseases in the Asia Pacific Region. She expressed appreciation to the Government of Malaysia for hosting the meeting and noted that Malaysia was the lead country for the ASEAN Plus Three Partnership Laboratories.

She emphasized that countries needed to have access to safe and accurate laboratory services to facilitate the early detection, tracking and monitoring of infectious agents and to support alert and response activities under the International Health Regulations (2005). She highlighted the importance of collaboration between WHO and ASEAN in achieving this objective and noted that both organizations had agreed to synchronize their workplans earlier in the year. A five-year Asia Pacific Laboratory Action Plan for Emerging Infectious Diseases was subsequently developed to strengthen laboratory capacity, particularly at the subnational level, with the establishment and enhancement of public health diagnostic laboratories close to the front line. In support of the Laboratory Action Plan developed in 2011, the Asia Pacific Strategy for Emerging Diseases Technical Advisory Group (APSED TAG) recommended that
Member States should develop laboratory capacity to undertake early detection of known and novel pathogens to support public health risk assessment and response.

She noted that this meeting was the first to bring together animal health and human health sectors at a regional level to discuss laboratory issues. The Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE) and WHO have a good working relationship at the regional level, and the long-standing relationship between WHO and ASEAN is even stronger.

She acknowledged the support of partners—Asian Development Bank, Australian Agency for International Development, Canadian International Development Agency, Government of Japan, United States Agency for International Development (USAID) and United States Centers for Disease Control and Prevention (CDC)—in emerging infectious disease capacity-building efforts under APSED.

*Dr Subhash Morzaria, Regional Manager, FAO Regional Office for Asia and the Pacific*

Dr Subhash Morzaria noted that the emergence of a series of infectious diseases in the region—Nipah virus infection, severe acute respiratory syndrome (SARS), highly pathogenic avian influenza (HPAI), pandemic (H1N1) influenza, foot and mouth disease (FMD) and porcine reproductive and respiratory syndrome (PRRS)—continues to cause high morbidity and mortality in animals and humans, threatening food safety and security, livelihoods and the well-being of people in Asia.

He noted that the emergence of diseases is a complex problem that no one institution has the capacity to address in isolation. He said that emerging diseases contributed significantly to enhanced collaboration among the three international organizations (FAO, OIE and WHO). FAO has worked closely with OIE and WHO to develop a formal collaborative mechanism that is now referred to as the FAO/OIE/WHO regional tripartite arrangement.

This arrangement is now thriving in the region, and a number of joint initiatives have been launched to promote collaborative activities under the overall umbrella of One Health.

Recently, the three organizations produced a tripartite document that articulates how these organizations will share responsibilities and coordinate global action to address high impact emerging and re-emerging infectious diseases at the animal–human–ecosystem interfaces.

He noted that to enhance greater collaboration between sectors, FAO, OIE and WHO in collaboration with ASEAN, organized this meeting, which involves participation from both animal and human laboratories in the region.

He said that the objectives of the meeting were to provide a forum for interaction between the experts from national medical and veterinary laboratories, to agree on the regional framework for animal health laboratory capacity-building, to identify gaps in biosafety, occupational health and quality management in laboratories, to identify priority zoonoses in the region and to explore areas of joint collaboration between the animal and human health laboratories.
Dr Ronello Abila, Sub-Regional Representative for South East Asia, OIE

Dr Abila noted that this meeting—the first official joint meeting of the human and animal health laboratories in the ASEAN region—was part of the global effort to strengthen collaboration of the human, animal and environmental health sectors implementing the One Health approach. He said that at the global level, collaboration among FAO, OIE and WHO had started long before the official recognition of One Health as a concept.

Dr Ronello Abila highlighted the importance of the Tripartite Concept Note issued by FAO, OIE and WHO on "sharing responsibilities and coordinating global activities to address health risks at the animal-human-ecosystems interfaces." He said that the Tripartite Concept Note provided clear guidance to ensure better collaboration in the implementation of future joint activities of the three organizations. Specifically on laboratory collaboration, the Tripartite Concept Note states: "A joint framework to address gaps and strengthen collaboration in human and animal health laboratory activities should be developed. The framework should cover the upgrading of facilities, training and collaboration between regional and international reference laboratories for diagnosis and quality assurance. The framework should also promote cooperation between human and animal surveillance systems in analysing available evidence and evaluating responses and the timely sharing of comparable epidemiological and pathogen data across the relevant sectors."

Dr Ferdinal Fernando, Assistant Director, Health and Communicable Disease Division, ASEAN Secretariat

Dr Ferdinal Fernando noted that collaboration between ASEAN and WHO could be traced back to 1979, when WHO first extended assistance to the ASEAN Technical Cooperation Programme in pharmaceuticals. The collaboration was formalized in 1997 through the signing of a memorandum of understanding (MoU) between the two organizations for a period of five years (1997–2002). He noted that two additional MoUs have been signed since then, covering the periods 2002–2007 and 2009–2013, and that a review of the implementation of the 1999–2002 MoU had been held in 2003. The most recent MoU and detailed action plans further support the Health Minister-endorsed Strategic Framework on Health Development.

Taking into consideration ASEAN's Charter and Socio-Cultural Community Blueprint, ASEAN's medium-term strategic plan and the WHO Country Cooperation Strategies, both organizations have identified areas for collaboration: prevention and control of communicable diseases, including new, emerging and re-emerging diseases; prevention and control of noncommunicable diseases with special emphasis on their common risk factors and healthy lifestyles promotion; health systems strengthening, including primary health care; food security, food safety and nutrition; health effects of climate change and the environment; emergency preparedness and response; globalization and trade and their impact on health, including access to medicines and essential technology; and traditional medicine.

Dr Hasan Bin Abdul Rahman, Director General of Health, Malaysia

Dr Hasan Bin Abdul Rahman welcomed the meeting participants to Malaysia. He said that the need for “joint meetings” cannot be overemphasized, considering the fact that 61% of all known human pathogens are of animal origin. He noted that the Asia Pacific region, home to more than half of the world's population, has been an epicentre for emerging infectious diseases, such as the novel Nipah virus encephalitis, avian influenza A(H5N1), and recently, pandemic influenza A(H1N1).
As emerging infectious diseases (EIDs) that happen in one country can rapidly spread to another, it is imperative that we find out as much as we can about the disease in the shortest time possible. Thus, laboratories must be strengthened so that they can quickly detect EIDs caused by known pathogens and also possess the capability to identify unknown or novel pathogens. He said, "We recognize the fact that in the Asia Pacific region, laboratory capacities and capabilities vary within and between the countries. And it is precisely here that we need to strengthen the laboratory network within the country and build a regional laboratory network among the Asia Pacific countries."

He noted that within each country, public health laboratories should join laboratories from other ministries, as well as, from universities, research institutions and private laboratories to form a network of animal–human laboratories to optimize resources and increase efficiency and capacity of diagnoses. The same holds for the ASEAN region as exemplified by the establishment of the ASEAN Plus Three Partnership Laboratories (APLs) in 2005. In the coming ASEAN Medium-Term Plan (2011–2015) on Emerging Infectious Diseases, these APLs will coordinate high-end pathogen identification and characterization, direct regional quality assurance and collaborate on regional biosafety, research and development. He was proud to note that Malaysia was entrusted with the responsibility of coordinating the strengthening of laboratory capacity and quality assurance among Member States.

He highlighted the importance of WHO and ASEAN agreeing to synchronize laboratory activities and, as far as possible, build on existing structures for the next five years in line with APSED (2010).

Dr Hasan Bin Abdul Rahman said that on the home front, it is his vision to see the National Public Health Laboratory of Malaysia playing an expanded role as a WHO Reference Laboratory, servicing the increased national and regional demands for high-end diagnostic requirements of EIDs. He requested WHO to assist Malaysia in this quest. In addition, the Ministry of Health Malaysia offers laboratory technical assistance to Member States, in the form of training and technical expertise.

Professor Hiroshi Kida, Director, Research Center for Zoonosis Control, Hokkaido University Research Centre for Zoonosis Control, Sapporo, Japan

Professor Kida delivered the keynote lecture: How to control avian and human pandemic influenza. He described the ecology of influenza viruses in nature, birds and mammals; the origin, evolution and perpetuation of influenza virus in nature; and the emergence of highly pathogenic avian influenza virus and human pandemic strains.

He presented on duck influenza and noted that each of the known subtypes (H1-16, N1-9) of the influenza A virus has been isolated from ducks. He also noted that non-pathogenic virus transmission occurs through waterborne faecal-oral ingestion. Ducks carry the viruses during migration, making the migratory duck a natural host of influenza A viruses. He also highlighted the role of pigs in the emergence of pandemic influenza virus strains, particularly with reference to re-assortment.

He presented the global overview of H5N1 HPAI in poultry and wild birds, and of confirmed human cases of H5N1 avian influenza. He noted that HPAI transmission had occurred in 15 countries with a total fatality of 331 out of a reported 565 cases. Most of the affected people were from four countries: China, Egypt, Indonesia and Viet Nam.
He noticed that influenza vaccine for bird flu may prevent manifestation of disease signs, but it does not confer protective immunity from infection. Countries where vaccine is used are not designated as HPAI-free as vaccination leads to the silent spread of the virus.

He updated the recommendations from the 26th Conference of the OIE Regional Commission for Asia, the Far East and Oceania, where it was considered that the long persistence of HPAI H5N1 in domestic poultry and antigenic variants circulated mainly due to the misuse of vaccine. He noted that the “stamping out” policy is the most effective measure for the control of HPAI. Vaccines should be used in addition to, but not instead of, stamping out. Surveillance of swine flu is crucial in countries where avian flu has not been controlled.

In conclusion, he said the eradication of H5N1 HPAI from poultry in Asia is urgently needed, and suggested using “stamping out” above all and cautiously using vaccines where vaccines are used. He noted that measures for pandemic influenza control should be based on the measures for the control of seasonal influenza.

2. PROCEEDINGS

2.1 Session One: Setting the scene

2.1.1 FAO transboundary animal diseases and emerging infectious disease activities in Asia

Dr Subhash Morzaria, Food and Agriculture Organization of the United Nations

Dr Subhash Morzaria presented the Global Framework for Progressive Control of Transboundary Animal Diseases (GF-TADs), a joint FAO/OIE initiative. GF-TADs provides a coordinating platform for addressing issues related to the prevention and control of transboundary animal diseases (TADs) and EIDs. The goals are to safeguard the livestock industry from repeated infectious disease epidemics; to improve food security and economic growth of developing countries; and to promote safe trade in livestock and animal products at national, regional and international levels. GF-TADs suggest that the focused efforts for the control of the major TADs must be at the source of infection and prior to the spread of the disease.

The Emergency Centre for Transboundary Animal Diseases (ECTAD) is a key component of GF-TADs. As the implementation arm of GF-TADs, ECTAD provides assistance to member countries to respond to transboundary animal health crises. ECTAD-RAP (Regional unit for Asia and Pacific) was established in 2005 in Bangkok with a subregional unit for South Asia in Kathmandu, Nepal. ECTAD’s major focus is HPAI.

Dr Morzaria also talked about the Regional Strategy for Highly Pathogenic Avian Influenza, which was revised in recognition of the changing situation and knowledge of HPAI in the region. The Regional Strategy serves to harmonize activities of various partners within the region to address HPAI and EID issues. A major focus of the Regional Strategy is HPAI high-risk areas such as the Gangetic Plains, Greater Mekong Subregion and Indonesia, where HPAI endemic infections persist and require long-term risk reduction measures.

In conclusion, he said that FAO is fully engaged with the One Health approach as a multidisciplinary, multisectoral collaboration among animal health, human health and ecosystems. FAO works in close collaboration with governments (national ministries),
international organizations and donors such as the European Union, ASEAN, the South Asian Association of Regional Cooperation (SAARC) on GF-TADs and the USAID Emerging Pandemic Threats programme IDENTIFY.

2.1.2 OIE Performance Veterinary Services Pathway

Dr Ronello Abila, Sub-Regional Representative, World Organisation for Animal Health

Dr Ronello Abila began his presentation by introducing the OIE Global Programme for Strengthening Veterinary Services and stating that improving animal health is a global public good.

The objectives of the Performance of Veterinary Services (PVS), an OIE programme, are to ensure good governance to address emerging and re-emerging animal disease threats, and to support veterinary services of developing countries to meet OIE international standards on quality. Capacity-building forms the main element and covers the following: legislation and national animal health systems, surveillance, early detection and rapid response to animal disease outbreaks, biosecurity, stamping out (with compensation) and vaccination.

He gave a comprehensive overview of the OIE PVS Pathway, describing it as a continuing process. He also introduced the OIE PVS Evaluation Tool, a tool for Good Governance of Veterinary Services and highlighted the critical components related to technical competency of veterinary laboratory, veterinary laboratory diagnosis and laboratory quality assurance. He also provided an update on the Global Programme country PVS evaluations and PVS evaluation missions implemented in Asia in 2011.

2.1.3 Asia Pacific Strategy for Emerging Diseases

Dr Takeshi Kasai, Director, Division of Health Security and Emergencies, WHO Western Pacific Regional Office

Dr Kasai provided an update on regional event-based surveillance and noted the increase in regional response capacity to health events and emergencies during the period 2008–2011. Experience gained from avian H5N1 influenza, SARS outbreaks and pandemic H1N1 influenza shows that no single institution has all the capacity to meet the threats of emerging infectious diseases.

To meet the challenges that emerging diseases pose to regional and global health security, the Global Outbreak Alert and Response Network was created in 2000 and the Asia Pacific Strategy for Emerging Diseases (APSED) was developed in 2005 as an operational framework to strengthen national and regional capacities to manage and respond to emerging infectious diseases, improve avian influenza and pandemic preparedness and fulfil the requirements of the revised International Health Regulations (2005). To achieve the goals and objectives of the APSED strategy, five priority areas were identified: surveillance and response; laboratory services; zoonoses; infection prevention and control; and risk communication.

Dr Kasai highlighted APSED achievements over the past five years in relation to meeting International Health Regulations (2005) core capacity requirements. He noted significant improvements made in the region towards outbreak identification, increasing the percentage of countries with minimum surveillance capacity, and timeliness of reporting for H5N1 human infections.
APSED (2010), an updated version of the original strategy, was developed to build sustainable national and regional capacities and partnerships to ensure public health security through preparedness planning, prevention, early detection and rapid response to emerging diseases and other public health emergencies. The strategy has a greatly expanded scope and now includes three new focus areas.

Dr Kasai provided a comprehensive overview of APSED (2010), its focus areas and key components. He stated that laboratory services had been identified as a key focus area and that APSED (2010) will focus on national/in-country networks and connections to international networks. He highlighted the importance of strengthening the referral system for known and unknown pathogens across the region and developing and/or strengthening subnational public health diagnostic laboratories to facilitate timely diagnosis. In APSED (2010), activities related to laboratory services are also included in “surveillance, risk assessment and response”, “zoonoses” and “public health emergency” focus areas.

2.1.4 Laboratory capacity-building under ASEAN and APSED – outcome of the Informal Consultation, May 2011, APSED TAG and SOMHD, July 2011

Dr Ferdinal Fernando, Assistant Director, Health and Communicable Disease Division, ASEAN Secretariat

Dr Fernando informed the group that after the ASEAN Charter came into force in 2008, ASEAN leaders adopted a roadmap for the ASEAN Community, which is composed of three pillars.

The ASEAN Strategic Framework on Health operationalizes the 54 health action lines of the ASEAN Socio-Cultural Community Blueprint. Regional activities in health involve:

- B3. Enhancing food security and safety;
- B4. Access to health care and promotion of healthy lifestyle;
- B5. Improving capability to control communicable diseases;
- B7. Building disaster-resilient nations and safer communities; and
- xii. Promote multisectoral coordination and planning on PPR at the regional level including development of a regional multisectoral PPR plan.

The ASEAN Expert Group on Communicable Diseases (AEGCD) is a technical working group that drafted the Medium-Term Plan (2011–2015) on Emerging Infectious Diseases. The Medium-Term Plan focuses on building the ASEAN mechanism for surveillance, prevention, preparedness and response to EIDs; and supporting initiatives in building the ASEAN EID mechanism such as the ASEAN Plus Three Partnership Laboratories (Proponent: ASEAN Plus Three National Laboratory Contact Points), ASEAN Risk Communication Resource Center and Strengthening Collaboration – Human & Animal Health Sectors for Zoonotic Diseases.

The goal of the ASEAN Plus Three Partnership Laboratories is to strengthen the capacity of ASEAN Plus Three Countries to respond appropriately to infectious diseases through regional laboratory networking.

The International Health Regulations (2005) mandated WHO and Member States to have in place capacities to prevent, detect, assess and respond to events that may constitute a public
health emergency of international concern. As such, APSED was developed and used as a roadmap for alert and response capacity-building under IHR (2005). An important component of early detection and response is having in place timely and accurate public health laboratory services. The vision for laboratory strengthening for EIDs is to strengthen the capability of countries to detect known pathogens and the capability to identify unknown/novel pathogens. This will be achieved through public health diagnostic laboratories, with public health reference laboratories, and national and regional networks supporting biosafety, external quality assurance (EQA) and reference functions.

APSED TAG recommended Member States and WHO to begin developing laboratory capacity and systems to undertake early detection of known and novel pathogens to support public health risk assessment and response. Countries without full laboratory facilities should use existing regional networks.

The 6th SOMHD identified EIDs (including APLs, risk communication, FETP, animal-human health collaboration) as one of the priority collaboration areas with Japan, China and Republic of Korea.

Dr Fernando noted that during this meeting, participants would discuss a detailed implementation plan for the five-year harmonized/synchronized laboratory workplan (May 2011) and how activities could be implemented (e.g. regional mechanisms). Discussions would be reflected in the recommendations and follow-up actions.

2.2 Session Two: Strengthening public health laboratories for alert and response

2.2.1 Guide on strengthening public health laboratories for alert and response

Professor Chua Kaw Bing, Principal Investigator, National University of Singapore

Professor Chua started his presentation by saying that if we engage in war, we will win every time if we know our own strengths and weaknesses and the strengths and weaknesses of our enemies, too. He made this statement in reference to infectious disease pathogens. He defined emerging infections as: “New, re-emerging or drug-resistant infections whose incidence in humans has increased within the past two decades or whose incidence threatens to increase in the near future.”

He informed the group about a regional guide that is under development that aims to assist Member States to develop their own public health diagnostic laboratories to support alert and outbreak response. He then proceeded to discuss the type of diagnostic tests and methods that would catch “known, most, almost all and all” pathogens. He talked about coordination among laboratories and the benefits of a public health laboratory system, the centre of which is the public health diagnostic laboratory.

2.2.2 Syndromic approach to detecting unknown pathogens in Malaysia

Dr Mohamed Naim Bin Abdul Kadir, Director, Ipoh Public Health Laboratory

Malaysia has a well-developed public health laboratory system that bases laboratory diagnosis on a syndromic or clinical signs and symptoms approach. Syndromic notification involves notification of a “health event” rather than a specific infectious disease.
The case definitions used are based on the following syndromes:

- **acute neurological syndrome**
- **acute respiratory syndrome**
- **acute dermatological syndrome**
- **acute haemorrhagic syndrome**
- **acute jaundice syndrome**
- **acute diarrhoeal syndrome**

The objectives of this method of laboratory diagnosis include facilitating and expediting notification and response; alerting attention to a problem for rapid investigation and containment of a potential outbreak; and complementing other existing specific disease notification (useful for rapid response to emerging/re-emerging diseases).

Some of the advantages of this method are as follows: the physician reports what he sees; there is a stable definition of clinical syndromes; and it facilitates timely notification and enables rapid response to disease outbreaks. A syndromic approach minimizes the chance of missing an unknown pathogen, provides early alert for investigation and control of infectious disease and proper coordination between the Ministry of Health (surveillance unit) and national and subnational laboratories.

### 2.2.3 Detecting unknown pathogens – China's laboratory network

*Dr Feng Zijian, Assistant Director General, Disease Control and Emergency Response, Chinese Center for Disease Control and Prevention*

Dr Zijian described the laboratory system in China, which comprises clinical diagnostic laboratories, public health laboratories in CDCs and other laboratories in academic institutions, medical universities, etc. He informed that the main functions of laboratories in the CDC system include outbreak diagnosis and investigation; vertical surveillance for specific diseases such as influenza, polio, HIV/AIDS, tuberculosis, and target Expanded Programme on Immunization diseases; health examination of workers in food industries, restaurants, hair salons and swimming pools; and scientific advanced research.

Since 2009, the Ministry of Health has organized a National Platform of Infectious Disease Surveillance as a part of the National Mega Science and Technology Project sponsored by the Ministry of Science and Technology, which covers:

- 31 provincial administrative regions;
- 91 surveillance laboratories: 52 laboratories in provincial and city CDCs, 8 laboratories in universities, 5 laboratories in high-level research institutes, 14 laboratories in the military system, 11 hospital laboratories and 1 laboratory from the animal sector;
- 240 sentinel hospitals; and
- 5 clinical syndromes: febrile respiratory disease, fever with rash, meningitis/encephalitis, haemorrhagic fever, and bloody and watery diarrhoea.

Ways to improve the system include the following: strengthen the link between public health laboratories in CDCs and clinical laboratories; establish a reference service for clinical laboratories; and legally require hospitals to report test results and submit strains and isolates to China CDC.
2.2.4 Panel discussion

Led by Dr Jeffrey Partridge Epidemiologist, Emerging Disease Surveillance and Response, WHO Regional Office for the Western Pacific

Dr Partridge led a panel discussion to clarify any issue regarding public health diagnostic laboratories and to highlight the potential benefits of such a system in countries in the early detection and response to public health threats. Issues such as the need for considering the epidemiology and clinical signs and symptoms before conducting diagnostic tests as well as benefits of services close to the front-line and linked through a network to reference laboratories were reiterated.

2.2.5 Surveillance

2.2.5.1 Indicator-based surveillance and laboratories

Dr Chin-Kei Lee, Team Leader, Emerging Disease Surveillance and Response, WHO Regional Office for the Western Pacific

Dr Lee introduced his presentation by talking about APSED (2010) and the eight focus areas. He then elaborated on Focus Area 1 – Surveillance, Risk Assessment and Response. He talked about event-based and indicator-based surveillance linked to the response through risk assessment.

He drew lessons from pandemic (H1N1) 2009, stating that laboratories should not be overwhelmed or inundated and that surge capacity plans are needed to prevent inundation of functional laboratories. Plans should consider decentralizing the testing capabilities and protocols should be in place for testing, including who and when.

Laboratory testing policy should change with the surveillance strategy. With the establishment of efficient community-level transmission, the focus should shift from case finding to viral characterization of mutation/antiviral resistance. Communication among epidemiologists, clinicians and laboratory staff should be strengthened.

He then talked about the “knowns” and “unknowns” in terms of pathogens. He made the point that we need to be able to diagnose the known pathogens and pick up the unknown ones. He then summarized by saying we need increased laboratory confirmation for priority diseases, and we need to move to a horizontal approach for laboratory testing, which means applying a syndromic type approach to laboratory diagnosis and establishing links between subnational and national laboratories.

2.2.5.2 Influenza surveillance

Dr Jeffrey Partridge, Epidemiologist, Emerging Disease Surveillance and Response, WHO Regional Office for the Western Pacific

Dr Partridge described how influenza surveillance is undertaken to demonstrate the progression with capacity-building for influenza diagnosis and the elements that need to be considered. He defined three areas of work—the epidemiology needs to be understood, the laboratory testing capacity needs to be improved, and communication and reporting need to be organized. He stressed the need to link epidemiology data with virology data and noted the region has produced guidance documents for this. He also stressed that laboratory capacity
needs to be improved and that laboratories need to fulfil minimum standards and adhere to quality standards, including those for EQA and biosafety.

To assist Member States, the WHO Regional Office for the Western Pacific is developing a guide for strengthening public health laboratories. He also highlighted the importance of national, regional and global networks.

2.2.5.3 Singapore's surveillance system

*Dr Wen Sim Tee, Head, Department of Pathology and Laboratory Medicine, KK Women's and Children's Hospital*

This presentation described how Singapore integrates laboratory services with their indicator-based surveillance system. The National Public Health Laboratory (NPHL) provides specialist laboratory facilities to track changes in existing organisms, detect new and re-emerging diseases and respond to outbreaks; and works with partners in medical laboratories and research institutions to enable a coordinated and broad-based response to infectious threats of public health importance.

Currently, NPHL conducts public health indicator-based surveillance programmes on the following organisms: *Clostridium difficile*; MDR bacteria; *Plasmodium* spp.; *Salmonella*; *Streptococcus pneumonia* (invasive); *Vibrio* spp.; chikungunya; influenza; measles and rubella; norovirus and soon HIV.

Information sharing and communications are the twin pillars of an effective and responsive surveillance system. Clinical data are transferred electronically and through hard copy forms (faxed or delivered). Under IDA (chapter 137), all health care professionals including medical practitioners and laboratory personnel are required to notify the Ministry of Health of the occurrence of infectious diseases and to send in samples as and when required for public health surveillance programmes. These samples are important for obtaining a representative nationwide sample of circulating strains and for providing an early warning of any changes in the virulence and/or infectivity of the pathogens. Collectively, these public health laboratory surveillance programmes provide the Ministry of Health with the necessary information to guide interventions where necessary.

In order to better prepare and manage any disease situation during “peacetime” and outbreaks, the Ministry of Health has developed a network of seven systems with the capability for:

- rapid detection of public health threats
- timely response to infectious disease outbreaks
- effective risk communication
- effective management of infectious diseases data/information.

This network was developed in response to lessons learnt from SARS and is called the Infectious Diseases Management and Outbreak System.

Through this system, medical practitioners and clinical laboratory personnel notify the Ministry of Health of legally notifiable diseases. On the other end of the system, Ministry of Health staff will be able to provide daily and weekly summaries of infectious disease events occurring, both locally and globally, to these medical practitioners and other key partners in public health.
The Communicable Diseases Live and Enhanced Surveillance System (CD-LENS), a platform for rumour surveillance and information sharing, increases vigilance of health care providers by providing them with an early warning of potential public health threats.

A powow is a platform for Ministry of Health administrators and management, surveillance and response teams, the risk analysis group (biostatisticians and epidemiologists) and hospital/public health laboratory staff to discuss the local and global communicable disease situation for the past week. This group meets once a week in the Ministry of Health (close proximity to NPHL). Sometimes there are special topic presentations by NPHL (e.g. laboratory surveillance data).

NPHL acts as a consultative link between laboratory results and interpretation for surveillance and response. The physical proximity of NPHL to the Ministry of Health—the administrative arm of NPHL is physically situated within the Ministry offices—means that staff can interact with each other and share information more readily (e-mail, phone calls, face-to-face discussions). Also, the physical proximity of NPHL to Singapore General Hospital and Tang Tock Seng Hospital (Singapore CDC) enables quicker and more effective sample transfers and information sharing.

In summary, Singapore’s clinical and public health laboratories tap on information technology networks and relational networks to strengthen overall indicator-based surveillance in Singapore. The networking and communication among NPHL, clinical laboratories and the Ministry of Health, both electronic and relational, are in line with the goal of APSED (2010) to strengthen laboratory support for surveillance and response, as well as coordination and networking between laboratories.

2.2.5.5 Summary of Day 1

Dr Lee Ching Ng, Director, WHO Collaborating Centre for Reference and Research for Arboviruses & their Associated Vectors, Singapore

Dr Lee Ching summarized the lectures and discussions from Day 1. She reminded the group that an outcome of the Informal Consultation on a Draft Asia Pacific Laboratory Action Plan (2011–2015) for Emerging Infectious Diseases in May 2011 was a harmonized laboratory workplan. She also reminded them that one of the recommendations from the APSED Technical Advisory Group in July 2011 was for Member States and WHO to develop public health laboratory systems. She drew attention to the draft Guide on Strengthening Public Health Laboratories for Alert and Response, which recommended adopting a syndromic approach to laboratory diagnosis and various diagnostic testing approaches with differing levels of sensitivity and specificity (e.g. “catch knowns”, “catch most”, “catch almost all,” “catch all”). The Guide also highlighted the need for developing subnational laboratory capacity, the benefits of which include being close to the field or front-line and providing surge capacity during outbreaks, thus allowing national laboratories to focus on reference functions.

The laboratory systems in Malaysia and China were described with respect to the syndromic approach to laboratory diagnosis and to the use of networks. The day ended with presentations on indicator-based surveillance and the role of laboratories, with an example of how influenza surveillance and laboratory diagnosis is organized and how Singapore fits laboratory data into their indicator-based system.

She noted that the panel discussion reviewed and clarified the content of the Guide on Strengthening Public Health Laboratories in terms of potential benefits of developing a public health laboratory system. In summary, Member States should develop a public health laboratory
system with consideration as to the ‘siting’ of subnational laboratories, the use of a syndromic approach to diagnosis, with effective communication between clinicians, epidemiologists and other stakeholders, with links between subnational and national reference laboratories, as well as, networks with universities and WHO collaborating centres.

2.3  Session Three: Implementing the public health laboratory system

2.3.1  How to implement the public health laboratory system

Dr Chin-Kei Lee, Team Leader, Emerging Disease Surveillance and Response, WHO Regional Office for the Western Pacific

Dr Lee reminded the group about the vision of the five-year laboratory workplan—for all Member States to have the capacity to detect known and unknown pathogens over the next five years through public health diagnostic laboratories. He noted that the “how” of achieving this is what this meeting was about—what are the next steps for Member States and WHO to start to implement the workplan.

2.3.2  Laboratory strengthening in the Lao People's Democratic Republic

Dr Phengta Vongphrachanh, Director, National Center for Laboratory and Epidemiology, Lao People's Democratic Republic

Dr Vongphrachanh described how the Lao People’s Democratic Republic is strengthening laboratory capacity using the APSED approach. Capacity is being built to ensure the following: accurate and timely diagnosis of priority diseases; a functional national referral and support system for differential diagnosis; participation of laboratories in outbreak response and surveillance activities; and participation of laboratories in international EQA programmes for multiple priority diseases with established national laboratory networks for national EQA.

The National Influenza Centre (NIC), which was established in 2010, provides national reference, referral and support services to national influenza surveillance systems. It participates in an established international EQA programme. Systematic reference, referral and quality assessment also exists for diseases such as polio, measles, Japanese encephalitis and HIV. With regards to emerging diseases, the systems for detection, reference, referral and quality assurance are limited.

A national health laboratory policy, which is currently being drafted, is expected to build laboratory capacity at the provincial level in five provinces. The Lao People’s Democratic Republic has undertaken laboratory capacity assessment, mapping and gap analysis; has developed laboratory standards for testing, human resources and equipment at each level; and plans to implement the standards in hospital laboratories in five selected provinces and six districts.

A Ministry of Health Laboratory Committee was established and a focal person was designated to strengthen the management of national laboratory services and regional cooperation on surveillance. A national strategy for the development of laboratories will be developed. It will incorporate guidelines to monitor and evaluate capacity, establish a network of clinical reference laboratories including private laboratories and design a way to link clinical and laboratory records.

Other activities planned include establishing and strengthening formal collaborative mechanisms among the National Centre for Laboratory and Epidemiology, clinical laboratories,
animal health laboratories and food and drug analysis laboratories; establishing a database of in-country human and animal laboratories; participating in and continuing collaboration with regional surveillance networks and developing a national mechanism for cross-border networking. Nuclear and radiological events are not a priority for laboratory strengthening in the next five years. For surveillance and response, a laboratory information management system will be developed, training and participation of laboratory staff in rapid response teams will continue, and advocacy will be stepped up for a national logistics centre and increased capacity at the medical supplies and equipment centre. There will be ongoing collaboration with Lao FET to conduct operational research in their projects as well as training in aspects of research for laboratory staff.

It is planned to develop a national guideline/policy and programme to regulate biosafety. The programme will include biosafety training courses for all central and regional human and animal health laboratory sectors and provincial hospitals. The capacity of provincial hospitals will be strengthened to enable them to train staff in district hospitals.

2.3.4 Public health laboratory surge capacity during pandemic (H1N1) 2009 in Japan

*Dr Keigo Shibayama, Director, National Institute of Infectious Diseases, Japan*

Dr Shibayama described the organization of laboratories in Japan, with the National Institute of Infectious Diseases (NIID) as the national laboratory and 100 subnational or regional laboratories. For pathogen detection, NIID prepares protocols and shares them with regional laboratories. NIID conducts training courses for regional laboratory staff every year and also undertakes research (improvement of testing, development of new vaccines, molecular and genetic analysis, biochemical analyses, etc.). For their part, regional laboratories perform routine testing.

During the H1N1 pandemic in 2009, NIID established a protocol for H1N1 by modifying the existing H5N1 protocol. The United States CDC provided the positive control. NIID sent the protocol and materials required for testing to all regional laboratories, enabling them to start the laboratory diagnosis of H1N1 very quickly. Through its network, and as the national coordinator, NIID was able to quickly organize the laboratory diagnosis of H1N1 in collaboration with all regional laboratories. NIID also obtained virus samples for further research. In terms of lessons learnt, standardization of the protocol was critical and staff training was essential.

2.3.5 Biosafety and public health laboratories

*Professor Chua Kaw Bing, Principal Investigator, National University of Singapore*

Professor Chua talked about potential hazards in medical diagnostic laboratories. These include external and internal hazards (physical and non-physical); fire hazards; conventional hazards (e.g. electrical equipment and appliances, flammable laboratory fuels and chemicals); and electrical hazards. These hazards could be due to designs of the supply system; design and construction of laboratory equipment; maintenance, repair and modification; and misuse of the laboratory equipment.

Microbiological hazards depend on the risk groups of microorganisms; their routes of infection; their mode of transmission; their vulnerability to disease; biosafety and containment level; universal precautions; and sterilization and disinfection.
Professor Chua described four risk groups of microorganisms: (1) “no or very low individual and community risk” – a microorganism that is unlikely to cause human or animal disease; (2) “moderate individual risk, low community risk” – a pathogen that can cause human or animal disease but is unlikely to be a serious hazard to laboratory workers, the community, livestock or the environment; (3) “high individual risk, low community risk” – a pathogen that usually causes serious human or animal disease but does not ordinarily spread from one infected individual to another (effective treatment and preventive measures are available); and (4) “high individual and community risk” – a pathogen that usually causes serious human or animal disease and can be readily transmitted from one individual to another, directly or indirectly (effective treatment and preventive measures are not usually available). Laboratory exposures may cause serious infection, but effective treatment and preventive measures are available and the risk of spread of infection is limited.

Other factors that influence microbiological hazards are route of entry and mode of transmission.

For biosafety practices in medical diagnostic laboratories, he noted five broad areas for consideration:

- safe and comfortable environment
- administrative control and biosafety programme
- appropriate safe equipment and correct use
- good microbiological techniques and practices
- personal protective equipment (PPE).

He indicated the need for a national policy on health and safety, a national system on coordination and implementation, and training, risk assessment, review and evaluation.

2.3.6 Biosafety resources

_Dr Chua Teck Mean, Asia Pacific Biosafety Association_

Dr Chua Teck Mean's presentation followed after Professor Chua’s presentation. Dr Chua stated that the Asia Pacific region is a hotbed for emerging and re-emerging diseases. He noted that FAO and the Asia Pacific Biosafety Association have been working together, and he shared available resources and elements that should be considered for biosafety in the laboratory. He also mentioned common areas for improvement that were noted during assessments. When designing a biosafety programme, he highlighted the need to consider management issues such as administration and finance, risk assessment, standard operating procedures and facilities, i.e. engineering and equipment.

2.3.7 Group discussion findings

After listening to presentations on the harmonization of APSED and ASEAN workplans and the five-year milestones, including the draft guide for strengthening public health laboratories, participants were divided into groups to discuss how to move forward in developing the public health laboratory system in countries.

Participants were asked to consider the following:

- What is the first step you would need to undertake in your country to establish an integrated public health laboratory system?
- What technical activities would ensure a network in your country?
• What activities may be undertaken at national level and at regional level?

Participants noted that most countries in the region have public health laboratory support for public health surveillance and response. However, laboratory capacities and capabilities vary within and between countries. For developing sustainable public health diagnostic systems, the participants highlighted the importance of reviewing the current laboratory situation to determine national laboratory capacity needs and to define the roles and responsibilities to be developed at each level. They also agreed with the approach of the Lao People’s Democratic Republic and discussed a national laboratory policy and national plan that would include the development of a public health laboratory diagnostic system.

In line with the model of the Lao People’s Democratic Republic, participants felt the Ministry of Health should create a national steering committee to coordinate the development of a national laboratory plan, to execute the existing law and regulations, and to strengthen public health laboratory capacity. The national steering committee should have a high level of commitment and political will to sustain the national laboratory plan. It was also discussed that a technical working group with a designated national focal point should be formed to implement the national laboratory plan. The plan would set out testing requirements, specify what tests need to be done at each administrative level and describe the referral system for specimens/pathogens.

National governments should develop nationally acceptable standards for each level of the laboratory system to ensure laboratory safety, consistency of performance and accuracy of test results. A flexible step-wise “accreditation” approach needs to be adopted for laboratories to meet the required standards.

Currently, not all countries in the region have capacity to perform all tests for emerging disease surveillance and response. Supporting the networking of national and regional reference laboratories for testing/referencing known and unknown pathogens is therefore essential. The technical working group and national focal point would play a central role in establishing or strengthening linkages between national and subnational laboratory networks, national laboratories with regional reference laboratories.

2.3.7.1 External quality assurance

External quality assurance (EQA) is defined as a system for objectively checking the laboratory performance using an external agency or facility. Participants were asked to discuss the EQA methods or processes commonly used, including:

1. proficiency testing – external provider sends unknown samples for testing to a set of laboratories, and the results of all laboratories are analysed, compared and reported to the laboratories;

2. rechecking or retesting – slides that have been read are retested, allowing for interlaboratory comparison; and

3. on-site evaluation – usually done when it is difficult to conduct traditional proficiency testing or to use the rechecking/retesting methods.

Participants noted that the regional referral system for reference and diagnosis of emerging pathogens (e.g. measles, rubella, and influenza) has been established within the ASEAN Plus Three Partnership Laboratories, and that the network coordinates the regional laboratory quality assurance scheme. It was suggested that countries in the region should establish
relationships with different laboratories for sample and laboratory data exchange in order to compare testing results for which no proficiency testing is available. It was also noted that regional technical assistance is required for establishing national EQA systems for priority diseases/pathogens and for developing a referral system. Regional referral systems for testing unknown pathogens need to be established, and reference laboratories need to be identified. Regional assistance is required for capacity-building and training of national laboratory staff and sharing information on antimicrobial resistance.

Thailand has developed national quality standards based on ISO 15189. Each country needs to develop a laboratory quality system and national standards based on international standards. There should be a policy in place for laboratory quality, a quality committee, standards and capacity-building training.

National public health reference laboratories usually provide standard reagents for public health laboratories and PT for quality assurance programmes. They also establish testing requirements: tests that need to be done at each level should be outlined in the policy and strategy.

2.3.7.2 Biosafety

Participants highlighted the importance of strengthening laboratory biosafety at all levels of the public health laboratory network by strengthening the national laboratory biosafety programme and developing biosafety standards.

When asked what technical activities could be done in their country to ensure a network, the participants suggested establishing a national body or authority, a system for diagnostics and a referral system for specimens.

2.3.7.3 Regional-level activity

There was discussion about the ASEAN Plus Three Partnerships Laboratories’ EQA programme for emerging pathogens (e.g. measles, rubella, influenza). Participants expressed concern about this programme’s shipment referral system.

There was discussion among the participants that technical assistance should be provided by the Region to develop national external quality assurance systems (EQAS) for specific disease/pathogens, to facilitate on-site training to improve diagnostic skills, to conduct laboratory capacity assessments, to improve technical expertise sharing and to set up a specimen referral system. Participants also discussed antimicrobial resistance and acknowledged that reference laboratories in Japan, the Philippines and Singapore have developed antimicrobial surveillance systems (Japan posts antimicrobial resistance data on its website). Other countries expressed a need for sharing of expertise in this area.

2.3.7.4 Selected country examples

In the Republic of Korea, the Korea Centers for Disease Control and Prevention (KCDC) is responsible for infectious disease surveillance and functions as the National Reference Laboratory to monitor predominant infectious diseases. KCDC coordinates more than 281 public health laboratories in 16 provinces. KCDC has developed a national biosafety training programme. A web-based training programme on biosafety management is available for laboratory staff, scientists and students.
Malaysia’s Ministry of Health has established a national steering committee and technical working group for public health laboratories. Terms of references have been developed, and a laboratory strategic plan exists. The national steering committee coordinates and oversees the strategic plan, and the technical working group is responsible for its implementation.

China has legislated biosafety standards and has developed guidelines and protocols on biosafety management. Biosafety training has been provided for laboratory staff.

Cambodia has developed a checklist for its quality assurance programme using a “five star” system for the evaluation of quality improvement in laboratories. Cambodia does not have an accreditation system yet.

2.4 Summary of day one and two

Dr Christopher Oxenford, Laboratory Quality and Management Strengthening, WHO Lyon Office

Dr Chris Oxenford summarized the preceding two days of the meeting. He reiterated that the aim of the meeting was to determine how to set about implementing the five-year workplan that was developed in May 2011.

He brought attention to the vision of the workplan, which was for the Region to have the capacity to detect both known and unknown pathogens early so that an appropriate response may be put in place in a timely manner.

He then focused on the linchpin of the public health laboratory system, which is the public health diagnostic laboratory. Member States will need to determine which laboratories at the different administrative levels will be selected for capacity-building, which tests will be undertaken at which laboratory, and how the referral system will be organized.

He noted that the group work discussions were fruitful and should lead to some concrete recommendations for the next steps.

2.5 Summary of day three

Joint Animal Health and Public Health Laboratory Assembly. Four working groups each discussed one of the following topics: (1) laboratory biosafety; (2) standard assays and reagents for priority zoonoses; (3) guidelines for joint laboratory investigation; and (4) information sharing.

2.5.1 Laboratory biosafety

Participants from China, the Lao People's Democratic Republic and Mongolia

Participants indicated that laboratory biosafety in the human health and animal health sectors remains a challenge. There is a lack of technical support and policy for laboratory biosafety. In general, there is a need to build capacity, such as by providing training and continuing education for maintenance, monitoring and evaluation of biosafety equipment and facilities. This includes improving calibration and certification of biosafety cabinets.
2.5.2 Standard assays and reagents for priority zoonoses

Participants from Brunei, Cambodia, Philippines and Viet Nam

Participants discussed the range of standard assays, protocols and EQA programmes for human health and animal health disease diagnosis of avian influenza, rabies, brucellosis, leptospirosis and (bovine) tuberculosis. Three major challenges were identified:

1. Financial. Lack of budget for laboratory equipment and reagents;
2. Regulatory. Lack of policy and standards; and
3. Lack of supplies. Some laboratory supplies may not be available locally.

Participants shared their experiences with sharing of reference reagents. In general, the animal health laboratories share reference materials within the country and across the region but not between the animal health and public health laboratories, except for in Brunei. The need to establish a formal mechanism of collaboration among public health and animal health, including wildlife health, within Member States was emphasized.

2.5.3 Guidelines for joint laboratory investigations

Participants from Myanmar, Singapore, Republic of Korea and Thailand

The participants discussed and identified major barriers to joint investigations between animal and human health. These included: Differences in testing protocols between human and animal samples; coordinating mechanism are only put in place during crises; unclear who to contact in the other sector during a crisis; and imbalance of human resources in animal health and human health.

Despite these barriers, the past crises have led to improved communications and work relationships between public health and animal health agencies. There was agreement among participants to advocate for a national policy to support a One Health platform to sustain such collaboration during “peace time”.

2.5.4 Information sharing

Participants from Indonesia, Japan and Malaysia

Member States have different mechanisms in place to share information, ranging from informal information sharing through professional associations to information sharing between the different ministries. Improving communication between ministries is encouraged.

2.6 Closing

Dr Chin-Kei Lee, Team Leader, Emerging Disease Surveillance and Response, WHO Regional Office for the Western Pacific

Dr Lee in his closing remarks thanked the participants and the chairpersons for their valuable contributions during the meeting. He was confident that the laboratory workplan has already begun to make progress and stressed that the momentum should not be lost. WHO and ASEAN are long-standing partners that will implement the workplan together. He said he looked forward not only to the next meeting to hear progress reports, but also to the time in between meetings when WHO would provide technical assistance as agreed in the recommendations.
3. CONCLUSIONS AND RECOMMENDATIONS OF DAYS ONE AND TWO

3.1 Conclusions

Led by Dr Chin-Kei Lee, the participants and secretariat agreed on the following meeting conclusions:

(1) An integrated public health laboratory system comprising laboratories at the subnational, national and regional levels is key to early detection and response to public health threats and will serve to fulfil obligations of Member States and WHO under the International Health Regulations (2005), thereby ensuring national and regional health security.

(2) The integrated public health laboratory system should contain capacity at the national and regional levels for screening of pathogens utilizing a syndromic approach to laboratory diagnosis, which will signal and facilitate the identification of new pathogens.

(3) There is a need for a regional coordinating body to facilitate the reference and external quality assurance functions.

3.2 Recommendations

3.2.1 National level

(1) Advocate to policy-makers through a technical working group the roles and potential benefits of an integrated public health laboratory system.

(2) Begin to take steps to establish/enhance the public health diagnostic laboratory system through the technical working group. These steps include:

(a) determining capacity of laboratories at the national level and developing terms of reference for those at the subnational level;

(b) developing a national laboratory plan that will lay out the specific function of the public health diagnostic laboratory system as well as other laboratories that are not part of the public health laboratory system;

(c) identifying a national laboratory contact point (person or office) that will be responsible for coordination and management of the system;

(d) establishing a national steering/advisory committee to oversee the implementation of the national laboratory plan;

(e) establishing technical working groups to implement priority components of the national plan;

(f) determining how to organize quality assurance within the country;

(g) identifying activities to ensure safe diagnosis (biosafety); and

(h) determining how the system would fit in an indicator-based surveillance system.
(3) Develop a national five-year implementation plan for public health diagnostic laboratories and report on progress at annual regional laboratory meetings.

3.2.2 Regional level

(1) Continue to advocate for building capacity for alert and response in a sustainable way.

(2) Coordinate the determination of training needs across the region.

(3) Facilitate a regional mechanism for organizing external quality assurance for specific priority diseases and also provide support for developing national quality assurance systems.

(4) Assist Member States to develop laboratory surveillance for antimicrobial resistance.

(5) Facilitate a regional mechanism to coordinate the reference and research functions.

(6) Organize annual meetings of laboratory personnel to review progress in implementing the workplan and to update and share experiences and lessons learnt.
PROGRAMME OF ACTIVITIES

Day 1 – 19 October (Wednesday)

07:45 – 08:30  Registration

08:30 – 09:45  Opening session

Opening remarks

- Dr Corinne Capuano  
  WHO Representative in Malaysia, Brunei Darussalam and Singapore

- Food and Agriculture Organization of the United Nations (FAO)

- World Organisation for Animal Health (OIE)

- Association of Southeast Asian Nations (ASEAN)

- Director-General of Health, Malaysia

Group photo

09:45 – 10:15  Coffee break

10:15 – 12:00  Keynote lecture:  How to control avian and human pandemic influenza?  
  - Professor Hiroshi Kida, Director, Research Center for Zoonosis Control  
    Hokkaido University Research Centre for Zoonosis Control, Sapporo

Questions and Answers

Background

FAO Approach to Laboratory Strengthening

- Dr Mia Kim, Animal Production and Health Division  
  Food and Agriculture Organization (FAO)

Laboratory Strengthening under OIE PVS pathway

- Dr Ronello Abila, Sub-Regional Representative  
  World Organisation for Animal Health (OIE)

Asia Pacific Strategy for Emerging Diseases

- Dr Takeshi Kasai, Director, Health Security and Emergencies  
  WHO/WPRO

Security briefing

12:00 – 13:00  Lunch break
13:00 – 15:00  **Session One: Setting the scene**

Objectives and agenda

Laboratory capacity-building under ASEAN and APSED – outcome of the Informal Consultation, May 2011, APSED TAG and SOMHD, July 2011

*Dr Ferdinal Fernando, Assistant Director, Health and Communicable Disease Division, ASEAN Secretariat*

Strengthening public health laboratories for alert and response

*Dr Shalini Pooransingh, WHO Consultant, Public Health*

**Session Two: National Plan – structural elements**

Indicator-based surveillance and laboratories

*Dr Chin Kei Lee, Team Leader, Emerging Disease Surveillance and Response, WHO/WPRO*

Influenza Surveillance

*Dr Jeffrey Partridge, Epidemiologist, Emerging Disease Surveillance and Response, WHO/WPRO*

Singapore's Surveillance System

Syndromic approach – detecting unknown pathogens

*Malaysia*

Laboratory Strengthening in the Lao People's Democratic Republic

Questions and answers

Introduction to group work 1

15:00 – 15:30  **Coffee break**

15:30 – 17:00  Group work

18:00  **Welcome reception**

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**Day 2 – 20 October (Thursday)**

08:30 – 10:00  Summary of Day 1

Group work 1 feedback

10:00 – 10:30  **Coffee break**
10:30 – 12:00  **Session Three: Networks – in-country and regional**

- Public health laboratory surge capacity during H1N1 in Japan
- Detecting unknown pathogens – China's laboratory network
- **Biosafety**
  - *Professor Chua Kaw Bing, Principal Investigator*
  - *National University of Singapore*

- **Influenza Networks**
  - *Dr Jeffrey Partridge, Epidemiologist, Emerging Disease Surveillance and Response, WHO/WPRO*

**Questions and Answers**

12:00 – 13:00  *Lunch break*

13:00 – 15:00  Panel discussion on quality management

- Introduction to Group work 2
- **Group Work 2**

15:00 – 15:30  *Coffee break*

15:30 – 17:00  Group Work 2 feedback

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**Day 3 – 21 October (Friday)**

09:00 – 10:00  **Session Four: Next steps**

- Implementation plan
- Activities for the next year
- Closing session

10:00 – 10:30  *Coffee break*
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