Asia Pacific Strategy for Emerging Diseases (APSED)

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Preface

The Asia Pacific Strategy for Emerging Diseases (APSED) is an overarching strategic framework, agreed by Member States of the South-East Asia and Western Pacific regions, for building capacities to detect, prepare for and respond to emerging infectious diseases and public health emergencies. Developed in 2005 by the World Health Organization (WHO) and partners, the strategy has gone through two five-year iterations. For nearly a decade, APSED has served as a comprehensive guide for Member States and key partners to work collaboratively to build core capacities. It is important to note, however, that these capacity-building efforts need to be consistent with national priorities, monitored by strengthened national planning processes and implemented through the systems of Member State ministries.

As such, for this APSED evaluation, it was necessary to consult widely with all Member States in both regions, as well as with funding and technical partners, to obtain their perspectives on the successes and challenges of APSED as a whole. This evaluation was done through questionnaires to four different categories of stakeholders; a desk review of available reports; field visits to Nepal, Mongolia, Indonesia, the Lao People’s Democratic Republic and Viet Nam; and discussions at the biregional Technical Advisory Group (TAG) meeting in July 2015.

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Abbreviations

ADB  Asian Development Bank
AMR  antimicrobial resistance
APSED  Asia Pacific Strategy for Emerging Diseases
ASEAN  Association of Southeast Asian Nations
ASEF  Asia–Europe Foundation
CIDN  Canadian International Development Agency (now Global Affairs Canada)
DAC  Development Assistance Committee
DFAT  Department of Foreign Affairs and Trade (formerly AusAID)
DFID  Department of International Development
DSE  Division of Health Security and Emergencies
EBS  event-based surveillance
EID  emerging infectious disease
EOC  emergency operations centre
EQAS  external quality assessment scheme
EU  European Union
EWARS  Early Warning Alert Response System
FAO  Food and Agriculture Organization of the United Nations
FETP  field epidemiology training programme
GISRS  Global Influenza Surveillance and Response System
GOARN  Global Outbreak Alert and Response Network
GDP  gross domestic product
H5N1  avian influenza A(H5N1)
H7N9  avian influenza A(H7N9)
IBS  indicator-based surveillance
ILI  influenza-like illness
IPC  infection prevention and control
JICA  Japan International Cooperation Agency
MERS  Middle East respiratory syndrome
MERS-CoV  Middle East respiratory syndrome coronavirus
NFP  National IHR Focal Point
NIC  National Influenza Centre
NIPPP  National Influenza Pandemic Preparedness Plan
OECD  Organisation for Economic Co-operation and Development
OIE  World Organisation for Animal Health
PC  Partnership Contribution
PCR  polymerase chain reaction
PHE  public health emergency
PIP  Pandemic Influenza Preparedness
PoE  points of entry
RRT  rapid response team
SARI  severe acute respiratory infection
SARS  severe acute respiratory syndrome
SOP  standard operating procedure
TAG  Technical Advisory Group
UNDP  United Nations Development Programme
UNICEF  United Nations Children's Fund
USAID  United States Agency for International Development
US CDC  United States Centers for Disease Control and Prevention
WHO  World Health Organization
WPSAR  Western Pacific Surveillance and Response Journal
Executive summary

The Asia Pacific Strategy for Emerging Diseases (APSED) is a common strategic action framework for Member States of the WHO South-East Asia and Western Pacific regions and their partners. It aims to strengthen regional and national core capacities to effectively prepare for and respond to threats posed by emerging infectious diseases (EIDs) and other public health emergencies (PHEs). APSED was first launched in 2005 to support Member States in meeting the obligations of the International Health Regulations, or IHR (2005). The first five-year phase of the strategy was reviewed in 2010. APSED’s underlying strategic approach has promoted keeping countries at the centre through: building generic capacities to address all EIDs rather than specific diseases; urging collective actions by Member States and their partners to achieve the common goal of improved international health security; building capacities before or between events; and step-by-step strengthening of capacities through revision of national EID plans. For many countries, influenza was the first area of focus and established a foundation to address other EIDs.

The purpose of this evaluation, after almost 10 years of implementing APSED, was to inform Member States, WHO and their partners of the status of achieving the APSED objectives, the impact on and sustainability of national and regional APSED capacities or systems, the relevance of what was supported or prioritized, the efficiency of management of the strategy, lessons learnt, and the future direction of emerging disease and public health emergency work.

Information used for the evaluation came from a combination of different sources: self-assessments gathered through the annual IHR (2005) questionnaires; published peer-reviewed articles; responses received through APSED evaluation questionnaires; field missions to five Member States; interviews with funding and technical assistance partners; lessons learnt through studying available outbreak reviews; assessments of recent Ebola preparedness planning for Member States visited; evidence of tracking implementation against annual milestones in the APSED (2010) work plan; and regular APSED progress reporting at APSED Technical Advisory Group (TAG) meetings.

The “triangulation” of data sources, or use of multiple sources of similar data to validate the initial findings, was not possible for all evaluation criteria of the Organisation for Economic Co-operation and Development’s (OECD) Development Assistance Committee (DAC). However, when used, triangulation provided the evaluation team with adequate confidence in the general conclusions, which are structured against the DAC evaluation criteria.

Relevance of APSED

Member States and their partners in both regions consistently acknowledged the continuing relevance of APSED in advancing health security. The recent experiences with Middle East respiratory syndrome (MERS) and Ebola virus disease demonstrate the regions’ vulnerability to the increasing threats of EIDs, unknown pathogens and PHEs. After 10 years of implementation, in the face of increasing health security threats, the APSED focus areas are still largely considered appropriate. Its strategic “systems approach” continues to be relevant, particularly in building broad capacities to address all EIDs, including influenza and unknown pathogens, and PHEs in general; conducting annual national planning and review processes; working collectively to achieve a common goal; and investing in capacity-building between events.

1 The OECD DAC evaluation criteria – relevance, effectiveness, efficiency, impact and sustainability – were the basis for the evaluation questions used in this exercise.
Impact of APSED (longer-term capacity changes)
The South-East Asia and Western Pacific regions are better prepared to respond to EIDs and unknown pathogens today than a decade ago. This improved situation is recognized as the result of combined capacity-building efforts of Member States and their many partners, and support from APSED and other programmes.

Effectiveness of APSED
With support from partners, APSED has been instrumental in strengthening Member States’ capacity to manage PHEs. Notable accomplishments have been observed in establishing event-based surveillance (EBS) systems, enhancing public health laboratory capacity for basic diagnosis of priority diseases, improving coordination mechanisms for zoonotic diseases, and establishing public health emergency contingency plans for points of entry. For instance, the use of standard operating procedures (SOPs) in EBS systems has helped National IHR Focal Points (NFPs) to verify reported events and notify WHO within the required 24-hour benchmark response time. Likewise, while public health laboratories are still dependent on external assistance, improvements in capacity have helped national reference laboratories identify unknown pathogens.

Considerable progress has been made in training field epidemiologists and establishing national field epidemiology training programmes (FETPs). In addition, the composition, geographic distribution and timeliness of rapid response teams (RRTs) have improved. Due attention given to human resource development has proven to be key in strengthening and maintaining surveillance, risk assessment and information sharing in the two regions. There is clear evidence of improvements in public health event communications, including reporting, consultation, notification, information sharing, and verification of public health emergencies of international concern by NFPs.

APSED has promoted an improved understanding of the implications of gender differences regarding vulnerability to disease, exposure to pathogens and response to illness, and hence the subsequent incidence, duration and severity of EIDs. These include differences due to social norms, roles and responsibilities, decision-making, health-seeking behaviours and access to resources, as well as differences due to sex, such as anatomy, genetics, hormones, immune system and pregnancy. APSED has also promoted the integration of “gender-specific considerations” into all focus areas.

Despite the progress noted above, the building of capacities to detect, prepare for and respond to EIDs and PHEs remains ongoing in all Member States. As a result, continued work and focus needs to be directed towards enhancing country-level risk assessment capacity, improving infection prevention and control (IPC), and integrating emergency operations centres (EOCs) within ministries of health. This capacity-building process will need to continue well beyond the deadline for the achievement of IHR (2005) core capacities and the end of APSED (2010).

Sustainability of the capacity enhancements under APSED
The sustainability of enhanced capacities is variable based on the responses from the questionnaires. While almost 10% of Member States are over 75% reliant on external funding for the capacity-building areas that demonstrated the most progress in the last decade, the majority of the Member States are confident that they can maintain the recent improvements in staffing capacity at the national level. Higher confidence levels were found in the South-East Asia Region than in the Western Pacific Region.

Progress made by the Member States indicates that APSED’s underlying strategic approach does
promote more sustainable change. Among the sustainable strategies pursued is the use of domestic funding sources to initiate or improve support for FETPs, which demonstrates both a growing capacity to invest in training as well as appreciation of the value of building capacity for EID and PHE-related work. Prospects for sustainability were found to be higher in countries that have strong political support, formal legal structures and increasing domestic funding.

Moreover, collaboration between Member States, often due to the recognition of mutual bilateral or multilateral benefits, is anticipated to promote the mobilization of additional, and arguably more secure, sources of funding, technical expertise and longer-term capacity-building commitments.

Management efficiency of APSED's implementation
WHO satisfactorily managed the TAG convening and meeting process, and effectively supported the annual planning and review process, in Member States where this process exists. Progress in implementing TAG recommendations was regularly tracked in the Western Pacific Region.

Evidence shows the increasing capacity of Member States to report events of regional importance through official mechanisms rather than relying on the media.

APSED has provided a valuable and effective action framework for advocacy and promoting collective action by Member States and their operational, technical and funding partners. In the last 10 years, APSED has been used to mobilize and coordinate over US$ 250 million in additional funding. The improved involvement of development partners in annual planning and review processes has also given Member States a platform to advocate for longer-term support to fund their capacity-building programmes. The annual planning and review process, where it exists, helps Member States to coordinate key internal and external stakeholders, promote greater and transparent reflection on progress achieved, and enhance the priority-setting process, which is considered very important in a strategic planning environment of scarce funding and staffing resources.

The WHO regional offices for South-East Asia and the Western Pacific pursued different approaches to promoting APSED with their Member States. While the Regional Office for South-East Asia focused predominantly on building IHR (2005) core capacities, the Regional Office for the Western Pacific explicitly promoted APSED as a strategic action framework for achieving the relevant IHR (2005) core capacities. As a result, the South-East Asia Region relies heavily on IHR (2005) data for assessing progress, while the Western Pacific Region supplements IHR (2005) data with information collected through annual APSED progress reporting, the use of APSED supplementary performance indicators and the annual planning and review process in focus countries.²

Future directions
Based on the proven continued vulnerability of all Member States, the demonstrated relevance of the current approach and its components, and the encouraging evidence of progress achieved to date, Member States and WHO are encouraged to commence discussions on the next phase of APSED to further strengthen capacities to prepare for and respond to EIDs and PHEs.

The future strategy is envisioned to address and take into consideration important questions raised

² Focus countries in the Western Pacific Region are Cambodia, China, Fiji, the Lao People's Democratic Republic, Malaysia, Mongolia, Papua New Guinea, the Philippines and Viet Nam.
about APSED’s scope and focus, including the lessons learnt throughout the evaluation process. Among the more prominent issues raised were calls for revisiting the relevance of a biregional scope, determining a more limited or broad technical focus, incorporating other IHR core capacities, aligning synergies with the Global Health Security Agenda and other partner initiatives, elaborating on the role of WHO, and incorporating better-defined monitoring and evaluation systems.

The biregional scope of the strategy is considered valuable for information sharing among neighbouring Member States from different WHO regions that share common borders and/or have significant intercountry air travel movements. This value is attributed to the potential to share capacities across regions, prevent the spread of EIDs, and promote healthy competition between regions. Some limitations, however, were noted due to different approaches being taken and some cultural differences between regions.

In summary, lessons learnt through the evaluation process and the suggested future direction should provide valuable inputs in crafting the next strategy, but without limiting its scope.
Evaluation methods

Broad evaluation approach and the evaluation team
This evaluation does not purport to be an “independent evaluation” conducted by a team separate from the main stakeholders. Rather, it was a collaborative evaluation involving monitoring and evaluation personnel from key partners, namely the WHO regional offices for South-East Asia and the Western Pacific, US Centers for Disease Control (CDC) and the governments of 38 Member States, seeking to reach a consensus on the main findings. The evaluation was led by an external evaluation consultant with five years’ involvement with APSED (2010) and earlier experience with APSED (2005). The evaluation team involved one expert from each WHO Region, plus an evaluation specialist from US CDC. During visits to three Member States in the Western Pacific Region, namely the Lao People’s Democratic Republic, Mongolia and Viet Nam, the team was supplemented by WHO regional personnel familiar with influenza, EIDs and public health administration, as well as in-country WHO specialists responsible for APSED implementation.

Evaluation questions
The overall analysis was focused on five evaluation questions and their sub-questions. These questions followed the Development Assistance Committee (DAC) evaluation criteria of the Organisation for Economic Co-operation and Development (OECD).

1. Relevance: To what extent has APSED been focused on the highest priority activities?
   • What process is in place to ensure a contestable activity prioritization process?
   • Has this process effectively involved the key stakeholders?
   • Is there evidence of modifying or fine-tuning established priorities and lessons learnt?

2. Effectiveness and impact: To what extent were APSED objectives, including broader public health security impacts, achieved in Member States between 2006 and 2014?
   • To what extent were IHR (2005) capacities achieved in Member States?
   • To what extent did the quality of capacity strengthening improve and contribute to better risk management, earlier detection, more rapid response, better preparedness and sustainable partnerships?
   • To what extent have these enhanced capacities/systems improved broader public health security?
   • What were the unintended direct and indirect consequences of APSED (both positive and negative)?

3. Sustainability: To what extent have APSED capacities been made sustainable?
   • To what extent are APSED functions routinely performed or more broadly adopted and replicated by national ministries of health?
   • What factors have supported sustainable detection and response systems?
   • What are the barriers to sustainable detection and response systems and what strategies should be pursued to enhance sustainability?

4. Efficiency: To what extent was the regional partnership model useful for APSED stakeholders and the programme managed efficiently?
   • How efficiently was APSED, including forums like the TAG meeting, managed?
   • To what extent and how did regional partners contribute to the APSED goal and what relevant parallel (non-APSED) assistance was provided?
5. Lessons learnt: What were the major lessons learnt and what are the implications for the future direction of emerging disease and public health emergency work?

- What lessons have been learnt and what are the implications for the future?
- What are the priorities of Member States and partners in the currently evolving discussion of global health security?

Data required and data sources

These evaluation questions were further unpacked into an evaluation information spreadsheet. This spreadsheet, developed by WHO representatives and the evaluation team during a five-day workshop in Bangkok, Thailand in January 2015, was used to document data from the main sources of information for the evaluation. The main sources of data were regular APSED/IHR progress reporting; responses to the annual IHR (2005) questionnaire; IHR (2005) second extension requests; and other significant progress reports, such as the independent evaluation of APSED (2005) in 2010. When possible, the evaluation used existing sources of data. However, when this was not feasible, questionnaires were sent to four different categories of stakeholders, namely Member States, technical partners, funding agencies and TAG members, with the aim of reducing the effort required by individual stakeholders.

As with most qualitative analysis, “triangulation” of data was performed to increase the credibility and validity of key findings. In this evaluation, the team compared responses to the annual IHR (2005) questionnaire, the APSED evaluation questionnaire and APSED/IHR progress reporting. The team also assessed outbreak reviews, sought technical assistance, obtained partners’ perspectives and assessed lessons learnt from the recent preparedness planning for Ebola virus disease.

Evaluation questionnaires

Through APSED, Member States in Asia and the Pacific work collectively with the WHO regional and country offices, technical assistance organizations and funding partners to achieve the common goal of building capacities to detect, prepare for and respond to EIDs and PHEs. As a consequence, it was important to provide all stakeholders with an opportunity to comment during this review. To facilitate broad participation, questionnaires were developed for four categories of stakeholders, namely Member States, technical partners, funding agencies and TAG members.

Member State visits

For five Member States, namely Indonesia, the Lao People’s Democratic Republic, Mongolia, Nepal and Viet Nam, desktop analyses were supplemented with one-week, in-country visits to learn more from the main stakeholders. During these visits, the team spoke to senior government officials of multiple ministries responsible for detecting, preparing for and responding to EIDs and PHEs. The ministries included, but were not limited to, those dealing with human health. In addition, team members spoke with relevant technical assistance and funding partners to obtain their perspectives on progress made in building capacities related to EIDs and PHEs and the relevance of the APSED approach. Finally, the evaluation team completed the evaluation questionnaire and updated a country case information spreadsheet for each Member State visited.
Research support work
As part of the evaluation team, a researcher was employed to prepare most of the draft country case studies, analyse the responses to the evaluation questionnaires and prepare a summary analysis of the relevant IHR (2005) questions.

Report finalization process
As the evaluation team was split up to cover different Member States, a group exercise was held after the last Member State visit in mid-May 2015 to determine the main conclusions and prepare a brief annotated outline of the main report. While this report was peer-reviewed by senior management in the WHO regional offices for South-East Asia and the Western Pacific and by some TAG members, any remaining shortcomings were the responsibility of the evaluation team. Stakeholders attending the mid-2015 biregional TAG meeting had an opportunity to discuss the report during a full day of focus group discussions and to review the main comments during a plenary session.
1. Relevance

To what extent has APSED been important for global health security, based on an appropriate underlying strategic approach and focused on the highest priority activities?

Relevance is generally defined as the extent to which an aid activity is suited to the priorities and policies of the target group, recipient and donor (OECD, 2016). In this situation, relevance can be best assessed by considering: the importance of APSED to the ongoing global health security policy agenda; the appropriateness of the eight focus areas (public health emergency preparedness; surveillance, risk assessment and response; laboratories; zoonoses; prevention through health care; risk communication; regional preparedness, alert and response; and monitoring and evaluation); and the appropriateness of the underlying strategic approach.

1.1 Relevance of APSED to global health security policy agenda

From an international perspective, EIDs continue to threaten global health security. The Western Pacific Region, in particular, has been the epicentre for many serious emerging diseases, including severe acute respiratory syndrome (SARS), avian influenza A(H5N1), and avian influenza A(H7N9). These EIDs, along with MERS, chikungunya, dengue and the recent outbreak of Ebola in West Africa, are stark reminders of their frequency and the potential for significant health, economic and social impacts worldwide. As the world continues to be confronted by these unpredictable and “borderless” health threats, it is essential that Member States work cooperatively and effectively to build systems to detect, prepare for and respond to these inevitable threats. It is widely recognized that we are collectively exposed by the “weakest link in the chain”, whether that be a domestic link or an international one.

The economic impacts of pandemics add compelling evidence of the need to strengthen global health security. Economies suffer greatly from the direct costs associated with controlling outbreaks and the indirect costs of rebuilding trust in tourism and trade. There is evidence of severe economic damage in the wake of SARS and A(H5N1) in 2003 and 2004. Studies published by the Food and Agriculture Organization of the United Nations (FAO) and the World Bank estimated that the 2003 outbreak of SARS reduced East Asia’s gross domestic product (GDP) by 2%, even though only about 800 people ultimately died (McLeod et al., 2007; Brahmhhatt, 2005). Others (Saywell, Fowler & Crispin 2003) estimated the cost of SARS to be US$ 11–30 billion. Since 2003, the estimated global loss from avian influenza, much of which has occurred in the Asia Pacific region, has run into the billions of dollars (McLeod et al., 2007). Outbreaks of avian influenza in 2003 and 2004 resulted in the deaths of an estimated 44 million birds or 17.5% of the poultry population in Viet Nam, and about 29 million birds or 14.5% of the poultry population in Thailand. In Viet Nam, before the final extent of spread was known, the cost of the 2003 and 2004 outbreaks was predicted to be 0.3–1.8% of GDP (McLeod et al., 2007), which, based on GDP estimates for 2004, would have been the equivalent of US$ 76–450 million. Similarly, early estimates in Thailand suggested that as much as 1.5% of GDP growth over a year, or over US$ 2 billion in 2003–2004, was lost (McLeod et al., 2007). Circulating influenza viruses in poultry are not the only threat to animal and human health and national economies. In a recent review of costs associated with controlling outbreaks of dengue, Stahl et al. (2013) estimated that, in 2011, Viet Nam and Indonesia devoted roughly US$ 12 million and US$ 6.75 million, respectively, for mosquito control, surveillance, information, education and communication, direct medical costs, and other indirect costs. Furthermore, a preliminary estimate of the cost of Ebola to West Africa by the World Bank indicated that by the end of 2015, it could cost US$ 32.6 billion (World Bank, 2014).
The profound impact of SARS in the Asia Pacific region can also be seen through a few subsequent initiatives: the development of enhanced pandemic influenza planning and surveillance efforts; a greater focus on global health security; greater support for improved laboratory and surveillance networks; and the urgent push in 2005 to revise the 1969 International Health Regulations to promote minimal core capacities for preparedness and response (Braden et al., 2013). Reflecting on the lessons learnt, Braden et al. (2013) warn against complacency and urge Member States to “strive to address global inequalities [in capacities] that are at the root cause”. Coker et al. (2011) also suggest that the increasing trends towards regional coordination, cooperation and information sharing should be complemented by a commitment to address imbalances in health system capacity.

Based on the continued emergence of new infectious diseases, as well as the re-emergence of known infectious diseases and the intensifying risk of natural disasters, the relevance of APSED’s guiding framework as an implementation mechanism for achieving core IHR (2005) capacities related to EIDs and PHEs and for mobilizing technical and funding resources seems self-evident. In a review of nearly 400 public health emergencies of international concern, Bogich et al. (2012) found that a breakdown or absence of public health infrastructure was the driving factor in the largest fraction of outbreaks (39.5%). It was also proposed that development agencies should pursue a systems approach to address pandemic prevention through routine national systems.

In this international context, it seems intuitive to build capacities to detect, prepare for and respond to EIDs in the South-East Asia and Western Pacific regions. It follows that the relevance of what APSED seeks to achieve seems beyond question.

1.2 Relevance of the APSED framework regarding focus areas and component structure

During the APSED (2010) biregional consultations, consensus was obtained among all Member States, and regional and global experts for determining the most relevant technical areas and key components. The eight focus areas are: 1) public health emergency preparedness; 2) surveillance, risk assessment and response; 3) laboratories; 4) zoonoses; 5) prevention through health care; 6) risk communication; 7) regional preparedness, alert and response; and 8) monitoring and evaluation.

To date, the APSED framework is still considered relevant, as evidenced by the latest thinking on building capacities in this area, such as the United States Government’s Global Health Security Agenda (GHSA, 2014) and Emerging Pandemic Threats Program Phase 2 (ETP-2, 2014–2019).

Another important aspect of the APSED approach has been the treatment of sex and gender differences as a cross-cutting issue. This is important because sex and gender differences affect the manifestation of many diseases, including many EIDs. It is recognized that a person’s sex and gender can affect the incidence, duration, severity of and mortality from EIDs (van Lunzen & Altfeld, 2014). As a consequence, it has been important to integrate gender and sex considerations across all of the eight focus areas of APSED. Hence, it is also appropriate to promote an improved understanding of the implications of gender (differences due to social and cultural norms, roles and responsibilities, decision-making, health-seeking behaviours and access to resources) and sex (differences due to anatomy, genetics, hormones, immune system and pregnancy) for vulnerability to disease, exposure to pathogens and response to illness and therefore the subsequent incidence, duration and severity of EIDs. In the absence of a full understanding of this issue, it seems fitting not only to promote additional research, but also to adopt recognized initiatives like gender-specific risk communication messages, to collect sex-disaggregated surveillance data and to undertake risk assessments that consider gender and sex. With the burgeoning movement towards universal
health coverage, the above initiatives and research are also considered appropriate for government leaders and policy-makers incorporating sex- and gender-specific health needs related to EIDs into universal health coverage schemes.

1.3 Relevance of the APSED approach

In evaluating relevance, a question arises about whether APSED is achieving its goal in the most relevant manner. APSED is based on a set of four underlying strategic approaches, or what might be considered as accepted good practices, for building capacities to detect, prepare for and respond to EIDs and PHEs:

1. building general capacities and systems to address all EIDs and PHEs, including unknown pathogens, rather than disease-specific capacities;

2. investing in capacity-building between events for the establishment of routine or ongoing functioning systems that can detect, prepare for and respond to an EID or PHE in a timely manner to minimize the social and economic costs;

3. promoting collective and collaborative action by operational, technical and funding partners for Member States in support of a common national goal and objectives that are consistent with the APSED framework; and
4. building capacities in a step-by-step manner by supporting an annual planning and review process that builds ownership of and helps implement the national EID plan, and fine-tunes national EID and PHE capacity-building work plans based on lessons learnt.

One measure of the perceived relevance of these underlying strategic approaches is the extent to which Member States have adopted these approaches. Based on findings from the five Member States visited and a review of APSED progress reporting, the following can be concluded.

1. Six of the nine focus countries from the Western Pacific Region have a national EID/PHE plan. While none of the Member States in the South-East Asia Region has a national EID/PHE plan, they all have a National Influenza Pandemic Preparedness Plan (NIPPP), a disease-specific plan that has been in place since before the 2009 pandemic.

2. The national EID/PHE plans in the Western Pacific Region and the NIPPPs in the South-East Asia Region are regularly reviewed and updated. Some Member States in the South-East Asia Region, namely Bhutan, Nepal and Thailand, have already incorporated or linked their NIPPPs to their disaster management plan. The South-East Asia Regional Workshop on the Pandemic Influenza Preparedness Plan, held on 23–25 September 2014 in Kathmandu, Nepal, recommended broadening the NIPPPs to include EIDs. As a result, Member States in the South-East Asia Region are now broadening the scope of their influenza pandemic influenza preparedness plans to include EIDs.

3. Almost all Member States (96%) have developed an Ebola-specific preparedness and response plan that is consistent with the APSED focus areas.

The value of the four underlying strategic approaches was further demonstrated by the questionnaire responses from Member States, technical partners and funding agencies, and TAG members. For example, when Member States were asked about the importance of partnerships in supporting
capacity-building, 90% indicated partnerships contributed significantly to the main capacity-building improvements, and 50% indicated partnerships contributed “very significantly” to these improvements.

It also should be noted that these underlying strategic approaches are similar to the underlying principles of the sector-wide approach. This indicates much broader, well-established support from the aid community for these development approaches in other health-sector capacity-building situations.

In summary, based on the responses received from the five Members States visited and the questionnaire responses from Member States, their funding agencies, and technical partners and TAG members, it is clear that the focus areas and components of APSED, which were developed five and 10 years ago, are still considered largely relevant. Member States agreed that EIDs and PHEs remain significant threats to both regions. In light of this, the underlying strategic approaches of APSED were adopted to guide the development of a capacity-building strategy and preparedness plans for Ebola.
2. Impact

What is the evidence of longer-term public health security capacity improvements?

Impact is generally defined by the development cooperation and evaluation community as the observed positive and negative changes assessed at the highest level of an initiative’s objective statements (OECD, 2016). In the case of APSED, impact is measured against the strategy’s long-term vision: “An Asia Pacific region prepared to mitigate the risk and impact of emerging diseases and other public health emergencies through collective responsibility for public health security.”

These longer-term (or impact-level) changes in capacity to prepare for and respond to EIDs and PHEs are the product of collective efforts by Member States and their partners (see Box 1 for an example). As a consequence, impact-level evidence of change is not likely to be strongly correlated with the work of APSED. Rather, APSED would be one of the many contributing influences. Impact-level changes in capacity can be observed through the ability of Member States to better manage successive events. International literature and the views of other “expert observers” were sought to assess evidence of impact-level change.

Box 1. Global partnerships: Using a US CDC pandemic influenza assessment tool to measure preparedness in the South-East Asia and Western Pacific regions

At the country level, the need to build capacity in influenza preparedness following SARS and A(H5N1) was the tipping point for the development of better detection and response capabilities. To assess longer-term capacity improvements in the two regions, the evaluation team looked at US CDC’s assessments of 12 core capabilities and 50 indicators for influenza preparedness in the five Member States visited. The increasing levels of capability – evidenced by a comparison of the baseline assessment and a more recent assessment – indicate stronger preparedness systems for influenza specifically, and EIDs more broadly. This analysis also highlights the value of the assessment tool and of partners who provide technical and financial assistance within both regions through hands-on training, standardized assessment tools, technical expertise, research platforms and financial support.

Sources: Moen et al. (2014); MacDonald, Moen & St. Louis (2014).

International literature suggests that, at both the country and regional levels, there has been significant progress over the past decade in building capacities to detect, prepare for and respond to EIDs and PHEs. There is also a strong consensus on the need for continued attention to maintaining and enhancing these capacities and the avoidance of complacency. Yao et al. (2013), for example, examined the status of and developments in China’s response to EIDs, comparing the outbreak of SARS in 2003 to the outbreak of H7N9 in 2013. They concluded that the mechanism for responding to EIDs had been improved in terms of command and decision-making, organization and collaboration, monitoring and early warning systems, protection, and international communication and cooperation. This mechanism for responding to EIDs allowed China to successfully deal with outbreaks of H5N1, H1N1 and H7N9. In a review of EIDs in South-East Asia,
Coker et al. (2011) concluded that there had been substantial investment in surveillance capacity, and this pointed to the increasing trend towards regional coordination, cooperation and information sharing in South-East Asia.

In 2011, the Review Committee on the Functioning of the International Health Regulations (2005) assessed and identified lessons learnt during the global response to pandemic influenza A(H1N1) in 2009 in order to help strengthen the functioning of the IHR (2005), the ongoing global response (including the role of WHO) and the preparedness for future pandemics. In its final report (WHO, 2011), the IHR Review Committee concluded: “The IHR helped make the world better prepared to cope with public-health emergencies. The core national and local capacities called for in the IHR are not yet fully operational and are not now on a path to timely implementation worldwide. ... The world is ill-prepared to respond to a severe influenza pandemic or to any similarly global, sustained and threatening public-health emergency. Beyond implementation of core public-health capacities called for in the IHR, global preparedness can be advanced through research, reliance on a multisectoral approach, strengthened health-care delivery systems, economic development in low and middle-income countries and improved health status.”

By late 2014, the IHR Review Committee noted that considerable progress had been made in implementation of IHR (2005) and identified the following key achievements: establishment and functionality of NFPs; increased transparency in reporting events; more systematic use of early warning systems; better communication and collaboration between animal and human health sectors; better coordinated, collective efforts of countries and partners to build capacities (such as APSED, Integrated Disease Surveillance and Response); establishment of emergency response coordination structures; and better international mechanisms to share information for rapid response. These achievements were the result of joint efforts made by Member States, WHO and donor partners. Core capacities at national, subnational and local levels are essential public health functions that are beneficial not only to the individual Member States, but also to the global community.

More specific to the South-East Asia and Western Pacific regions, these findings of general progress are further supported by responses to the annual IHR (2005) questionnaire, conducted since 2011. According to these data, almost all South-East Asia and Western Pacific Member States have national systems in place to promptly detect 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 improved 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 both regions, there is a strong network of individuals and organizations ready to provide expert support during outbreaks.

Most recently, through the conduct of an Ebola preparedness planning exercise in 2014–2015, which involved a combination of questionnaires, simulation exercises and/or in-country assessment missions, it was revealed that higher levels of preparedness exist today compared to when the regions were confronted by SARS in 2003.

When the impacts of EIDs are assessed within society, it is clear that a person’s sex and gender affect incidence, duration, severity and mortality from EIDs. This occurs both directly through effects on vulnerability of men and women to infectious diseases, exposure to infectious pathogens, and responses to illness, as well as indirectly through effects on disease prevention and control programmes. This is explained partly by cultural and behavioural differences between the sexes which play a prominent role in the exposure to pathogens and partly by differences in their immune...
response to infections. This variability in sex-based risks applies to infections with pathogens relevant to human health, causing malaria, tuberculosis, HIV, hepatitis and influenza. The biological pathways responsible for these sex-based differences related to infectious diseases have only begun to be understood. Further research is required to gain an adequate understanding of the biological differences in manifestations of EIDs between women and men to develop individualized treatment concepts (van Lunzen & Altfeld, 2014). In addition to biological sex-based differences between males and females, there are gender-related differences that influence norms and behaviours, the division of labour, health-seeking behaviours, and access to and control over resources. One’s gender has important health implications in terms of:

- health-seeking behaviours, such as women seeking health care more often for their children and themselves than men;
- engagement in particular risk behaviours through gender-related activities, for example, men smoking more than women; and
- environmental exposures due to different social roles and responsibilities, such as women often preparing food including poultry more than men, men tending to go to live-bird markets more than women, and a larger number of female health-care workers (Vlassoff, 2007).

Finally, it is recognized that sex and gender differences can disadvantage males or females depending on the pathogen (WHO Regional Office for the Western Pacific, 2011–2014). As a consequence, analysing sex and gender differences with regards to exposure and outcomes is an important element of risk-reduction strategies to achieve overall health equity and requires additional research to better understand the issues and to develop more effective targeted interventions (WHO Regional Office for the Western Pacific, 2011–2014).

In summary, in terms of capacities to detect, prepare for and respond to EIDs, the Asia Pacific region, while still not safe (Coker et al., 2011), is more prepared today than a decade ago because of the combined capacity-building efforts of Member States and their multitude of partners.
The epidemic curve of human influenza A(H7N9) cases, at least 271 deaths.
3. Effectiveness

To what extent were APSED objectives achieved in Member States between 2006 and 2014?

Effectiveness is generally defined in the development cooperation and evaluation community as the extent to which an initiative achieves its planned objectives (OECD, 2016). For APSED (2010), effectiveness pertains to the ability of a Member State to achieve objectives that are structured in a sequence of statements combining a long-term vision, an ambitious medium-term goal, five broad objectives (see next paragraph), eight focus areas of work, and 32 key components that further disaggregate the eight focus areas of work. While APSED (2005) consisted of five focus areas, APSED (2010) had three additional focus areas: public health emergency preparedness; regional preparedness, alert and response; and monitoring and evaluation.

APSED’s goal is for Member States “to build sustainable national and regional capacities and partnerships to ensure public health security through preparedness planning, prevention, early detection and rapid response to emerging diseases and other public health emergencies”. This goal is disaggregated into APSED’s five objective statements which are to: 1) reduce the risk of being exposed to and contracting emerging diseases; 2) strengthen early detection of outbreaks of emerging diseases and public health emergencies; 3) strengthen rapid response to outbreaks of emerging diseases and public health emergencies; 4) strengthen effective preparedness for outbreaks of emerging diseases and public health emergencies; and 5) build sustainable technical collaboration and partnerships in the Asia Pacific region.

The evidence of effectiveness reported in this evaluation is drawn from a combination of data sources: self-assessments gathered through the annual IHR (2005) questionnaire; published peer-reviewed articles; responses received through the APSED evaluation questionnaire; field missions to five Member States; views expressed by funding and technical assistance partners; lessons learnt through studying available outbreak reviews; an assessment of the recent Ebola preparedness planning for the Member States visited; evidence of tracking implementation against annual milestones in the APSED (2010) work plan; and regular APSED progress reporting to IHR/APSED TAG meetings. While ideal, the “triangulation” of data sources, or use of multiple sources of similar data to better validate findings, has not been possible for every “aspect” of effectiveness. However, when used, triangulation has provided the evaluation team with adequate confidence in the following findings.

The following key component areas of APSED (2010), on which the South-East Asia and Western Pacific regional offices have primarily focused, are considered to be the most appropriate areas to pursue evidence of APSED’s contribution to reported long-term capacity improvements

Event-based surveillance

Significant improvements have been made in the establishment of EBS systems that operate according to SOPs and provide NFPs with the ability to verify requests from WHO within the required 24-hour benchmark response time. China’s response to H7N9 exemplifies the use of EBS systems to detect novel viruses and IHR (2005) mechanisms to report them (Box 2). Further evidence of improvements in EBS systems is demonstrated by IHR (2005) data that indicate a significant increase (from about 60% to more than 80%) between 2010 and 2013 in a number of Member States in both regions that have implemented SOPs and guidelines for event capture, reporting, confirmation, verification, assessment and notification. While the evaluation team could
not assess progress from the IHR (2005) data, Member States from both regions reported that their NFPs responded within 24 hours to more than 80% of verification requests received from WHO in the last 12 months.

APSED progress reporting provides numerous examples of important health events being detected. For example, as stated in the 2014 APSED progress report: “More than 200 disease or suspected disease outbreaks have been identified and reported through the [Pacific Syndromic Surveillance System] PSSS since 2010. The early and consistent reporting of early warning surveillance data has facilitated the rapid implementation of control measures to reduce the severity of outbreaks. ... In the past year, the important role of EBS in the early detection of acute public health events has been evident. The major events detected by EBS led to prompt responses from Member States, including the first human infection with H7N9 outside China (Malaysia) and the first report of MERS-CoV in the [Western Pacific] Region (Malaysia and the Philippines). ... Influenza-like illness [(ILI)] clusters in Cambodia and the Lao People’s Democratic Republic and multiple arboviral disease outbreaks in the [Pacific island countries] PICs were also detected through EBS.”

**Box 2. Avian influenza A(H7N9) response: An investment in public health preparedness in China**

The outbreak of H7N9 in China in 2013 was a stark reminder that public health threats continue to put the global community at risk and that all countries need to maintain a high level of vigilance and preparedness.

On 31 March 2013, China notified WHO of the existence of a new virus of global concern. Within 24 hours, the IHR (2005) mechanisms were activated and China and WHO began working together to identify the virus and to implement public health measures. China’s strong leadership and commitment translated into a swift and effective response, starting with immediate virus sharing so researchers internationally could commence efforts to classify and contain the threat. A joint China–WHO mission exemplified collaboration in action. To inform public health actions, the mission’s joint risk assessment called for enhanced surveillance, epidemiological investigations, animal and human health sector collaboration, and scientific research.

By 30 April 2013, within a month of the first IHR notification, the number of reported cases of laboratory-confirmed H7N9 infections in humans had increased to 126 cases with 24 deaths; it subsequently peaked at 132 cases and 37 deaths. However, by the end of May 2013, there was a decline in the number of laboratory-confirmed cases of infections in humans. This decline is attributed to the rapid introduction of a number of public health interventions, which included closure of live bird markets and increasing public awareness about the disease.

Another important aspect of the response was the availability of high-quality data for detecting and monitoring the outbreak. Through early detection and investigation, the EBS system recorded an unusual family cluster of severe acute respiratory disease of unknown cause. Sentinel hospitals of the national ILI surveillance network provided weekly updates on the number of outpatients with symptoms and collected swab samples for real-time polymerase chain reaction (PCR) testing. The ILI data were vital for ongoing risk assessments and the establishment of baseline data for subsequent monitoring of the outbreak. Early in the event, the age and sex distributions of human cases were rapidly
assessed to inform risk assessments and potential next steps. The combined efforts of the human and animal health sectors – mutual sharing of information, close and timely communication, and coordinated response – were also critical in the successful response to this event. Information was also shared with the global community through regular and timely updates.

The swift and effective response to the H7N9 event in China in 2013 clearly indicated to the global community that investments in building the IHR (2005) core capacities could result in timely detection, reporting and response to potential public health emergencies of international concern. It also confirmed that unpredictable and borderless health threats continue to threaten the world, making it imperative that Member States, WHO and partners continue to work together through programmes like APSED.

Source: WHO Regional Office for the Western Pacific (2013).

APSED progress reporting in 2014 indicated that most Member States in the South-East Asia Region have established an EBS system. All Member States in the Region have a list of priority diseases, conditions and case definitions for surveillance, and have units designated for surveillance of public health risks, including EBS. All but one Member State have developed SOPs and guidelines for EBS, and the majority of Member States have achieved full integration of EBS and indicator-based surveillance (IBS) systems. Furthermore, appropriate information sources for public health risks have been identified by more than 80% of Member States, and all except one have reported that they are able to assess such events within 48 hours. Over the period 2013-2014, diseases and infections found in the South-East Asia Region and reported through daily EBS monitoring included avian influenza, suspected MERS, H1N1, cholera, viral hepatitis C and E, anthrax, West Nile virus, Nipah virus, Chandipura virus, encephalitis, dengue virus and vaccine-preventable diseases (i.e. diphtheria, typhoid fever and vaccine-derived poliovirus).

Responses from the Member State questionnaire indicated that about 50% of Member States considered the creation of an effective EBS system an important area of capacity-building progress, and two thirds of these responses reported it as the most significant change in capacity.

Evidence of progress in establishing EBS systems was also captured in independent assessments found in international literature. For example, based on research in Papua New Guinea, Dagina et al. (2013) note: “EBS is timelier (than IBS), and given the challenges within developing countries, particularly island nations, this evidence shows progress in the establishment of EBS in a country that has successfully met virtually all of the IHR (2005) requirements related to EBS. The only area requiring further work is direct outreach to communities to increase reporting. Feedback mechanisms and laboratory confirmation would also further enhance the system.” Similarly, Khampapongpane et al. (2014) make mention of the extraordinary progress made by the Lao People’s Democratic Republic in their dengue surveillance system, which was found to meet “many of the key international recommendations for surveillance and outbreak response”.

Field epidemiology training

Evidence culled from IHR (2005) data in 2013, APSED progress reports, country visits and other independent assessments suggest considerable progress has been made in training field epidemiologists and in establishing national field epidemiology training programmes (FETPs).
The IHR (2005) data in 2013 indicate that more than 90% and 70% of Member States in the South-East Asia and Western Pacific regions, respectively, have developed a field epidemiology plan or a strategy to access field epidemiology training (for one year or more) either in-country, regionally or internationally. However, less than 75% of Member States have implemented that plan or strategy.

According to the 2014 APSED progress report, six Member States in the Western Pacific Region, namely Cambodia, the Lao People’s Democratic Republic, Mongolia, Papua New Guinea, Singapore and Viet Nam, set up a FETP during the first phase of APSED. A total of 12 Member States have established such a programme. Numerous examples of graduates and trainees contributing to outbreak responses and major public health emergencies, like Typhoon Haiyan in the Philippines (known locally as Typhoon Yolanda), are also documented in the APSED progress reporting.

The APSED progress reporting also adds that FETPs in the South-East Asia Region, which started in the 1980s, have continued to be strengthened both directly through APSED and as part of more general training on international outbreak response. In the South-East Asia Region, national FETPs have been established in Bangladesh, India, Indonesia and Thailand, while the Democratic People’s Republic of Korea is setting one up. Other Member States in the South-East Asia Region are sending participants to attend field epidemiology training in other countries, such as India and Thailand. FETP graduates have contributed to various outbreak investigations of national concern, including avian influenza, malaria, measles, rabies, leptospirosis and diphtheria.

During country visits, it was discovered that several FETP graduates in Indonesia, the Lao People’s Democratic Republic, Mongolia and Nepal were from the animal health sector. Inclusion of trainees from the animal health sector is under consideration in other Member States.

Independent assessments found in the international literature corroborate progress made by Member States in strengthening their respective human resources. According to Subramanian, Herrera & Kelly (2013), 10 Member States in the Western Pacific Region (Australia, China, Japan, the Lao People’s Democratic Republic, Malaysia, Mongolia, the Philippines, Singapore, the Republic of Korea and Viet Nam) and four Member States in the South-East Asia Region (Bangladesh, India, Indonesia and Thailand) have a field epidemiology training laboratory programme. Their list should be supplemented with Cambodia and Papua New Guinea. Collectively, during the period studied, there had been 1468 graduates, with 323 FETP residents in 2012. Their research concluded, “FETPs are a competent and diverse source of highly skilled public health professionals who contribute significantly to public health’s global human resource needs. This finding is evidenced by 1) the training curricula that were adapted over time to meet public health’s human resource needs, 2) the FETPs’ continued support from internal and external partners, 3) the increasing number of FETP residents and graduates and their increasing contribution to effective public health work, and 4) the increased quality improvement initiatives facilitated through the FETPs membership in one global network, TEPHINET.”

In Indonesia, Kandun et al. (2010) mention how linkages with universities, ministries and international agencies as well as the cultivation of trusting and good working relationships among stakeholders proved to be critical in building a sustainable high-quality programme. Kandun et al. note, “Strengthening Indonesia’s [FETP] to address [IHR] requirements further presents important lessons learnt about steps taken to enhance geographic distribution of students, quality of student performance and to sustain FETPs in the region. Inclusion of the programme in the Ministry of Health by governmental decree has been instrumental in enhancing curricula and strengthening field visits to provide trainees with better learning experiences, and linking the programme to the Indonesian Epidemiologists’ Association, local governments and donors to cultivate future FETP champions and to maintain funding. Courses, competitions and discussion forums were established for field supervisors and alumni.”
**Rapid response capacity**

Considerable progress has been made in improving the effectiveness of RRTs in terms of their numbers, geographical spread, multisectoral composition and the timeliness of their response – as corroborated by IHR (2005) data, APSED progress reporting and country visits. Responses from the Member State questionnaire indicate that about 33% of Member States considered RRTs to be an important area of capacity-building progress.

The IHR (2015) data in 2013 indicate that more than 95% of Member States in both regions have RRTs. However, it is difficult to determine the direction of the trend, as the 2013 figure is slightly lower than the 2010 figure for the South-East Asia Region and slightly higher for the Western Pacific Region. It is possible that the lower figure recorded in 2013 for the South-East Asia Region reflects a more realistic assessment, and that some systems recorded in 2010 were not functional.

In terms of timeliness of response, more than 80% of the Member States in both regions indicated that emergency response management procedures, including a mechanism to activate the response plan, had been implemented for a real or simulated public health response in the last 12 months. Unfortunately, as there are no equivalent data available in the 2010 report, it is not possible to confirm if this represents an improvement. To test the timeliness of the RRT system, an increasing number of Member States in both regions have systematically conducted evaluations of RRT response (that is, for timeliness and quality of response). It is also important to note that, in 2013, more than 85% of Member States in both regions reported the ability to deploy multidisciplinary RRTs within 48 hours. The widespread existence of RRTs and the timeliness of their response were confirmed by outbreak review information obtained during the country visits.

While information gathered through IHR (2005) data could not substantiate the existence of RRTs at the subnational level, their existence at this level was consistently confirmed during country visits. However, the uneven geographic spread and lack of adequate skills at this level were consistently expressed as concerns. According to the 2014 APSED progress report, RRTs are established at the subnational level in many Member States of the South-East Asia Region.

These conclusions are further supported by independent assessments in the international literature. For example, Soulaphy et al. (2013), when writing about the responses to a number of outbreaks in the Lao People’s Democratic Republic, note that “these outbreaks show the effectiveness of health care worker event-based surveillance [the utility of RRTs] and the importance of sharing of information across borders for detecting emerging diseases”.

**Risk assessment capacity**

Despite Member States accepting the importance of building risk assessment capacity, as expressed in the APSED framework, it is not being thoroughly and consistently applied, as suggested by IHR (2005) data, APSED progress reporting and international literature.

The IHR (2005) data in 2013 indicate that both regions are achieving reasonable levels of success (more than 80%) in identifying the source of and the risks for PHEs, and high levels of compliance (90%) in applying the IHR (2005) decision-making instrument for assessment and notification of PHEs (IHR Annex 2). Likewise, in 2013, the percentage of NFPs who notified WHO within 24 hours of conducting risk assessments over the last 12 months was reasonably high in both regions (73% in the South-East Asia Region and 81% in the Western Pacific Region), even if these figures demonstrated little improvement since 2010.
APSED progress reporting indicates that Member States have started conducting risk assessments, as well as adopting and adapting the WHO risk assessment tools. Enhancing capacity for systematic and structured risk assessment of events, as the link between event detection and an appropriate response, is a priority for both regions. In the South-East Asia Region, in 2013, WHO reviewed and refined SOPs for event surveillance, risk assessment and event response, with a view to providing additional support to Member States whenever required. In 2014, national risk profiles and risk assessments to identify potential and urgent PHEs were developed in the Democratic People’s Republic of Korea, Indonesia, Myanmar and Thailand.

However, consistent feedback received during the in-country visits indicates that Member States consider this aspect of APSED to be challenging as it requires a multidisciplinary skill set. It is often applied on an ad hoc basis.

These conclusions are further supported by independent assessments in the international literature. According to Costard, Fournié & Pfeiffer (2014), in their research on using risk assessment as part of a systems approach to the control and prevention of highly pathogenic avian influenza virus subtype H5N1, one of the challenges of integrating systematic risk assessments is ensuring that the assessment teams comprise individuals with expertise in the various scientific disciplines and other key stakeholders. A range of disciplines is needed to appropriately understand the risk pathways and their system-specific drivers. In the case of infectious zoonotic diseases, such experts include not only epidemiologists and other biomedical experts, but also animal production systems experts, economists and social anthropologists. Bridging the gap between this varied expertise and integrating each into the estimation of risk will be key to successful risk assessments.

**Accurate laboratory diagnosis**

Public health laboratory capacity for diagnosis of national priority diseases (and laboratory support for surveillance and response) has been significantly strengthened, as demonstrated by the IHR (2005) data in 2013, APSED annual progress reporting, analysis of WHO FluNet data and findings from external quality assessments. About 70% of Member States that responded to the questionnaire indicated that laboratory capacity for surveillance and response is an important area of capacity-building, and one third indicated that it was the most significant change in capacity. The IHR 2013 data indicate that more than 95% of national reference laboratories in Member States in the South-East Asia and Western Pacific regions have participated in external quality assessment schemes (EQAS) for major public health diagnostic laboratories. It is important to note that this participation rate is a minor improvement (about 10%) since 2010. An improvement also can be seen in the Member States undertaking biorisk assessments. However, this participation in biorisk assessments is starting from a base of less than 50% for both regions. As of 2013, more than 80% of Member States in both regions indicated their laboratory staff have been trained in laboratory biosafety and have laboratory biosafety guidelines.

The results of the dengue EQAS (in 2013) highlighted proficiency in dengue diagnostics among national laboratories in the Western Pacific Region. About 80% of participating laboratories demonstrated technical capability to detect dengue in both acute and convalescent phases of infection. The remaining laboratories could strengthen their detection capacity through the use of commercially available dengue NS1 ELISA assays for early detection of acute cases. About 80% of the participating laboratories also achieved perfect performance scores in terms of detection accuracy. Nonetheless, a few participants need to review their protocols and assays for the accuracy of results. The consistency and replication of results is another area that needs further improvement. Based on analysis of WHO FluNet data, there has been an increase in the total number of influenza viruses processed in the five Member States visited during this evaluation (Fig. 1). The largest
increases were seen in 2009, the year of pandemic influenza A(H1N1), and in 2014. This trend indicates an increasing ability to test for and monitor influenza viruses, especially during major events. This is considered to be a crude proxy for national laboratory capacity to undertake basic diagnosis.

Fig 1. Aggregate number of specimens tested for influenza in five Member States in the South-East Asia and Western Pacific regions, 2004–2014

Numerous references to improving regional laboratory capacity have been cited in APSED progress reports. For example, in 2014, the progress report stated, “The laboratory capacity for influenza testing is strong in the Western Pacific Region as shown by the increasing performance of laboratories in the EQA for influenza. This laboratory capacity/network, often referred to as the National Influenza Centres (NICs), has been built in large part by the Member State ministries of health with the assistance of external partners, notably, the US CDC, WHO, the Global Influenza Surveillance and Response System (GISRS), a network of WHO collaborating centres, and other regional reference laboratories.” Importantly, the 2014 APSED progress report went on to note: “China has made substantial progress in laboratories with diagnostic capacities for virus detection including at the subnational level. Using a referral system, all unidentifiable influenza strains are required to be sent to the national laboratory for testing. From this, H10N8 and H5N6 were both detected in human cases of severe pneumonia by enhanced influenza surveillance, specifically through laboratories” (WHO Regional Office for the Western Pacific, 2011–2014).

According to APSED progress reporting for the South-East Asia Region, all Member States have the basic capacity to use PCR for diagnostic purposes, and regional laboratories have been identified to provide additional diagnostic services for less common infectious diseases. All Member States participated successfully in EQAs for major public health laboratories for testing the diagnostic capacity of their laboratories. In all Member States, staff at national or other relevant levels have been trained for the safe shipment of infectious substances according to international standards set by the International Civil Aviation Organization or the International Air Transport Association. Furthermore, the NICs in nearly three quarters of Member States are participating in the GISRS PCR EQAS conducted by the WHO HS Reference Laboratory in Hong Kong SAR (China). In addition, some of the Member States’ laboratories are participating in EQAS for bacterial/fungus detection and antimicrobial resistance (AMR), though the number of participating laboratories is small. The Regional Office for South-East Asia is working closely with WHO collaborating centres in Thailand to organize a regional EQAS for bacterial detection and AMR for all Member States.
Furthermore, 14 laboratories across the South-East Asia Region are participating in an HIV serology EQAS provided by the national reference laboratory of Australia with funding support from WHO. The Regional Office for South-East Asia is also supporting an EQAS for Member States undertaking cluster designation 4 (CD4) enumeration.

**Coordination and laboratory networking**

National reference laboratory capacity to identify unknown pathogens is another area in which there has been improvement, even if it has often been dependent on external assistance and still requires ongoing support.

The IHR 2013 data show a marginal improvement in terms of Member States having designated and authorized or certified biosafety level 2 laboratories or above as the diagnostic laboratories to support outbreak investigations for IHR (2005) events in both regions. In terms of laboratory networking capacity, as of 2013, more than 80% of Member States in both regions reported that their laboratories were able to reliably deliver clinical specimens from investigation of urgent PHEs to appropriate national or international reference laboratories within an appropriate time frame for testing. These 2013 figures indicate a marginal improvement in capacity compared to 2010. Furthermore, national and international laboratory networks have been established in more than 90% of Member States for both regions (2013). However, due to data variability between the regions, it is not possible to determine if the situation is improving.

APSED progress reporting indicates that all national public health laboratories in the Western Pacific Region have reagents in place for MERS testing, including key laboratories based in Pacific island countries that support neighbouring countries or areas.

Laboratory capacity in the South-East Asia Region, both within and between Member States, and experience in dealing with different infectious agents remain variable and uneven. For instance, while links between national public health laboratories, regional reference laboratories and WHO collaborating centres have been established throughout the Region, many Member States still need support for referral for testing various specimens. Specimens also continue to be sent to WHO collaborating centres for confirmation and validation of results. Lastly, despite the majority of Member States (90%) in the South-East Asia Region having established biosafety guidelines, regulation, policy or strategies and trained their staff to practise biosafety, only 70% of those Member States have undergone formal laboratory biorisk assessment. Although laboratory professionals have been trained in biosafety and biosecurity, much more needs to be done by strengthening the regulations, policies and strategies to implement available guidelines.

**Coordination mechanism for zoonoses**

Improved coordination between human and animal health sectors for zoonotic diseases has been observed in areas of outbreak detection, response, laboratory confirmation and formal communication mechanisms.

The IHR (2005) data indicate that in 2013 more than 90% of Member States in both regions recorded improvements in intersectoral collaboration, such as animal and human health surveillance units and laboratories, compared to the situation in 2010.
Member States in both regions have witnessed improvements (from less than 70% in both regions in 2010 to more than 80% in the Western Pacific Region and more than 90% in the South-East Asia Region) in the timeliness of data collection for zoonotic diseases and the existence of functional systems for information exchange among animal and human health surveillance units, laboratories, and other relevant sectors for potential zoonotic risks and urgent zoonotic events. These enhanced mechanisms were reportedly successfully used in responses to outbreaks of H5N1 in Cambodia in 2013 and 2014, H7N9 in China in 2013 and 2014, anthrax in the Lao People’s Democratic Republic in 2013, and rabies in Viet Nam in 2013. Based on 2013 data, more than 95% of Member States in both regions have established a national policy, strategy or plan for the surveillance and response to zoonotic events, and a coordination mechanism between animal and human health sectors for the detection of and response to zoonotic events. However, these mechanisms tend to be more active during outbreaks, such as avian influenza, rabies and other zoonotic diseases of common interest.

All Member States in the South-East Asia Region have prioritized zoonotic diseases of national importance and have case definitions. Almost 70% of Member States in the South-East Asia Region regularly exchange information between relevant sectors regarding potential or urgent zoonotic risks or events, such as avian influenza, rabies and anthrax. However, not all Member States of both regions have access to national or international laboratories to confirm priority zoonotic events. A survey of 19 Member States, 11 from the South-East Asia Region and eight from the Western Pacific Region, confirmed the following: 16 out of 19 Member States had developed national coordination mechanisms; 14 Member States regularly held stakeholders meetings; and 12 Member States had officially formalized coordination mechanisms. However, during the country visits to five Member States, the need for ongoing improvement in these coordination and collaboration arrangements was consistently mentioned.

These conclusions are further supported by independent assessments in the international literature. For example, Daniels et al. (2014) report that the progress in zoonotic disease detection and response could be seen through the progress made in laboratory networks for avian influenza and other emerging diseases. In their review, it was concluded that the capacity of laboratories in the South-East Asia Region had been strengthened through staff training provided by reference laboratories. It was noted that the willingness of affected Member States to share information and viral isolates during the H5N1 outbreak in the Region can be seen as a positive step towards stronger regional coordination. Cambodia, Indonesia, the Lao People’s Democratic Republic, Myanmar, Thailand and Viet Nam have all shared H5N1 isolates with the regional reference laboratories. Such laboratory networking is essential for better regional responses to assess the movement of viruses and the monitoring of the evolution of viral strains. H5N1 and subsequently influenza H1N1 have confirmed that regional reference laboratories and trusted networks of expertise are critical. This is a particular strength of the WHO network of designated influenza collaborating centres and NICs. This is a system that Daniels et al. suggest should be emulated within the animal health sector.

**Infection prevention and control**

Reviews of IHR (2005) data and APSED progress reports indicate minor progress in the area of infection prevention and control (IPC), having received less attention compared to other APSED focal areas.

The South-East Asia and Western Pacific regions have invested, respectively, less than 1% and about 2% of their total APSED budgets to IPC work. These percentages are relatively minor when
compared to investments made for surveillance (32% and 32%), strengthening laboratory capacities (12% and 9%) and improving coordination mechanisms for zoonoses (16% and 4%) for the South-East Asia and Western Pacific regions, respectively. Hence, expectations of significant progress should be moderated by this reality.

APSED progress reporting confirms that less attention is paid to IPC than other components. The attention that has been given to IPC has focused on strengthening national structures to oversee and coordinate work for IPC as well as on developing technical guidelines and conducting training.

The IHR (2005) data indicate that more than 80% of Member States in the South-East Asia Region and almost all Member States in the Western Pacific Region have developed SOPs, guidelines and protocols for IPC for hospitals. However, in 2014, only about half of Member States in the South-East Asia Region and about two thirds of those in the Western Pacific Region have regularly evaluated and subsequently published assessments of the effectiveness of these IPC measures. Further, there appears to be some recent deterioration in the monitoring system for AMR in both regions.

Risk communication or awareness-raising measures for the public (especially outbreak communications)

Evidence of mixed progress in the area of risk communication capacity has been collected during the evaluation period. While the percentage of Member States reporting the development of a risk communication plan has increased in the past five years, many stakeholders still regard risk communication as a challenge and argue that greater emphasis should be placed on evaluating the effectiveness of communications.

The IHR (2005) data tell a slightly unclear story. For the South-East Asia Region, in 2013, about 80% of Member States reported they had developed a risk communication plan, which was down about 10% from the 2010 figure. Meanwhile in the Western Pacific Region, the percentage of Member States that had developed a risk communication plan has increased significantly since 2010 (from 62% to 92%). In addition, in 2013, about 90% of Member States in both regions reported that they have informed their populations and partners of a real or potential risk within 24 hours following confirmation.

APSED progress reports indicate that Member States use guidance prepared for both regions. Focus countries in the Western Pacific Region have progressed from responding in an ad hoc manner to responding through more established systems, such as risk communication committees, risk communication SOPs and identifying approved spokespersons. All Member States in the South-East Asia Region have identified partners, stakeholders and spokespersons for risk communication for PHEs. Risk communication plans are in place for 80% of Member States in both regions, and such plans were implemented or tested either through an actual emergency or through simulation exercises in over half of those Member States. While 80% of Member States have SOPs and guidelines for disseminating information during an emergency, 90% ensure that regularly updated information is accessible to the media and the public during an outbreak. Furthermore, 90% of Member States have information, education and communication (IEC) materials tailored to the needs of the population. In the last three national or international public health emergencies, the majority of Member States have informed populations and partners of a real or potential risk within the benchmark of 24 hours following confirmation of the event. Media training has been conducted in most Member States, and various communications channels have been tailored to the needs of populations. However, only about half of Member States in the South-East Asia Region (Bhutan, the Democratic People’s Republic of Korea, India, Indonesia, Myanmar and Thailand) have evaluated the timeliness, transparency and appropriateness of the risk communication activities.
Based on the five countries visited, there has been a significant increase in the use of social media to improve the reach and speed of communications with the public, especially during outbreaks.

These conclusions are further supported by independent assessments in the international literature. In a study of risk communication in China, Vong, Leary & Feng (2014) report, “The return on the investment (in improved risk communication) is significant and exemplified by China's early response to the emergence of avian influenza A(H7N9) virus in humans in 2013.” During this time, “China notified [WHO] of the first recorded human infections with A(H7N9) virus, closed poultry markets in affected areas - which were rapidly identified as a major source of transmission of A(H7N9) to humans, heightened surveillance in humans and poultry and updated and disseminated technical guidelines, and collaborated with WHO in risk assessments and risk communication to report new cases promptly and publicly.” This was, considerably “[a] vast improvement from the handling of SARS in 2003”.

**NFP functions and their integration into the national public health emergency command and response structure**

There is clear evidence of improvements in communication of PHEs by NFPs, including reporting, consultation, notification, information sharing, and verification of public health emergencies of international concern compared to the situation before APSED (2005) and IHR (2005).

The IHR (2005) data indicate that, in 2013, all Member States in both regions reported that NFPs have provided WHO with updated contact information and annual confirmation. Unfortunately, there are no data available for 2010 to determine the baseline situation of the functions and effectiveness of the NFPs, such as timeliness, empowerment, transparency and appropriateness of the communication. However, it is encouraging to see that in 2013 almost half of Member States for both regions have evaluated the effectiveness of the functions of NFPs.

To maintain and strengthen the functions of NFPs and the WHO IHR Contact Point, the WHO Regional Office for the Western Pacific has conducted seven IHR (2005) exercises (referred to as IHR Exercise Crystal) for its Member States in 2008, 2010, 2011, 2012, 2013, 2014 and 2015. IHR Exercise Crystal tests the IHR (2005) verification and notification functions, and again highlights the vital role of NFPs and the importance of IHR (2005) event communications. In 2013, a modified functional exercise with a hypothetical scenario was carried out to test the NFPs’ capacity for assessing an emerging disease situation by utilizing the decision instrument contained in Annex 2 of IHR (2005) and its notification processes. Of the participating NFPs, the vast majority (almost 80%) provided notification to WHO, and about three quarters were able to complete the process of posting on the IHR Event Information Site. The percentage of NFPs who participated steadily increased from 50% in 2011 to 75% in 2013. In 2014, IHR Exercise Crystal focused on coordination between NFPs and national INFOSAN counterparts, stressing the importance of intersectoral coordination.

APSED progress reporting in 2014 indicated the vast majority of Member States in the Western Pacific Region have SOPs in place for their NFPs. It is clear that these NFPs are active because, for the period 1 July 2013 to 31 May 2014, WHO's IHR Contact Point at the Regional Office for the Western Pacific received more than 1000 IHR-related email messages from NFPs. NFPs have been designated in all countries in the South-East Asia Region, and their functions are updated annually. The IHR Event Information Site is being used as an integral part of the NFP information system in the majority of countries in the South-East Asia Region. There is no systematic analysis of the appropriateness of the seniority of the NFPs. The obligations of NFPs were disseminated to relevant authorities in the majority of Member States, and almost 75% have identified additional roles and responsibilities.
Establishing and effectively utilizing an EOC within the ministry of health – new in APSED (2010)

There is evidence that central command-and-control centres exist, although this does not necessarily mean that there is an EOC established within the ministry of health. According to the IHR (2005) data report, since 2010, more than 80% of Member States in both regions have consistently reported the existence of a functional, dedicated command-and-control operations centre. In countries where EOCs exist within ministries of health, stakeholders have reported positive changes in coordination and communication.

APSED progress reporting for the Western Pacific Region indicates that EOCs have been established within ministries of health and equipped with communications facilities in Cambodia, the Lao People’s Democratic Republic, Mongolia and Viet Nam. SOPs have been drafted or developed in Cambodia, Mongolia and Viet Nam.

Four of the five countries visited have used their EOCs for outbreaks and regular surveillance work. Hence, where these facilities exist within the ministries of health, there is a potential, which is often being realized, to strengthen management of surveillance more generally – the original purpose of establishing the EOCs within ministries of health.

These conclusions are further supported by independent assessments in the international literature. Tran et al. (2014) described the steps taken by Viet Nam’s Ministry of Health to establish an EOC. Most notably, Viet Nam’s Ministry of Health personnel received three levels of training: at the country’s EOC (involving 30 participants), at US CDC headquarters (involving two groups of three participants each), and at the WHO Regional Office for the Western Pacific’s EOC (for three participants). This is a good example of partnership in supporting and strengthening global security through the establishment of EOCs.

A systematic review of 291 studies on public health EOCs, conducted by WHO (2013), revealed the following key factors for optimal functioning: collaboration, coordination, communication, harmonization, respect, cooperation, vertical and horizontal integration, trust, and leadership. The literature also showed that the biggest barriers to EOC function were lack of sufficient communications and coordination.

Points-of-entry preparedness – new in APSED (2010)

A comparison of IHR (2005) data from 2013 and 2014 indicates that good progress has been made in establishing public health emergency contingency plans for points of entry (PoE).

According to IHR (2015) data, in 2013, public health emergency contingency plans at designated PoE existed for less than two thirds of all Member States in both regions. It was also noted that only half of Member States had integrated public health emergency contingency plans at designated PoE with other response plans, tested and updated as needed. Further, the existence of SOPs for PoE were available in less than 80% of Member States for both regions, and it was unclear from the data whether this represented an improvement compared to 2010.

Meanwhile, in 2014, 90% of Member States in the Western Pacific Region indicated that their PoE had an established and maintained public health emergency contingency plan to provide a public health emergency response. This was confirmed in 2015, when the WHO Regional Office for the Western Pacific conducted an Ebola preparedness survey, which indicated that 84% of countries had a public health emergency contingency plan available at PoE that could be used for Ebola case management.
Bangladesh, Indonesia, Myanmar, Sri Lanka and Thailand have reviewed the implementation of plans by looking at their response to actual events or simulation exercises.

For the majority of Member States in the South-East Asia Region, the national public health emergency response plans incorporate IHR-related hazards and PoE. Also, more than 90% of Member States in the South-East Asia Region have designated PoE for IHR (2005) implementation, and also have mechanisms in place for exchanging information between designated PoE and medical facilities. In over 70% of Member States in the South-East Asia Region, information is shared between PoE and the national surveillance unit, with most Member States having established bilateral or multilateral agreements to control the international spread of diseases.

**Improving regional-level surveillance, risk assessment – new in APSED (2010) – information sharing and response**

It is apparent that good progress has been made in improving regional surveillance, risk assessment, information sharing and response, as evidenced by existence of enhanced EBS and IBS systems in the WHO Regional Office for the Western Pacific; strengthened regional risk assessment processes; and increasing surveillance and response support extended to Member States during reported acute PHEs from 2012 to 2015. The circulation of guidelines, best practices and publications, such as the *Western Pacific Surveillance and Response Journal* (WPSAR), has also contributed to building capacity through sharing of epidemiological and operational research.

The EBS system in the WHO Regional Office for the Western Pacific, through the regional surveillance team and supported by the regional Field Epidemiology Training Fellowship Programme, conducts monitoring, verification and assessment activities on a daily basis in the regional EOC. The Field Epidemiology Training Fellowship Programme has provided on-job-training on surveillance and risk assessment since about 2010. A total of 50 fellows from 13 Member States have been trained since 2010.

Since 2011, the enhanced IBS system in the Western Pacific Region has been sharing biweekly updates on regional priority diseases such as influenza, dengue, H5N1, and hand, foot and mouth disease with Member States. Furthermore, from October 2012, it has operated a regional database, with weekly/monthly reporting of dengue and hand, foot and mouth disease data by Member States, allowing for improved data management and assessments through automated calculation of cumulative numbers and moving means.

The regional risk assessment processes were strengthened through the conduct of daily risk assessments at the regional level. Of note, risk assessments have been conducted for 18 major PHEs in eight Member States, and routine risk assessments involving country offices, the WHO Regional Office and WHO headquarters have been conducted for H7N9 and MERS. Risk assessment skills across the Region have been developed through guidance, and upgrading, piloting and institutionalizing of practical risk assessment tools for rapid application in acute PHEs. In 2013, the Region’s risk assessment tool was used to guide the response to the H5N1 outbreak in Cambodia in January and the H7N9 outbreak in China in March.

Preparedness and response support have been provided to Member States during acute PHEs. In March 2013, the regional EOC was significantly upgraded and subsequently activated for dengue in the Lao People’s Democratic Republic, for Typhoon Haiyan in the Philippines, for H7N9 in China and for MERS in the Republic of Korea. Meanwhile, simulation exercises, like IHR Exercise Crystal, have been conducted to assess the preparedness of WHO and Member States.
In recent years, the following significant PHEs have been directly supported:

- 2012: leptospirosis and cholera in the Philippines, and hand, foot and mouth disease in Cambodia and Viet Nam;
- 2013: H7N9 in China, Typhoon Haiyan in the Philippines, arbovirus in the Pacific and dengue in the Lao People’s Democratic Republic;
- 2014: floods in Solomon Islands; and

In response to the recent Ebola outbreak in West Africa, a regional framework for action on Ebola was developed to guide preparedness activities of Member States in both regions. In addition, the WHO Regional Office for the Western Pacific contributed to the global response through the Western Pacific Region Ebola Support Team (WEST), including staff deployments and provision of training. Alongside this, two Ebola preparedness surveys were conducted to assess Member States’ capacities, and Ebola preparedness review teams were sent to select Member States in both regions to provide more detailed guidance.

APSED progress reporting indicates that the WHO Regional Office for South-East Asia monitors information about events that are a potential risk to public health in the Region on a daily basis. The information includes rumours and other ad hoc reports transmitted through both formal channels (established routine reporting systems) and informal channels, such as media, health workers and nongovernmental organizations. Events that pose a potential risk to public health include 1) events related to the occurrence of disease in humans, such as clustered cases of a disease or syndromes, unusual disease patterns or unexpected deaths as recognized by health workers and other key informants in the Member State; and 2) events or risks related to potential exposure for humans, such as diseases and deaths in animals, contaminated food products or water, and environmental hazards, including chemical and radio-nuclear events. Information received is assessed for the risk posed by the event to public health and responded to appropriately. The information is regularly shared with other relevant programmes in WHO regional offices, focal points in WHO country offices as well as WHO headquarters.

The WHO Regional Office for South-East Asia has upgraded its Strategic Health Operations Centre to support surveillance and response at the regional level. The EOC has been utilized regularly for daily event-based monitoring of the Ebola outbreak in West Africa, the H1N1 outbreak in India and Nepal, the MERS outbreak in the Republic of Korea and other significant EID outbreaks. The operations centre has also been activated to support surveillance of and response to a recent earthquake in Nepal and a recently reported MERS case in Thailand.

Complementing the regional surveillance efforts, APSED progress reporting notes that all Member States in the South-East Asia Region have public health emergency response management procedures in place for command, communications and control during a public health emergency. In addition, they have prepared case management guidelines for priority conditions and have trained staff, including RRT members, in specimen collection and transport.

The improved capacity in regional-level surveillance, risk assessment, information sharing and response is corroborated by findings made by independent assessments found in the international literature. In a review of WHO regional response mechanisms, Mackenzie et al. (2014) note that the Global Outbreak Alert and Response Network (GOARN) has grown substantially globally. They write, “Over the past 13 years, the number of technical partners and participating networks has grown substantially and now numbers 153 institutions and 37 additional networks, the latter encompassing a further 355 members, which together provide a wide geographic reach and broad representation of technical skills and disciplines.” Within the Asia Pacific region there are
approximately 64 partners (50 in the Western Pacific Region and 14 in the South-East Asia Region) and eight network hubs (five in the Western Pacific Region and three in the South-East Asia Region) participating in GOARN. Most GOARN activity in the Asia Pacific region seems to have occurred between 2003 and 2005 in the wake of SARS and H5N1, with only a few other examples since 2005.

Further, in the context of the Ebola response, Burkle (2015) recognizes the indispensability of GOARN and foreign response teams to global health security. He argues that they both deserve stronger strategic capacity support and institutional status under the WHO leadership granted by IHR (2005).

In regard to regional information sharing, Fung & Wong (2013) note that the 2013 outbreak of H7N9 in China is recognized as a good example of strengthened regional capacity to coordinate and utilize information-sharing systems effectively during an outbreak. Social media, like Twitter and Weibo, were used by WHO and Chinese authorities to direct the attention of online communities towards official press releases posted on their websites. This was the first time that WHO used Weibo (China’s version of Twitter) for initial release of official outbreak information.

**Enhancing national planning, monitoring and evaluation systems - new in APSED (2010)**

Evidence of progress in developing national planning, monitoring and evaluation systems is limited because of minor progress in adoption of these systems across the regions. However, significant progress was noted in Member States where these systems were encouraged and adopted. Mongolia is a notable example of one such Member State (Box 3).

Elsewhere in the Asia Pacific region, the APSED (2010) Technical Papers (WHO Regional Office for the Western Pacific, 2010) indicated, “Implementing a comprehensive [monitoring and evaluation] M&E system for APSED has posed significant challenges during the first cycle of the strategy. The diverse range of stakeholders implementing or involved in APSED resulted in an M&E system operating at different levels and examining different aspects of the strategy. The tools used also have evolved as lessons have been learnt and feedback has been incorporated over the duration of the strategy.”

APSED progress reporting indicates that six Western Pacific Member States have adopted the annual planning and review meeting process, with its multisectoral representation and its process of assessing progress, fine-tuning the priorities in the annual EID work plan, jointly assessing the IHR (2005) responses and often completing the APSED supplementary indicators. This annual planning and review process has been operating for three or four years in these Member States.

In the South-East Asia Region, most Member States are currently focused on utilizing APSED as a strategic framework to inform work priorities to support the establishment of IHR (2005) core capacities. As a consequence, the national and regional planning and review processes in the South-East Asia Region are focused on the annual IHR (2005) self-monitoring process as the primary national planning, monitoring and evaluation priority. As per the APSED progress report in 2014, only two Member States in the South-East Asia Region – Indonesia and Timor-Leste – have developed specific implementation plans based on APSED (2010). However, other South-East Asia Region Member States, such as India and Thailand, have used APSED to inform the development of plans to address EIDs.
Box 3. Monitoring and evaluation arrangements in Mongolia

The second phase of APSED placed an increased emphasis on improved national planning, as well as monitoring and evaluation, in order to fulfil the external accountability obligations, enhance internal learning and promote ongoing improvement. Six Member States fully adopted this new focus area. The following changes implemented in Mongolia demonstrate that APSED (2010) is encouraging:

- A formal ministerial order outlines a range of monitoring and evaluation obligations, including a regular process of monitoring and evaluation, such as midterm and end-of-implementation evaluations, and annual reviews of significant outbreaks.
- A senior national coordinator has been appointed to oversee the overall monitoring and evaluation system.
- Midterm and end-of-implementation evaluations are required to be conducted by a joint or independent team.
- The annual planning and review meeting is formally recognized as a significant monitoring and evaluation process. This meeting assesses progress with the annual work plan, considers the lessons from the outbreak review report, agrees on the IHR (2005) questionnaire responses, approves the annual APSED progress report and recommends changes to the programme.
- The overall monitoring and evaluation system is based on established international good practices, such as being based on evidence, involving the implementing parties in the monitoring and evaluation process, and aiming to assess and improve the results achieved.
- Outbreak reviews are required to involve multi-stakeholder teams to promote adequate involvement of different disciplines, and to enhance ownership, transparency and learning.
- A standard comprehensive annual work plan has been developed and is regularly updated.
- Targets or benchmark achievements for 24 performance indicators have been established and progress is assessed annually against these targets.
- A “scorecard” for enhancing the quality of self-assessed performance, for all EID and PHE capacities, has been developed and is completed annually.
- A monitoring and evaluation working group, involving representatives of the main implementing agencies, analyses the main monitoring and evaluation reports, agrees on the IHR (2005) questionnaire responses, discusses the outbreak review report recommendations, and approves a progress report for the annual planning and review meeting.

Based on the country visits to five Member States, it is evident that the annual planning and review meetings in the Lao People’s Democratic Republic, Mongolia and Viet Nam are inclusive, transparent, honest, evidence-based and focused on learning and programme improvement. These meetings have also been used to complete the annual IHR (2005) questionnaire responses. As a result of this process, the annual progress reports to WHO are of more value, the IHR (2005) questionnaire responses are more contested and balanced in their assessments, and the multisectoral relationships have been strengthened.

In early 2014, an analysis of the establishment of monitoring and evaluation systems since 2011 in
the Western Pacific Region was performed. This analysis revealed that six Member States were conducting an annual planning and review process. All six involved representatives from non-human health sectors, and four involved key partners in their annual meetings. Only two Member States thought the process would continue without WHO involvement. Furthermore, eight Member States had a national EID annual work plan, four prepared APSED supplementary indicators and four produced an annual APSED progress report.

While there is no comprehensive supporting evidence, it is apparent that Member States have just begun the practice of undertaking reviews of recent outbreaks or significant PHEs. However, based on a study of outbreak reviews, it is clear that these outbreak reviews provide potentially valuable lessons for programme improvement. It is also evident that considerable scope exists to strengthen this outbreak review system.

Simulation exercises are considered important by in-country stakeholders to gauge a country’s preparedness to respond to EIDs and PHEs. IHR Exercise Crystal is a good example of a regular simulation exercise (see the discussion under the “NFP functions and their integration into the national public health emergency command and response structure” section above). The recent Ebola preparedness simulations were also considered valuable by in-country stakeholders.

The conduct of annual and biennial APSED TAG meetings has been an important part of the regional monitoring and evaluation arrangements. Detailed information can be found under the management efficiency section of this report.

It should be noted that IHR (2005) data have not been used to track progress with domestic monitoring capacity or relevant monitoring and evaluation systems.

Fig. 2 provides a summary of Member State questionnaire responses about what they considered to be the three most important improvements in capacity over the last decade. Three areas – laboratory support for surveillance and response, event-based surveillance, and rapid response capacity – were consistently rated as important areas of capacity improvement; event-based surveillance was rated as the most significant area of improvement. It is also important to note that, consistent with other evidence, IPC policy and technical guidelines and EOCs were rated low or not at all.
In summary, based on a process of “triangulating” the information available, there is good evidence of progress over the last decade in most APSED focus areas. Member States and their partners have promoted the development of action plans to encourage systematic capacity-building, monitored the execution of these plans, and regularly reviewed progress of these plans. Further, efforts have been made to consider gender and sex in all aspects of APSED implementation, but the effectiveness of these efforts could be better documented. Evidence of progress is highlighted below.

1. Significant improvements have been made in the establishment of reliable EBS systems that operate according to SOPs and provide NFPs with the ability to verify requests from WHO within 24 hours.

2. Considerable progress has been made in training field epidemiologists and in establishing FETPs.

3. Considerable progress has been made in improving the effectiveness of RRTs, in terms of their numbers, their multisectoral composition and the timeliness of the RRTs responding.

4. Despite the accepted importance of this aspect of the APSED framework, risk assessment is not being systematically and adequately applied.

5. Public health laboratory capacity for basic diagnosis is arguably one of the areas of most significant improvement.

6. National reference laboratory capacity to identify unknown pathogens is another area of improvement, even if it requires ongoing support and has often been dependent on external assistance.

7. There is mixed evidence of progress in the area of risk communication capacity. It is recognized as an area that is challenging and requires greater emphasis on evaluating the effectiveness of communications.
8. There is clear evidence of improvements in public health event communication by NFPs, including reporting, consultation, notification, information sharing and verification of public health emergencies of international concern.

9. While there is evidence that central command-and-control centres exist, this does not mean that EOCs are widely established within ministries of health. However, where these facilities do exist within ministries of health, positive changes in coordination and communication were observed.

10. Improved coordination between human and animal health ministries for zoonotic diseases has been observed in areas of outbreak detection, response, laboratory confirmation and formal communication mechanisms.

11. There has been only minor progress in the area of IPC due to it receiving less attention than other APSED focus areas.

12. Significant progress has been made in improving regional surveillance, risk assessment, information sharing and response.

13. Reaching a meaningful conclusion on the adequacy of public health emergency contingency plans for PoE and other capacity enhancements is difficult because of limited information.

14. Evidence of progress in developing national planning, monitoring and evaluation systems, while limited, indicates minor progress overall and significant progress in Member States where these systems have been adopted.

Notwithstanding reaching these general conclusions, the following qualifications apply.

1. Important evidence, like the IHR (2005) questionnaire responses, is still based on self-assessments.

2. The level of contestability of these self-assessments in Member States is often unknown and likely to be variable. However, where annual planning and review meetings are held, greater confidence can be placed in the assessments made.

3. The existence of a transparent, contestable and evidence-based evaluation culture is often nascent and in need of further encouragement.

4. There is an ongoing need to maintain and enhance these core capacities to detect, prepare for, and respond to EIDs and PHEs.

5. The growing use of outbreak reviews is promoting an evaluation culture and is allowing Member States to learn from past outbreaks and develop capacities to detect, prepare for, and respond to future EIDs and PHEs.
4. Sustainability

To what extent are the improved capacities built under APSED likely to be sustainable?

Sustainability is generally concerned with assessing whether the benefits of an aid activity are likely to continue after donor funding has been withdrawn. It is suggested that the likely sustainability of achievements under APSED should be defined as the likelihood of the maintenance and replication of capacity improvements by the Member State. In the International Influenza Program Sustainability Guide, US CDC (2012) suggests that likely sustainability can be determined based on the existence of a combination of, but not limited to, the following:

1. organizational capacity, through adequate internal staffing (both in numbers and skills) and funding resources, and the existence of champions;
2. a funding strategy, with short-term and long-term targets, for transitioning support to the national government;
3. national strategic planning and regular review processes that promote national ownership, ongoing fine-tuning and greater control over prioritization processes;
4. supporting partnerships, political advocates and formal legal frameworks, such as memorandums of understanding; and
5. a communications strategy to promote successes to key stakeholders.

In the APSED context, the assessment of likely sustainability of improved capacities also needs to consider the following elaborations of organizational capacity:

1. adequacy of staffing numbers and skill levels and internal funding for major improvements in capacity at both national and subnational levels;
2. evidence of staff turnover or loss of experienced and skilled staff; and
3. establishment of key training courses within domestic training institutions to meet Member State human resources development needs, especially for training field epidemiologists.

The evidence of likely sustainability, which is largely based on reasonably consistent feedback from the country visits and questionnaire responses, indicates the following.

1. Funding of routine functions and staff resources at the subnational level as well as the maintenance of the public health laboratory system are of most concern to Member States and their partners.
2. Turnover of trained staff, with the implications for lost skills and corporate memory, is a general concern in most developing countries. It also affects much more than APSED. Anecdotal evidence collected by the evaluation team indicates that training needs to be considered more as an ongoing domestically resourced function, rather than an externally funded and often ad hoc effort.
3. Formal memorandums of understanding, national EID and PHE plans, and ministerial or departmental declarations, meaning statements of political intent, have assisted in improving
the extent of domestic funding as well as senior management and political support provided for these capacity-building programmes.

4. Where adopted, the national planning and review process has been mentioned by Member States and other stakeholders as an important factor for strengthening national ownership.

5. The efforts by WHO to help advocate for additional domestic and external funding has been appreciated by Member States, but they would like WHO to increase its focus on this area in the future.

6. Based on experience reviewing recent disease outbreaks and developing Ebola preparedness and response plans, it is clear that there have been sustainable improvements in the capacity of Member States to prepare for potential PHEs compared to the situation when these countries were confronted with the SARS outbreak in 2003.

It has been suggested that the underlying strategic approaches of APSED are promoting more sustainable change in several ways.

First, building generic capacities to address all EIDs and PHEs, rather than disease-specific capacities, can be readily applied to address the next possibly unknown pathogen, such as Ebola.

Second, encouraging investment in the establishment of routine or ongoing functioning systems that can better detect, prepare for and respond to an EID or PHE tends to promote more sustainable models of capacity-building, especially when done between events. It also minimizes the social and economic costs and avoids capacity absorption constraints in times of major outbreaks. Member States visited that had strengthened routine systems reported enhanced national capacity to address subsequent EID outbreaks and PHEs.

Third, promoting a “step-by-step” or systematic capacity-building process through annual planning and review processes promotes alignment with government plans, greater government ownership and ongoing fine-tuning of priorities, as noted by Member States visited that had a national planning and review system.

Lastly, fostering collaborative efforts and longer-term partnerships among like-minded partners to achieve the common goal of enhanced mutual health security is promoting more sustainable personal relationships and more sustainable capacity-building efforts. For example, some neighbouring Member States are building bilateral and multilateral relationships when there is significant mutual interest to promote cooperation, information sharing and capacity-building arrangements, and consequently improved mutual health security. These collaborations usually entail sharing and maximizing resources. For example, Thailand has been providing neighbouring Mekong countries with free laboratory testing for unknown pathogens, and Pacific island networks have been working together on laboratory testing and IPC. Meanwhile, India and Nepal have entered into a cross-border agreement for communicable diseases that promotes dialogue through disease-specific technical working groups, information sharing and annual high-level talks.

In addition, Australia, China, Japan and other Member States have provided considerable technical and humanitarian funding assistance to West African countries affected by the recent Ebola outbreak. This support has demonstrated an underlying willingness of Member States to provide bilateral and multilateral assistance to other Member States in an emergency situation. It should be noted that some additional funding has been channelled through the South-East Asia and Western Pacific regional offices for Ebola-specific capacity-building activities in these two regions.
Field epidemiologists are widely recognized as important human resources for detecting, preparing for and responding to EIDs. As a consequence, the establishment of Member States’ programmes to train their own field epidemiologists is considered a more sustainable approach to meeting this important need, rather than relying on external funding for overseas training. According to Subramanian, Herrera & Kelly (2013), 10 Member States in the Western Pacific Region (Australia, China, Japan, the Lao People's Democratic Republic, Malaysia, Mongolia, the Philippines, the Republic of Korea, Singapore and Viet Nam) and four Member States in the South-East Asia Region (Bangladesh, India, Indonesia and Thailand) have a domestic-based FETP. Note that their list for the Western Pacific Region now should be supplemented with Cambodia and Papua New Guinea.

In summary, while it is arguably too early to make a confident judgement about the likely sustainability of enhanced capacities, and evidence gathered to date is mixed, the following can be said:

1. The underlying strategic approaches of APSED are promoting more sustainable change.

2. More than 40% of Member States have started or improved support for FETPs, so that they can now produce their own field epidemiologists, key human resources for EID- and PHE-related work.

3. Funding of routine functions, as well as staffing numbers and skill levels, tend to be lower at the subnational level (though this is not a consistent finding).

4. While the evidence is not conclusive about whether an improvement trend exists or not, the prospects for sustainability are better when there is strong political support, formal legal structures are in place and domestic funding support is increasing.

5. Bilateral and multilateral collaboration among Member States, often due to mutual benefits, is likely to promote the mobilization of additional (and arguably more secure) sources of funding and technical expertise, and longer-term capacity-building commitments.

6. Almost 10% of Member States are still over 75% reliant on external funding for the capacity-building areas that demonstrated most progress in the last decade, and only 75% of Member States are confident of their staffing capacity at the national level to maintain the recent improvements.
5. Management efficiency

To what extent was the regional partnership model useful for APSED stakeholders and the programme managed efficiently?

Management efficiency is traditionally thought of as a cost-effectiveness judgement, and an assessment of whether an initiative was delivered on time and within budget (OECD, 2016). However, for the purpose of the APSED evaluation, it is suggested that management efficiency is better analysed through a combination of evidence of:

1. Member State satisfaction with the administrative arrangements that are most under WHO’s control, such as the value of the content, recommendations and networking opportunities of the TAG meeting;
2. the trend towards increased official sources, as opposed to unofficial or media reports, for the initial report of an event of regional importance;
3. implementation and/or tracking of the implementation of the TAG recommendations by WHO;
4. successful promotion of the benefits of the APSED framework to Member States;
5. WHO regional and country offices collaborating with regional and other organizations to utilize their expertise;
6. whether national stakeholder meetings involve partners; and
7. whether the APSED framework was useful for mobilizing funds from donor members and promoting dialogue.

Value of the content, recommendations and networking opportunities of the TAG meeting

From the feedback provided during the five country visits, the content, recommendations and networking opportunities of the TAG meetings were consistently perceived as “very valuable”. Responses to the questionnaires, as completed by Member States, funding and technical partners and TAG members, also indicate that these aspects of the TAG mechanism were considered valuable, though suggestions were made for improving the process, such as enabling broader stakeholder involvement in setting the TAG agenda and promoting greater emphasis on assessing the functionality of systems through outbreak reviews.

Reporting by official sources

Between 2008 and 2015, over 1700 events of regional importance for the Western Pacific Region were reported, an average of 249 events per year (Table 1). For events characterized as “infectious diseases, chemical and others”, the proportion of events reported by official sources, including Member States, increased from 40% in 2011–2012 to 66% in 2014–2015, indicating an increase in domestic capacity to detect and report such events. However, it should be noted that there is ongoing discussion about how to define an “event of regional importance”.

Implementation of the TAG recommendations

The monitoring of progress in implementing the TAG recommendations is suggested as further evidence of efficient WHO management. In the Western Pacific Region, the status of implementation has been documented and published annually since 2012, and has been part of the annual APSED progress report since 2013. The Regional Office for South-East Asia has not systematically documented the status of implementation of TAG recommendations from earlier meetings; however, it is following up with Member States on the implementation status of recommendations from the regional IHR (2005) meeting in Bangkok, Thailand in 2014. Monitoring implementation progress is part of the regular programme management tasks for the responsible officer in the Regional Office.

Table 1. Event-based surveillance data for the Western Pacific Region, 2008–2015

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<tr>
<td>Infectious diseases*</td>
<td>142</td>
<td>174</td>
<td>206</td>
<td>69</td>
<td>47</td>
<td>72</td>
<td>78</td>
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<tr>
<td>Animal H5N1**</td>
<td>35</td>
<td>26</td>
<td>136</td>
<td>69</td>
<td>49</td>
<td>79</td>
<td>33</td>
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<tr>
<td>Disasters and others***</td>
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<td>9</td>
<td>7</td>
<td>87</td>
<td>95</td>
<td>184</td>
<td>95</td>
</tr>
<tr>
<td>Chemical</td>
<td>13</td>
<td>9</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>1</td>
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* Fiscal year for TAG meeting (July 2008 to June 2009)
** Excluding animal avian influenza events
*** Based on FAO reporting since 2012

Successful promotion of APSED to Member States

Based on the country visits, it became apparent that Member State awareness of APSED differed significantly between the two regions. In the Western Pacific Region, implementation of APSED was endorsed by the sixty-first session of the WHO Regional Committee for the Western Pacific in October 2010, while in the South-East Asia Region, implementation of APSED was not endorsed through the Regional Committee. In the Western Pacific Region, six Member States have adopted national APSED work plans and are annually reporting progress against APSED focus areas and milestones. This annual process provides for multisectoral representation and a process of assessing progress, fine-tuning the priorities in the next annual EID work plan, jointly assessing the IHR (2005) responses and completing the APSED supplementary indicators. However, in the South-East Asia Region, most Member States are currently only reporting progress against IHR (2005) core capabilities. Hence it is suggested that the most observable difference is the promotion, primarily in the Western Pacific Region focus countries, of focus area 8 (monitoring and evaluation).

Utilization of expertise from regional and other organizations

It is evident from the 2014 APSED progress report of the WHO Regional Office for the Western Pacific that expertise from regional and other organizations is being utilized by the WHO Regional Office as well as Member States to support implementation of IHR (2005) core capacities under the APSED focus areas. In addition, according to research by Mackenzie et al. (2014), since its establishment in 2000, GOARN has provided effective support in coordinating multilateral...
response to various disease outbreaks in both regions by rapidly deploying experts when and where they are needed. In the South-East Asia Region, experts from regional and country offices have been deployed to respond to disease outbreaks and other public health emergencies in the Region. National stakeholder meetings involving partners

While it has not been possible to assess comprehensive data on the involvement of partners in annual planning and review meetings, it is apparent from the meetings attended by the evaluation team in the Lao People’s Democratic Republic, Mongolia and Viet Nam that partner involvement is not systematically occurring as envisaged, even in the Western Pacific Region focus countries. However, where annual planning and review processes have been adopted, they have helped to bring important partners together – aiding in coordination, information sharing and prioritization of activities among different sectors and promotion of a culture of learning and evaluation. It is clear from the responses received in country that promoting collective and coordinated action by operational, technical and funding partners tends to enhance the efficient implementation of the national work plans. As a consequence, this further enhances the efficient application of APSED in building the capacity to detect, prepare for, and respond to EIDs and PHEs and in monitoring progress towards IHR (2005) compliance.

Effectiveness in mobilizing funds

APSED has received financial support from key international donors and partners to promote dialogue around the APSED agenda. From January 2006 to May 2015 (inclusive), WHO mobilized about US$ 284 million (US$ 121.1 million in the South-East Asia Region and US$ 162.8 million in the Western Pacific Region) for APSED. Of this total, about US$ 32 million (US$ 11.6 million in the South-East Asia Region and US$ 20.5 million in the Western Pacific Region) were assessed contributions (from core WHO funding) and about US$ 252 million (US$ 109.5 million in the South-East Asia Region and US$ 142.3 million in the Western Pacific Region) were voluntary contributions, that is, additional donor funding provided to the regions.

A disaggregated analysis of the voluntary contributions shows that the WHO Regional Office for the Western Pacific mobilized about US$ 142.3 million, while the WHO Regional Office for South-East Asia received about US$ 112.8 million. The WHO Regional Office for the Western Pacific’s voluntary contributions were from the following donor partners (in alphabetic order): Asian Development Bank (ADB); Asia–Europe Foundation (ASEF); Global Affairs Canada (formerly DFATD and CIDA); Department of Foreign Affairs and Trade of Australia (DFAT, formerly AusAID); Defence Threat Reduction Agency (DTRA); European Union (EU); Government of Japan; Korean Centers for Disease Control and Prevention; Government of New Zealand; Norwegian Agency for Development Cooperation; Pandemic Influenza Preparedness (PIP) Partnership Contribution (PC); United Nations Development Programme (UNDP); SAFETYNET; United States Agency for International Development (USAID); and US CDC. DFAT provided “generic or overall” (or untied) budget support to APSED, over both phases, of about US$ 18.5 million to the WHO Regional Office for the Western Pacific. All other donors provided “specified” (or tied) funding for particular aspects (that is, disease-specific or one or more focus areas of APSED) of EID capacity-building. The WHO Regional Office for South-East Asia received voluntary contributions from the following donor partners (in alphabetical order): ADB; Global Affairs Canada; DFAT; Department for International Development (DFID); EU; FAO; Japan International Cooperation Agency (JICA); Korea Foundation; PIP PC; Norway; UNDP; United Nations Children’s Fund (UNICEF); USAID; and US CDC. DFAT provided approximately US$ 35.1 million of “generic or overall” (or untied) budget

Data for the South-East Asia Region are available only for 2008–2015.
support. All other donors provided earmarked (or tied) funding for particular aspects of EID capacity-building.

US CDC is arguably the most significant APSED donor partner in terms of both financial and technical contributions. It provides voluntary contributions through the WHO South-East Asia and Western Pacific regional offices for strengthening influenza surveillance and laboratory capacities. These activities and the outcomes targeted are strongly aligned with APSED and IHR (2005) core capacities. The US CDC Influenza Division channelled a total of approximately US$ 36.5 million through the South-East Asia and Western Pacific regional offices, over nine years, from 2006 to 2014, amounting to about 20% of all voluntary contributions received by the two regional offices for APSED. However, it is important to recognize that US CDC also supports an even larger bilateral programme for influenza in these regions. This bilateral programme is estimated at over US$ 65.6 million for this same nine-year period and is also strongly aligned with APSED and IHR (2005) core capacities. It is noted that this APSED-allied US CDC funding estimate does not include direct support for research or establishing EOCs in these regions.

It is important to note that this analysis of US CDC is purely an example of one significant donor partner that has been active in engaging and aligning with APSED. This analysis does not include all parallel contributions from the multitude of other donor partners that regularly attend APSED TAG meetings, and have been indirectly supporting APSED and building relevant core IHR (2005) capacities through bilateral initiatives. However, this analysis does clearly demonstrate that APSED has been effective in mobilizing and/or aligning support for its agenda.

It is also important to note that it has not been possible to estimate the very considerable amount of additional government staffing and funding resources that have been mobilized in support of APSED.

A financial analysis of the APSED budget provides a brief analysis of donor funding sources, Member State allocations and the focus area utilization for the period January 2006 to May 2015.

1. For the South-East Asia Region, this analysis currently indicates that for the 7.5-year period (January 2008 to May 2015):
   • about US$ 121.1 million, in both assessed contributions and voluntary contributions, were mobilized for APSED;
   • funding for APSED was primarily directed towards Indonesia (44.1%), Regional Office activities (43%), India (4.3%), Myanmar (3.0%), the Democratic People’s Republic of Korea (1.7%), Nepal (1.4%) and Bangladesh (0.9%); and
   • activities supported with APSED funding related to surveillance (32%), public health emergency preparedness (18%), regional preparedness (17%), zoonosis (16%), laboratory (12%), risk communication (3%) and IPC (2%).

2. For the Western Pacific Region, this analysis indicates that for the 9.5-year period (January 2006 to May 2015):
   • about US$ 162.8 million, in both assessed contributions and voluntary contributions, were provided to APSED;
   • funding for APSED was primarily directed towards Regional Office activities (38%), the Lao People’s Democratic Republic (17%), Cambodia (11%), Viet Nam (10%), China (8%), Pacific island countries and areas (6%), Papua New Guinea (4%) and Mongolia (4%); and

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4 This analysis is for the 3.5-year period of January 2012 to May 2015.
• activities supported with APSED funding related to regional preparedness (31%), surveillance (27%), public health emergency preparedness (16%), monitoring and evaluation (10%), laboratory (7%), risk communication (6%), zoonoses (3%) and IPC (<1%).

In summary, in relation to management efficiency, the following can be stated:

1. WHO is regarded as having satisfactorily managed the TAG mechanism.
2. There is scope for improved involvement of development partners in Member State annual planning and review processes.
3. Due to the staged introduction of changes to the WHO financial management system, it has not been possible to provide totally comparable financial data for the two WHO regional offices for the whole period of APSED implementation. However, it has been possible to present data for the Regional Office for South-East Asia from January 2008 to May 2015 and for the Regional Office for the Western Pacific from January 2006 to May 2015.
4. The efficiency of the preventative approach of investing in capacity-building between events needs to be compared to the opportunity cost of providing a more expensive humanitarian response after a major outbreak.
5. It is possible to track the subsequent implementation of TAG meeting recommendations in the Regional Office for the Western Pacific.
6. APSED was promoted more explicitly in Member States of the Western Pacific Region than of the South-East Asia Region. The most significant difference was the promotion of annual planning and review meetings in the Western Pacific Region focus countries, which has assisted in improving coordination and communication among Member States, WHO and their other partners, and in promoting Member State ownership.
7. APSED has been an effective, but arguably still underutilized, framework for mobilizing funding for investment in preparedness activities before and between public health emergencies.
6. Lessons learnt and future directions

What were the major lessons learnt and what are the implications for the future direction of emerging disease and public health emergency work?

Lessons learnt are generalizations based on the experience of implementing an aid activity. As these generalizations should be useful for defining and developing future directions, these topics are presented together in this chapter.

6.1 Lessons learnt

Based on a process of “triangulating” the available data, or obtaining multiple sources of similar data to validate findings, the following are the lessons learnt, or general conclusions, from this evaluation.

1. EIDs and PHEs remain a significant threat to all Member States in both regions and vulnerability to EIDs is universal, as clearly demonstrated by the recent global experience with MERS and Ebola.

2. The focus areas of the APSED framework are still considered largely appropriate, 10 years after APSED (2005) and five years after APSED (2010), and the underlying strategic approaches are considered appropriate for guiding a strategy to build capacities to detect, prepare for and respond to EIDs and PHEs. These underlying strategic approaches, which have also been collectively referred to as a systems approach, are as follows:
   • building generic capacities to address all EIDs, including influenza and unknown pathogens, and PHEs more generally;
   • taking a step-by-step approach to building capacities through annual national planning and review processes;
   • working collectively with partners to achieve a common goal; and
   • investing in capacity-building between events to build capacities.

3. In terms of capacities to detect, prepare for and respond to EIDs, the two regions, while still not fully safe, are better prepared today than a decade ago. This improved situation is recognized as resulting from the combined capacity-building efforts of Member States and their multitude of partners, and support from programmes like APSED.

4. There is adequate evidence of APSED’s contribution to observed capacity-building progress in some key component areas, that is, evidence exists of progress resulting from joint efforts consistent with APSED. Those key component areas are: EBS systems; RRTs; FETPs; public health laboratories for basic diagnosis, referral network and ability to identify unknown pathogens; public health emergency contingency plans for PoE; risk communication; NFP capacities; animal-human health coordination; regional surveillance; and monitoring and evaluation (when it occurs). The progress may result from a combination of priority activities carried out (sometimes jointly) by Member States, WHO and other partners as well as some unique aspects of APSED, such as monitoring and evaluation.

5. In some other key component areas, it is not possible to be as confident about APSED’s contribution, simply because there is inadequate evidence about the existence of capacity improvements and APSED’s influence, including EOCs, risk assessment and IPC. Limited
evidence of APSED’s contribution may have resulted from these key component areas being given emphasis only recently.

6. Due to the array of Member State partners involved, the level of improvements in capacity brought about by APSED is difficult to determine. Assessing individual partner contributions to improved capacity would require a monitoring and evaluation system that is better resourced and more sophisticated (that is, outcome-based and contestable) than most Member States would be prepared to invest in. It is suggested that if additional monitoring and evaluation resources were available, then allocating these resources to assessing individual contributions would be less important than establishing better systems to track overall progress, promote learning and encourage improvements, such as outbreak reviews.

7. It should be noted that there are difficulties in interpreting and using some of the IHR (2005) data. This is not to conclude that there is a systemic problem; rather, it is explicitly recognizing the existence of important limitations of some of the IHR (2005) data. These limitations result from one or more of the following factors:

- the unknown extent of multi-stakeholder involvement and the quality assurance process followed in strengthening the self-assessment process;
- the unknown interpretation by respondents of some questions;
- the lack of a precise alignment of some IHR (2005) questions with the information requirements of this APSED evaluation;
- the inconsistency and volatility of some multi-year data trends observed between regions; and
- the discontinuities in some multi-year data sequences that undermine the ability to assess trends for some data.

8. It is too early to make a confident judgement about the sustainability of enhanced capacities, and the evidence gathered so far is mixed. However, it can be said that the underlying strategic approaches of APSED are promoting more sustainable change. In addition, based on broader Member State feedback through the questionnaires, the following can be said:

- almost 10% of Member States are still over 75% reliant on external funding for the three capacity-building areas that demonstrated the most progress in the last decade; and
- only 75% of Member States are confident of their staffing capacity at the national level to maintain recent improvements.

9. APSED has provided a valuable and effective framework for promoting collective and coordinated action by Member States and its operational, technical and funding partners, and for mobilizing additional funding.

10. WHO is regarded as having satisfactorily managed the regional TAG convening and meeting process, and supported the national annual planning and review process, where this latter process exists.

11. The annual planning and review process, where it exists, has helped to coordinate key internal and external stakeholders, promoted greater transparency and reflection on progress achieved, and enhanced the priority setting process. This is considered very important in a strategic planning environment of scarce funding and staffing resources.

12. Due to the established sex and gender differences in how many EIDs manifest themselves, combined with the evolving understanding of these observed differences, it is important to continue to promote improved understanding of this issue and to fully integrate sex and gender considerations into any future EID programme.
13. Despite the progress made to date, it is clear that building capacities to detect, prepare for, and respond to EIDs and PHEs remains an ongoing and unfinished process for all Member States. This process will need to continue well beyond the deadline for the achievement of IHR (2005) core capacities and the end of APSED (2010).

6.2 Key questions for future strategic plan

Based on the proven vulnerability of all Member States, the demonstrated relevance of the current approach and its components, and the evidence of progress achieved to date, Member States and WHO are encouraged to commence discussions regarding the next phase of APSED to further strengthen capacities for detecting, preparing for and responding to EIDs and PHEs.

In doing so, the following important questions about the scope and focus of the future strategy should be addressed:

1. Should the strategy continue to be biregional? The biregional scope of the strategy is considered valuable for information sharing between neighbouring Member States from different WHO regions that share common borders and/or have significant intercountry air travel movements. This value is attributed to the potential to: share capacities across regions; prevent the spread of EIDs; and promote healthy competition between regions. Some limitations were noted due to different approaches being taken and some cultural differences between the regions.

2. Should the strategy be expanded in scope to incorporate other IHR (2005) core capacity areas and so become a post-2016 IHR implementation platform?

3. Should the strategy be narrowed in terms of the number of technical areas to be more focused on the priority capacity constraints and/or fewer well defined outcomes for each objective?

4. Should the strategy be broadened to give greater emphasis on advocacy work (especially for increased funding and general awareness-raising) to ensure greater involvement of all Member States, and to better recognize that there is universal vulnerability, as clearly demonstrated by the recent global experience with MERS and Ebola?

5. How can activities be best harmonized with the Global Health Security Agenda and other partner initiatives?

6. Should the strategy elaborate on the role of WHO to be clearer about its planned contribution or should this be left to the work plan? If so, should this more explicit WHO role include more than national and regional technical assistance, advocacy for funds mobilization, general awareness-raising among all Member States, and monitoring and evaluation?

7. Should the strategy incorporate a better defined system for monitoring and evaluation of targeted outcomes and other features consistent with elements of the proposed draft post-2016 IHR monitoring and evaluation agenda?
References


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