Securing Our Region’s Health

Asia Pacific Strategy for Emerging Diseases

World Health Organization
South-East Asia Region Western Pacific Region
Securing Our Region’s Health

Asia Pacific Strategy for Emerging Diseases
Acknowledgements

We would like to congratulate WHO Member States for the enormous progress made over the last five years and acknowledge their collective effort towards securing the health of the Asia Pacific region. We would also like to thank the many organizations, partners, technical experts and others who have supported implementation of the Asia Pacific Strategy for Emerging Diseases. A list of the members of the Asia Pacific Technical Advisory Group for Emerging Infectious Diseases and our main partners can be found on page 91.

This book was prepared by WHO Regional Offices for South-East Asia and the Western Pacific, with support from WHO Country Offices and Member States. The editorial team included Dr Takeshi Kasai, Dr Chusak Prasittisuk, Dr Khanchit Limpakarnjanarat, Dr Ailan Li, Dr Shalini Pooransingh, Wayne Antkowiak, Rhiannon Cook, Marc Lerner and Floyd Whaley. It was produced under the leadership of Dato’ Dr Tee Ah Sian and Dr Jai P. Narain. Design and photography were coordinated by Hamdorf Photography and Design, under the direction of Kevin Ronald Hamdorf and Roselyn Tuazon-Castillo.

The collaborative input and valuable contributions of the following people are also gratefully acknowledged: Dr Nima Asgari, Dr Rajesh Bhatia, Dr Richard Brown, Amy Cawthorne, Peter Cordingley, Adam Craig, Dr Maria Nerissa Dominguez, Emma Field, Dr Gyanendra Gongal, Jan-Erik Larsen, Vismita Gupta-Smith, Qiu Yi Khut, Dr Jacob Kool, Dr Chin-kei Lee, Dr Dapeng Luo, Dr Bee Lee Ong, Noel Orosco, Dr Satoko Otsu, Dr Christopher Oxenford, Dr Augusto Pinto, Charles Raby, Dr R.M. Rastogi, Alexander Rosewell, Dr Charuni Senanayake, Dr Harpal Singh, Dr Nicole Smith, Dr Reiko Tsuyuoka, Dr Suzanne Westman, Cathy Williams, Dr Ayana Yeneabet, Dr Weigong Zhou and Wenqing Yeo.
Message from the Regional Directors

Protecting the health and lives of people against the threat of infectious diseases is an ongoing challenge. In 2005, two regions of the World Health Organization, the South-East Asia Region and the Western Pacific Region, joined forces in a new initiative to confront these challenges. The resulting *Asia Pacific Strategy for Emerging Diseases* (APSED) has guided countries and areas in strengthening their capacity to prevent, detect and respond to infectious diseases, and in ensuring they are well prepared in the event of a newly emerging threat.

At both the country level and regional level there has been enormous progress over the past five years. Almost all Member States now have national systems in place to detect as early as possible outbreaks of potentially life-threatening diseases. The majority of Member States have the capacity to detect influenza viruses, thereby providing an early warning of unusual strains. There is greater networking among laboratories and more effective collaboration between hospitals and public health authorities. Animal and human health sectors are working more closely than ever before to prevent and respond to zoonotic disease outbreaks.

In the Asia Pacific region, we now have a strong network of individuals and organizations ready to provide expert support during outbreaks. Meanwhile, training programmes are ensuring that successive generations of health care workers and officials are skilled in investigating and managing disease outbreaks and other public health emergencies.

Thus, there is much to be proud of. This book documents some of the activities and achievements since APSED’s inception in September 2005.

While WHO and its Member States should be proud of the achievements, we cannot become complacent. As our world continues to change, with enormous growth in international trade and travel, more densely populated cities, and an increasingly volatile climate, so too does the way in which emerging diseases threaten our health, as well as social and economic security.

We cannot guard against these threats without both strong national systems for surveillance and response and international cooperation.

The *International Health Regulations (2005)* provide a framework for collective efforts, calling on all Member States to build, strengthen and maintain core capacities for disease surveillance and response. Under APSED, countries and areas in Asia and the Pacific have made steady progress towards fulfilling these requirements.

In drawing together a wide range of partners, including Member States, donors, multilateral organizations and small community-based programmes, the *Asia Pacific Strategy for Emerging Diseases* has turned the size and diversity of the region into one of its greatest strengths.

As we cooperate in small- and large-scale activities to broaden our understanding of infectious diseases and to design and implement more effective public health systems, we are working towards a common goal: to protect the health of all our people. Let us recognize the achievements of APSED while we continue that work.
Dr Shin Young-soo
WHO Regional Director for the Western Pacific

Dr Samlee Plianbangchang
WHO Regional Director for South-East Asia

Photo provided by SEARO and WPRO
# Table of Contents

Chapter 1

Putting It to the Test: Responding to Pandemic (H1N1) 2009 ................................................................. 1

Chapter 2

A Collective Effort: Asia Pacific Strategy for Emerging Diseases ................................................................. 9

Chapter 3

Keys to Early Action: Surveillance and Response .......................................................................................... 15

Chapter 4

Building Strong Laboratories: Improving Laboratory Capacity Across the Asia Pacific Region ................. 29

Chapter 5

Reducing the Risk: Infection Prevention and Control in Health Care and Beyond .................................. 39
<table>
<thead>
<tr>
<th>Chapter 6</th>
<th>Bridging the Gap: A Collaborative Approach to Zoonotic Diseases .................................................................</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 7</td>
<td>Communicating in a Crisis: Managing Risk, Uncertainty and Reputation ................................................................</td>
<td>61</td>
</tr>
<tr>
<td>Chapter 8</td>
<td>Working Together: A United Effort to Secure our Region's Health ......................................................................</td>
<td>69</td>
</tr>
<tr>
<td>Chapter 9</td>
<td>APSED’s Legal Framework: Committing to the International Health Regulations (2005) ........................................</td>
<td>79</td>
</tr>
<tr>
<td>Chapter 10</td>
<td>Towards Health Security: Sustaining the Momentum ............................................................................................</td>
<td>85</td>
</tr>
</tbody>
</table>
Chapter 1  **Putting It to the Test**

**Responding to Pandemic (H1N1) 2009**

Rapid response teams across the Asia Pacific region are now well equipped to respond to reports of unusual incidents that could signal an emerging disease.
In March 2009, surveillance systems in Mexico City began picking up cases of influenza-like illness. Appearing well past traditional flu season, the illness prompted an unexpected increase in the number of people complaining of high fevers, intense headaches, coughing with heavy phlegm, nausea and vomiting.

The number of cases continued to rise, with outbreaks of respiratory illness and increased reports of influenza-like illness (ILI) in several areas of the country. In April, the Government of Mexico notified the World Health Organization (WHO) of an outbreak of influenza-like illness in a small community in the state of Veracruz.

Soon after, clinicians treating a hospitalized patient with atypical severe pneumonia grew concerned about the unusual nature of the case. After five days of treatment, the patient died and surveillance was enhanced. Like many cases, the patient was previously a healthy young adult.

Meanwhile, laboratory analysis of two cases in the state of California in the United States of America identified a virus containing genetic segments from swine influenza viruses from Asia, Europe and North America, avian influenza viruses from North America, and human influenza viruses—a combination that had not been recognized previously.

On 23 April, officials confirmed that the same virus was present in Mexico. Two days later, on 25 April, WHO declared the first-ever Public Health Emergency of International Concern under the International Health Regulations, or IHR (2005). At that point, 62 deaths had been reported.

That same day, a group of students and teachers returning from a school trip to Mexico landed in New Zealand, bringing the virus to the Asia Pacific region.

**APSED: Prepare, Prevent, Protect**

In the years following the 2003 outbreak of severe acute respiratory syndrome (SARS), Member States of the World Health Organization South-East Asia Region and Western Pacific Region had been working together to prepare for such outbreaks. The framework for this collective effort is the *Asia Pacific Strategy for Emerging Diseases* (APSED).

Developed to confront the threat of emerging infectious diseases, APSED provides a common framework to accommodate three main areas of work: capacity-building for emerging infectious diseases in general; meeting the minimum core capacity requirements of the International Health Regulations (2005); and pandemic preparedness.

With the announcement of a virus that presented pandemic potential, APSED’s first major test began. WHO’s South-East Asia and Western Pacific Regional Offices swung into action—establishing emergency management teams and supporting Member States to fast-track preparation.

Under the auspices of APSED, Member States had been systematically building capacity in five key areas: surveillance
and response; laboratories; infection control; zoonoses; and risk communications. With a pandemic now imminent, a rapid gap analysis was conducted to identify urgent needs. A Framework for Action highlighting immediate priorities was quickly developed. This framework clearly conveyed the core components of an effective response system and became a simple tool to guide close coordination and communication.

As the pandemic continued to spread, WHO distributed medicine and equipment to countries across the region. Meanwhile, Member States ramped up measures to detect cases of the virus and slow the spread.

In Hong Kong (China), the first confirmed case of the virus on 1 May 2009 prompted the Government to cordon off the hotel in which the infected person was staying.

In Thailand, two teenagers who had recently returned from Mexico were the country's first confirmed cases on 12 May. Eighteen passengers on the same flight who sat close to the teenagers were contacted and given precautionary treatment.

The number of countries identifying cases continued to grow. As countries activated the communication structures set up in accordance with IHR (2005), WHO was quickly informed of any new cases. At the regional level, daily situation updates were prepared. A record level of information sharing between WHO and its Member States made close monitoring of the virus possible as it continued to spread across the world.

With huge gains in laboratory capacity under APSED, national influenza centres in most Member States in the region could provide laboratory confirmation of cases in country. Where this was not possible, mechanisms for shipping and testing specimens at external laboratories had been established.

On 11 June, WHO raised the level of alert to Phase 6. Characterized by community-level outbreaks in at least two different WHO regions, Phase 6 indicated that a pandemic was officially under way.

Authorities in Member States across the region continued to implement public health interventions—from quarantining suspect cases to promoting the use of masks in the community. With the need to balance the effectiveness of an intervention against potential cost, WHO issued guidance to assist health authorities in making often difficult decisions, based on practical risk assessments.

The websites for the WHO South-East Asia and Western Pacific Regions became one-stop shops with daily updates and information for health professionals, the media and the public.

As the virus continued to spread, WHO provided support as Member States began moving from containment strategies—where
Rapid response teams played a vital role in conducting field investigations during pandemic (H1N1) 2009. Continuous training for these teams is needed, including infection prevention and control practice.
surveillance systems focused on identifying all cases—to a transition phase—where event-based surveillance became increasingly important in detecting clusters of cases.

Under APSED, Member States across the Asia Pacific region had worked to formalize surveillance systems that rely on reports from any number of sources, including health care workers, the media and dedicated hotlines. This approach is called event-based surveillance. APSED calls for close links between this and more traditional indicator-based surveillance reported through regular channels.

Rapid response teams played a vital role in conducting field investigations of initial reported cases. Later, case clusters and other reports triggered investigations and interventions ranging from the distribution of antiviral medicines to school closures.

As widespread community transmission was confirmed, Member States began announcing the move to mitigation, shifting efforts to focus on high-risk groups. Detailed data collected during early surveillance helped identify these groups at a very early stage.

Those at higher risk of more severe illness associated with infection—including children under 5, pregnant women, and people with chronic health conditions or suppressed immune systems—were encouraged to seek treatment early. The identification of high-risk groups was also important in guiding clinical treatment and ensured that resources were used most effectively.

Following the spread of SARS in health care systems six years earlier, significant efforts had been made to improve infection-
With huge gains in laboratory capacity under the Asia Pacific Strategy for Emerging Diseases, national influenza centres in most WHO Member States in the region can now provide laboratory confirmation of cases in-country. This was vital during pandemic (H1N1) 2009.

control practices. Many health care facilities had established systems for triaging and isolation, and awareness of the need for stringent precautionary measures was high. National authorities worked to develop specific guidelines based on those provided by WHO, and these quickly translated into action.

Although it soon became clear that the virus was less severe than many initially feared, the speed at which the disease spread meant that many Member States experienced a steep spike in the number of cases—with some hospitals cancelling elective surgery or making other arrangements to cope with the surge of patients.

Laboratories also began struggling to keep up with demand. On 8 July 2009, WHO recommended that countries hardest hit by the pandemic shift from testing individual cases to focusing on broader data collection about the disease.

Despite findings that most people who contracted the virus would experience only mild illness, authorities were advised to remain vigilant. Influenza viruses are unpredictable. Monitoring for changes or drug resistance is essential. Strengthened national influenza centres played a vital role in monitoring the situation nationally, and in contributing to WHO’s Global Influenza Surveillance Network.

Pandemic (H1N1) 2009 received unprecedented media attention. As the event unfolded, it was in newspapers and on radio and television broadcasts around the world. At the same time, the Internet—and the proliferation of social networking sites—meant that people could access, or were exposed to, more information than ever before. Much of this information fuelled anxiety and panic, potentially leading to inappropriate or ineffective actions.
Through APSED implementation, many health authorities were prepared to deliver strong and consistent messages to the public. Risk communications had been integrated into pandemic plans—which had been tested and strengthened during outbreaks of avian influenza across the region. Many countries had invested in building the systems and skills needed to develop effective messages and in strengthening ties with the media. Where needed, WHO provided guidance and support in media relations and assisted countries to disseminate messages aimed at encouraging positive behavioural changes.

The Way Forward

Pandemic influenza preparedness and the regional response to pandemic (H1N1) 2009 demonstrated the gains of long-term capacity-building efforts. It put plans into action and systems to the test. Efforts at capacity-building under APSED translated into stronger surveillance systems, better coordinated laboratory efforts, more rigorous infection-control practices and more effective risk communications.

Despite these gains, we should not become complacent. In 2009, we were lucky. By some measures, pandemic (H1N1) 2009 was relatively mild. Yet in many countries—including developing countries—health care facilities and laboratories were stretched to the limit during an early, intense wave of cases. Ongoing efforts are needed to prepare for such surges.

The pandemic provided a lesson in preparing for the unexpected. Many plans had been drawn in anticipation that avian influenza—a much more deadly virus—would one day mutate into something with pandemic potential. While this threat is still very real, pandemic (H1N1) 2009 showed that other scenarios are also possible. Adaptability and flexibility are essential.

The critical importance of communication was also confirmed. When so much is uncertain and so much is changing, this continues to be a challenge.

With ongoing implementation of the Asia Pacific Strategy for Emerging Diseases, the region is becoming better prepared to respond to all acute threats to public health. The events of 2009 provide important insight into developing, improving and refining the systems that are securing our region’s health.
Lessons learnt during the severe acute respiratory syndrome (SARS) crisis in 2003 gave rise to improved infection-control procedures during pandemic (H1N1) 2009.
Chapter 2  A Collective Effort

Asia Pacific Strategy for Emerging Diseases

Through the sharing of information, resources and skills, APSED is helping to build a strong, ongoing defence against emerging diseases.
While outbreaks of diseases such as dengue, cholera, typhoid and leptospirosis continued to devastate communities in the developing world throughout the late 20th century, many developed countries became cautiously optimistic that they had largely beaten infectious diseases.

But the emergence of new diseases, such as SARS, Nipah virus, avian influenza and more recently pandemic (H1N1) 2009, proved otherwise. These outbreaks—spreading quickly through both developed and developing countries—were stark reminders of the world’s vulnerability to infectious diseases. The Asia Pacific region has been the epicentre of many of these outbreaks.

Encompassing two WHO regions—South-East Asia and the Western Pacific—the Asia Pacific region is home to approximately 3.4 billion people—more than 53% of the world’s population. It is one of the most economically, socially and geographically diverse areas of the world, including developed countries such as Australia, Japan, New Zealand and the Republic of Korea; fast-growing economies such as China, India and Thailand; and some of the world’s least developed countries.

While Member States such as China and India have populations of more than 1 billion, others, including many Pacific island countries, have populations of less than 20,000. With its dense, crowded cities and a predominantly tropical climate, the Asia Pacific region is particularly vulnerable to emerging diseases.

Asia Pacific at the Epicentre of Many Diseases

The 2003 outbreak of SARS was severe and highly contagious. Less than two months after the outbreak was first identified, almost 4000 cases had been reported from 25 countries on five continents.

Although SARS was eventually contained, 812 people lost their lives to the disease, and the economic impact in East Asia alone was estimated at US$ 18 billion. But the devastation could have been far worse. SARS clearly showed that public health infrastructure and systems needed strengthening.

Soon after SARS, another health threat surfaced. Between December 2003 and early February 2004, eight Asian nations reported poultry outbreaks of what is now termed highly pathogenic avian influenza (HPAI). In an attempt to control this disease, huge numbers of domestic birds were culled—with enormous economic and social consequences that were felt the hardest by those in poorer, rural communities.

Despite efforts to control HPAI, the disease is now considered endemic in avian flocks in parts of Asia. Significant economic losses are incurred each year in attempts to control the disease. As of 6 May 2010, at least 294 people have died after contracting the disease. While at this stage HPAI does not appear to be easily
transmitted from birds to humans, there is ongoing concern that the virus could change into a form that is highly transmissible, potentially triggering another pandemic.

The emergence of SARS and avian influenza led to growing recognition that all countries needed to do more to protect their citizens from emerging diseases. Globally, the public and private sectors began investing in activities to combat avian influenza and prepare for a potential pandemic.

Although SARS and avian influenza are two of the most widely publicized emerging diseases, they are not the only two. The threat of new diseases is ongoing, with an average of one new disease discovered each year. And in the Asia Pacific region, at least one disease outbreak is detected every second day.

With the need to confront both new and established infectious diseases firmly on the international agenda, the biregional Asia Pacific Strategy for Emerging Diseases (APSED) was born.

**Asia Pacific Strategy for Emerging Diseases**

*Asia Pacific Strategy for Emerging Diseases* answers the call for a collective defence system against the threat of emerging disease. Vulnerability in any country exposes the whole world to risk: APSED is working to improve health security nationally, regionally and globally.
Endorsed by WHO Member States in South-East Asia and the Western Pacific in September 2005, the Asia Pacific Strategy for Emerging Diseases has streamlined efforts towards a common purpose: strengthening core public health capacity for detecting and responding to emerging infectious diseases.

APSED outlines an approach to all emerging infectious diseases—from cholera, dengue and leptospirosis to the ever-present threat of pandemic influenza.

It encompasses three main areas of work. As well as supporting capacity-building for emerging infectious diseases in general, APSED guides Member States towards fulfilling requirements of the International Health Regulations (2005)—a legal instrument that aims to help the international community prevent and respond to acute public health risks—and incorporates pandemic preparedness.

With a larger and increasingly mobile population, the world has seen that a new pandemic could emerge at any time from any geographic location. WHO has advocated an approach to pandemic preparedness focusing on two components: supporting Member States in developing, testing and revising influenza pandemic plans; and increasing readiness. The readiness component of this two-tiered approach is incorporated into APSED’s broad activities of core capacity-building.

The International Health Regulations (2005) define the rights and obligations of countries to report public health events, and outline the requirements of countries to strengthen their existing capacities for public health surveillance and response. In the Asia Pacific
region, Member States are working towards fulfilling the core capacity requirements of IHR (2005) through the implementation of APSED.

In providing a streamlined approach to addressing the threat of emerging diseases, APSED has given Member States a powerful tool to coordinate donor funding and to align previously disjointed programme activities towards systematically building strong public health systems. In directing resources into an integrated capacity-building approach, the APSED framework avoids duplication and ensures that investments in disease control will leave a lasting legacy.

**APSED’s Goals, Objectives and Components**

APSED works to improve health protection in the Asia Pacific region by developing productive partnerships for preparedness. It also contributes to the prevention, detection, containment and control of emerging infectious diseases.

The *Asia Pacific Strategy for Emerging Diseases* identified five interrelated objectives that will contribute to securing the health of our region: working to ensure the region is well prepared for potential outbreaks; reducing the risk of emerging diseases; building surveillance systems that can detect outbreaks early; strengthening response systems; and building sustainable partnerships to support effective capacity-building efforts.
APSED
Minimizing the health, economic and social impact of emerging diseases in the Asia Pacific region

Surveillance and response
- Event-based
- Indicator-based
- Response

Laboratory
- Accurate diagnosis
- Biosafety
- Laboratory support of surveillance
- Laboratory networking

Risk communication
- One coordination mechanism for:
  - Risk reduction
  - Information sharing
  - Coordinated response
  - Research

Infection prevention and control
- National structure
- Policy and Guidelines
- Education and Training
- Equipment and Supplies

Produced by Mark Blackwell
Strengthened surveillance systems are providing early warning of unusual disease events.
In a world where a virus can travel from one side of the world to the other in a little more than 13 hours, rapid detection and response are essential weapons in the fight against emerging diseases.

Early warning of a potential disease outbreak gives authorities time to prepare, to mobilize resources and to put in place control measures to limit the spread of an infectious disease.

As well as heading off potential outbreaks, strong surveillance systems can have a widespread impact on the health of a society. Monitoring trends in diseases enables officials to make informed decisions about how to best protect their populations. An increase in cases of dengue over time, for example, might highlight the need for more control measures.

APSED provides a framework for systematically developing surveillance and response systems, strengthening national capacities to protect the health and well-being of societies. Through APSED, Member States in the Asia Pacific region have been supported to build effective surveillance and response systems with three interlinked components: indicator-based surveillance; event-based surveillance; and response.

**Event and Disease Surveillance**

A community worker might be the first to notice that several people in a village have been complaining of headaches and fevers. A teacher may observe that a growing number of children are staying home sick each day. A doctor might see several patients with unusual symptoms, or a journalist might report on unexplained chicken deaths in several commercial farms.

All these people could potentially contribute to the early detection of a disease outbreak. But while observations such as these are made every day, they are often overlooked.

APSED has promoted the establishment of surveillance systems that tap into these rich sources of information—involving sectors of the community such as midwives, traditional healers, the media, schools, village leaders and nongovernmental organizations—in the systematic collection of rumours of potential health threats. Known as event-based surveillance, these systems capture information on public health threats through formal and informal channels, with reports of unusual events prompting assessment and response.

Event-based surveillance complements more traditional indicator-based surveillance systems, which involve the routine capture of defined data on diseases or syndromes through official channels. When a patient meets the case definition of a notifiable disease, the information is recorded and collated at the central level. When the number of cases reaches a predetermined threshold, alerts are automatically triggered.

While indicator-based surveillance systems are essential for gathering and analysing information about known diseases, they can miss the rare or unknown diseases that may be the greatest threats. SARS was a classic example.

Event-based systems, on the other hand, can be highly sensitive. As well as providing early warning of new or unusual diseases,
In mid-February 2010, Amphai Khamsing was scanning the computerized reports of notifiable diseases in provinces of the Lao People’s Democratic Republic and saw an orange indicator on the text. The orange color was an alert that the number of cases was higher than usual.

A staff member at the country’s National Centre for Laboratory and Epidemiology, Amphai took a closer look and found a spike in diarrhoea cases in one district in Borikhamxay Province between 7 and 13 February. She verified the information by phone with provincial health officials and then notified her supervisor.
In consultation with local officials, a rapid response team was sent to the area to collect detailed information. The team’s investigation quickly revealed that the water was contaminated with a dangerous form of *E. coli* (*Enterotoxigenic E. coli*). Villagers were alerted so that further illnesses could be avoided, while provincial and national authorities were notified that the problem was local and not an emerging disease with broader implications.

The Borikhamxay diarrhoea outbreak is an illustration of the early warning and response network now in place in the Lao People’s Democratic Republic.

The alert system tracks 19 notifiable diseases nationwide on a computerized database that flows from health facilities to district health offices to national health officials who can spot broad trends by comparing current data to historical data. It replaces a paper-based system that relied on the submission of weekly reports, and phone calls if a local official suspected an outbreak.

Under the new system, orange indicators highlight unusual events detected by the software. This helps technical staff, who must review a large amount of data weekly, to spot incidents that need further investigation.

In nearby Cambodia, a similar system is in place, with a sophisticated provincial alert system that uses mobile phone technology in areas where there is no Internet connection.

A mobile phone-compatible checklist is installed on the phones at local health offices to guide staff through the information they need to provide to provincial and national officials of disease occurrences in their area.

Cambodia and the Lao People’s Democratic are also equipped with national information hotlines that are operated 24 hours a day to answer questions from the public, local health officials and others about disease outbreak incidents, unusual animal deaths and other concerns which might indicate an emerging threat.

Both countries have also bolstered their laboratory capacity in order to quickly and effectively analyse samples coming from provincial outbreak reports.

Across the region, early warning and response systems are now standing guard against the next emerging disease, while at the same time serving the health needs of the people.
they can detect non-infectious disease events, such as a chemical leak, that may be affecting the health of a community. They can also pick up health issues in a much broader population, including in populations that do not access health care through traditional channels.

APSED has supported Member States to improve indicator-based surveillance systems, to establish formal event-based systems and to develop close linkages between the two.

The *Guide to Establishing Event-based Surveillance* was developed to assist Member States in this work. Recognizing that resources can be limited, it provides guidance on prioritizing investments to develop systems best suited to a country’s requirements. India, for example, through its Integrated Disease Surveillance System has established online event-based reporting of outbreak-prone diseases from peripheral health facilities. This is further supported by a public toll-free call line and 24/7 media-alert tracking of outbreak rumours. Indonesia has chosen to establish a reporting hotline, while Nepal has established an event-based system that relies primarily on media reports. Cambodia and the Philippines have also implemented event-based systems, while the Lao People’s Democratic Republic and Mongolia have run pilot programmes to inform the future establishment of sustainable national systems.

**Responding to an Outbreak**

In a remote border village, a number of chickens die unexpectedly. Several farmers are taken ill. Is there a link?

The emergence of avian influenza as a major health threat made it clear that controlling the disease required the ability to initiate rapid
China’s new web-based reporting system has reduced the time between diagnosis and reporting from five days in 2003 to 14 hours in 2009. The countrywide system uses modern technology to capture data at all levels, providing authorities with an early warning of urgent public health events.

Prompted by the 2003 SARS outbreak, China has made significant investments in strengthening its public health surveillance system. The move from a county-based monthly reporting system to the real-time web-based Chinese Information System for Disease Control and Prevention has resulted in major improvements in the country’s ability to detect, analyse, prevent and respond to communicable disease outbreaks and other public health emergencies.

At the end of 2009, the system had 68 000 users, covering Centers for Disease Control and Prevention (CDCs) at every level; 97.79% of county-level (or above) hospitals; and 83.77% of township-level clinics.

The system captures information on 39 notifiable diseases, but is also flexible, as shown by the addition of hand, foot and mouth disease in 2008 and pandemic (H1N1) 2009.

Data collected through the system can be analysed at both the local and national level, with collated reports regularly uploaded—giving hospitals and CDCs access to up-to-date information about disease trends nationally.

The system includes an automated early-warning and response function. When fixed-value and temporal detection methods identify a potential threat, automatically generated cell phone text messages are sent to duty officers responsible for epidemic intelligence at the country level.

The system has strengthened China’s overall Public Health Emergency Management and Information System (PHEMIS) established in 2004. Between 2004 and 2009, a total of 14 331 significant public health events were reported under PHEMIS.
India has established two Field Epidemiology Training Programmes (FETPs) which are conducted by the National Institute of Epidemiology (NIE) in Chennai and by the National Centre for Disease Control (NCDC) in Delhi. Both programmes have a strong component of hands-on learning, including field practice and research work.

The programmes have a combined annual enrolment capacity of 40 to 45 scholars. Since the FETP at NIE-Chennai began in 2001, a total of 68 students have successfully completed the programme, and another 33 are currently enrolled. The FETP at NCDC was launched in 2006. Since then 43 have graduated while 24 scholars are currently pursuing their studies. While most of the graduates are from India, candidates from the Democratic People's Republic of Korea, Myanmar and Nepal have also graduated.

The National Centre for Disease Control (NCDC), a WHO Collaborating Centre for Epidemiology and Training, also organizes short-term training courses. These include three-month Regional Field Epidemiology Training for medical officers, one-month Regional Training on Prevention and Control of Communicable Diseases for paramedical workers; and two-week courses on basic epidemiology for peripheral health workers.

To date, 206 medical officers from 10 Member States in WHO’s South-East Asia Region and one from Papua New Guinea in the WHO Western Pacific Region have completed the three-month course. Likewise, 157 paramedical workers from seven countries have completed the one-month training programme. NCDC has also supported the organization of two-week epidemiology training in Bhutan, Maldives and Myanmar; national and subnational short courses in epidemic and pandemic preparedness and response, outbreak investigation, and disease surveillance are also organized.

The above training programmes have promoted the networking of institutions in the region, and contributed to building the core competencies required for implementation of the International Health Regulations (2005).
responses at multiple levels—from small-scale investigations by health workers at the village level to responses involving coordination across multiple sectors and countries.

In 2006, a biregional rapid response training-of-trainers programme in Bangkok jointly organized by WHO and the United States Centers for Disease Control and Prevention acted as a catalyst for the development of rapid response teams throughout the Asia Pacific region. Central response teams were established in many Member States, and national preparedness was further strengthened through rapid containment training and table-top exercises. With the dissemination of skills and knowledge in rapid response, teams at the subnational level have since been developed and strengthened.

Many countries, including Cambodia, India, Indonesia, the Lao People’s Democratic Republic, Myanmar, Sri Lanka, Thailand and Viet Nam now have strong rapid response teams at the provincial or district level with more than 12 000 people trained in rapid response across the Asia Pacific region. Reports of unusual events—such as poultry deaths or unexplained illnesses—now trigger responses from risk assessment and testing to a wide range of control measures and protective actions.

Although the threat of avian influenza provided momentum for much of the initial investment in rapid response, APSED has translated this investment into systems and structures that can respond to all diseases and public health threats. Rapid response teams now assist in responding to outbreaks of any threatening infectious disease—from dengue to pandemic influenza, and have also been mobilized to help in the aftermath of natural disasters—such as cyclone Nargis in Myanmar.

Rapid response should be linked to viable and sustainable surveillance systems, as described in Early Warning and Response to Outbreaks and other Public Health Events: A Guide. When reports initiate a response, the response encourages more reports—a positive feedback loop that promotes widespread participation in protecting against infectious diseases.

In Singapore, an improved surveillance system has played a key role in facilitating rapid and coordinated responses as a crisis situation evolves. Called the Infectious Diseases Management and Outbreak System (IDMOS), the system enables complex and voluminous outbreak data from various sources to be automatically translated into comprehensible maps, charts and graphs for presentation to key decision-makers and health care providers. The system includes components to assist in managing response strategies such as contact tracing and quarantining. It was also used to track the prescription of antivirals by primary care doctors during pandemic (H1N1) 2009.

**Assessing the Risk**

When the pandemic (H1N1) 2009 virus emerged as a threat, pre-planned control measures kicked into action—many of which had been developed on the assumption that the next pandemic would be the highly pathogenic influenza.
We now know that by some measures, pandemic (H1N1) 2009 virus was less severe than initially feared with the wisdom of hindsight, Member States have recognized the importance of developing public health responses based on careful risk assessment. In response, WHO has developed risk assessment training for participants from government departments in both human and animal health. This training was rolled out in Malaysia and New Zealand in early 2010 and will be conducted in the South-East Asia Region later in 2010.

Although formalized risk assessment processes have been used in environmental and animal health for years, their use in public health is relatively new. By encouraging a more systematic process for organizing information and decision-making, APSED is guiding responses that are effective and appropriate while causing minimal disruption.

**Field Epidemiology Training Programmes**

While traditional two-year FETPs are well established in several Member States in the Asia Pacific region, in recognition of the unique training opportunities they present, APSED has encouraged all countries to establish similar programmes.

FETP trainees receive training in the spectrum of skills required to be a field epidemiologist and apply their skills under the supervision of experienced public health practitioners in designated full-time roles supported by their ministries of health.
Web-based Disease Surveillance in Maldives

With support from the WHO Regional Office for South-East Asia, Maldives has successfully introduced an Integrated Disease Surveillance and Data Management System (SIDAS). The system is a web-based integrated tool for data collection, maintenance, analysis and dissemination of information. The system can generate reports, charts and maps and run statistical analyses. It is flexible and can accommodate changes depending on user needs.

The system became operational in 2008 following work to customize the tool, establish connectivity and train users at various levels. Data are entered online and analysed at central and atoll levels with information on priority diseases generated on a daily basis. As well as assisting in the timely detection of disease outbreaks, the system has been used in the preparation of the annual statistical yearbook, for advocacy, in handling media queries and in the preparation of projects. Information generated from the system is also used to produce a fortnightly epidemiological report that is widely disseminated among stakeholders.

In recognition of the system’s relevance, efficiency and user-friendliness, as well as the minimal cost required to build it into the existing public health system, the Ministry of Health and Family has decided to expand the application of the tool to capture more diseases of public health importance.

The traditional two-year training programme is well established in several Member States in the Asia Pacific region. Recognizing the invaluable contribution of these unique training opportunities, APSED has encouraged all countries to establish similar programmes.

While WHO has provided guidance in the minimum requirements for such a programme, it has also worked closely with Member States to support modified programmes adapted according to the needs and resources of a particular country.

In the Western Pacific Region, both the Lao People's Democratic Republic and Mongolia have recently established one-year training programmes. In the South-East Asia Region, Member States participate in a three-month Regional Field Epidemiology Training course at the National Centre for Disease Control in Delhi (NCDC), a WHO Collaborating Centre for Epidemiology and Training. Maldives, Myanmar and Sri Lanka have all initiated short-term epidemiology courses tailored to their needs.

FETP modules have also been used to build capacity more broadly. Viet Nam, for example, runs a traditional two-year training programme for preventive medicine staff at the regional and national level, while shorter courses are conducted for staff at the provincial level.
Connecting the Systems

The broad, coordinated development of capacity to detect and respond to emerging diseases is illustrated in the work being done at the NCDC in India. In the last five years, it has greatly strengthened its institutional capacity through improved communication, data management, and laboratory and conferencing facilities.

As a result of this improved capacity, surveillance data from districts are reported online and transmitted to the NCDC. These are compiled, analysed and disseminated to surveillance officers for appropriate action. There is a 24-hour Outbreak Monitoring Unit which coordinates public health response actions, including mobilization of technical support and resources.

In addition, the Media Monitoring Unit daily tracks, compiles and disseminates alerts on rumours of outbreaks to states and districts. Where required, a central Rapid Response Team is deployed to support states and districts in investigation and control of disease outbreaks. To strengthen this effort, outbreak investigation guidelines have been prepared and distributed.

As Member States work to develop skills in public health, epidemiology and response, while directing resources towards building sensitive, reliable surveillance systems, they are better placed to serve the broad health needs of their people. They are also making a valuable contribution to making the world safer from the threat of emerging diseases.
Zika Virus Outbreak on Yap Island

In April and May 2007, physicians on Yap Island in the Federated States of Micronesia noticed a sudden and large increase in patients suffering from rashes, conjunctivitis (red eye), fever, and joint pain. Rapid tests done on three patients indicated that the illness seemed to be caused by dengue. However, the physicians had the impression that this illness was clinically different from dengue and reported the phenomenon to the local health department.

In response to this unusual event, a joint outbreak investigation was organized by the Yap State Department of Health Services and the Federated States of Micronesia Department of Health, Education and Social Affairs, with investigators from WHO, the United States Centers for Disease Control and Prevention and the Pasteur Institute of New Caledonia.

The investigation found that the unusual outbreak was caused by Zika virus.

First isolated in 1947 from a rhesus monkey in the Zika forest near Entebbe, Uganda, Zika virus is transmitted by mosquitoes. In humans it causes a mild dengue-like syndrome, with conjunctivitis and joint pain the most prominent symptoms. No outbreaks and only 14 cases of human Zika virus disease had previously been documented. Until this outbreak, no transmission of Zika virus had been reported outside of Africa and Asia.

Surveillance was enhanced, with health care providers trained to recognize Zika virus infection, obtain diagnostic samples and report cases. A household-based serological survey was conducted to define the extent of the outbreak and identify risk factors.

According to an account of the report, Zika virus Outbreak on Yap Island, published in The New England Journal of Medicine in 2009, 185 suspected human cases (including 49 confirmed cases) were identified. Although there were no deaths in this outbreak, approximately 75% of Yap’s population of approximately 6300 people were thought to have been infected.

The Zika virus outbreak in the Federated States of Micronesia was the first public health event officially notified to WHO in the Western Pacific Region under the mechanism of the International Health Regulations (2005). It was later reported that travellers from Yap had brought the illness as far away as the west coast of the United States of America.

The emergence of Zika virus as an important human pathogen on Yap in 2007 underscores the ease with which exotic pathogens can be transported between continents. It also clearly showed the important role of physicians in outbreak detection and the need for strong epidemiologic and laboratory surveillance systems to detect the spread of infectious diseases.
Rapid Response in Cambodia

In remote Sre Som Thmey village, a few hours north-east of Cambodia’s capital of Phnom Penh, Phan Makarah is a welcome sight to local residents. The village recently had a spate of chicken deaths and local health officials were concerned that it could indicate the possibility of avian influenza.

Local health officials reported the incident to a national hotline, and Phan, a technical staff member on one of Cambodia’s Rapid Response Teams, was immediately dispatched. Phan coordinated with local health officials, and brought samples from suspect cases to Phnom Penh for testing. Two days later, confirmation arrived: no avian influenza had been detected.
In years past, such a quick, clear answer would not have been possible. Since the implementation of APSED, with WHO’s support Cambodia has established 26 such teams at national, provincial and sub-provincial levels to quickly respond to reports of disease outbreaks.

The teams have received extensive outbreak and response training. Once notified of an unusual event, teams immediately initiate rapid response activities, including sample collection and transfer, reporting, and containment and community mobilization measures.

In Sre Som Thmey, a local resident acts as a village volunteer who takes charge of posting public health information posters and is key to reporting unusual incidents. The arrival of Phan, in personal protective equipment, is received calmly by the villagers, who have been informed of the purpose of the activity by local health officials and are supportive of protecting their village from a disease outbreak.
The Research Institute for Tropical Medicine is one of the top facilities in the Philippines for testing possible emerging diseases. Building laboratory capacity is a key aspect of APSED.
Laboratories with the capacity to produce accurate, reliable results are crucial in protecting against infectious diseases. As new diseases continue to emerge, detecting and characterizing these diseases, and tracing their spread, are possible only through an effective public health laboratory system.

Donor-funded initiatives often target specific aspects of laboratory work—such as diagnosing a particular disease, or transporting specimens safely. APSED presents a simple framework for building laboratory capacity, providing a structure for these often disjointed initiatives to contribute to a step-by-step approach to creating laboratory systems with the capacity to address both existing and new diseases.

APSED has supported Member States to build laboratory services that provide accurate and safe diagnoses and contribute relevant information to national and international surveillance systems. In bolstering the efficacy of laboratories and ensuring resources are used effectively, APSED has also called for the development of laboratory networks at the national level, as well as regionally and globally.

As well as presenting an approach to strengthening laboratory capacity for emerging diseases, the strengthening of capacities under APSED has contributed to a broader framework for all laboratory services. Building on existing efforts, the Asia Pacific Strategy for Strengthening Health Laboratory Services has now been finalized following extensive consultations across the regions. This strategy will support Member States to develop comprehensive, nationally coordinated laboratory services across all areas of work.

Prior to 2006, it took up to 10 days to obtain laboratory confirmation of a suspected case of avian influenza in the Lao People’s Democratic Republic. With limited capacity to perform the necessary tests in country, suspect specimens were sent to the WHO Collaborating Centre for Reference and Research in Influenza in Tokyo, Japan, for analysis. This long waiting time—also an issue in countries such as Maldives and Nepal—resulted in ambiguity around how to proceed with outbreak response and infection-control measures and provided an opportunity for community speculation, fear and rumours.

The establishment of capacity for molecular testing for influenza at the National Centre for Laboratory and Epidemiology (NCLE) in Vientiane means that a specimen can now be confirmed within 24 hours of receipt in the laboratory—adding valuable lead time to outbreak response.

NCLE is now working towards designation as a National Influenza Centre, a status conferred on a number of laboratories in the Asia Pacific region in the last five years including Bangladesh, Cambodia, Myanmar, Nepal and Viet Nam. The growing number of countries with National Influenza Centres represents a significant boost to the region’s capacity to diagnose influenza viruses accurately and consistently.
For influenza—as for many other diseases—polymerase chain reaction (PCR) is now the preferred method of testing. When performed correctly, the technique is highly sensitive and specific. An added advantage is that under certain conditions the results may be available within a few hours of the sample being received in the laboratory. PCR testing works by targeting a small piece of genetic material present only in the pathogen under investigation. Millions of copies of the target are made and then detected using one of a number of different mechanisms. Through APSED, WHO has worked towards ensuring all Member States have the ability to carry out PCR testing for a range of priority diseases.

Where necessary, such as during pandemic (H1N1) 2009, critical influenza diagnostic reagents not commercially available can be produced by specialized laboratories within the Region—such as the WHO H5 Global Reference Laboratory (National Institute of Virology, Pune, India)—and supplied to national laboratories.

**Laboratory Networks and Research**

Laboratories cannot function effectively in isolation. The development of networks enables laboratories to provide support across a much greater area and to contribute to far more sophisticated research and analysis.

At the national level, networks create opportunities for better-resourced laboratories to support provincial and district laboratories and expedite testing for pathogens where there is no local capacity.

In Cambodia, for example, the lack of diagnostic microbiology labs—particularly outside of the capital, Phnom Penh—hampered clinical management of patients and outbreak investigations for
Under APSED, Member States are working to ensure that laboratories have systems in place to protect the health of staff members, as well as the wider community, when working with both known and new diseases.
many years. A network of regional microbiology laboratory, however, is currently being established. Two laboratories are now functioning in Kampong Cham and Takeo provincial hospitals with a third planned for Battambang hospital. In addition to providing diagnostic support for patients within the hospitals, these facilities act as local public health laboratories for outbreak investigations.

At the regional level, WHO has worked with the Association of Southeast Asian Nations (ASEAN) to develop a network of partnership laboratories in the region. These partnerships ensure the less developed countries can access support from counterparts in neighbouring countries—taking advantage of the expertise that already exists in laboratories across the region.

**Diagnosing Safely**

In September 2003, a 27-year-old researcher in Singapore who had been working with West Nile virus was diagnosed with SARS. Investigators discovered that the West Nile sample had been cross-contaminated with the SARS virus, leading to the worker’s illness. A few months later in Taiwan, Province of China, a researcher became infected with SARS while trying to decontaminate a safety cabinet. In 2004 in Beijing, a medical student working in a laboratory developed SARS and passed the infection to seven others. One of them, her mother, died from the disease.

The SARS laboratory infections drew attention to the need to ensure that laboratories have systems in place to protect the health
In November 2009, Dr Keiji Fukuda, WHO Assistant Director-General, headed a delegation conducting an on-site assessment of the Chinese National Influenza Center (CNIC).

In recognition that CNIC has become a centre for excellence in influenza, the delegation unanimously agreed that the process for designation as a WHO Collaborating Centre for Reference and Research on Influenza should proceed.

As a collaborating centre, CNIC will be more actively involved in supporting WHO’s Global Influenza Surveillance Network, exchanging information on influenza strains, providing advice on vaccine development and supporting surveillance activities.

CNIC will also continue to provide expertise and laboratory support to influenza outbreak investigations and responses in WHO Member States.

Established in 1957, CNIC is part of the Chinese Center for Disease Control and Prevention (CCDC). Following the SARS epidemic in 2003 and the re-emergence of avian influenza A (H5N1) in 2004, the activities of CNIC were greatly expanded to cover epidemiological surveillance, domestic and regional influenza technical capacity-building, sharing of information, and participation in international meetings and consultations.

In August 2007, CNIC began the process of becoming a WHO collaborating centre, and in 2008 China and WHO formally agreed on a road map for CNIC to strengthen its capacities and performance in certain areas.

China’s sustained investment in strengthening laboratory capacity is testament to its commitment to protecting its own population—and the world’s—against influenza.
Testing the Laboratories
National Influenza Centres in the WHO South-East Asia and Western Pacific Regions are now producing more reliable diagnoses according to a global external quality-assessment programme.

Implemented on behalf of WHO by the Hong Kong Centre for Health Protection, the programme monitors the capacity of participating laboratories to detect seasonal, pandemic and avian influenza.

Laboratories that take part in the programme are sent test panels containing 10 samples of influenza virus RNA twice each year. They analyse the samples and identify the pathogen using polymerase chain reaction (PCR)—now the preferred laboratory test for detecting many pathogens.

Since the programme began in 2007, an increasing number of laboratories in WHO’s South-East Asia and Western Pacific Regions have participated. The performance of these laboratories has shown marked improvement, with 10 out of 17 laboratories returning all correct results for the first panel in 2007 and 24 out of 29 laboratories returning all correct results for the most recent panel in 2010.

With more Member States capable of consistent and reliable diagnosis, laboratories are playing an increasingly valuable role in facilitating patient management, outbreak response and pandemic preparedness.

of the staff, as well as the wider community, when working with both known and new diseases.

Promoting biosafety within an institution requires action in a number of areas, including ensuring the physical infrastructure is adequate for the work being performed—and developing, validating and documenting standard operating procedures that are appropriate to the level of risk. Administrative procedures are also needed to ensure compliance with standard procedures, along with training programmes, vaccination programmes and medical surveillance systems. In addition, appropriate personal protective equipment must be available, and staff adequately trained in its use.

Across the Asia Pacific region, more and more countries are expressing interest in establishing high containment laboratories—those capable of diagnosing more dangerous pathogens. This has made safe diagnosis an even more pressing issue. Through APSED, WHO has supported countries to upgrade existing infrastructure to ensure facilities are built to a standard that is appropriate for their intended purpose. The establishment of a biosafety consortium has enabled Member States to access expert advice when planning and designing laboratories.

Regional workshops have been organized to disseminate the essential principles and practices needed to ensure the safety of people and material, as well as the security of biological material in the context of health laboratories.

At the national level, APSED has advocated for central public health laboratories to take a lead role in promoting biosafety, thus
During the past seven decades, antimicrobial agents have saved millions of lives, substantially reduced the burden of diseases that were previously widespread, and improved the quality and longevity of life. Accordingly, these drugs were considered “wonder drugs”. In recent past, the emergence and spread of resistance in several microorganisms have rendered management of many infectious diseases difficult using the common anti-infection drugs. Resistance poses a growing threat to the treatment and control of endemic, epidemic-prone and pandemic diseases, including pandemic (H1N1) 2009. Accordingly a regional strategy was developed that is acceptable to multiple stakeholders, is simple and practical, can be adapted by Member States, and acts as a powerful tool to prevent negation of progress made in the field of communicable diseases. The regional strategy aims to give particular attention to interventions involving the introduction of legislation and policies governing the use of antimicrobial agents, to establish laboratory-based networks for the surveillance of resistance, and to ensure rational use of these drugs at all levels of health care settings.

Laboratories and Surveillance

Laboratory information is a critical component of disease surveillance. While confirmed diagnoses facilitate the implementation of treatment, control and prevention practices, ongoing monitoring of disease pathogens can provide early warning of potential outbreaks, including novel strains of influenza or drug-resistant strains of known diseases.

National Influenza Centres play a crucial role in monitoring influenza activity within a country and serve as key points of contact between the World Health Organization and the country of origin in questions relating influenza surveillance.

They also form the backbone of WHO’s Global Influenza Surveillance Network—a mechanism on constant alert for the emergence of influenza viruses with pandemic potential. Centres maintain active communication with the network through the timely submission of viruses, sharing information on the isolation of unusual viruses or disease outbreaks, submitting regular reports on influenza activity during the influenza season and providing other relevant information on influenza surveillance and control.
The capacity of these national influenza laboratories to effectively monitor resistance in influenza viruses is also being built through hands-on training and appropriate post-training support.


The coordinated effort by Member States to build the capacity of their laboratories in order to safely produce accurate, reliable results has proven to be a strong link in the chain when it comes to fighting emerging diseases.

Accurate laboratory diagnosis in a safe environment is a cornerstone of a national emerging infectious disease programme.
Under APSED, many health care facilities in WHO Member States have established systems for triage and isolation to protect health workers, patients and the community at large. While progress has been made, more effort is needed to ensure good infection prevention and control practice.
In 2003, when severe acute respiratory syndrome (SARS) began spreading across the world, one group of people was disproportionately affected: health care workers accounted for more than one fifth of confirmed cases. Of the more than 8000 individuals who contracted the disease, a large proportion picked up the infection in clinics, hospitals or nursing homes.

While SARS is not the only disease known to have spread through health care facilities, its emergence was a stark reminder of the vulnerability of workers, visitors and patients in health care settings.

Good infection prevention and control practices can protect against the spread of disease, with the role of infection-prevention measures in stopping the transmission of SARS documented in a number of studies. A case-control study in five Hong Kong (China) hospitals, for example, surveyed participants about the use of masks, gloves, gowns and hand-washing. All infected staff had omitted at least one measure. The institution of rigorous infection-control measures effectively stopped transmission.

While SARS showed that a systematic approach was needed—one which protected against the spread of all diseases and could be scaled up in the event of an outbreak. The Asia Pacific Strategy for Emerging Diseases has worked to develop such an approach, increasing capacity for effective infection-control practices at every level of health care.

Supporting Member States to Take Control

APSED has advocated for the development of national structures to lead the development and dissemination of national policies and guidelines and set direction for the strengthening of infection-control practices. APSED has also recommended that ministries of health appoint a National Infection Control Focal Point, and establish a National Infection Control Resource Centre to promote implementation of infection-control practices by bringing together policies, guidelines, training and education materials, as well as other resources.

Over the last five years, Member States have strengthened national capacity to oversee infection-control practices. In the Lao People's Democratic Republic, for example, a national infection-control committee is now taking a pivotal role in coordinating activities at
Over the last five years, Member States have made significant progress in strengthening national capacity to oversee infection control practices.

the national level. They have also taken steps towards assigning a focal person in designated health care facilities and in developing an Infection-control Resource Centre.

In less developed countries, it can be difficult, if not impossible, to implement infection-control guidelines developed in countries where resources are more abundant. A national infection-control structure can take responsibility for developing knowledge-based infection-control policies and guidelines that are also practical.

Viet Nam, for example, has developed a national policy which is now forming the basis for regional and national plans, and will provide a good model for other resource-limited countries.

Nationally led infection-control programmes can also ensure that previously ad hoc education and training activities lead to systematically building awareness and skills in good infection-control practices. Viet Nam is in the process of developing a comprehensive training programme for nurses and establishing monitoring tools to measure progress of infection prevention and control activities.
The establishment of a WHO Collaborating Centre for Infection Control in Hong Kong (China) will facilitate learning opportunities for Member States throughout the region.

Insufficient resources can significantly undermine infection-control practices. While guidelines for best practices for infection control may outline measures such as the use of surgical masks, some countries do not have the resources to implement these measures.

In emergency situations, regional cooperation systems supported by WHO allow Member States to access vital personal protective equipment and infection-control supplies. Most recently, supplies such as masks, gowns, gloves and eye protection were deployed from regional stockpiles to numerous developing countries during pandemic (H1N1) 2009.

Since the SARS outbreak in 2003, there has been considerable progress in infection prevention and control across the region. APSED has been a driving force in raising the profile of infection control, establishing it as a key component of preparedness against emerging infectious disease. While mainstreaming good infection-control practices at all levels of health care remains a challenge, Member States are now actively engaged in building on the progress of the last five years.
Chapter 5  Reducing the Risk

Training on Respiratory Infection Prevention and Control

In early 2008, the WHO South-East Asia Regional Office began developing a package of training materials on respiratory infection prevention and control. The materials advocate a generic approach to infection control for infectious respiratory diseases, but have a focus on influenza and tuberculosis.

The training resources were developed in line with APSED recommendations and involved collaboration with partners including the WHO Western Pacific Regional Office, WHO Headquarters, the United States Centers for Control Prevention, REDI Centre (Singapore), Jhpiego and the Ministry of Public Health, Thailand.

Aimed at health care professionals and hospital managers, the training resources are now available for use by national and local infection prevention and control teams. They use training techniques to build technical knowledge of infection control based on WHO guidelines and to develop practical skills in the use of personal protective equipment and hand washing.

Participants from across the Asia Pacific region have attended training-of-trainers workshops held in Bangkok in September 2008 and in New Delhi in November 2009. Strong support for both the technical content of the materials as well as the training approach was shown. The skill stations (hands-on training) were singled out as being especially useful.

National training courses have since been organized in China, Myanmar, Nepal, the Philippines and Viet Nam, with subnational courses also rolled out in several countries.
Bloodstream Infection in a Neonatal Intensive Care Unit in Fiji

Ten newborn babies in a neonatal intensive care unit in Fiji were found in 2007 to have developed a bloodstream infection. Three of them died from the infection. The hospital requested that the local WHO office help with the epidemiological investigation.

The investigation revealed that the patients spiked a fever within hours after their line was flushed with saline from the shared bag. Subsequent laboratory analysis found Enterobacter aerogenes bacteria in the shared saline bag: an exact match with the bacteria recovered from the blood of all the patients.

In addition, it was found that the physicians and nurses involved in the cases were not strictly following hand-hygiene protocol and proper disinfection was seldom performed on the intravenous rubber ports on fluid bags and lines before withdrawal and injection. This is probably what caused the contamination of the saline in the one-litre bag.

Immediately after the epidemiological investigation, urgent infection-control measures were implemented. Small one-time-use saline vials were used for line flushing and use of a single bag for multiple patients was banned. A strict hand-hygiene policy with the provision of alcohol-based hand rub was instituted. Use of disposable hand gloves for nappy changes was reinforced, and training and education on infection prevention and control was conducted. Infection-control staff monitored compliance with the infection-control guidelines.

In the following weeks, additional training for nursing and medical staff was conducted to raise awareness of the importance of hand hygiene. The infection-control practices in the other intensive care units and wards of the main hospitals of Fiji were also reviewed, and where necessary, corrected.

No new cases of hospital-acquired bloodstream infection were identified for at least three years after the implementation of these control measures.

This outbreak revealed that basic infection prevention and control practices in health care settings are of paramount importance in reducing the risk of life-threatening hospital-acquired infections.
Diseases that spread from animals to humans are often novel and unpredictable. They can emerge anywhere and have the potential to spread rapidly around the globe.
Some of the most devastating illnesses to emerge in recent history have been related to zoonoses, infectious diseases that can be transmitted between animals and people.

Highly pathogenic avian influenza (HPAI), Nipah virus, Ebola and severe acute respiratory syndrome (SARS) all have links to the animal kingdom. In some cases, outbreaks have been mainly limited to people who were exposed to infected animals. In others, viruses have mutated and spread, causing widespread human-to-human transmission.

Zoonoses are of growing concern because of their often novel and unpredictable nature. Zoonotic diseases can emerge anywhere and have the potential to spread rapidly around the globe. These tenacious diseases take not only a devastating human toll, but can have a major economic impact on the areas affected.

**A Framework for Collaboration**

Control of zoonotic diseases starts at the source: with animals. The health sector cannot address the issue alone. While animal and human health sectors have come together to respond to particular events or emergencies, the structures and systems established are often short-lived—lasting only until a particular crisis is over.

Ongoing and combined efforts are needed for effective prevention, control and response. But although health professionals and decision-makers recognize the importance of intersectoral approaches in addressing zoonotic diseases, putting the theory into practice presents a challenge.

Under APSED, a unique zoonoses framework has been developed to guide collaboration between human and animal health sectors. This framework can be used to address any zoonotic disease events and emergencies. It covers all areas of work including risk reduction, surveillance for information sharing, coordinated response and collaborative research.

Rather than calling for the establishment of a new, standalone programme, the framework strengthens links between animal and human health sectors, clearly defines the roles and responsibilities of each, and takes advantage of the resources and expertise within existing structures. As both human and animal health sectors continue to build capacity within their own fields, the zoonoses framework avoids duplication to create a practical and sustainable coordination mechanism.

As a first step in developing a collaborative approach to zoonotic diseases, APSED initiated the establishment of a regional coordinating mechanism between the Food and Agriculture Organization of the United Nations (FAO), the World Organisation
for Animal Health (OIE) and the WHO South-East Asia and Western Pacific Regional Offices. Together, the three organizations produced *Zoonotic Diseases: A Guide to Establishing Collaboration between Animal and Human Health Sectors at the Country Level*. Using this guide, countries across the Asia Pacific region have established a national coordination mechanism for zoonotic diseases.

While a number of Member States established national coordination mechanisms between public health and animal sectors in the wake of avian influenza outbreaks in 2004, many have since been expanded to cover all zoonotic diseases. Indonesia has established the National Zoonoses Commission, and India has reactivated its National Zoonoses Committee. With guidance from WHO, Myanmar is currently reorganizing its coordination mechanism in line with APSED guidance.

**Working Together to Reduce the Risk**

Whenever animals and humans are in close contact there is a risk that diseases can transfer from one species to the other. As they do, these pathogens can potentially mutate into more contagious and infectious diseases. The APSED framework provides a means by which animal and human health sectors can work to reduce this risk.

Influenza viruses in particular are known to combine and change their genetic make-up. Through the regional coordination mechanism, Regional offices of WHO, FAO and OIE are developing a risk-
A Collaborative Approach to Zoonotic Diseases

When animals and humans are in close contact, there is a risk that diseases can transfer from one species to the other. As they do, these pathogens can potentially mutate into more contagious and infectious diseases.

reduction strategy to prevent the emergence of a new influenza genotype in countries with the co-circulation of H5N1, H1N1 and other influenza viruses. The three organizations are using a risk-based approach to monitor and respond to the emergence of new influenza viruses. The animal health sectors are charged with preventing the mixing of pigs and poultry along the market supply chain, and with improving surveillance and response. Both human and animal health officials are responsible for improving biosecurity practices along the pig-poultry market supply chain.

At the national level, animal and human health sectors have worked to identify high-risk sites and activities. While interventions along every point of the supply chain have been implemented, many countries have focused their attention on live bird and wet markets. Interventions have ranged from environmental changes such as building more appropriate structures for markets to reducing risky practices and behaviours, with training materials for market managers and vendors prepared and delivered in Indonesia, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam. These efforts have contributed to improved hygienic conditions in wet markets and a considerable reduction in human cases of avian influenza (H5N1) in the recent years.
Sharing Information and Coordinated Response

Identifying an outbreak of a disease in animals can provide early warning that humans might also be affected. Sharing surveillance information between human and animal health sectors is essential for the early detection and tracking of emerging zoonotic diseases.

Under APSED’s guidance, Member States across the Asia Pacific region have worked through national coordination mechanisms to establish systems for sharing information, including surveillance and laboratory data, about zoonotic events and outbreaks. These efforts are showing results. In Mongolia, for example, the sharing of surveillance information during a recent outbreak of rabies enabled the animal and human sectors to shorten their response time, preventing any infections in humans.

Across the region, responses to zoonotic diseases have been made more effective and efficient by the establishment or strengthening of national coordination mechanisms.

Following outbreaks of anthrax in 2008 and 2009 in the Lao People’s Democratic Republic, cooperation between animal and human health departments led to a response addressing both the immediate situation and long-term risk. Both sectors played an important role, with strategies including the vaccination of animals in highly endemic areas.

Collaborating for Health

Men wearing masks and rubber gloves descend on a small farm in the village of Thalat, a few hours from the Lao People’s Democratic Republic’s capital of Vientiane. The men capture the farmer’s ducks, carefully swabbing the animals’ cloaca, and take blood samples and specimens of waste and pond water. The samples are quickly secured and put on a bus to the capital, where they will be tested within hours.
The exercise, which is coordinated with village leaders and local farmers, is part of a training course in avian influenza poultry surveillance. If a positive result is found for a pathogen in poultry, human health officials are brought in to test and protect the human population.

Though this programme is supported by FAO and focuses on avian influenza, it ties in with APSED initiatives. And while focusing primarily on avian influenza it can be adapted to other diseases.
Bhutan’s Experience in Animal and Human Health Sectors Collaboration

Prompted by the outbreak of highly pathogenic avian influenza (HPAI) in 2003, Bhutan’s Ministry of Health and Ministry of Agriculture and Forestry jointly developed in 2006 a National Influenza Pandemic Preparedness Plan. Coordination committees were formed at the national, regional and local levels, and an incident command system was developed and field-tested to avoid confusion during a time of crisis. In February 2010, an outbreak of HPAI near the country’s southern border was rapidly contained and human infection due to avian influenza (H5N1) was prevented because of the high level of preparedness and active collaboration between the animal health and public health sectors.

In the Philippines, the timely sharing of information following the discovery of Ebola Reston virus in pigs prompted WHO, FAO, OIE, the United States Centers for Disease Control and Prevention, together with national authorities from both the human and animal health sectors, to conduct an immediate joint mission to investigate and assess the risk to public health. The response involved mass culling at infected pig farms—a potentially risky operation. By working together, the animal and human health sectors ensured the safety of all people involved.

In supporting greater collaboration between medical and veterinary professionals, WHO has also supported the development of joint training modules in field epidemiology. Veterinary professionals from Bhutan and Nepal, for example, have attended the three-month field epidemiology training programme organized by the National Institute of Communicable Diseases in New Delhi. Work on training modules to improve laboratory diagnosis of emerging zoonoses for medical and veterinary laboratory professionals is also under way.

At the regional level, information-sharing protocols have enabled WHO, FAO and OIE to monitor changes in the patterns of avian and human influenza across the Asia Pacific region. Information sharing has also facilitated a better understanding of influenza viruses, and has enabled the three organizations to improve preparedness and coordinated responses for human and animal avian influenza.

The scope of the coordination committees and incident command system has expanded, and it is now used to develop effective responses against other zoonotic diseases such as rabies. In 2007, WHO supported a project for the prevention and control of rabies, helping officials galvanize coordination and cooperation between the two ministries. Several joint activities were initiated, such as a national-level stakeholder workshop and the drafting of rules and regulations for prevention and control of the disease. School teachers were also educated about rabies and other zoonotic diseases, training on rabies diagnosis was rolled out, and dogs were vaccinated and sterilized. The development of diagnostic facilities in the animal sector is also benefiting human health, as the same facilities can be used to detect the disease in humans.

The Kingdom of Bhutan has also endorsed the development of the Center for Tropical and Zoonotic Disease, which will strengthen collaboration between human and animal health agencies. Will be an autonomous institute focused on researching tropical and zoonotic diseases. It will use existing laboratory facilities for zoonoses under the Ministry of Health and the Ministry of Agriculture, avoiding duplication and making the best use of the limited facilities and technical expertise in a small country.
Responding to Rabies in Bali

Bali, an island of Indonesia, has historically been free of rabies, and as a result dogs were not previously vaccinated.

But in November 2008, a human fatality from a rabies-compatible illness was reported. Subsequent testing of dog brain specimens at a national veterinary laboratory confirmed the presence of rabies in dogs in southern Bali. Since then, eight clinically compatible human rabies cases have been diagnosed, one of which was laboratory confirmed through fluorescent antibody testing of a saliva specimen. All cases had reportedly involved dog bites and showed clinical symptoms evocative of rabies. The constant movement of small boats among the 13,000 inhabited islands of the Indonesian archipelago, many with dogs on board, is probably how rabies entered Bali.

Following a request from national livestock services, FAO deployed an international technical team in December 2008 that worked together with WHO Country Office staff to support a coordinated response.

A range of activities to control the disease and minimize its impact has since been implemented. Local health care workers have been trained in the management of rabies, animal bites and the provision of human rabies vaccine. In addition, the diagnostic capacity of local laboratories has been strengthened with laboratory professionals supported to attend international training on rabies diagnosis.

An intensified dog vaccination campaign was carried out in the outbreak area, complemented with measures to control the stray dog population and animal movement. By April 2010 over 80,000 dogs and cats had been vaccinated.

The national protocol for post-exposure rabies prophylaxis was revised, and a policy-level meeting for introduction of cost-effective intradermal rabies vaccination schedules conducted. Bali now has 26 rabies centres that can deliver vaccinations to dog bite victims, and more than 37,000 post-exposure vaccinations have been provided to the victims of animal bites.

Most importantly, coordination mechanisms between animal and human health agencies have been strengthened at district, provincial and national levels, and there is advocacy among decision-makers for Bali to regain its rabies-free status by 2012.

Ongoing Research

Much uncertainty surrounds newly emerging zoonotic diseases such as Nipah, SARS and Ebola Reston. Within APSED’s framework, WHO, FAO and OIE are facilitating scientific studies and organizing workshops in the area of zoonoses control to inform policy-makers.

The recent discovery of Ebola Reston has stimulated a research agenda to study bats as a potential natural reservoir of the virus. In 2009, a workshop on Nipah and Ebola was conducted in Brisbane, Australia, to provide updated scientific information and inform public health officials of new findings regarding these viruses. Collaborative studies amongst animal, wildlife and health departments are also ongoing for Nipah in Bangladesh, India and Malaysia.

Researchers and public health officials have also collaborated on the problem of leptospirosis in
In early 2010, veterinary surveillance identified rabies outbreaks in several areas of the south Gobi in Mongolia. The outbreaks spread to 12 provinces, and within two months, 107 animals, including foxes, wolves, dogs, cows, sheep, camels, horses and goats, were diagnosed with rabies.

Rapid information sharing between the human health sector and veterinary and national emergency management agencies—facilitated by the new Mongolian Intersectoral Coordination Committee on Zoonotic Diseases—led to early detection and effective outbreak response. It also allowed for the sharing of resources, including laboratories.

A joint Rapid Response Team, consisting of veterinarians, medical epidemiologists and emergency officers undertook a risk assessment and implemented restrictions on animal movement, compulsory animal vaccinations and culling of possible carriers. A rabies telephone hotline for health care providers was established, and an awareness campaign was launched to prevent the spread of the disease to humans.

Despite the high number of animals exposed, no humans contracted the disease.

Vice-Minister of Health Dr Jadamba Tsolmon acknowledged the role of newly established Intersectoral Coordination Committee on Zoonotic Diseases in responding to the outbreak. “Current events indicate how important cooperation and coordination among veterinary, human health and national emergency agencies really are, when an outbreak occurs that threatens human health,” she said.

Established in December 2009, membership of the Mongolian Intersectoral Coordination Committee on Zoonotic Diseases includes the human and animal health sectors, the National Emergency Management Agency and WHO.
the Asia Pacific region. In November 2008, a joint scientific meeting focused on the health and economic burden leptospirosis places on countries in the region, and how best to address the problem. Topics of discussion also included vaccine development, laboratory diagnosis, surveillance, and prevention and control of the disease.

WHO’s South-East Asia Regional Office has identified priority areas for research in communicable diseases including zoonoses. Research and academic institutions have been encouraged to submit proposals for multidisciplinary operational research.

**New Cooperation**

Under APSED, the Asia Pacific region has seen unprecedented regional, national and local collaboration among animal and human health professionals who in the past rarely communicated. In many parts of the region, the local veterinarian and doctor previously did not discuss public health issues. Today, unusual events that occur on the farm or are detected in the public market are shared with medical professionals to establish the significance for human health.

With the guidance of APSED, public health officials, food inspectors and agricultural authorities are sharing surveillance information and specimens, planning and implementing coordinated interventions, and improving animal husbandry practices to protect human health.

Control of zoonotic diseases starts with the animal kingdom. The health sector cannot address the issue alone. Animal and human health professionals are working together under APSED at the regional, national and local levels.
Healthy Markets, Healthy People

An early morning walk through the neighbouring Kuadin and Nong Chan public markets in Vientiane, Lao People’s Democratic Republic, shows the colourful bustle of people buying their meat and vegetables for the day.

A closer look reveals small but important details about the market. The floors have sloped drains that don’t hold water or the blood from meat; most poultry vendor tables are stainless steel, not the hard-to-clean older wooden type; hand-washing stations stay busy with
vendors keeping clean; and public information signs show detailed illustrations of how to keep food free from contamination.

Improvements to the market are part of a project in which the Department of Health is working with the Department of Livestock and Forestry to reduce the risk of zoonoses along the market chain.
The project also looks at the mixing of food with live ducks and chickens at markets. Humans can pick up viruses from infected birds or surfaces, and birds can pick up viruses from nasal secretions, saliva or feces of other birds. At Nong Chan, there are still live birds for sale nearby, but they have been moved away from the proximity of the meat and vegetables being sold.

Chances for disease transmission increase when animals are packed closely together during transport, when sick animals are slaughtered for meat or when different species are mixed at the market. The project emphasizes hygienic practices and food safety to address these concerns.

Similar programmes are being implemented in other countries. Efforts to improve live bird markets and wet markets are ongoing in Indonesia and Myanmar.

In Kuadin and Nong Chan challenges remain. A vendor eats her lunch too close to uncooked chicken meat she is selling, an unsafe practice. Greater efforts are needed to increase public awareness about safe market practices (centre photo). But despite such infractions it is a much healthier market than before. The administrator of the market notes that they have always worked with the vendors to keep their stations clean and to wash their hands regularly, but that previously they did not have the facilities to do so. With the new facilities and increased public awareness, progress is being made. “It’s not 100 percent,” he said. “It’s difficult to change the behaviour of the vendors and customers, but it’s getting better.”
Taking on Anthrax
In 2008 and 2009, in the Lao People’s Democratic Republic, more than 20 people died and dozens more were sickened from suspected exposure to anthrax.

When an animal dies from anthrax, the blood does not clot and is commonly seen discharging from the mouth, nose and anus. This blood contains large amounts of bacteria that once outside an animal and exposed to air, forms spores which can survive in soil for many years, infecting animals grazing on contaminated land. If the animal carcass is cut open or butchered for consumption, the number of spores formed, and thus amount of soil contaminated, is exponentially increased.

Humans can acquire anthrax by handling meat, hide, wool, hair or bones from infected animals, or by consuming flesh from animals that have died as a result of the disease. The intestinal form of the disease can be fatal if not treated quickly.

In the past, human outbreaks of anthrax in the Lao People’s Democratic Republic prompted responses such as public awareness campaigns, and the distribution of educational material teaching people how to recognize the disease and how to properly dispose of livestock carcasses. The establishment of the National Emerging Infectious Disease Coordinating Office, however, brought the animal and human sectors together to develop a long-term joint control and response strategy.

The response was also facilitated by the country’s recently established field epidemiology training programme, with participants from both animal and human health sectors.

When unconfirmed cases and clusters of suspected anthrax in humans were reported in 2009, a joint outbreak investigation was launched. The field epidemiology trainees collected more data and specimens, interviewed animal and human health officials, interviewed patients, provided education to villagers, public health officials and clinicians, mapped the cases, and generated a timeline.

The trainees’ review fed into discussions between the animal and human health sectors, making recommendations to improve the immediate response and providing a basis for the development of short- and long-term goals.

Reviewing the impact on the local communities and potential spread provided convincing evidence to reinstate the vaccination of cattle and buffalo that had ceased years earlier. Better information about both past and present outbreaks meant that priority areas for vaccination could be identified.

Ongoing work will continue to strengthen communication and cooperation between the animal and human health sectors, helping prevent animal and human cases of anthrax.
Risk communications are vital to the effective management of any emerging disease outbreak, especially in the midst of uncertainty.
“Swine flu could kill up to 120 million,” declared one newspaper headline soon after pandemic (H1N1) 2009 began spreading beyond the Americas. “Briton quarantined as killer flu spreads,” announced another.

As these alarming headlines illustrate, in high-profile health emergencies the difference between widespread panic and the effective management of an outbreak often hinges on one area of work: risk communications.

Clear, open communication empowers communities, enabling them to take an active role in protecting themselves and others from a disease, while poor or delayed risk communications can fuel fear, mistrust and anxiety, potentially causing greater social and economic harm.

But during an outbreak, much of the most important communication happens in the midst of uncertainty. Many factors, such as the severity of the disease, how easily it spreads and what actions should be taken to control it, may be unknown. Good risk communicators grapple with these uncertainties to develop clear and constructive messages, smoothing the way for thoughtful public health interventions.

While developing appropriate messages is one challenge, making sure these messages are both audible and influential is another.

People now receive information from more sources than ever before: word-of-mouth, radio, television, newspapers and, of course, new media such as the Internet and text messaging. While greater volumes of information can now be accessed more quickly, many of the messages heard by the public may be incorrect, inconsistent or incomplete. The result is confusion.

In this modern setting, it is vital to build public trust in authorities and ensure key messages are heard, understood and acted on.

Good risk communications draw on a range of skills, including education, marketing and journalism—skills that have traditionally been neglected in favour of the more scientific aspects of a public health response.

The Asia Pacific Strategy for Emerging Diseases has raised the profile of risk communications, placing it as one of the five core areas in which countries should focus their efforts to build robust and responsive public health systems. Work has concentrated on three main areas: communications planning; communication for behaviour change; and communications during outbreaks.

As information flows ever more freely among countries, opportunities for better and more effective communication are created. But there are also dangers: unhelpful or exaggerated reports in one country can quickly proliferate, affecting countries throughout the region.
APSED has provided an effective framework for building risk communications capacity in all Member States, from those with advanced systems already in place, to those for whom risk communications was a completely new concept only five years ago.

**Communication Planning**

During outbreaks or other health emergencies, the structure provided by well-developed plans supports the delivery of effective risk communications messages even in an environment of much uncertainty. Communications plans facilitate the flow of information between relevant agencies, enabling better informed decision-making. They also set in place the systems needed to release information quickly, helping generate a communications response that builds trust in public health authorities.

Member States throughout the Asia Pacific region now routinely incorporate risk communications into outbreak response plans. Some Member States have also invested in developing communications plans for events where the risk of an outbreak is high, such as mass gatherings.

In late 2009, for example, the Lao People’s Democratic Republic hosted the Southeast Asian Games. In the six months prior to the Games, a WHO risk communications specialist, supported by APSED, had been working with the Government to bolster the country’s risk communications systems. As one component of this work, the specialist mentored national staff as they developed a tailored communications plan for the games, applying the principles of good risk communications before, during and after the event to deliver relevant health messages.

**Enlisting the Support of the Community**

Knowledge and information can empower communities to protect themselves and others in an emergency. During an outbreak, behaviour-change communications can encourage health-seeking behaviours to minimize the spread of a disease and educate people about how and when to seek help.

Influencing behaviour at the community level before, during and after an outbreak requires knowledge of how communities receive information. During the 2009 leptospirosis outbreak in the Philippines, for example, men were at higher risk of contracting the disease as they continued working in infected waters. While they were encouraged to take a prophylaxis to reduce this risk, information sessions on the precautionary medication were more effective when delivered directly to the target group, and needed to be scheduled accordingly.

One method of behaviour-change communications employed by APSED is Communication for Behaviour Impact (COMBI), an approach that mobilizes societal and personal influences to prompt individual and family action. During the pandemic (H1N1) 2009 outbreak, the COMBI approach was used to develop hand- and respiratory-hygiene interventions throughout the Pacific to help protect the community from the influenza virus, but also to protect against other hygiene-related illnesses.
Knowledge and information can empower communities to protect themselves and others in an emergency. Influencing behaviour at the community level before, during and after an outbreak requires knowledge of how communities receive information.
WHO has worked closely with Member States across the Asia Pacific region to develop communication materials for use during outbreaks of diseases such as H1N1, H5N1, dengue, malaria and anthrax. While WHO provides guidance on key messages to help protect vulnerable populations, Member States and other partners work to disseminate these and other messages to the local level and to ensure they are translated into action.

**Communicating During an Outbreak**

As awareness of the importance of strong health risk communication grows, WHO has received more requests each year to provide training, support and advice to Member States. Training packages catering to the needs identified by Member States have now been developed and run in countries throughout the Asia Pacific region.

Many countries, including India, Maldives, Nepal, Papua New Guinea, the Philippines and Timor-Leste, have invested in training journalists and others working in the media on effective and responsible coverage of emerging infectious diseases. In several countries, senior government officials and health ministers have also undertaken WHO training on conveying health messages effectively during high-stress events.

In 2008, a regional risk communications capacity-building workshop in Nepal dealt with the importance of risk communications in public health emergency management. As well as sharing updates, best practice examples and challenges, the participating health officials received training on guidelines and tools for risk communication under the International Health Regulations (2005), thus facilitating communications within and between countries in the event of an outbreak.

**Regional Support for Strong Communications**

In major disease outbreaks and other emergencies that threaten to overwhelm national capacity, Member States can call on assistance from WHO to ensure that expert advice is quickly available when and where it is needed. The support provided by WHO also creates opportunities for national staff to work in partnership with experienced consultants, facilitating local skills development.
Communicating a New Threat

In 2008, Ebola Reston virus was detected in pigs on a farm on Luzon, the main island in the Philippine archipelago. Globally, this was the first time the virus had been detected in the swine population and the potential threat to animal and human health was unknown—posing a significant communication challenge for public health officials.

The Ebola Reston outbreak highlighted the crucial importance of strong risk communications skills, acting as a catalyst for strengthening risk communications capacity more broadly. While many of the Department of Health staff called to assist in the response had previously participated in risk communications training as part of the national APSED workplan for the Philippines, the outbreak initiated capacity-building on a much broader scale.

Since the events of 2008, basic and specialized training has been delivered across different levels of government and for a range of partners.

Training for teams from each Regional Center for Health Development has led to the development of regional risk communications plans, while a national risk communications planning workshop led by a University of the Philippines-based group of communicators formed the basis for the National Risk Communications Plan currently under development.

The Ateneo Graduate School has supported training for participants from the health sector and selected partners—especially those dealing with zoonoses, health security and emergencies—building skills in speaking to the media and in developing key risk communications messages. A baseline study on needs assessment to support the development of framework for risk communications messaging has also been conducted.

Using a combination of government, nongovernmental organization and WHO funds, the Philippines has prioritized risk communications capacity-building. Using APSED as a guide, the Government of the Philippines is now better prepared to deal with the communication challenges posed by outbreaks of disease.
Learning from a Pandemic

From May to October 2009, pandemic flu struck Thailand, affecting an estimated 8.4 million people, or 13% of the population. The Ministry of Public Health activated its risk communications plan, working with a variety of sectors to communicate with the public about the unfolding situation. Television, radio, newspapers, the Internet, village loud speakers and other mechanisms were used to keep people informed and promote preventative behaviours. Many of these—from hand-washing to wearing masks to staying home when ill—were widely adopted.

Yet as the pandemic progressed, some alarming and inaccurate headlines and other news report were published. “Thailand badly struck by deadly flu while neighboring countries remaining untouched,” noted one story.

Together with WHO, the Thai Ministry of Public Health formed a team to rapidly review its risk communications activities, document achievements and identify areas for further strengthening.

The Ministry’s updated strategy included a stronger focus on active listening. While mechanisms to gauge public sentiments were already in place, this information began to be systematically gathered, analysed and integrated into the decision-making process. Short reports were produced to guide communication decision-making and keep messages to the public consistent, clear and focused.

An emphasis was also put on building public trust in the Government and its commitment to transparency. Training for policy-makers and senior spokespersons was instituted, and systems were established to ensure more consistent messaging.

By proactively evaluating its risk communication activities during the first wave of pandemic (H1N1) 2009, the Government of Thailand was able to consolidate its risk communications activities, strengthening links with the media and building public confidence in the information and advice it provided.

As advocated by APSED, the Thai Ministry of Public Health is investing in risk communications as a crucial component of public health emergency preparedness and response. As a result, the Government of Thailand, its health care establishments, the media and the public are better prepared to communicate during a crisis.

With risk communications activities important across a broad spectrum of development work, APSED has also looked at how the United Nations, other agencies, regional institutions, donors and nongovernmental organizations communicate with each other, and with Member States. By coordinating their activities, agencies can provide more effective and targeted support.

During the pandemic (H1N1) 2009 outbreak, WHO together with UNICEF and the Secretariat of the Pacific Community, established a mechanism to facilitate rapid and targeted service delivery to Pacific island countries and areas. Now called the Pacific Tri-Agency Initiative, the three agencies pooled expertise and resources to rapidly support Pacific island countries in preparing for the spread of the pandemic (H1N1) 2009 virus within their borders. This initiative has now evolved into a coordination mechanism providing communications assistance in response to other diseases that threaten the people of the Pacific.

Using a similar model, WHO has led the establishment of the South Asian Risk Communication Initiative, bringing together eight United Nations and other development partners with the intention of coordinating responses across the South and South-East Asia regions. In 2010, this group will lead a meeting of communications experts from across the region to reflect on the experience responding to the H1N1 outbreak.
As well as assisting with coordination and collaboration at the national level, this initiative will create a forum for risk communicators from across the region to work together in developing methods and approaches that continue to be effective in our fast-changing world.

WHO has worked closely with Member States across the Asia Pacific region to develop communications materials for use during outbreaks of diseases. While WHO provides guidance on key messages to help protect vulnerable populations, Member States and other partners work to disseminate these and other messages to the local level and to ensure they are translated into action.

**Member States take the Driver’s Seat**

In calling attention to the importance of risk communications in responding to disease outbreaks, APSED prompted Member States in South-East Asia to work through the Association of Southeast Asian Nations (ASEAN) to build risk communications systems and skills in their countries.

The ASEAN countries along with China, Japan and the Republic of Korea (ASEAN+3) tasked Malaysia with coordinating this work.

Under the leadership of the Disease Control Division, Ministry of Health, Malaysia, regional protocols to facilitate the sharing of information between focal points working in infectious diseases, in communications and in the animal sector have been agreed upon.

Malaysia has led the development of a regional risk communications plan for ASEAN, and supported the review of national risk communications plans. It has also hosted regional training courses including the 2009 Risk Communications Training of Trainers, setting in place the basis for the dissemination of risk communications skills beyond the national level and regional consultations to develop a risk communications training module.

This collaborative model demonstrates how Member States have taken the initiative, building on established structures within the region to contribute to achieving the goals set by APSED.
A United Effort to Secure Our Region’s Health

The WHO Regional Office for the Western Pacific monitoring and assessing disease outbreaks and other acute public health events. Ongoing risk assessments are conducted, informing advice on public health responses.
As the 2003 SARS outbreak showed, even the most developed countries cannot fight emerging infectious diseases alone. Strong national systems are vital. But to effectively prevent, detect and respond to diseases, so too are systems that create cross-border links and share information, resources and expertise.

Across Asia and the Pacific, APSED is building connections between the villager whose chickens die unexpectedly, the local clinic experiencing a surge of patients, local and national public health authorities, and regional and global support systems.

Each year, between 200 and 300 events of public health concern are detected and verified by the WHO South-East Asia and Western Pacific Regional Offices.

The majority of these events are linked to infectious diseases—from meningitis to anthrax, cholera to typhoid fever, legionella to chikungunya. Other threats, including chemicals, animal events and food safety hazards such as melamine, have also been identified.

Such events are detected using both unofficial and non-official sources of information. As Member States have developed national surveillance capacity and as participation in regional systems has improved, these events are now being detected more quickly. Faster information flows mean faster responses that are more likely to be effective in reducing morbidity and mortality, and minimizing health, economic and social impact.

Reports of unusual events are carefully assessed for the risk they pose. Relevant countries may be warned, assistance and support offered, and response networks activated. In rare situations, such as pandemic (H1N1) 2009, an outbreak or public health event may be declared a public health emergency of international concern, in accordance with the procedures under the International Health Regulations (2005).

**Strengthening Regional Networks**

APSED has drawn on the expertise and resources of governments and nongovernmental organizations, multilateral and bilateral agencies, donors, research facilities, colleges and universities, and the public to work collectively towards a world resilient to infectious diseases.

The Global Outbreak Alert and Response Network (GOARN) links partner organizations including scientific institutions, laboratory networks, United Nations agencies and international humanitarian groups from around the globe to create a pool of human and
technical resources that can be activated and deployed as soon as an outbreak occurs. Initiated in 2000, the network provides rapid expert-led responses to combat disease outbreaks of international importance.

WHO has worked to strengthen GOARN within the Asia Pacific region. Since 2007, annual meetings have helped increase participation in the network, while ongoing development opportunities for GOARN partners, such as leadership training courses, have enhanced the ability of outbreak responders to effectively support outbreak responses.

GOARN missions can provide advice on all aspects of an outbreak response—from technical aspects, such as clinical management and laboratory diagnosis, to management issues, such as identifying factors that may deter patients from seeking treatment or assessing how best to use limited resources.

As awareness of the network has grown, so too has the willingness of Member States to call on GOARN’s expertise to support responses to disease outbreaks.

In 2009, GOARN partners assisted governments in responding to pandemic (H1N1) 2009, an outbreak of *Vibrio vulnificus* in New Caledonia, cholera in Papua New Guinea and, following widespread flooding after a string of devastating typhoons in the Philippines, one of the largest outbreaks of leptospirosis ever recorded.

GOARN partners have also provided support to countries outside the region experiencing disease outbreaks. In 2008, experts from the International Centre for Diarrhoeal Diseases, Bangladesh (a GOARN partner) took part in a field mission to Zimbabwe to assist
A child recuperates from dengue in the central Philippines. Studies have found that the cost of failing to prevent and control infectious diseases can be enormous, with social and economic impacts as devastating as the disease itself.
in controlling a cholera outbreak. Such deployment not only provides the assistance needed to the country in which the outbreak is occurring, but also strengthens the capacity of the regional team and experts deployed.

**Emphasizing Collective Efforts and Building Partnerships**

By working together, Member States are protecting the health of their populations. The continued sharing of resources, information and ideas will make the region even more resilient to emerging diseases, not only today, but also tomorrow and into the future.

In the WHO South-East Asia Region, a regional technical advisory group on respiratory infection and diarrhoeal diseases prevention and control has been established. This group aims to reduce morbidity and mortality in the region by advising on appropriate intervention packages and identifying areas for research.

In 2009, the formal establishment of the Regional Clinical Advisory Network on Emerging Infectious Diseases in the Western Pacific Region represented a unique opportunity for experienced clinicians and other experts to pool their knowledge on the management of infectious diseases. Hand, foot and mouth disease, which affects large numbers of children in countries throughout the region, has been identified as a priority disease. During 2010, the network will support the development of guidelines that will help doctors diagnose and treat cases of this disease. The network’s efforts will also provide a firm foundation to build the knowledge base around this and other diseases.
The continued sharing of resources, information and ideas will make the region even more resilient to emerging diseases, not only today, but also tomorrow and into the future.
Regional Accountability

Each year, experts, country representatives and partners come together to review national and regional progress under APSED. These biregional technical advisory group (TAG) meetings have helped build commitment to a collective regional defence system and strengthen national capacities. Recommendations made each year have been incorporated into workplans, steering efforts towards shared goals.

In addition to the annual TAG meetings, an ongoing monitoring and evaluation process has ensured that APSED has remained relevant, with the flexibility to deal with emerging priorities, while continuing to work toward the overarching goal of building the capacity of the region’s public health systems.

Early in the implementation of APSED, baseline data collection or assessment checklists were developed to help Member States identify capacity gaps and prioritize national plans. Since then, updated information collected using the APSED Common Indicator Assessment has shown that significant progress has been made in strengthening event-based surveillance and rapid response—with rapid response teams supporting timely outbreak investigations now established in most countries—as well as in building capacity for accurate laboratory diagnoses, establishing mechanisms for collaboration between animal and human health sectors, and conducting risk communications training.

The use of common assessment tools across the region has helped identify potential weaknesses at both a national and regional level. By making comparisons possible across the region, Member States are encouraged to take responsibility for progress within their own countries.
A Regional Surveillance Officer from Yangon reported that cases of diphtheria had been admitted to the Yangon Children's Hospital, and expressed an urgent need for diphtheria antitoxin.

Late on 14 January 2009, this urgent request was relayed to the WHO Myanmar Country Office. International suppliers and stockholders were immediately approached in a bid to identify a source for the requested antitoxin. In treating severe cases of diphtheria, early administration of this drug can be vital.

The Bureau of General Communicable Diseases, under the Department of Disease Control, Ministry of Public Health Thailand, agreed to provide 100 vials of the drug, and the goods were picked up early on 15 January 2009. Meanwhile, an international freight forwarder had been contacted and charged to ensure rapid transport and delivery of the goods to Yangon Children's Hospital by means of a "cold chain".

The life-saving drugs were delivered in good condition and on time. With the task given high priority by the Ministry of Health, Myanmar, the necessary customs procedures were completed after delivery.

This operation demonstrates how systems facilitating international cooperation and the mobilization of resources can save lives. In this case, only 13 hours elapsed between picking up goods in Bangkok, and delivering them to the Yangon Children's Hospital, where they were used to treat children who were in a serious condition.

Across the Asia Pacific region, stockpiles of equipment and essential medical supplies, such as antivirals, have been established. Pandemic (H1N1) 2009 led to the enhancement of stockpiles as well as improvements in systems for management and deployment. In the South-East Asia Regional Office, a web-based system that tracks supplies from procurement to shipping to arrival in country is now in operation, strengthening coordination between the Regional and Country Offices. Stockpiles at both levels are monitored via a continually updated inventory. At any time, information on the stocks held and deployed may be obtained.
Preparing for the Unexpected

A newspaper reports that several villagers have died from influenza in one village. A local clinic has seen a surge in patients with flu-like symptoms. The laboratory tests confirm a new influenza virus. Most cases report no history of contact with birds. It appears that sustained human-to-human transmission is occurring.

This was the scenario played out during PanStop 2007, the first regional rapid containment simulation exercise involving an influenza virus with pandemic potential. The exercise was designed to test containment protocols and procedures, and gave the World Health Organization, the Association of Southeast Asian Nations and the Governments of Cambodia, Japan and Singapore the opportunity to practise working together to mobilize resources to control an outbreak.

Although highly pathogenic avian influenza (HPAI) no longer makes the headlines as often as before, it remains a real threat. This, or any other virus, could potentially mutate into one that spreads more readily. With its unusually high mortality rate, the consequences could be devastating.

In preparing for the unexpected, APSED encourages governments and partners to participate in exercises to test how national and regional systems would work together in a public health emergency. The PanStop exercises—held annually since 2007—are just one example, consolidating rapid containment processes and the deployment of stockpiles.

Participants can encounter twists in the scenario, such as villagers hiding chickens to keep them from being slaughtered, reports of adverse effects from antiviral medications, and a truck careening into a canal and losing 25,000 treatment courses of medication. These are just some obstacles authorities could encounter in a real-life event.

By identifying strengths and weaknesses in existing systems, authorities will be better prepared when an actual outbreak occurs.

A midterm review conducted in the Lao People’s Democratic Republic and in Sri Lanka in 2008 also highlighted the relevance of the strategy, identifying areas in which the most progress had been made, and making recommendations to accelerate implementation in other areas.

In 2010, a rigorous evaluation of the APSED approach was conducted in five countries in the two WHO regions. While significant progress has been made, much work lies ahead.

The World Health Organization is working together with Member States to ensure that the region is better prepared to confront emerging disease challenges.
A United Effort to Secure Our Region’s Health

The WHO Regional Office for South-East Asia monitoring and assessing disease outbreaks and other acute public health events. Ongoing risk assessments are conducted, informing advice on public health responses.
The International Health Regulations (2005) are a legal framework that underpins joint efforts to prevent the spread of disease in an era where infections can travel at the speed of jetliners.
The emergence of two major new diseases in the early 21st century—SARS and avian influenza—acted as a global alarm, alerting the world of the need to do more to protect against infectious diseases.

In our interconnected world, where diseases can travel at the speed of jetliners, the spread of these diseases demonstrated the need for strong national and international collective defence systems.

In a united effort to work towards a safer world, Member States in May 2005 unanimously adopted the substantially revised International Health Regulations (2005): a legal framework that underpins joint efforts to prevent the spread of disease. This unprecedented level of international commitment marked a new era of cooperation. IHR (2005) set the basis for global solidarity in defending populations from disease and other public health threats and provided a mandate for WHO to support Member States in working towards a common goal.

The regulations call for strong public health systems at the national level as well as an international defence system that is able to prevent, detect and respond to acute public health events and emergencies of international concern, including emerging disease outbreaks, chemical spills and nuclear accidents.

The Asia Pacific region is fully committed to the International Health Regulations (2005) and has embraced the unique opportunity they present for all countries to work within a common framework. Together with its Member States, the WHO South-East Asia and Western Pacific Regional Offices have identified and implemented a number of key actions to fulfil the requirements of IHR (2005).

In particular, the Asia Pacific Strategy for Emerging Diseases has provided regional guidance for Member States to develop and maintain the core capacities outlined in IHR (2005) for surveillance and response.

IHR (2005) also outlines the requirements for an international communications system to facilitate the exchange of information about disease outbreaks and other public health concerns and sets the basis for control measures—particularly those at points of entry—that minimize potential disruptions to international traffic and trade.

**Strengthening International Communication on Public Health Threats**

IHR (2005) calls on Member States to establish National IHR Focal Points, accessible 24 hours a day, seven days a week, to communicate with WHO on public health events and to take responsibility for communicating with relevant ministries and sectors within their countries.

Together, Member States and WHO have worked to establish and maintain the functions of National IHR Focal Points. The network of WHO IHR Contact Points and National IHR Focal Points now in place plays an invaluable role in verifying, notifying and responding to potential public health emergencies of international concern.
The first real world event to test IHR (2005) communications came on 25 April 2009 when pandemic (H1N1) 2009 was declared a public health emergency of international concern by the WHO Director-General. During the pandemic, all countries with laboratory-confirmed cases of the pandemic (H1N1) 2009 virus provided regular updates through the National IHR Focal Points. They proved to be a valuable mechanism for sharing information, enabling monitoring of the regional and global situation, and informing ongoing risk assessment.

As well as pandemic (H1N1) 2009, more than 100 public health events in the Asia Pacific region have been communicated to WHO through the National Focal Points. These events included the first Zika virus outbreak, outbreaks of polio, cholera and Ebola Reston virus, human infections of H5N1 and H9N2 viruses, cases of multidrug-resistant tuberculosis and food contamination.

**Role of Points of Entry in Confronting Emerging Diseases**

Historically, border-control measures have been used to prevent the entry of so-called quarantinable diseases. But while border-control measures such as passenger screening, health quarantines and isolation may help slow the spread of some diseases, they have limitations. In a world with increasingly fluid borders, they have become less effective and less appropriate. Border-control measures can also carry significant resource implications, and can result in major disruptions to international travel and trade.

The adoption of IHR (2005) represented a major shift in strategy from border control to also containing diseases at their source.

Points of entry, which generally are international airports, ports and ground crossings, now have a new role to play in contributing to public health security. In November 2009, the first WHO-ASEAN meeting on public health measures at international points of entry in the Asia Pacific region worked to define this new role.

Member States including China, India, Malaysia and Thailand shared their experiences in strengthening public health measures and response capacities at points of entry, and public health measures implemented at borders during the pandemic (H1N1) 2009 were reviewed. A *Points of Entry Public Health Emergency Planning Guide* has been drafted to support future emergency preparedness and response in line with IHR (2005).

In connecting countries with one another, points of entry are of vital importance in supporting collective defence systems for emerging infectious diseases and public health risks. Future work under APSED will incorporate the core capacity requirements outlined in IHR (2005) concerning designated points of entry. Some countries, such as the Philippines, have already incorporated this area of work into current APSED workplans.

The Asia Pacific Region is fully committed to the **International Health Regulations (2005)**, and has embraced the unique opportunity they present for all countries to work within a common framework.
Key Regional Actions to Comply with IHR (2005)

- Advocate and improve understanding about IHR (2005) and foster partnerships.

- Strengthen National IHR Focal Point functions and IHR event-related communications.

- Develop, strengthen and sustain the IHR core capacities for surveillance and response through effective implementation of the Asia Pacific Strategy for Emerging Diseases.

- Strengthen public health measures and emergency response capacities at designated international points of entry.

- Provide legal, administrative and procedural advice and support.

Border-control measures at international points of entry, such as health information for international travellers, play an important role in responding public health emergencies.
Prioritizing Key Points of Entry in Malaysia

Malaysia has 66 international points of entry. Three of these—one airport, one seaport and one ground crossing—have been designated and prioritized for the strengthening of public health functions and emergency response capacity.

At these key points of entry, capacity assessment and training programmes have been undertaken that involve officials at the district, state and national level. Yearly evaluations by the Ministry of Health, Malaysia, using the IHR core capacities assessment tool, have helped identify gaps and other requirements under IHR (2005). These regular assessments have supported the development of a plan of action that improves routine risk management and early warning and response systems.

Malaysia has also participated in the Cooperative Arrangement for Preventing the Spread of Communicable Diseases through Air Travel (CAPSCA) project, led by the International Civil Aviation Organization (ICAO), with the involvement of WHO and other partners. In 2008, Kuala Lumpur International Airport was certified as having “Fully Implemented the ICAO Guidelines for the Prevention of Spread of the Communicable Diseases Through Air Travel”.

83
Chapter 9  APSED’s Legal Framework
In 2008, WHO set up the first regional simulation exercise to test its communication channels, established under IHR (2005), with Member States in the Western Pacific.

Known as “Exercise Crystal”, the test was based on a scenario in which a young girl attending an international school dies from a mysterious illness shortly after returning from school camp. In subsequent days, classmates and teachers, along with the girl’s mother and 4-year-old brother, are also admitted to hospital with similar symptoms.

The communications system between WHO and the National IHR Focal Point in each Member State allowed rumours to be quickly verified during the exercise. This is vital, as fast communication is essential in triggering international alerts and enabling control measures to be implemented in order to delay the spread of the disease.

Twenty-three Member States participated in Exercise Crystal, which served to raise awareness of the communications requirements outlined in the International Health Regulations (2005). It also helped identify challenges, such as language barriers and the need for National IHR Focal Points to be accessible 24 hours a day, that WHO and its Member States have since worked to address.
The World Health Organization is consulting with Member States, experts and partners to review key experiences and lessons learnt from APSED implementation and to agree on a way forward.
Over the last five years, firm foundations for managing emerging infectious diseases have been laid. The Asia Pacific Strategy for Emerging Diseases has become a widely used tool, guiding regional efforts to address the threat of emerging diseases. More Member States are using APSED to direct efforts to build strong public health systems that can withstand the threats of emerging diseases. And more development partners and donors are aligning their support with the direction set out in the strategy, leading to a coordinated, effective approach to safeguarding the health of our region.

The initial phase of APSED implementation is now drawing to a close. But with growing impetus behind APSED’s systematic approach, more work is being planned.

The 2009 meeting of the Asia Pacific Technical Advisory Group called for the development of an updated strategy to build on momentum and to ensure all Member States achieve the minimum core capacities required under the International Health Regulations (2005).

The annual TAG meetings bring experts, donors and representatives from Member States and WHO together to foster a spirit of collaboration and strengthen efforts to work towards shared goals. The 2009 TAG meeting recommended that while future work should continue to focus on emerging infectious disease threats, the scope should now be broadened to incorporate the capacity and mechanisms to respond to non-infectious disease events such as food safety-related events and the threat from chemical and nuclear hazards.

The WHO South-East Asia and Western Pacific Regional Offices are currently consulting with Member States, experts and partners to review key experiences and lessons learnt from APSED implementation and to agree on a way forward for the next five or more years.

Preliminary consultations were conducted in Cambodia, China, the Lao People’s Democratic Republic, Mongolia, the Philippines and Viet Nam in early 2010, while the February 2010 meeting of National IHR Focal Points in South-East Asia sought views from Member States on what issues should be addressed in a future strategy. A meeting of Pacific National IHR Focal Points hosted in March 2010 provided an opportunity to discuss how the future strategy can best serve the unique needs of the small Pacific island countries and areas.

Throughout these consultations, countries have consistently expressed the view that the five core capacity-building areas within the current strategy remain key to fulfilling the goals and objectives of APSED, which are still relevant and important for countries in the Asia Pacific region.

While the five core areas will continue to underpin capacity-building efforts, the need to include additional areas, such as...
clinical management or health care system response, public health emergency preparedness, and managing events related to points of entry, has also been raised. Special situations that might need to be addressed include natural disasters, bioterrorism and mass gatherings.

The consultation process thus far has also identified numerous cross-cutting issues, including human resource development, social determinants of health and the potentially wide-ranging effects of climate change. While there is general agreement that these issues need to be taken into account, an in-depth biregional consultation should clarify how they will be incorporated into the updated strategy.

Under APSED, countries have consistently expressed the view that the five core capacity-building areas within the current strategy remain key to fighting emerging diseases.
**Special Considerations**

An effective workforce is an important component of strong public health systems. WHO will continue to support Member States to build the capacity of countries, through activities such as the Field Epidemiology Training Programme, while working to develop approaches to building human resource capacity in other essential areas.

Infectious diseases and other public health threats can have a disproportional effect on different populations. Gender, for example, can affect transmission patterns, health-seeking behaviour, and responses to health promotion and protection measures. There is growing recognition that these differences must be taken into account to ensure public health and clinical responses are both effective and equitable.

Future work will place greater emphasis on addressing the social determinants of health such as gender, although we should...
acknowledge that this is a very difficult area. As a first step, a draft framework, *Sex and Gender Analysis in Emerging Infectious Diseases*, has been developed. This framework, once finalized, will help guide the integration of gender considerations into public health planning and will form the basis of training for WHO staff and Member States.

The most recent report of the Intergovernmental Panel on Climate Change highlighted a wide range of implications for human health. Many diseases are highly sensitive to changing temperatures and precipitation. These include common vectorborne diseases such as malaria and dengue, as well as other major killers such as malnutrition and diarrhoea. Natural disasters are likely to occur more frequently and become more intense, and small islands will be most directly affected.

While climate change poses a significant threat to public health, strengthening key features of health systems can help reduce much of the health risk.

*Foundations for the Future*

The *Asia Pacific Strategy for Emerging Diseases* provides a common framework and adopts a systematic approach to strengthening national and regional capacities that are required for managing emerging infectious diseases—including pandemic influenza—and meeting the IHR core capacity requirements.

One of APSED’s proudest achievements has been the fostering of cooperation and collaborative efforts across the Asia Pacific region to address emerging diseases. Member States, development partners, political bodies, and public and private organizations have made a collaborative effort to secure our region’s health.

As WHO works with Member States to develop an updated strategy for beyond 2010, the South-East Asia and Western Pacific Regional Offices will continue to build on this spirit of collaboration to work towards a common goal.
Main Partners

Asian Development Bank
Asian Disaster Preparedness Center, Bangkok, Thailand
Asia-Pacific Biosafety Association
Association of Southeast Asian Nations
Australian Agency for International Development
Canadian International Development Agency
Central Epidemiology Unit, Ministry of Health, Myanmar
Centre for Health Protection, Hong Kong, China
Chinese Center for Disease Control and Prevention, China
Epidemiology Unit, Ministry of Healthcare and Nutrition, Sri Lanka
European Commission
Faculty of Tropical Medicine, Mahidol University, Thailand
Field Epidemiology Training Programme Indonesia, Gadjah Mada University, and Ministry of Health, Indonesia
Food and Agriculture Organization of the United Nations
Global Outbreak Alert and Response Network (GOARN) Partners
Institute of Epidemiology, Disease Control and Research, Bangladesh
International Centre for Diarrhoeal Disease Research, Bangladesh
International Field Epidemiology Training Program, Ministry of Public Health, Thailand
Johns Hopkins Program for International Education in Gynecology and Obstetrics
Kenan Institute Asia, Bangkok, Thailand
Korean Foundation for International Healthcare-Dr Lee Jong-wook Memorial Fund
Luxembourg Agency for Development Cooperation

Mekong Basin Disease Surveillance, Bangkok, Thailand
Ministry of Health of the People’s Republic of China
Ministry of Health and Family Welfare, India
Ministry of Health, Labour and Welfare, Japan
Ministry of Health, New Zealand
Ministry of Health and Welfare, Republic of Korea
Ministry of Health, Singapore
Ministry of Public Health, Thailand
Nagasaki University, Japan
National Institute of Infectious Diseases, Japan
National Institute of Preventive and Social Medicine, Bangladesh
National Institute of Virology, Pune, India – International H5 Reference Laboratory
National Red Cross and Red Crescent Societies
International Federation of Red Cross and Red Crescent Societies
New Zealand’s International Aid and Development Agency
Institut Pasteur, Paris, France
Public Health Agency of Canada
Regional Emerging Diseases Intervention Centre
Secretariat of the Pacific Community
South Asian Association for Regional Cooperation, Kathmandu, Nepal
Tohoku University, Japan
United Nations Children’s Fund
United Nations System Influenza Coordinator
United States Agency for International Development
United States Centers for Disease Control and Prevention
WHO Collaborating Centre for Reference and Research on Influenza, Melbourne, Australia

WHO Collaborating Centre for Reference and Research on Leptospirosis, Queensland, Australia

WHO Collaborating Centre for Virus Reference and Research on Influenza, Influenza Reference Laboratory, Victorian Infectious Diseases Reference Laboratory, Victoria, Australia

WHO Collaborating Centre for Research, Training and Outbreak Response in Infection Control, Queen Mary Hospital Infection Control Centre of Hong Kong, China

WHO Collaborating Centre for Surveillance, Research and Training of Emerging Infectious Diseases, Center for Disease Control and Prevention, Guangdong Province, China

WHO Collaborating Centre for Diagnosis, Reference, Research and Training in Leptospirosis, Indian Council of Medical Research, Port Blair, India

WHO Collaborating Centre for Epidemiology and Training, National Centre for Disease Control, New Delhi, India

WHO Collaborating Centre for Rabies Epidemiology, National Institute of Communicable Diseases, New Delhi, India

WHO Collaborating Centre for Reference and Research in Rabies, National Institute of Mental Health and Neurosciences, Bangalore, India

WHO Collaborating Centre for Influenza and Respiratory Viruses, Influenza Laboratory, Department of Viral Diseases and Vaccine Control, National Institute of Infectious Diseases, Tokyo, Japan

WHO Collaborating Centre for Reference and Research on Tropical and Emerging Virus Diseases, Department of Virology, Nagasaki University, Nagasaki, Japan

WHO Collaborating Centre for Antimicrobial Resistance Surveillance and Training, National Institute of Health, Department of Medical Sciences, Ministry of Public Health, Thailand

WHO Collaborating Centre for Case Management of Dengue Fever/Dengue Haemorrhagic Fever/Dengue Shock Syndrome, Queen Sirikit National Institute of Child Health, Thailand

WHO Collaborating Centre for Diagnostic Reference, Training and Investigation of Emerging Infectious Diseases, Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand

WHO Collaborating Centre for Field Epidemiology, Bureau of Epidemiology, Ministry of Public Health, Bangkok, Thailand

WHO Collaborating Centre for Research on Rabies Pathogenesis and Prevention, Queen Saovabha Memorial Institute, Thai Red Cross Society, Bangkok, Thailand

WHO Collaborating Center on Research and Training on Viral Zoonoses, Chulalongkorn University, Bangkok, Thailand

WHO Collaborating Centre for the Surveillance, Epidemiology and Control of Influenza, Centers for Disease Control and Prevention, Influenza Branch, Atlanta, Georgia, United States of America

WHO Reference Laboratory for Diagnosis of Influenza A/H5 Infection, National Institute of Virology, Pune, India

WHO Reference Laboratory for Diagnosis of Influenza A/H5 Infection, Faculty of Medicine, University of Hong Kong, Hong Kong, China

World Bank

World Organisation for Animal Health
The Asia Pacific Technical Advisory Group (TAG) Members

Dr Brenda Ang (2006)
Dr Poh-Lian Lim (2007-2010)
Senior Consultant
Department of Infectious Diseases
Tan Tock Seng Hospital
Singapore

Professor N.K. Ganguly
Director-General
Aruna Asaf Ali Marg
Translational Health Science and Technology Institute
National Institute of Immunology
India

Dr Shiv Lal
Former Special Director-General Health Services (Public Health)
and Director, National Centre for Disease Control
India

Professor John Sheppard Mackenzie
Research Associate/Professor of
Tropical Infectious Diseases
Australia Biosecurity CRC
Curtin University of Technology
Australia

Dr Tatsuo Miyamura
Former Director-General
National Institute of Infectious Diseases
Japan
(Alternate: Dr Nobuhiko Okabe)

Professor Angus Nicoll, CBE
Senior Expert – Influenza Coordination
European Centre for Disease Prevention and Control
Sweden

Dr Anne Schuchat
RADM United States Public Health Service
Assistant Surgeon General
Director
National Center for Immunization and Respiratory Diseases
Centers for Diseases Control and Prevention
United States of America
(Alternate: Dr Ann Moen)

Dr Viroj Tangcharoensathien
Director International Health Policy Program
International Health Policy Program
Ministry of Public Health
Thailand

Dr Donglou Xiao
Deputy Director-General
Bureau of Disease Control
Ministry of Health
People’s Republic of China
WHO wishes to acknowledge the support from the above organizations and agencies.