Asia eHealth Information Network Workshop Proceedings

7-10 August 2012

United Nations Conference Centre
Bangkok, Thailand
Prepared by:

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Asia eHealth Information Network
Workshop Proceedings

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www.aehin.org
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Executive Summary

Nearly 90 Health Information Systems (HIS), eHealth, and Civil Registration and Vital Statistics (CRVS) professionals from 19 countries in South and Southeast Asia and 14 development and implementing partners met in a workshop 7-10 August 2012 in Bangkok to launch the Asia eHealth Information Network (AeHIN, www.aehin.org) and organize a collaborative community for better knowledge sharing and peer-to-peer technical assistance.

AeHIN is a unique forum to promote better use of information and communication technology (ICT) to achieve better health. The AeHIN is open to all eHealth, HIS, and CRVS professionals from multiple sectors within South and Southeast Asia—including developed and low- and middle-income countries—to maximize a regional approach for greater country-level health impacts. AeHIN builds directly upon several outcomes of the 2011 Asia-Pacific HIS Country Ownership and Leadership Forum (www.hisforum.org), where participants called for increased inter-country collaboration, openness, strategic reuse, and peer-to-peer assistance in better and new ways.

The AeHIN workshop achieved the following objectives:
1. Promoted and increased membership of AeHIN;
2. Reviewed, enhanced, and endorsed the draft AeHIN mission, strategy, and priorities, and focused on actions to be taken through 2013;
3. Promoted eHealth, HIS, and CRVS Systems sharing, learning, and peer-to-peer assistance which tackles HIS and eHealth advocacy, policy, institutional readiness and planning challenges;
4. Explored innovative techniques and tools to resolve eHealth, HIS, and CRVS technical issues;
5. Promoted standard data sets and platform of standards and interoperability system across countries in Asia; and Promoted new approach for strengthening HIS at country level.

Country participants represented both the health and CRVS sectors. A few representatives from the interior / local government as well ICTs / science and technology sectors joined to enrich country discussions and the forum, in general.

A brief, high-level *draft* AeHIN Strategic Plan: 2012-2017 developed by the organising members of AeHIN from Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Viet Nam was presented. Through consultation with AeHIN members and development partners, this plan was prioritised and enhanced with next steps, timelines, and identification of roles and responsibilities of key partners. This document can be used to influence national eHealth, HIS, and CRVS policies, strategies, plans, coordination, activities, and change/risk management through peer-to-peer learning and sharing.

After the four-day workshop, country participants were able to assess the strengths and weaknesses of their current health information systems and were able to draft their country HIS priorities for the next six months.

In general, most countries listed strengths and weaknesses in all four AeHIN strategic dimensions, although more weakness / challenges were listed. Among the strengths, up to 14 countries cited capacities in many dimensions of eHealth/ HIS/ CRVS – existing opportunities for training / education at the university level, infrastructure, eHealth systems at various levels of the health system. 12 countries cite that eHealth/ HIS/ CRVS governance structures exist. Occasions for peer-to-peer support are available and are listed by 10 countries. International standards on eHealth/ HIS/ CRVS are being used, cited at least by 10 countries.
Based from inputs of participants, parallel to AeHIN strategic dimensions, the following are key priorities of AeHIN for the immediate future:

- Majority of country participants (67%, 13 countries) gave priority to **AeHIN Strategy 4: Enhancing leadership, sustainable governance, and monitoring and evaluation.**
  - 10 among them, cited reviving/organizing their multi-sectoral Steering Committees on eHealth-HIS-CRVS. Thailand described that upstream and downstream advocacy/networking is vital to achieve goals. While according to China - Hong Kong, Malaysia, Bangladesh, Cambodia, India, Pakistan, Philippines and Sri Lanka, this is most needed (as they have cited this as their 1st priority).
  - Four countries (Lao PDR, Nepal, Singapore, Sri Lanka) will evaluate their own country strategic plans on eHealth-HIS-CRVS. Nepal and Singapore will benchmark their plans against the WHO guidelines.

- Eight countries (Indonesia, Malaysia, Mongolia, Nepal, Philippines, Thailand, and Viet Nam) prioritized **AeHIN Strategy 1: Build capacity for eHealth-HIS-CRVS in the country.**
  - Altogether, they call for training and education on (a) eHealth-HIS-CRVS, in general; (b) Data management, health informatics, surveillance, including use of software for aggregate data management (cited were Microsoft Access, Excel – by Viet Nam); (c) Basic software training; and (d) Advocacy skills (for eHealth-HIS-CRVS and its multi-sectoral governance).
  - Special attention for specific stakeholders on eHealth-HIS-CRVS capacity building shall include: (a) consider short courses for leaders; (b) create academic graduate degrees, and encourage universities to educate and train public health managers in this area; and (c) consider evidence-based interventions in analysing how country invests in capacity building could cut health care cost.

- Seven countries (Malaysia, Bhutan, Philippines, Pakistan, Thailand, Viet Nam, and Mongolia) prioritized **AeHIN Strategy 2: Increase peer-assistance, knowledge-exchange and sharing through effective networking.** Viet Nam and Mongolia placed this as their top priority.

- Five countries (Indonesia, Malaysia, Mongolia, Nepal and Thailand) cited **AeHIN Strategy 3: Promote standards and interoperability within and across countries.** From among these, only Indonesia cited this as top priority.

- Bhutan, Indonesia and Nepal cited ICT infrastructure/capacity development as a priority for their countries.

Below is a summary of country priorities discussed above:

<table>
<thead>
<tr>
<th>AeHIN Strategies</th>
<th>Bangladesh</th>
<th>Bhutan</th>
<th>Cambodia</th>
<th>China</th>
<th>Hong Kong</th>
<th>India</th>
<th>Indonesia</th>
<th>Korea</th>
<th>Lao PDR</th>
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Continuing Call for Inclusive and Collective Leadership and Governance of HIS-CRVS towards Equity in Health

AeHIN country representatives prioritized Enhancing leadership, sustainable governance, and monitoring and evaluation as the fundamental first step in addressing persistent HIS concerns. The discussions on HIS leadership and change management was among the most appreciated part of the Workshop.

These are interesting, considering the generally “high” results of the pre-Workshop survey: Most of the respondents (52.2%, 12) gave a rating of 3 (out of 4, with 4 as highest) for the strength of leadership and governance of their country's HIS. Yet, only 34.8% (8) respondents gave a rating of 2 - 3 as the strength of their country HIS policy and regulatory environments. 56.5% (13) has a high-level guiding committee composed of leaders from multiple agencies/ ministries on HIS, 47.8% (11) eHealth, and 43.5% (10) on CRVS. 17 (81%) have a national strategy or action plan for HIS, 8 (38%) on CRVS, and or 7 (33%) on eHealth. Among 15 who responded to this query, 73.3% (11) said that their country's HIS has a formal vision that has buy-in from stakeholders, 53.3% (8) has buy-in for their eHealth systems vision, but only 2 (13%) for their CRVS.

At the end of the Workshop, there is a general sense that the situation is “not ripe enough” - the country environment is not enabling enough to maximize the multiples talents within the country and the global learnings available. Thus, building capacities towards more inclusive and collective leadership and governance of HIS-CRVS will be a priority of the AeHIN.

The AeHIN chair (Philippines) and co-chair (Thailand) will work with the AeHIN secretariat to address the priorities and next steps established at the workshop to support the AeHIN strategy through country-level actions. Following activities will be part of AeHIN's approach to building the network from six months and beyond:

- activate and load content onto its new Website, www.aehin.org, and compile technical resources and documents to include in the Health Ingenuity Exchange (HingX) resource repository (www.hingx.org);
- organise eLearnings, such as the "AeHIN Hour" on the fourth Friday of every month as a Webinar to address important topics;
- conduct eMeetings, follow-up surveys on country eHealth priority actions, continue to consolidate country needs towards regional needs, prepare concept paper for the regional courses on eHealth, HIS, and CRVS for leaders in Asia, and continue to exchange experiences with implementing the WHO-ITU National eHealth Strategy Toolkit or similar strategies; and
- participate in national eHealth/informatics conferences when possible.

Currently, the AeHIN secretariat is supported by the National TeleHealth Center (NTHC), University of the Philippines-Manila and is hosted by WHO Western Pacific Regional Office (WPRO). Development partners in eHealth, HIS, and CRVS are encouraged to continue supporting AeHIN to delivery country impacts.

At the end of the 4 day workshop, participants noted in an evaluation, the important “take-aways” of the meeting. It surfaced that:

1. WHO-ITU eHealth strategy toolkit
2. Networking with HIS experts and member countries
3. Governance and policy mainstreaming
4. Importance of informal leadership

provided country participants important inputs which they can readily use or implement in their current health information systems.

This workshop report is organized by day of the workshop. Illustrations from the plenary, examples used as case points, and some question and responses during each session were incorporated in the documentation. Strengths and weaknesses of each Health Information Systems of the 19 participating countries were presented in matrices including their detailed action plan for six months and beyond.
Introduction

Building networks is essential to increase capacities in eHealth, health information systems, and civil registration and vital statistics, across countries. Partnerships, collaborations, peer to peer sharing and learning, and interaction between and among Health information systems (HIS) and eHealth professionals could nurture mutual support, foster trust, and build friendship that could bring more time-bound actions than statistics and evidence-based research could do alone.

Since December 2011, eHealth/HIS and CRVS professionals from South and Southeast Asia have been organising themselves into a collaborative community to strategically better plan and implement activities, accelerate innovation, and coordinate improvements in health outcomes across countries. The result is a unique forum geared to promote better use of information and communication technology (ICT) to achieve better health. Dubbed as the Asia eHealth Information Network (AeHIN), this forum is open to all HIS/eHealth professionals from multiple sectors within South and Southeast Asia to maximize a regional approach for greater country-level impacts.

AeHIN is an offshoot of the 2011 Asia-Pacific HIS Country Ownership and Leadership Forum (www.hisforum.org), where participants called for increased inter-country collaboration, openness, strategic reuse, and peer-to-peer assistance in better and new ways. Interest in AeHIN is growing already, with individuals and countries as well as numerous development partners already engaged in improving HIS and civil registration and vital statistics (CRVS) systems using innovation and eHealth solutions across the region.

A regional workshop was conducted to launch AeHIN in Bangkok, Thailand to South and Southeast Asia HIS/eHealth managers, decision-makers, and technical experts and 14 development and implementing partners. It was hosted by the National Telehealth Center (NTHC), University of the Philippines – Manila and the WHO Western Pacific Regional Office (WPRO) from 7-10 August 2012. AeHIN’s official website, www.aehin.org, was launched as platform for sharing resources, technical documents on eHealth/HIS, and CRVS.

Agenda

The workshop engaged technical and non-technical HIS/eHealth professionals through plenary and parallel track sessions and discussions, learning and sharing through country experiences, access and utilization of global expertise, and convenient networking opportunities. A mechanism for capturing input that enabled participants to continuously refine the *draft* AeHIN strategy throughout the first three days were employed as AeHIN members and participants reflected upon their own experiences, learning, and contribute to shared set of priorities and actions.

Participants

There were 94 participants from 19 countries and 14 development partners organizations, and temporary advisors from five agencies.

<table>
<thead>
<tr>
<th>Country Participants</th>
<th>Temporary Advisors</th>
<th>Development Agencies</th>
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<tr>
<td>Bangladesh</td>
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<td>Canada International Development Research Center (IDRC).</td>
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<tr>
<td>Cambodia</td>
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<td>China</td>
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1 Landry, M. 7 July 2012. AeHIN Workshop Overview. and Landry, M. 7 August 2012. AeHIN Workshop Objectives, Methodology, Agenda and Norms
The Workshop Scientific Committee consists of country HIS / eHealth leaders from the Philippines, Thailand, Viet Nam, Cambodia, Indonesia and Malaysia, who convened in December 2011 to discuss how to organize the growing community of eHealth practitioners and HIS leaders in Asia, as a means to synergize efforts and facilitate peer-to-peer learning. The NTHC, provided Secretariat support.

The AeHIN Workshop Organizing Committee consists of technical officers from the World Health Organization (led by the Regional Office in the Western Pacific, with the Southeast Asia Regional Office and Headquarters in Geneva), UNESCAP and the International Telecommunications Union.

Workshop Proceedings

This Workshop Proceedings has three parts: the first, lays the foundation for and provides an overview of the Workshop. The second captures discussions to organize the AeHIN as an enabler for change and better health outcomes, especially among participant-countries. This features how the AeHIN was organized, the gallery of country HIS-CRVS analyses, the highlights of the pre-Workshop Survey, group discussions to clarify next steps for the participant-countries and the AeHIN. These provide directions for action by the AeHIN Executive Committee for the next six months and beyond.

The third part of this Proceeding presents highlights of the Talks and discussions during the open forums following each of the lecturetes. These provide input for consideration by participant-countries to benchmark their own eHealth/ HIS/ CRVS status. It concludes with the Workshop Evaluation. Slide presentations of speakers are presented can be accessed through the AeHIN website www.aehin.org.
Below is the list of AeHIN countries based from their WHO region and income class while the diagram below shows the density of the 19 participating countries in the workshop.

<table>
<thead>
<tr>
<th>WHO Regional Office</th>
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<th>Lower-middle-income economies</th>
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<td>Regional Director: Dr Samlee Plianbangchang</td>
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<td><strong>Regional Office for the Western Pacific</strong></td>
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<td>Regional Director: Dr Shin Young-soo</td>
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</table>

Country Classification Based on WHO Regions and Income

[Diagram of the world showing density of 19 participating countries]

Countries who participated in the workshop

Country Classification Based on WHO Regions

[More detailed diagrams and maps showing WHO regional offices and their associated countries]
Welcome

Boonchai Kijsanayotin, MD PhD
Health System Research Institute, Ministry of Public Health-Thailand

Good morning, distinguished participants, ladies and gentlemen.

My name is Boonchai Kijsanayotin from Thailand. It is with great pleasure that I greet you all, “Welcome!” to Bangkok and to the first Asia eHealth Information Network, or in short, the AeHIN Workshop, on behalf of the Workshop’s Scientific Committee and as representative of Thailand, the host country.

It is very exciting that we have 87 participants from 18 countries coming to this Workshop.

The AeHIN builds directly upon several outcomes of the 2011 Asia-Pacific HIS Country Ownership and Leadership Forum in Manila, Philippines, where participants called for increased inter-country collaboration, openness, strategic reuse of learnings and technologies, and peer-to-peer assistance in better and new ways.

This AeHIN workshop is designed to promote awareness and collaboration on eHealth and Health Information Systems development among Asia Pacific countries. The workshop includes 10 plenary sessions and small group discussions organized for peer-to-peer learning and sharing of best practices and eHealth/HIS advocacy, policy, leadership, and technical assistance.

Furthermore, it is an honor that we have Dr. Somsak Chunharas, the Chair of the Thailand National Health Information Committee, coming to give the opening remarks of this event.
Please welcome Dr. Somsak Chunharas.
Opening Message

Dr. Somsak Chunharas  
Secretary General, National Health Foundation, and  
Chair, National Health Information Committee, Thailand

Distinguished guests and speakers, active members of the AeHIN, ladies and gentlemen, welcome to Thailand! (Or may be, welcome only to Bangkok, for many of us - as the meeting schedule seemed to be quite tight.)

But I am sure that the objective of forming a network on eHealth is something that is worth the time and effort to work seriously, no matter how broad you define the word eHealth.

I have been fortunate enough to pay attention to the issue of a good information system ever since the first year of my career as a director of a district hospital in the northeastern part of Thailand. Not very much as the “active user” but as “reporter of data to the central ministry”, as some of you might have that role if you work somewhere in the health care delivery system in a country like ours. But I was also fortunately to be asked to draw a plan for my district hospital. I had no idea about what constituted a “plan of a district hospital”, having been a fresh graduate from medical school, where nothing of that sort was ever mentioned, leave alone taught to make (this plan) systematically. So I came to know, that in order to develop a good plan, you need to look at some of the data that you had so diligently and obediently sent to your boss, whom you never saw.

Moving to central Ministry (of Health), the first division I was assigned to direct was Health Statistics Division. So you would be able to guess that one of my first missions was to reduce the reporting load and to help those sending reports realize the importance of using the data that come from them. In fact, my predecessors have been trying to do that all along but what happened to me might be a good example of how we came to be successful. My job at the health statistics division came at a different time when information technologies had already shown what is possible. Then I came to know that what is possible is not the same as what is feasible, and not to mention executable. Up to now, when I speak at this Meeting, we still strive for the day when service providers in the field would be able to gather and use data immediately - to guide their decisions to take care of people’s health. The data captured should further be processed by those in the most peripheral units for their own planning or research. The same set of data could be accessed by those in “higher up” offices without burden to those at the lower levels. The same set of data
could be accessed and used by those at different facilities at the same level to provide better care, with less duplication and better continuity. These will all mean better quality of and more safe health care.

I believe, this is the same kind of vision or dream - if the word dream is not taken lightly as something elusive or even impossible - that we all share here in this gathering. We all have struggles and we also know that our friends somewhere tried this (strategy) before; maybe their successes or failures might be of use to us despite the different context. We also know that such “knowledge” would not be easily obtained thru documents, despite the explosion of knowledge in the internet - that leave many of us puzzled if not perplexed, but hopefully not misled. Moreover, we hope that we would be more interactive in our learning processes, given what we all know that the new technologies have made it possible for us.

I hope that many of us are here, with these two if not three backgrounds (health system manager, information/statistics management, health care provider), share the dreams of an ideal health information system made possible by information technologies, the desire to learn more from colleagues with comparable experiences in this struggle to build up a better system. I emphasize the word system, as I am sure it is relatively easier if we are to “improve a partial bit of this complex system”. If you had the third background - which is working as a health care provider or manager in the somewhere in the periphery of the health care system - then you will understand better the importance of these benevolent dreams and desires.

I repeat, how glad I am that you have chosen Bangkok as a venue to discuss and formulate concrete plans to move ahead as a Network. Bangkok is the centre of many things in Thailand, with such vibrant environment and at times, sensitive (political / social) development viewed differently by many of us, Thais. On the whole, we also know that the country is more than Bangkok. (Even though you may not have the time to see the real Thailand, and not be able to learn and enjoy what we have to offer here, please try our durian, we hope you find the smell pleasant and enjoyable. If not just yet, it might be time you for you to start learning and develop the new olfactory faculties so as to add more joy to your life, as it should be happening with everything else!)

The development of good HIS and other infrastructure and utilities to allow better learning in health (or in other aspects) are just a few among many things that we hope to happen equally, rather than just here only in central Bangkok.

I bid you all to have fruitful interactions, happy learning and successful networking - in Bangkok - as your springboard for actions!
Overview of the Workshop Objectives, Agenda, Methodology, Norms

Mark Landry
Health Information Technology Officer
Health Information, Evidence and Research
WHO Western Pacific Regional Office (WPRO)

The Asia eHealth Information Network, or AeHIN, builds directly upon the outcomes of the 2011 Asia-Pacific HIS Country Ownership and Leadership Forum (www.hisforum.org), held in Manila, Philippines. In December 2011, a meeting of eHealth / HIS leaders from six countries was convened to conceptually define this network of more like-minded country leaders who would [1] share and build on common ground – country challenges, priorities and next steps; and [2] engage other similar-minded leaders in countries in South and Southeast Asia. It was also held here, in the UN Conference Center in Bangkok.

This six-country group would eventually comprise what is currently the AeHIN Scientific Committee. Together with the Workshop Secretariat - members of the WHO, UNESCAP and ITU - the Scientific Committee would meet virtually over the past six months and defined today’s Workshop Objectives, Conceptual Framework and Agenda (described in Fig.1).

This Workshop launches AeHIN, as we talk about eHealth, Health Information Systems (HIS), Civil Registration and Vital Statistics (CRVS). We also launch the AeHIN website www.aehin.org For the next four days, we will
talk about knowledge learning and sharing, and networking; explore and agree on common principles; look into opportunities for training and peer-to-peer assistance; and share about tools and techniques, as well as technical and non-technical components of HIS/CRVS.

At the end of four days, we expect that we become better united, be able to declare our country and Asia regional priorities create demand for HIS/CR-VS/eHealth strengthening, and take action, yet do more with less.

<table>
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<th>Objectives</th>
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<tr>
<td>1. Promote and increase membership of AeHIN.</td>
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<td>2. Review, enhance, and endorse the AeHIN mission, strategy, priorities, and proposed five-year work plan, focusing on actions to be taken through 2013.</td>
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<td>3. Promote eHealth, Health Information Systems (HIS), and Civil Registration and Vital Statistics (CRVS) Systems sharing, learning, and peer-to-peer assistance which tackle HIS/eHealth advocacy, policy, institutional readiness and planning challenges.</td>
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<td>4. Explore innovative techniques and tools to resolve eHealth, HIS, and CRVS technical issues.</td>
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<td>5. Promote standard data sets and platform of standards and interoperability system across countries in Asia. Promote new approach for strengthening HIS at country level.</td>
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*Figure 2. Workshop Objectives*
eHealth/HIS/CRVS Regional Perspective and Linkages with the Work of the Commission on Information and Accountability (CoIA) for Women’s and Children’s Health

WHO Southeast Asia Regional Programme

Jyotsna Chikersal
Regional Adviser, Health Situation and Trend Assessment
WHO Southeast Asia Regional Office (SEARO)

**e-Health** and the urgency to integrate information and communication technologies (ICT) in national HIS and health infrastructure is growing, and in fact is among the recommendation of the Commission on Information and Accountability (CoIA) for Women’s and Children’s Health. Globally e-Health and m-Health is increasingly used in all aspects of health. e-health offers powerful opportunity to bridge the health gap among population groups with increasing mobile phone accessibility, better access to Internet, social media reaching more people, and ICTs increasingly available in multi-lingual environments. Coordinated efforts and a multi-sectoral approach is required – government and partners need to work together.

In the last decade in the WHO Southeast Asia Region, four eHealth pilot projects have shown its usefulness in improving health service delivery, in particular; and health system performance, in general. Each went through a three-step implementation approach: first, improve access to information (through tele-education); second, improve access to medical advice (through tele-consultation); and finally, improve access to diagnosis and patient management. The experiences in Bhutan, Democratic Republic of Korea, Sri Lanka and the Maldives were described. All four began with telemedicine initiatives and have since expanded to other aspects of eHealth.

The Global Observatory on eHealth provides useful indicators of eHealth for the Region (2009); Bangladesh, Bhutan, India, Indonesia, Maldives, Nepal, Sri Lanka and Thailand were the only countries that participated, however. Presented were the WHO Regional Office in Southeast Asia (SEARO) status of eHealth policy framework development and implementation, as well as barriers to telemedicine, mHealth and eLearning implementation. Presented similarly, are efforts the to improve CRVS systems in the SEARO.

WHO will implement its SEARO Regional Strategy for improving HIS, and is committed to support development of SEARO country eHealth / mHealth / telemedicine policies. It will help establish pilots in requesting countries, other than the four described earlier, and harness CRVS, MOVE-IT (monitoring Vital Events through information technology) initiatives and developments under CoIA Recommendations. SEARO will also help in the evaluation of pilot projects in the region, as well as organize its own regional meeting to share experiences and plan a roadmap to accelerate the e-health / m-health initiatives in the SEARO.
In December 2010, UN Secretary General organised the CoIA, or the Commission on Information and Accountability for Women’s and Children’s Health as an integral part of the Global Strategy for Women’s and Children’s Health. CoIA was established to monitor progress towards achieving MDG4 and MDG5 (child and maternal health); specifically, the objective of CoIA is to provide a framework for results, oversight and accountability. There was also an announcement of US$ 40 billion commitment by development partners and countries to escalate work towards this end, in a time-limited process. CoIA Co-chairs are the Presidents of Tanzania and Canada; the WHO serves as its Secretariat. Following are recommendations of CoIA:

**ColA Recommendations 1-3:**
Better information for better results

1. **Vital Events:** By 2015, all countries have taken significant steps to establish a system for registration of births, deaths and causes of death, and have well-functioning health information systems that combine data from facilities, administrative sources and surveys.

2. **Health indicators:** By 2012, the same 11 indicators on reproductive, maternal and child health, disaggregated for gender and other equity considerations, are being used for the purpose of monitoring progress towards the goals of the *Global Strategy*.

3. **Innovation:** By 2015, all countries have integrated the use of Information and Communication Technologies in their national health information systems and health infrastructure.

The WHO Western Pacific Regional Programme for CRVS Strengthening is a multi-partner, multi-stakeholder initiative involving the UN ESCAP, HMN, WHO, University of Queensland, UNICEF, UNFPA, Plan International, SPC, and others. A high-level Meeting of country leaders in the sectors of Health, Statistics, Civil Registrar was held on 10-11 December 2011. Programme components include: defining the Legal framework and improving institutional capacity, securing political commitment and public awareness, efforts to achieve completeness of registration of vital events and improve quality of civil registration and vital statistics, the use and dissemination of vital statistics, and coordination and collaboration.
AeHIN as an Enabler for Change and Better Health Outcomes
Background: Organizing the AeHIN

Alvin Marcelo, MD, FPCS
Chair, AeHIN Executive Committee

The AeHIN took seed, perhaps, during the HIS Interoperability Workshop in Hoi-An, Viet Nam in April 2011. Then came the Asia Pacific Leadership Forum on HIS in June 2011, held in Manila, Philippines, where many of the same country HIS / eHealth leaders convened. What was an emerging issue across countries are the “islands or silos” of expensive (yes, they are expensive!) electronic information systems – which have come to embed the same problems of our manual, paper-based, vertical, disease-based health reporting systems. As a post workshop event to this June 2011 HIS Forum, the UP NTHC organized Connectathon - 2 to demonstrate to participant-countries (as well as local Philippine delegates) a methodology to escalate discussions and work towards interoperability of various electronic HIS. I acknowledge the support of the WHO WPRO for these events, enabling all these discussions to happen.

The USAID, on the other hand, provided the opportunity for the participant-country leaders of this June 2012 HIS Forum to convene more often through a three-month Virtual Leadership Development Program on HIS. This enabled further collective analysis of how country HIS can be improved and how other sectors are critical in the process. As Knut (Staring) said, people interoperability precedes electronic and technical interoperability.

In December 2011, the WHO WPRO supported, yet again, another meeting of these eHealth leaders - also here in UN Conference Center, in Bangkok, Thailand – to plan how to engage other like-minded individuals and organizations as a community. It was envisioned that learnings by others can be re-used and maximized as experiences in implementing eHealth. Over the last few months, we would meet virtually - again with the support of Mark (Mark Landry, WHO-WPRO) to plan for this Workshop - and draft this five-year Strategic Plan, now presented to you for your evaluation and input.

Results of the pre-workshop survey are presented herein. There are 19 participant countries; we evaluated our own country settings – strengths and weaknesses in your HIS-CRVS. Priorities for local action were articulated. Your country priorities would now become AeHIN’s collective priorities. As we conclude our Workshop, we have agreed on an interim leadership – the Executive Committee - who would oversee how to firm up AeHIN in the next several months.

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2 Also from notes, Alvin Marcelo, MD, FPCS, Final Technical Report: Planning for the AeHIN, for the WHO WPRO, 12 December 2012
3 Connectathon-1 in April 2012, was also organized by the National Telehealth Center (NTHC), University of the Philippines –Manila, with the support of the WHO-WPRO. Participants were units of the Philippine Department of Health, the Philippine Health Insurance Corporation, and the NTHC who have eHealth systems. Recommendations for local national level action were raised. Participants also cited the need to work closely for Asia Regional interoperability.
Critique of the AeHIN Strategic Plan: 2012-2017 *Draft*

From country participants, observers, and temporary advisers, seven groups were organized for a small group discussion (SGD). The first SGD on day 1 provided an opportunity to hear from the participants their [1] expectations from this workshop and AeHIN; and [2] critique of the proposed AeHIN Strategic Plan.

This summary is organised according to the four AeHIN strategic areas. These are perceived to be actionable items for the AeHIN leadership. New points were defined and emphasized. Many of the topics raised in the SGD were already pointed-out during the December 2011 brainstorming meeting of the AeHIN Scientific Committee. This observation affirms the synergies of concerns among a broader set of country eHealth-HIS-CRVS leaders and point out how AeHIN should communicate its direction for the network.

**Purpose of AeHIN and eHealth-HIS-CRVS Strengthening**

There is a need to strengthen the value statement of AeHIN in order to communicate better with people, the link of eHealth-HIS-CRVS strengthening, with health and human development, the link with the country’s context, and the alignment of these initiatives with local, national, regional and global goals for health and human development. While every country is unique, there are a lot of similarities that cuts across them. While participants agree that AeHIN is a forum that enables learning from each other, more discussions should be on the how-to’s [1] to integrate fragmented (HIS-CRVS) systems, and [2] to integrate important data and increase data utilization.

There is still a need to know how to better answer the question: “Why do we need AeHIN?” in order to “sell” (our involvement) to the authorities in our country-ies.

AeHIN also has to recognize that some countries have limitations with sharing their concepts or systems.

**Building country and Asia-regional capacity in strengthening eHealth, HIS and CRVS systems**

Many technical terms, domain areas and their building blocks are unclear and perhaps not uniform through countries: for example, the concept of ehealth, mhealth, HIS, CRVS, etc. There is a need to harmonize the terminology of the health information sciences so for easier understanding, communication, and data exchange.

Missing in the four-prong strategies are: data usage/use, data management of health usage or process of information delivery, decentralization process, quality of data.

What are lessons from the use of the WHO-ITU e-Health Toolkit/s and strategies implemented across countries? What are maturity models and milestones for eHealth / HIS and CRVS development? What are building blocks, components (of various levels of the maturity model?) What is the (level of) capacity in the various levels?

There is a need for better capacities among health providers to understand Health IT, and for IT people to better understand clinical workflows and Health. Likewise, there is a need for an Open e-Health academic session for policy makers (executive level).

Legal concerns about e-Health and health information, including security and privacy aspects of eHealth, have not been discussed in the AeHIN Strategy.

**Alliance-building, networking, and peer-to-peer support**

How do we create the networks within each country and among countries? What should be considered for in-country mechanisms are formal and informal organizations; often times, an informal way of interaction is (more) helpful.

On the scope of AeHIN: To what extent will AeHIN connect with other networks in the field (e-health, m-health, HIS, CRVS), both formally and informally? The following were suggestions on how AeHIN members can build networks and support peer-to-peer assistance:

1. AeHIN should / can provide expertise/ coordinators to support other countries’ needs. AeHIN should / can help jump start countries with “lower level” HIT implementation; for example - use of mobile technologies as as an intermediate step.
2. Use and share webinars - as a mechanism of sharing experiences with others.

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* A copy of the AeHIN Strategic Plan 2012-2017 is attached as Annex 1 of this document.
3. Sharing resources - databases (on e-health, m-health, HIS, CRVS strengthening, inter/intra) within and across countries.

4. Adding information and experience sharing in the website (as cited in 2.2) will be helpful to increase international sharing.

**Promoting standards towards interoperability**

This Strategy has to be clarified; questions were raised by participants: What is the aim of health information/ data sharing among countries? What is the level of data sharing? What is the legal framework of how data can be shared within and between countries? At the global level, it is necessary to identify universal indicators which could be harmonized to better evaluate the benefit and burden of global initiatives.

**Leadership and governance of the country and Asia-regional capacity in strengthening eHealth, HIS & CRVS systems**

It is important to recognize that leadership strategies have different cultural contexts. However, what are not discussed are strategies for sustainable governance and programs.

Iterated are: first, the need for an Open e-Health academic session for policy makers (executive level); and second, lack of discussion on legal concerns about e-Health and health information, including security and privacy aspects of eHealth in the AeHIN Strategy.

Define further the secretariat or administrative system to manage the health information.

Strategy 4.1 and 1.1 are very close in meaning; but 4.1 has a clearer picture of what to be accomplished: setting up a clearing house/office of information management (Strategy 1.1 can therefore be skipped.)

Strategy 4.1 – the process of engaging “official” representatives / organizations may not be appropriate for this type of network (AeHIN) since nobody can control their input / involvement. The more informal representatives / organizations may have more influence in countries. However, some events or actions need to be formal and go through official channels / representatives.

AeHIN has to clarify concepts in Strategy #4.3: What is corporate social responsibility? Define stakeholder collaboration between public and private sectors, and in which technical support area.

It was suggested that AeHIN should use “improving public and private partnership” instead of promoting linkage between public and private sectors.

On M&E / Measurements: How will AeHIN monitor the progress of eHealth-HIS-CRVS Strengthening in member countries? It was suggested that AeHIN can conduct monitoring and analysis on the impact of the strategies on an overall national and Asia regional scale. Measurements can be such as completeness of data, evaluation of health outcomes, benefits and global disease burden. This would need support from all levels from local to national. There is a need to share common goals across countries, common “Milestones” should be developed.

The strategies should also mention about the cost analysis (cost-benefit, cost-effectiveness) and/or overall cost-reduction if investments are put in eHealth-HIS-CRVS Strengthening.

What is the timeline for these goals? For AeHIN’s work?

**AeHIN Organizational concerns**

Membership should be free of charge. What membership structure (should be promoted / implemented) must be decided. What are criteria for selection of representatives from each of the countries to the AeHIN, positions in the organization and types of organizations which could be encouraged to join should also be defined.

AeHIN should describe the strategy to promote the cooperating structures within the country. This may involve establishing a coordinating/ working group similar to AeHIN in every member-country.

What are the roles of the chair and co-chair within AeHIN? Within the country coordinating group – will there be a structure, similar to that of the AeHIN Executive Committee? Define coordinating structure for similar networks within countries. How do these relate to AeHIN?

**Others:** What is the link between eHealth-HIS-CRVS improvement and the environment? Country topography?
Country and AeHIN Priorities for Action by the Executive Committee

The spot map as shown in page 7 of this document shows country priorities on HIS/CRVS strengthening. These priorities were guided based on AeHIN Strategies as described in the Strategic Plan 2012-2017 *Draft*. Assessment of country HIS strengths and weakness, with consideration for the input from the various speakers of the AeHIN Workshop have helped countries draft these inputs.

Majority of country participants in the workshop (67% or 12 countries) gave priority to Strategy #4: Enhance leadership, sustainable governance and M&E 10 of these cited reviving / organizing the multi-sectoral Steering Committee on eHealth-HIS-CRVS: Thailand described upstream and downstream advocacy / networking to achieve goals. Eight cited this as their top priority: China - Hong Kong and Malaysia, as well as Bangladesh, Cambodia, India, Pakistan, Philippines and Sri Lanka. Four countries will evaluate their own country strategic plans on eHealth-HIS-CRVS (including Sri Lanka and Laos); two of these - Nepal and Singapore - will specially benchmark their plans against the WHO guidelines.

Eight countries prioritized Strategy #1: Build capacity for eHealth-HIS-CRVS in the country; although only Myanmar rated this as top priority. These also include Indonesia, Malaysia, Mongolia, Nepal, Philippines Thailand, and Viet Nam.

Areas for training / education listed by participants, include
- eHealth-HIS-CRVS, in general
- Data management, health informatics, surveillance, including use of software for aggregate data management (cited were MS Access, Excel – by Viet Nam)
- Basic software training
- Advocacy skills (for eHealth-HIS-CRVS and its multi-sectoral governance)

Skills to do cost-benefit analysis should be built. When the country invests in building capacities in eHealth, country stakeholders should be able to appreciate the reduction in costs of health care.

Special attention for specific stakeholders on eHealth-HIS-CRVS capacity building: There should be special short courses for leaders. More formal academic graduate degrees, should be developed: universities should be encouraging to be more deliberate in building capacities among public health managers.

Seven countries prioritized Strategy #2: Increase peer-assistance, knowledge-exchange and sharing through effective networking; these include Malaysia, Bhutan, Philippines, Pakistan and Thailand. This is top priority for two countries – Viet Nam and Mongolia. Thailand is mentioned here again for their upstream and downstream advocacy / networking among various sectors / stakeholders within their country to achieve goals.

Five countries - cited Strategy #3: Promote standards and interoperability within and across countries; only Indonesia cited this as top priority. These also include Malaysia, Mongolia, Nepal and Thailand.

In addition to these four AeHIN strategies, Bhutan, Indonesia and Nepal cited ICT infrastructure / capacity development as a priority for their countries.

Five countries - cited Strategy #3: Promote standards and interoperability within and across countries; only Indonesia cited this as top priority. These also include Malaysia, Mongolia, Nepal and Thailand.

In addition to these four AeHIN strategies, Bhutan, Indonesia and Nepal cited ICT infrastructure / capacity development as a priority for their countries.

Strengths and Weaknesses Matrices of each country that guided inputs for this section and corresponding Priority Matrices are attached in Annex 2 and 3 of this document, respectively.
Pre-Workshop Survey

Mark Landry
Health Information Technology Officer
Health Information, Evidence and Research
WHO Western Pacific Regional Office (WPRO)

This survey was a rating of the strength of key aspects of your country's health information system (HIS):
- Level of engagement of multiple sectors
- Availability of HIS, eHealth, civil registration and vital statistics (CRVS) strategies and plans
- Current and planned use of health data standards
- Infrastructure

There were 25 respondents from 10 countries (Bangladesh, Cambodia, China, China/Hong Kong, Indonesia, Lao PDR, Mongolia, Myanmar, Philippines, Thailand, Viet Nam). 10 out of the 22 respondents said that information quality of their country’s HIS is “high” (with a general rate of 3 out of 4; 4 being the highest).

Most of the respondents (52.2%, 12) gave a rating of 3* for the strength of leadership and governance of their country's HIS. Yet interestingly, only 34.8% (8) respondents gave a rating of 2 - 3* as the strength of their country HIS policy and regulatory environments. 56.5% (13) has a high high-level guiding committee composed of leaders from multiple agencies/ministries on HIS, 47.8% (11) eHealth, and 43.5% (10) on CRVS. Hong Kong, China has well established HIS through the governance Hospital Authority (for its public sector).

17 (81%) have a national strategy or action plan for HIS, 8 (38%) on CRVS, and or 7 (33%) on eHealth. Among 15 who responded to this query, 73.3% (11) said that their country’s HIS has a formal vision that has buy-in from stakeholders, 53.3% (8) has buy-in for their eHealth systems vision, but only 2 (13%) for their CRVS.

Indonesia, Myanmar, Philippines, Malaysia, China and Cambodia has a specific model / framework / architectural planning mechanism for their HIS. In China, they have their 3521 Project. In Hong Kong-China, they have a clear “vision of building a central eHR Repository and Portal for health care stakeholders. A territory-wide, patient-centered electronic health record sharing system will also be built.” In Thailand, it could be said that it is incorporated into the national policy and national agenda, with the creation of the necessary national commissions.

Malaysia has an eHealth blueprint since 1997, Transforming Healthcare through Information Technology, and incorporated eHealth into the National 5-year Strategic Five Year Plan (2001-2005) (2006-2010). The government supported the Telehealth Project, Teleprimary Care Project and Total Hospital Information Systems Project, among others.

Myanmar has their Strategic Plan for HIS for 2011-2015; this is based on findings of HIS assessments with technical and financial assistance from WHO and Health Metrics Network. “The Ministry of Health has developed a truly country-owned, functional and integrated Health Information System to meet its planning and management needs.” They reported that they are in the process of updating and renewing their overall strategy on strengthening their health care delivery system.

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6 This Pre-workshop Survey was conducted virtually and sent for a period of 24 July – 6 August 2012 prior to the AeHIN Workshop, to all expected participants

* Rating scale of 1 to 4 with 4 being the highest
In the Philippines, they have their eHealth Enterprise Architecture, System Integration Framework, and Information System Architecture to support the vision for Universal Health Care of their Department of Health.

In Indonesia, health is part of the government's eGovernance plan; the Ministry of Health cites eHealth as part of its Strategic Planning Document (2010-2014). However, “the lack of coordination among internal MOH structures and with other sector (i.e. Ministry of Informatics, National Board of Research and Technology, National Board of ICT and Ministry of Interior) hindered the Plan's effective implementation. Mostly, every directorate general in MOH claims its excellence on any e-health related application. The decentralization policy also induced many districts to develop its own systems. Vendors are actively marketing in the market.”

13 out of the 18 respondents (72%) have formal mechanisms or processes for involving stakeholders in strengthening HIS, 33.3% or 6 both have as such for their eHealth and CRVS systems. 47.8% (11 out of the 23) gave a rating of 2* in terms of their country's ability for multi sectoral engagement in HIS. Players include public health, statistics, interior and local government, information and communications, science and technology, local and international development partners, universities and institutes. An example cited was the Philippine Health Information Network.

47.8% (11 out of 23 respondents) rated 3* on their country's strength in terms of HIS strategic planning and financing.

43.6% (10 out of the 23) or most of the respondents rated their country's human and institution capacity strength for HIS only 2 over 4*. Myanmar reported that “systematic mechanism for capacity building of people who design, implement, operate and use of the e-Health systems has to be planned and implemented.”

In Cambodia, the private health sector workers do not have an eHealth System. “eHealth solutions are on a basic level and the National Social Security Fund is currently designing the plan for the new HIS System.” Even in Hong Kong, IT use in the private health sector is “relatively in its early stage. The majority of private practitioners still rely on paper-based clinical records. The government plan is to promulgate electronic health records across the public/private sectors for continuity of care.”

44% (10 out of the 23) rated the strength of HIS infrastructure between 2 to 3*. With regards to its reliability 61% (14) rated “fairly reliable” wireless access and broadband. Telephone line (dial up, Telephone line-leased, and Telephone-mobile are “very reliable” rating 65% (15), 74% (17), and 74% (17 respondents) respectively. Infrastructure that rated also as “very reliable” were satellite technology (VSAT) by 10 respondents (46%) and ground-based connectivity, fiber-optic among 50% (11 respondents)

System standards and interoperability was rated only 2* by 52% (12) of respondents. The majority (83.3% or 20 of the 24) use the WHO International Classification of Diseases (ICD-10). Digital Imaging and Communications in Medicine (DICOM) is used by eight respondents who replied to this query; eight other respondents plan to use DICOM in the future. 14 representatives said that there are plans to implement Health Level 7 (HL7) version 3 in their countries. The following HIS/eHealth standards are also listed as part of country plans to (develop and) implement in the future: NHDD / national health data dictionary, National Standard Health Data Set, National Drug Code, meta data, HIS technology specification, ICD-10-PCS (modified), ATC (modified), ICD-9-CM, ICPC2.

Cambodia has a “standard data form and open source web application. Currently use PHP/MySQL for web based database.” In Thailand, administrative functions such as billing has been integrated with their health information system. While most health information were already digital, standard health data set
established from the Ministry of Public Health in collecting health data from provincial and national levels, interoperability remains an issue that needs to be resolved.

Challenges to Country Systems on Civil Registration and Vital Statistics

Among all the countries who responded on CRVS reporting, only Hong Kong, China reported that they have a well established birth and death registration to routinely generate vital statistics. Barriers to reliable codification of cause of death, complete birth and death registration, and in general, reliable collection, analysis, and use of vital statistics include the following:

- **Lack of coordination.** In Bhutan, it was reported that coordination with organizations responsible for civil registration is difficult because 60% of the population live in rural areas and literacy among the populace is low.

- **Low literacy, education, interest, and awareness on its importance, benefits, and value of civil registration.** In one country in SEARO, the Ministry of Interior itself appears to have low appreciation on the importance of civil registration. In Cambodia, most people who did not go to school seems to not care about accomplishing birth and death certificates because they cannot read it. In Malaysia, people are not aware of the benefits of the registration system, particularly on death registration. Spelling errors, unaccomplished information, result in a large number of medically unverified cause of deaths, or large percentage of ill-defined or unknown cause of death. The lack of expertise on vital statistics and cause-of-death data analysis are barriers to better CRVS.

- **No ownership of data**

- **Inaccessible areas** which results in unrecorded births or deaths at home or outside health facilities - In Thailand and Malaysia, not all deaths, most specially among those who died outside the health facility, are verified by the doctors. This is the same case in Myanmar were they encounter low reporting of death and causes of death from remote areas.

- **Lack of competency/ experience.** Thailand reported that quality of information at the point of entry depreciates due to lack of interest and training among doctors. A similar situation was also reported in the Philippines were there is a lack of expertise of people in the field to provide quality data/information and manpower to attend to the vital event.

- **Lack of resources**-In Bangladesh cause of death information is most of the time unreliable due to lack of resources to maintain quality reporting

This Survey, also listed top priorities of respondents, spurring interest in this AeHIN workshop:

- Building capacity,
- Standards and interoperability,
- Governance,
- Reducing costs,
- Developing and implementing specific strategies—HIS, eHealth, CRVS,
- Specific types of solutions—telemedicine, EMRs, data warehouse, claims systems
- Specific technical issues—unique IDs, security

Ms. Tong Xin and Mr. He Qi, country participants from the Health Information Standard Division CHSI of Ministry of Health, China.
Indonesia, a country-member of the WHO SEA Region, is described briefly in terms of important health and economic indicators. The organizations of the health system and country health workforces are also described: for a country of 238 million, per 10,000 population there are 1.6 physicians, 3.5 midwives and 2.4 nurses, respectively. The proportion of HIS-related responsibilities of a typical health professional is depicted. What is unknown, however, is the number of health workers with IT / HIS skills, nor the IT workforce. Indonesia is ranked 80 out of 142 countries in terms of its IT Network Readiness (Index = 3.7 / 7), reflecting most of lower middle-income countries.

Formal training courses on health information system and health information management in Indonesia in the undergraduate and graduate levels are listed. Two were described in detail.

The Master of Public Health program, with focus on Health Management Information Systems, of the Faculty of Medicine, Universitas Gadjah Mada (UGM) is discussed, including thematic course topics, and areas of research interest by the graduate students. Since it was offered in 2005, it has produced up to a hundred alumni, mostly government workers on study scholarships, and strategically posted in public health management positions in various provinces nationwide. Yet, seven years hence, the Indonesian health information system is criticized still to be fragmented, and there are reported cases of outright failure of information systems development.

There remains high turn-over of health personnel, especially after they complete their mandatory tour of duty in the provinces / districts. Many are promoted, or “go back to barracks” - return to clinical work, primarily, such that health information management responsibilities are relegated peripherally. Many just do not use their training, and when asked why, “I am not in academia!” is a common reply.

On further evaluation of what the country needs and how graduates have responded, a three-month short course on health information management was proposed as a partnership endeavor by the UGM, the Ministry of Health and the GIZ. It is offered in blended learning format with internship; it has produced two batches of graduates. Participants are followed up and organized into an HIS “community” through social networking; this is also a forum for sharing experiences as well as a benchmark study. More UGM plans are listed, including an

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7 Presented, also on behalf of Lutfan Lazuardi & Guardian Y Sanjaya, Graduate Program of Public Health, Master program of Health Management Information Systems, Faculty of Medicine, Universitas Gadjah Mada
upcoming Indonesian Health Informatics Forum to be held in 2013, as a means to prepare for the implementation of the national policy on universal health coverage.

QUICK FACTS ABOUT INDONESIA

238 million population
33 provinces, 530 districts/municipalities

Double burden of disease:
- Communicable diseases + nutrition + MCH challenges
- Non communicable disease

GDP per capita: 4.151 US $

Health expenditure/GDP: 2.5%

Adult literacy rate: 92%

Mobile network coverage: 90%

Mobile phone subscription: 69%

Figure 5. Distribution of alumni of the sort course on HI management program of Universitas Gadjah Mada and GIZ

Q&A

Q: What are major capacity issues for eHealth in Indonesia?
A: Information technology (IT) related capacities are very much needed to push eHealth. IT in our MoH is “alien”!
Many of our public health practitioners who become our students in UGM need skills in management, although they are better clinicians. We emphasize public health informatics rather than clinical informatics. (The program is Master of Public Health program, with focus on Health Management Information Systems.)

Annual Health Informatics Forum in Indonesia since 2010
Standards and Systems Implementation: Challenges in implementing HIS and ICD 10 in Cambodia

Dr. Mean Reatanak Sambath
M&E and Health Informatics Program Leader
USAID BHS Project implemented by URC Cambodia

Strengthening Cambodia's initiatives in HIS and HMIS was formalized in 2010, and was launched officially in 2011. Cambodia now has its own HMIS webpage. Standards and systems implementation was heralded with standard and distinct reporting forms for health centres and hospitals; data is processed monthly and is accessible at all levels of the health system. (Results in terms of timely reporting, daily HMIS page visits and number of users were described.) A Patient Medical Record System (PMRS) was designed and implemented in several clinical sites. While the results are promising, challenges identified include limited accessibility of electronic HMIS at remote health facilities, the need for new technology (equipment and infrastructure) as well as skills on using the PMRS, and even maintenance cost for PMRS at hospitals.

Testing ICD 10 at health facilities was also embarked on: medical school graduate students who were recruited and trained for this endeavour. Results of the testing of ICD 10 at health facilities and sample codes in the PMRS were presented. Challenges in using ICD 10 Codes were listed, with examples. On the ICD 10 itself: [1] Some codes changed within a year (i.e. 2011 vs 2012); there are conditions where [2] there are many terms for one code, [3] there is One diagnosis with multiple codes, [4] Limited codes for combined diagnoses; and [5] Some codes do not fit into regional needs. Other equally challenging issues in implementing ICD 10 in Cambodia are identified. Physicians are not familiar with the codes; and even with careful training, human errors do happen: incorrect coding by staff causes incorrect diagnosis classification. There are variations in local language (which contribute to the recording of diagnostic terms), and the accuracy of the code depends on the quality of the diagnosis term. Several general and AeHIN-specific recommendations are listed.

Q&A

Q1: With eHealth, what are the most significant improvements in the Cambodian improved HIS?
A: Recording of reports has increased from 80% to 100%; these are submitted monthly to the MoH. Validation of these reports is still being done by the District Health Office. They report that the quality has improved from 70% to 90%.

Q2: How do you encourage the participation of the private sector to embark on eHealth?
A: The MoH is regulatory, through its licensing powers. eHealth is not obligatory at this point.

Cambodia is also able to contribute to inter-country peer-to-peer learning in HMIS strengthening: below are photos of the visit of a delegation from the Viet Nam Ministry of Health with Cambodia's MoH and the URC.
Thailand Health Information System Development Endeavor: Harmonizing Challenges

Daorirk Sinthuvanich MD
Health System Research Institute (HSRI)
Ministry of Public Health

Thailand’s geographic divisions and how health care services are delivered at the regional, provincial and district levels, and corresponding HIS are described briefly. At the village level, a Village Health Volunteer is assigned to a cluster of families, whose health records are organised as individual family folders. Six sub-district databases are kept for identified population groups: children 0-6 years, women of reproductive age, pregnant women, those with disabilities, those with chronic diseases and the elderly. As far back as 1989, a standard data set for Hospital information systems has been defined. The Thai Drug Related Group is already on its fifth version; this and in general, the Thai HIS support the three national health insurance schemes currently implemented – mechanisms to ensure better health care for the people of Thailand. Unique identifiers were described: patient ID, hospital ID and health personnel ID.

Discussed as an example of nationwide standards adoption is LOINC (Logical Observations, Identifiers, Numbers and Codes) for laboratory transactions.

Much of the gains in achieving better health in Thailand are attributed to good governance and leadership: in 2007, the National Health Commission was organized, and is chaired by the Prime Minister him-/herself. Its National Health Information Committee would later be organised in 2010, currently chaired by Dr. Somsak Chunharat. It has a five prong strategy to achieve the goal of quality, integrated and effective HIS (see Figure 6).


8 Presented also on behalf of Boonchai Kijsanayotin MD., PhD.(Health Informatics)
Q&A

Q1: What are major challenges of the NHIC?
A: First, there is a misconception that information is cheap and easy (to collect and manage). So the process is unfolding and people are learning along the way. Second, “Doctors go fast, but stop early.” We learn that we really need to collaborate with other sectors in order to continue and sustain the work. The NHIC also listens to and empowers patient groups.

Q2: Please clarify on the “use” of the Canadian Infoway.
A: The framework of Canada’s Infoway was used by the Thai’s as a guide to align production and use of data to ensure interconnection among stakeholders. For instance, with the implementation of LOINC, provider needs were considered and how the eHealth personnel (informatician, computer programmer and system analysts) can support both the provider and maximize the laboratory information system, the hospital information system and what other features vendor information systems introduce. This is to ensure that data will flow across various systems for different purposes.

Active Thinking. Country participants from Thailand, Indonesia, China-Hong Kong listening fervently and taking notes on Day 1 of the workshop.
Viet Nam 2011-2015 Master Plan for eHealth and How to Collaborate with AeHIN

Associate Professor Nguyễn Hoàng Phương, MD
Director of Cabinet, Steering Committee on IT Applications,
Deputy Director (Responsible for IT), Department of Science and Training,
Ministry of Health

Viet Nam has four functional systems in the health sector: the state administration is led by the Ministry of Health (MOH) and its provincial and district departments; the (disease) preventive health system consists of preventive health centers at the provincial and district levels and more than 10,000 commune health stations, as well as 10 central research institutes; the medical service system consists of more than 1100 hospitals nationwide, including private clinics; and the research and training system consisting of research institutions, medical universities, colleges and training institutions. There are thousands of pharmacies and medical equipment business units or companies.

Information technology in the MOH is systematically integrated through the leadership of the Steering Committee of IT for the medical sector, and the Department of Science and Training (DST) has responsibility for IT state management for the MOH. Hospitals have their own IT departments or groups. The MOH is establishing the Administration of IT combining the IT group of DST and CHITI. IT applications, activities training / education opportunities/ projects are described at various levels of the MOH and functional health systems.

Some major concerns of eHealth in Viet Nam include insufficient investment in IT, the field of eHealth and data standardization are under development, there is no unique patient identifier, there is no enterprise architecture for the country health information systems and the lack of health IT human resources.

Priorities for eHealth / HIS development for 2011-2015 are listed: organising IT groups in the health/medical sector, guarantee IT capacity for health/medical institutions, proposing priority policy especially ensuring salary for the IT staff, and guaranteeing the budget for IT applications, developing and issuing legislation/ guidelines for IT applications, developing IT human resources, and international cooperation.

Common interests between MOH of Viet Nam and AeHIN for collaboration are many: unique patient ID, health data standardization and interoperability, HIE / health information exchange engine, telemedicine for rural areas, and generally, strengthening HMIS/HIS. To save time and budget, AeHIN members can perhaps develop some software for “common use”, applying web based, open source technology, for many countries in the Asia Region. Cooperation, under the framework of AeHIN, is important to push (health) IT development in every country and the Region.
eHealth and Telemedicine Priorities in Mongolia

Jargalsaihan Dondog, MD PhD
Director, Department of Information, Monitoring and Evaluation
Ministry of Health, Mongolia

Mongolia is a landlocked state in East and Central Asia. It is the most sparsely populated nation in the world; there are only 2.75 million people living in a land area of more than 1.5 million square kilometres.

Up to about 200,000 Mongolians are currently on-line; this represents a 53% increase since 2009. Internet services are via fiber optic, DSL, GPRS, wi-fi and wi-max, dial up and VSat. (See Figure 6.) It was only recently (2012) that the Resolution on eGovernment, as a National Program was approved by Prime Minister. However, the health sector came ahead: in 2011, the Ministry of Health developed the eHealth Strategy, 2010–2014. Defined a priority areas strengthening the Health Management Information System (HMIS) was ordered by the Minister of Health for the period of 2011 to 2015. A supportive environment for telemedicine and e-health is getting started.

Telemedicine is a technology to be maximized in a country like ours, where people are thinly spread out throughout a vast expanse of land. Telemedicine support projects have been initiated by local private companies as well as international development agencies, led by the WHO, the government of Belgium, UNFPA and Lux-Development (Luxembourg), SDA, the World Bank and Asian Development Bank. Their geographic distribution is depicted in Figure 7.

There is vertical health information flow; H-info-2 has been set up within the health sector. In terms of the clinical information systems in health care facilities, up to 82% use CPOE computerized physician order entry software and a few numbers use laboratory, drug and/or radiology information systems.

Challenges, however, include the lack of integration of e-health software (lack of interoperability and need for standardization), HIS security and patient privacy, as well as the lack of capacity for eHealth in the country. These have to be addressed in order to maximize the benefits of a modern integrated health information system in the health sector in Mongolia.

Figure 7. Internet access and speed.

Figure 8. Telemedicine Support Projects in Mongolia
Q&A

Q1: What are contributions of the Banks – World Bank and ADB?
A: Their help is to enable HIS improvement at the lowest health center level. Unfortunately, we still do not have back-ups for these data, and health information exchange is poor.

Q2: What are Mongolia’s priorities for HIS improvement?
A: We need to learn, hence this type of forums is important for us (to learn from international best practices). Second, is the development of our health data dictionary. Also our priority is addressing concerns in the legal environment, such as patient privacy in these digital times.

Small group discussion with country participants from Sri Lanka, Malaysia, and Lao PDR and observers from USAID.
Session #2: Collaborative Approaches

ICT4H: Multi-sectoral Approach to eHealth Promotion in the Philippines

Alvin B. Marcelo, MD
Chief Information Officer – Senior Vice-President
Philippine Health Insurance Corporation

The Philippines' health governance system is described at the national, regional, provincial, municipal and city levels; a typical (government) municipal health facility is managed by its medical-health officer, public health nurse and midwives. In 2010, the new Philippine President Aquino called for Universal Health Care, and mandated the Department (Ministry) of Health (DOH) to carry this out. ICTs are recognized by the current leadership as enabling tools to attain UHC; it developed a five-point eHealth strategy. In October 2012, the Secretary of Health engaged the academe, non-government organizations (NGOs) and the private sector to support UHC through ICT, and organized the ICT4Health Technical Working Group (ICT4H TWG). Chaired by the DOH, the ICT4H TWG consists of representatives from the government science and technology agency, IT professionals association, two from NGOs, a telecommunications company, a private sector health IT, and two from the academe.

In its preliminary meetings, the ICT4H agreed to hold monthly meetings and expand the group to other interested individuals or organizations; meetings would be hosted by volunteers. 25-30 individuals and/or organizational representatives have participated in each of the monthly face-to-face discussions; a mailing list is maintained. Concerns about the eHealth landscape were defined: Unclear directions, Lack of standards, Lack of capacity, how to align the healthcare with IT, and security, privacy, and confidentiality issues. Thus, an almost a year-long discussion, focused on four key areas of analysis: Enterprise architecture (EA, health sector-wide), Standards and interoperability, Capability building, and demonstration of Compliance to the sector-wide EA and standards. In February 2012, recommendations of the ICT4H TWG were presented to the DOH Secretary, a foreign consultant was engaged to review these, and finally, a local consultant is designing a draft action plan to move forward.

Major lessons from this experience are at least three-prong: Gathering a wide audience provides an array of different ideas and expertise, Spending time on consultations is worth it, and Governance is key to forging ahead. Leadership must be visible at all steps of the process.

This found immediate application in my realm of work at the Philippine Health Insurance Corporation – that which is charged with the responsibility over universal coverage in the Philippines. The ICT4Health Recommendations convinced the Board (of Directors) to undertake Enterprise Architecture development activity. Our Enterprise Architecture now defined standards (e.g. enterprise service bus, see Figure 6), the Standards now informs content for capability building programs.

Figure 9. Application of the ICT4Health Recommendations in the Philippine Health Insurance Corporation
Coordination, Management, Implementation, Oversight: Experiences of the Hong Kong eHEALTH Consortium

Winnie Tang MD
Co-founder and Chair, Steering Committee
eHealth Consortium

Hong Kong’s overarching health policy is that “No citizen would receive inadequate medical care for financial reasons.” It has a two-track system run by the public and private sectors. While Hong Kong’s (HK) Department of Health is responsible for management of public health and port health, the Hospital Authority has direct management responsibilities over clinical services in the hospitals and primary care. In the financial year of 2010/11, a lump sum of more than HK$34.1 billion dollars was granted to Hospital Authority for universal public healthcare at a highly subsidized model. It is expected to be a strategy that would result to cost-effective use of public resources, but heavy in terms of system loading. Services of the Hospital Authority is described; of note is that eHealth record sharing within public hospitals and clinics is possible. Private health care spending of HK is $35.9 billion, accounting for 53% of Hong Kong’s total medical expenses; the private sector is further described. Challenges to healthcare management are also listed. These provide the context for eHealth development in Hong Kong.

The eHEALTH Consortium is a non-profit association in Hong Kong founded by the Internet Professional Association and Hong Kong Society of Medical Informatics in 2005. Its goal is to bridge healthcare and IT industries to advance the eHealth development in HK and China. It has organized eHealth Forums for HK and the region since 2006. Currently, there are 60 Corporate/NGO Members, and over 400 individual members. The eHealth Consortium focuses on three key areas: education and capability building; facilitating pilot projects for the advancement of eHealth applications; and data standardization.

Hong Kong’s recent and most prominent eHealth development effort has three objectives: it focuses on developing patient-centric electronic healthcare records (eHR) in all clinics, preserves the family doctor concept where primary and hospital care are integrated, and ensures public-private interface and partnership. This is described in detail: management and governance structure, guiding principles and strategies, and development phases. Core components are noteworthy: the eHR Sharing Infrastructure, Clinical Management System adaptation and on ramp, and Standards definition and pilot interface.

Multi-sectoral participation through the eHR Engagement Initiative (EEI) is described. EEI invited all relevant stakeholders to submit proposals on partnerships for eHR development; this was launched in 2009 and some 50 proposals were received. It was an opportunity to promote and update the stakeholders with the latest development of eHR programme, gain feedback from healthcare sector stakeholders in what ways eHR would assist their care of patients, facilitate continuity of care and enhance safety and quality, and Share ideas that can promote interoperability of eMR/ePR (electronic medical/patient records) systems and seamlessness in eHR sharing. Stakeholders included all private and non-government healthcare providers; and IT sector.
Three pilot projects were described. The eHealth Consortium developed a validation platform for eHR Data Standards Conformity, we systematically conducted Training Programme & Certification for Healthcare and IT Practitioners, eHealth Trainings for Doctors, Nurses & Chinese Medicine Practitioners. The Hong Kong Medical Association & Information and Software Industry Association developed an open source clinic management system (CMS 3.0) for use by private doctors; and the Hong Kong Association of Medical Laboratories developed a Laboratory Integration Platform for laboratory information exchange, and provided training and technical support for the private laboratory practitioners.

### CRITICAL SUCCESS FACTORS

Government-led Model for Development
Based on HA’s Home-built System
Building Block (Non-Big Bang) Approach
Pilot Sites
Dedicated User Training Teams
Multi-sectoral Engagement
Unique Citizen Identity Card

### CHALLENGES

- Voluntary Participation (take times to convert)
- Clinicians Engagement
- Implementation

### OPPORTUNITIES

- Rich enhancement opportunities for healthcare services and quality of our lives
- Healthcare service providers
- Clinicians
- Patients
- Society
- Cross-border collaborations in neighboring cities like Shenzhen, Qianhai and even the Region in the areas of trainings, validation & certification of health IT systems, drug tests, etc.

Three important aspects are discussed: first, defining the Legal, Privacy & Security Framework for eHR Sharing – this began with Public Consultation conducted between December 2011 and February 2012, which became basis for drafting the eHR legislation. Standardization, a cornerstone to eHR Sharing, forms the foundation for accurate and efficient communication of electronic data. Critical was the establishment of HL7 Hong Kong in 2010, although it was in early 2009 that the eHealth Consortium - as the Primary Petitioner (with four other prominent health organizations - for Affiliate Membership of HL7 in Hong Kong. Standards for eHR Content and eHR Data Interoperability have been defined (and are available at ehealth.gov.hk and fhb.gov.hk).

Finally, continuous professional trainings for healthcare and IT practitioners through collaborations and support among government, industry associations and academia is highlighted. Again, the eHealth Consortium is an active player in this. Noteworthy is the University of Hong Kong’s Advanced Certificate/Diploma in Health Informatics.

### Q&A

**Q1:** How did Hong Kong migrate non-standard EMR to what you have now?

**A:** Since the 1990s hospitals have started to use computers. Legacy (old) systems have to be mapped to the new user interface provided. New clinics did not have problems. The process has been a gradual upgrading of systems, as well as ensuring stakeholder engagement – authorities worked closely with hospital administrators and clinicians.

**Q2:** What were the results of the public consultations?

**A:** Consulted were professional medical and IT associations, patient groups. These were fruitful, people were organized as work groups to align interests and concerns. Their output became the basis for legislation, and we went through the process.
HIS Strengthening in Indonesia: Successes, Failures and Lessons Learned from a Decade of German Technical Assistance Support

Kelvin Hui
Senior Advisor,
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

From 1999-2011, GIZ's technical assistance support to Indonesia were in five areas: SISKES (HSS/ Health systems strengthening) at Provinces (NTT & NTB), SHI: Social Health Insurance; in Aceh: Health Systems Management (Post tsunami reconstruction/rehabilitation); HRD: Human Resources Development in Health; and PAF: Policy Analysis & Formulation. The last two years were efforts to consolidate the learnings and gains of the decade-long support.

The HIS landscape, especially its challenges, was described. HIS strengthening was a cross cutting effort in all GIZ projects, with concentration of interventions at the sub-national level. GIZ's contribution is primarily support to Systems development and implementation: i.e. Province wide HMIS in hospitals, primary care health clinics, and Human Resources MIS. Institutional change management with new information system was integrated in the efforts; HIS strengthening was a relatively new field for GIZ's work in Indonesia.

On evaluation of efforts, identified were wrong assumptions (such as transparency and efficiency is welcomed) and unsuitable strategies. The process was generally difficult, but everyone agreed, it was necessary. In 2010-2011, focus of HIS strengthening was on the central level support to the Ministry of Health Center on Data and Information. Outcomes – both positive results and continuing challenges - were presented.

In summary, the GIZ HIS Development model has two objectives: to enable easy access to accurate information in a timely manner to support policy dialogue and decision making; and to increase efficiency and transparency of work processes. Elements are organised, and best described like a butterfly and its wings - butterflies cannot fly when one wing is broken; all four should be functional (see Figure 11).

Figure 11. GIZ HIS Development Model
Effective Planning → Priority Actions → Expected Results
Session 3: WHO-National eHealth Strategy Toolkit

Orientation, Application and Use of the Toolkit

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International Telecommunication Union
Regional Office for Asia and the Pacific

The International Telecommunication Union (ITU), organized in 1865, is the UN's lead special agency for ICTs. The World Summit on Information Society in 2005 defined 10 action lines; the ITU is involved in eight, and is the sole lead “facilitator” for ensuring the ICT infrastructure as well as building confidence and security in ICTs. Listed were the roles of ICTs in attaining the MDGs, with special note for MDG 4 and 5. ICTs are growing incrementally worldwide, and e-Applications – especially for eGovernment are deemed priority for development by the World Telecommunication Development Conference (2010). In the same meeting of ICT for development leaders, it was resolved also as a priority to increase access to health care services by using ICTs.

ICT / Broadband are powerful tools to achieve MDGs on health. There are impressive success stories through mobile health, among others. National strategy, vision and leadership are MUST for achieving comprehensive e-Health objectives. The ITU accords high priority for use of ICT / broadband for enabling e-Health for all citizens. ITU Initiatives for e-Health include: first, specific emphasis on health in National Broadband Plans; second, Interoperable standards for e-Health; and finally, encouraging the Move from pilots to scalable, sustainable e-Health strategy. Collaboration with the health sector is described; of note is with the CoIA on Women's and Children's Health, as well as the development of the ITU-WHO “National e-Health Strategy toolkit”, a resource guide for country decision makers to develop their national e-Health strategy and roadmap.

Joan Dzenowagis, MD
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Department of Knowledge Management and Sharing
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eHealth in countries is generally characterized as a landscape of isolated islands of small scale applications unable to effectively communicate and share information with other systems or across geographies, technologies or programs; there exists barriers to scale up to support a larger patient and care provider base. It is difficult for decision makers to understand the current health situation, for meaningful planning and policy formulation. There are duplication of efforts, leading to waste and inability to integrate solutions.

Changing the landscape: The WHO and ITU jointly committed to develop systematic guidance for countries. The process must be thorough, comprehensive and credible; it should be broadly applicable and available in all UN languages.

National eHealth Strategy Development
This session has the following objectives: [1] To introduce the joint WHO-ITU National eHealth Strategy Toolkit; [2] To discuss its use and how to get started; and [3] To demonstrate our joint commitment to multi-sector collaboration for eHealth.

Country national eHealth strategies have been articulated, with similar lofty goals (examples cited are Australia, Kenya, Mauritius, etc.). Essentially, it serves as an umbrella for planning and coordinating different national
eHealth efforts...while considering fundamental elements in terms of regulatory, governance, standards, human capacity, financing and policy contexts.

The **WHO-ITU National eHealth Strategy toolkit** is a resource for developing or revitalizing a country’s eHealth strategy. It is intended for a range of countries, from those that are just setting up to those that have already invested in eHealth. It is a framework and method for the development of a vision, action plan and monitoring framework. It has three parts: first, Establishing a national eHealth vision and strategy; developing the national eHealth action plan; and finally, monitoring and evaluation. Discussed in detail is the first two parts.

![Figure 12](image)

**Figure 12. Establishing a national eHealth vision and strategy: Method for developing a national eHealth vision**

**Who can use the Toolkit?** It is intended for countries seeking to build on promising results of pilot projects; those with high-level statements of intent seeking to turn these into action; those which are beginning comprehensive planning and scaling up; and/or those with experience in eHealth, updating strategies to respond to changing environments.

**Initiating a national eHealth strategic planning process**

**Confirm health sector leadership.** National planning requires sustained leadership and commitment from senior government officials and health sector leaders. Development of a national eHealth plan often launches a country’s formal program in eHealth.

**Establish governance mechanisms** to provide improved visibility, coordination and control of planning activities. This includes the formation of a steering committee and an eHealth strategy team.

**Identify key health and non-health sector stakeholders** to be involved in the development of a national vision and plan and its subsequent implementation.

![Figure 13](image)

**Figure 13. eHealth Components**
**Establish the strategic context for eHealth.** This provides the foundation for eHealth vision and planning, and enables the government to assess and make informed decisions on how to better harness ICT for health system strengthening and improved health outcomes.

**Forming an understanding of the current eHealth environment** in terms of the eHealth components that already exist as well as existing programmes or projects that will deliver eHealth capabilities. These are **foundations for change.** eHealth components are building blocks of a national eHealth environment that allow the eHealth outcomes to be achieved. They describe what is introduced or strengthened to achieve the eHealth vision.
Session 4: Standardization and Interoperability

Health Data Standardization and Interoperability: Context and Overview

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Four seminal – timely, relevant and inter-related documents articulate the sense of urgency in improving country HIS and eHealth:

*Keeping Promises, Measuring Results: Commission on Information and Accountability for Women’s and Children’s Health*

*Framework and Standards for Country Health Information Systems*

*Strategy and Plan of Action on eHealth, 2012-2017, PAHO/WHO*

*Meeting the Demand for Results and Accountability: A Call for Action on Health Data from Eight Global Health Agencies*

A technical overview of HIS was provided: HIS is described as a complex system of sub-systems, its functional elements are depicted. Multi-sectoral engagement and appropriate use of ICT are key to strengthening Health Information Systems at all levels. To turn the strategies into action, there is a sense of urgency for multi-sectoral approach to HIS. A fragmented HIS poses a big threat to health care delivery and a well-designed HIS is essential for rapid detection and containment of infectious diseases, automatic response to health emergencies, and appropriate and timely delivery of healthcare to population at all levels. Mandatory reporting of data to national and international institutions call for reliable HIS and with multiple sectors within countries depending on accurate and reliable health information for decision making, multi-sectoral involvement is indeed key.

**Coordination is primary to owning and sustaining HIS at all levels.** Engaging various sectors keeps information systems alive through supporting its different elements. This implies that stakeholders must be aligned, with their positions depending on a country’s health system, information system architecture, and stakeholders’ capabilities. Opportunities to involve the private sector should be taken to catalyze development. And once this has been fleshed out, with roles and capabilities identified, strategies can be articulated. It is interesting to note that the producers and consumers of HIS data are multi-sectoral: ministries of health, finance, education, labor, local health governments, private health sector, insurance providers, development partners, and a whole lot more. This emphasize the significance of multi-agency participation as a key elements of a country HIS.

A discussion on Data Standardization begins with appreciating the challenges of data acquisition and management from varied and disparate sources. These health data may be obtained from censuses, civil registries, population surveys, individual records, service records, and resource records. Typical manual, paper-based data collection and aggregation processes and tools were shown. Issues related to data collection and complex data flow were listed.

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9 WHO Publication; ISBN 978 92 4 156432 8
10 WHO Publication; ISBN 978 92 4 159594 0
11 PAHO/WHO Document; CD51/13 Eng. 1 August 2011
12 PLoS Medicine | www.plosmedicine.org January 2010 | Volume 7 | Issue 1 | e1000223
Functional HIS depends on harmonized and interoperable data elements between and within systems. Without health data, health information cannot be extracted hence, decision-makers cannot come up with evidence-based programs and policies, hence, quality data is the foundation of any HIS. Again, with data being the backbone of any HIS, without interoperable and integrated data, the conceptual elements will not be as functional as a well-oiled HIS engine that will drive management of health systems and health systems delivery. This system is a central supply chain information system connected to the Ministry of Health and should interface with statistical and financial systems to efficiently manage health services. There is the problem of fragmentation among disease data systems. These programs are usually vertical; cross data linking is very much needed. As a consequence, data standardization is required for better data collection, aggregation, analysis, and management.

The data standardization process is described: development, maintenance and adoption; organizations involved in these processes are also described. General categories of standards are on Data, Information Content, Information Exchange, Identifiers, Privacy and Security, Technical Standards; also sometimes included in these discussions are Functional Standards or Business Requirements. The Public Health Data Standards Consortium (2012) lists steps in the Standardization Approach: first, identify and Prioritize interoperability needs; this should be informed by Use Cases and Functions/Business Needs. Next is harmonization, (i.e. this should include functional requirements assessment; standards gap identification and harmonization; dataset & value set development; interoperability specification development). Third, identify appropriate standards to prioritized needs; that is, matching existing standards to prioritized needs. Fourth, test Standards Interoperability – i.e. software instantiation, conformance testing. Once satisfied with these steps, standards begin to be implemented.

Data Standardization and WHO. The WHO assists Member States through convening and coordinating the eHealth standards adoption at national and sub-national levels. It also offers technical assistance to countries in developing architecture, standards-related policy frameworks, and implementation. Recently formed is the U.N. Interagency Workgroup on Health Data Standardization. A work in progress, this Workgroup is in the process of consultation with various stakeholders to develop what would be the “WHO Handbook on Health Data Standardization and Interoperability” (tentative title).

Q&A

Q: How can WHO help countries, when many have more than one set of standards, and they don't even a standards authority, or body?

A: WHO can help - This is a systematic process where we start with helping countries define what they have or do not have. There will also be an important forum on December 2012 where SDOs and SMOs will join this meeting. We want to categorize what are core and life-saving standards and make sure that these are available for free. We also want to define what are optimum standards, and make these available on a sliding scale to LMICs.

Comment: China's experience is interesting, especially since the population is large, thus we expect high volumes of transactions, and exchange. Yet quality of data did not suffer.

Comment: It appears that the key to standards is that interoperability becomes automatically embedded into the technology. See the examples of GSM, html, http → these are all successful! The user need not worry about these.
Enterprise Architecture Framework: The Malaysia Connected Healthcare Enterprise Initiative

Dato' Jai Mohan, MD
Professor of Health Informatics & Pediatrics,
International Medical University, Malaysia

Malaysia, with a population of 25 million, is in Southeast Asia. With a GDP of USD$120 billion, it is the 17th largest trading nation. Its vital health statistics compare with many European and North American countries. Malaysia’s health landscape is further described.

Malaysia’s Vision for Health

Malaysia is to be “A nation of healthy individuals, families, and communities through a health system that is equitable, affordable, efficient, technologically appropriate, environmentally adaptable and consumer-friendly, with emphasis on quality, innovation, health promotion and respect for human dignity and which promotes individual responsibility and community participation towards an enhanced quality of life”

Malaysia spends 4.0% of its GDP for health; ICT expenditure is at least USD$2.4 billion annually.

1995 to 1998 is a fruitful period for Malaysia’s HIS, where it saw the formulation of Information System Strategic Plan: health infrastructure to plan to become more than a mere conduit for collecting and transmitting health management information. It was to be exploited to directly serve core business of managing and delivering actual healthcare services to people. The Patient Management Information System was introduced in 14 state hospitals. Wide area infrastructure was implemented to connect state and national programme heads. Automation introduced into National Drug Ordering System: significantly reduced drug wastage and improved drug availability.

Other milestones were presented, along with Malaysia’s current Health Infrastructure (please refer to Figure 14).

The PLHP / Personalized Lifetime Health Plan. An initial PLHP is a generic plan, and gets to be personalized by incorporating specific wellness plan and illness plan. Ad-hoc changes are incorporated also to improve plan. Similarly, reminders, alerts and customised messages are incorporated. Each Malaysian can access her/his
New additions to the team. A number of country participants join the AeHIN Scientific Committee in a meeting for the next day’s session and expressed interest in joining the committee. L-R: Dr. Portia Fernandez-Marcelo (Philippines), Dr. Lutfan Lazuardi and Prof. Anis Fuad (Indonesia), Dr. Jun Gao (WPRO), Dr. Boonchai Kijsanayotin (Thailand), Dr. Founkhham Rattanavong (Lao PDR), Tom Hutton (CDC), Prof. Jai Mohan (Malaysia), Tong Xin (China), Mohammad Ahmed Sohail Virk and Imran Majeed Malik (WHO-Pakistan), Prof. Phuong Nguyen (Viet Nam), Dr. Alvin Marcelo (Philippines), Mark Landry (WPRO).

PLHP on a website. The PLHP demonstrates many of the principles of health care in Malaysia: wellness focus, patient-centric, informed persons, accessible, quality, integrated and lifetime care.

Teleconsultations and Hospital Information Systems are discussed at length.

Recent efforts at interoperability were systematized as Malaysia’s Information Health Exchange. A Connectathon to develop and demonstrate interoperability using nine integration profiles was conducted in 2011; standards are also being developed, now at different stages of completion.

**Q&A**

Q1: What is the role of social determinants of health in Malaysia’s development?
A: To the MoH, social determinants is not “just part” of the work. It has a strong inter-agency group where meeting the basics like nutrition and water is a priority. We have a strong MCH program. Health promotion is equally important as treatment and cure. The NGOs in Malaysia are a strong and powerful sector in the country.

Q2: How do you maintain top level support for what is obviously an expensive automated HIS?
A: Dr. Mahatir worked for economic development, and IT is a seven-year investment – from i-Schools and telehealth, etc. What is critical is that it had been a long-term commitment → middle and lower management levels bought in. “Simmer slowly” then push it!
The Development of Health Information Standards in Thailand

Boonchai Kijsanayotin MD, PhD (Health Informatics) 13
Thailand Health Information Standards Development Center (THIS)
Health System Research Institute (HSRI)
Ministry of Public Health

Presented was an overview of the WHO eHealth Development Model and contrasted this with efforts in Thailand. Provided too was technical input as background on discussions on Thai health information standards development: Communications within HIS → Systems Interoperability; Continuum of Health Vocabularies Interoperability: categories and levels; Interoperability requiring Standards, and categories of Standards (semantic, syntactic, core data set, security & privacy standards).

Discussion on the Thai health information standards development began with an analysis: while there were existing semantic and syntactic standards, gaps were identified, missing too, were core data set standards as well as security & privacy standards. Areas of development were identified; actors were also listed including the Thailand Health Information Standards Development Center (THIS), of Health System Research Institute (HSRI), Ministry of Public Health.


Discussed at length was the adoption of LOINC (Logical Identifiers, Names and Codes) as a standard in laboratory terminology in Thailand. This stem from three social and health development needs: The country urgently needs to control the rising pharmacy cost. Detailed drug information at drug item level is needed by health insurance schemes for reimbursement and utilization monitoring. And harmonization of the three national health insurance schemes payment mechanism need standard drug terminology. The process of adoption was a multi-agency, multi-stakeholder engagement process. It began with the analysis of the current Thai system.

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13 Presented also on behalf of Daorirk Sinthuvanich MD
Lessons from other countries were also reviewed. These processes informed the development of the Thai Medicine Terminology, with the following features: Defined Thailand Standard Drug Information and codes; Adoption of SNOMED – CT; Employ Pharmaceutical/biological product and substance Hierarchies; and developed Thailand SNOMED-CT extension.

Q&A

Q1: Provider ID for Thailand – how were you able to make a case for this?
A: The Provider ID is linked with the facility ID. Statistics of their (provider) performance can be used for insurance, i.e. for more active payment.

Q2: Why a Thai Medicine Terminology?
A: ICD-10 has about 30,000 concepts, but is not granular enough. SNOMED is better, up to 1.3million with the needed hierarchies. We, however, need to develop what is more immediately useful to us at the point of care. Thailand has limited experts, however.
Collaborative Requirements Development Methodology

Kate Wilson
Senior Program Officer
Health Management Information Systems
PATH

Vivian Singletary
Director, Requirements Lab
Public Health Informatics Institute (PHII)

CRDM, or Collaborative Requirements Development Methodology, is an approach to bringing together stakeholders to facilitate a structured discussion to define information system requirements. In the recent years, health IT spending has increased; this provides a context why defining requirements - well before expensive investments are made - is a critical step. Presented were benefits of CRDM, its guiding principles, steps, and phases, contrasted against the IT life cycle. A practical application was described to demonstrate the concept of CRDM (Raja's Fashion). CRDM has been applied in several settings such as Public Health Surveillance, Immunization Information System, Laboratory Information Management System, Logistics Management Information System, Emergency Preparedness, and Chronic Disease Management.

Joint Learning Network for universal health coverage: Presented also as an example of CRDM is the Joint Learning Network (JLN) Information Technology Track, where collaboration across countries for health insurance information systems is encouraged. JLN is governed by a core secretariat, and supported by several organizations including Rockefeller foundation. PATH as well as PHII are technical partners. Each of the CRDM steps, applied in the health insurance sector in country members of the JLM was discussed.
87% of the global population uses mobile phones: up to 4.5 billion of them are in the developing world. The global mobile phone subscription has steadily increased in the recent years. Presented also is the global situation of the health workforce: 57 countries have severe shortages of health workers. Community health workers (CHWs) have a unique role in bridging the communities with that of the formal health care systems, especially in these countries with many social and health development challenges. mHealth is defined as the delivery of health care services using mobile communications devices. mHealth is also uniquely positioned at the intersection of mobile communication technologies as well as health.

Presented was a research to gather evidence on efficacy of mHealth in helping CHWs. From an initial search of a little less than 6000 papers, only 26 full text papers were reviewed; the experiences of Colombia and Tanzania were discussed as examples. Generally these articles showed that among CHWs using mobile phones for health, there were fewer errors in reporting and less data loss. For the health system, mHealth afforded real-time review of quality, close CHW supervision, and rapid response capabilities. mHealth was found to be cost effective. The challenge for these eight projects, however, is avoiding pilotitis. This describes, the small scale, independent, exploratory and non-collaborative efforts. What is needed are mHealth solutions that are reusable, interoperable, scalable, and sustainable.

Recommended is to connect mHealth opportunities to the eHealth architecture for interoperability. Introduced was: meHealth = eHealth + mHealth \rightarrow to increase access to a full range of health services.

Presented also were the experiences of InSTEDD, Innovative Support for Emergencies, Diseases and Disasters in lower middle income countries, including Cambodia. InSTEDD Technologies use free and open source software, and are customizable. They can be used independently or together; allows for real-time alerts and data synchronization. They work on any phone, work with low signal. Most don’t require internet, many do not require literacy. InSTEDD Technologies are generally cheap, fast and easy.
Making mHealth Work

Jeanette Lazatin, MD
Provincial Health Officer
Wireless access for Health Project
Tarlac, Philippines

The Philippine health care system is decentralized. This as well as the manual and paper-based HIS result in the current challenges we experience: timeliness, accuracy, completeness. One asks, “Is data actually useful?” Fortunately, there are initiatives to improve the country’s HIS. The Department of Health recently issued an Administrative Order compelling the electronic submission of health data from the countries’ municipalities by October 12, and by January 2013, the Philippine Health Insurance Corporation will provide incentives and priority to reimbursing health insurance claims that are submitted electronically.

The Wireless Access for Health Project (WAH) is among these efforts to improve the local HIS. It is the first public-private-and-academe partnership project on eHealth in the Philippines. It is accepted as a local government- and Rural Health Unit (RHU)-friendly, patient-centered, and health service provider-oriented health information system. It is supported by the Department of Health (DOH), and endorsed by all Local Government Units (LGU) in Tarlac, a province in the northern part of the country. This is led by the Provincial Government and Health Office of Tarlac, all its constituent municipalities, RTI and USAID, Qualcomm, Smart Communications, the Tarlac State University, and National Telehealth Center (NTHC), University of the Philippines. The NTHC, contributed its CHITS, Community Health Information Tracking System: an electronic medical records and surveillance system as the base of the WAH information system. CHITS has since been improved under WAH; other features include mHealth technologies. Aside from the electronic medical record, WAH has its Synchronized Patient Alerts via SMS (SPASMS): a practical channel for health information dissemination intended for patients; 2,380 are currently enrolled in the system. The WAH Mobile Midwife, using tablets, was also developed as a means to increase the productivity of rural health workers, and promote fidelity to the submission of government-set health indicators. It enables data capture at the point of care or contact at the village level. Five midwives are field testing the system. The inter-connectivity and inter-operability features are described.

The success of WAH is due to the flat governance structure of the Project, yet, the Provincial Government of Tarlac is the first among equals. The Provincial Health Office, spearheaded the project, in close collaboration with the DOH. A second critical factor is the mission of the WAH partners: working together for the common good; each partner brought their own contribution to achieve Project objectives. The WAH open partnership also favored the use of, as well as the values embedded in Open Source Software.

Q&A

Q1: If WAH is down, what is its redundancy?
A: It uses local storage in the health centers.

Q2: Did you do an audit, or before/after studies?
A: Unfortunately not. The WAH information system is now in 26 of the 39 health centers or RHUs in the Province. Maybe we can still do that for the remaining 13 others.

Q3: I saw the logo of GE/ General Electric. What is their role in WAH? They are your partner?
A: They are not our partner yet, but they are exploring whether we can test their mobile ultrasound. It costs USD$ 7 to 9 thousand per unit.
Learning by Doing
Session 7 and 9: Policy Institutional Readiness and Leadership

Institutional Readiness and Change Management

John Novak, MD
Office of HIV/AIDS, Global Health Bureau
United States Agency for International Development

This session will address the following questions:

- What does a well-functioning HIS look like—what is the vision?
- What are some of the challenges to achieving that vision?
- What is a coordination secretariat with sufficient authority and skills to establish a National Multi-sectoral e-Health/HMIS?
- What are some of the major considerations required and the skills needed to establish a well-functioning e-Health/HMIS?
- Where do you find your own county situation in relation to that vision?

We want to make it clear that the process and skills for creating a national consensus about the HIS function are perhaps new and different. It is important to include the range of actors or stakeholders of the different information sources or those who can use the information. This is not only a technical challenge (the technical part is the most familiar part, and most of you are well trained in the technology). It is an organizational development challenge and a process challenge. It requires getting others to buy into a process and a system that is larger than the piece of the elephant that is in front of one’s nose.

Vision of a well-functioning HIS (refer to Figure 14, below; from HIS Country Ownership and Leadership Continuum[14]). This is what we have found around the world to be the major elements of a vision for a complete National, multi-sectoral well-functioning e-Health/HMIS. Of those large categories, by far, the foundations for change are the first three: Multi-sectoral Engagement in Governance, Strategic Planning & Financing, Policy & Regulatory Environment. (The others – are intervention-specific components - we know how to do because they are within our technical training.) If we agree on this as a vision of a well-functioning HIS, then why do so many efforts to achieve this fail? There are some challenges that others have faced when they begin to try and establish or realize this vision. Let’s explore some challenges:

1. Political priorities play a major role in allocating resources and HMIS is not high on the list.
2. Aligning other ministries around a common vision and goal for the HMIS.
3. This requires new set of skills: Advocacy (pushing for what you need), Direction-setting (leading toward a vision), Alignment of stakeholders (getting people together around the same ideas), Oversight and ensuring accountability (managing the process)

Case study discussions on hypothetical Asiatica were conducted in small groups and plenary (Refer to Resources folder on readings and case studies shared for Session 7 and 9).

Figure 15. Vision of a well-functioning HIS

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14 First presented during the 2011 Asia Pacific HIS Leadership Conference.
**HIS Strengthening: Action Planning**

**John Novak**  
United States Agency for International Development, Office of Health

**Dan Edwards & Rachelle Jacobsen-Le**  
Training Resources Group, Inc.

This session will address the question: How does one begin the process of setting up a multi-sector National e-Health/HMIS? We will hear some **proposed steps for beginning the process for a successful country-led, multi-sectoral e-Health/HMIS.** (see Figure 16)

An example of a success story and lessons learned from the process of organizing a multi-sectoral HIS leadership body will be presented from the Philippines. (Refer to slide presentation/s of Ms. Jovita Aragona, Department of Health, and/or Dr. Portia Fernandez-Marcelo, NTHC-UP Manila.

You will identify a few steps you will need to take, then complete action plans for strengthening HIS in your country. Work through the questions on the planning chart. (Figure 17.) Sharing was in small groups as well as in plenary.

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**Figure 16. Proposed steps for beginning the process for a successful country-led, multi-sectoral e-Health/HMIS**

**Figure 17. Planning for Setting Up a Multi-sectoral National eHealth**
Session 8: Overcoming Technical Challenges

Protecting the Confidentiality and Security of Patient Information

Thomas Hutton
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There are four elements of a Data Security and Confidentiality Framework: Physical security, Electronic security (for Data in transit and Data at rest), Procedural security. There are ethical and legal considerations, i.e. policies and procedures for Data use and release.

Striking a Balance
The most secure systems are also the most useless (e.g. releasing only national-level data is more secure than releasing local data). The cost of implementation must be weighed against the both the likelihood of harm and the severity of harm. Continuous vigilance is required to ensure an appropriate balance between the mission of public health, which is to serve the population's health, and its ethical obligations to serve the community and safeguard privacy.

Scope of Coverage: These guidelines are applicable in many settings: Communities, non-governmental organizations (NGOs), Health and other facilities, Sub-national (district/regional/provincial/state), national, as well as National data repositories or data warehouses, and International organizations.

Physical Security Policies
All physical locations containing electronic or paper copies of surveillance data must be enclosed inside a locked, secured area with limited access. Paper copies of surveillance information containing identifying information must be housed inside locked filed cabinets that are inside a locked room. Electronic Security Policies must address, at minimum: Encryption, Authentication, Role-based access, System availability and Disaster recovery. [Datasets] must be held securely by using protective software (i.e., software that controls the storage, removal, and use of the data). Data transfers must be approved by the [Confidentiality and Security Officer] and incorporate the use of access controls. Confidential data must be encrypted before electronic transfer. Utilization of standards is highly encouraged. Laptops and other portable devices (e.g., personal digital assistants [PDAs], other handheld devices, and personal computers [PCs] or tablet computers) that receive or store information with personal identifiers must incorporate the use of encryption software.
**Procedural Security Policies**

Policies must be in writing. A policy must name the individual who is the [Confidentiality and Security Officer (CSO)] for the organization. A policy must incorporate provisions to protect against public access to raw data or data tables that include small denominator populations that could be indirectly identifying. All authorized staff must annually sign a confidentiality statement.

**Legal and Ethical Policies**

Access to any [confidential] information containing names for research purposes must be disclosed to the patient and contingent on a demonstrated need for the names [and] Institutional Review Board (IRB) approval. Access to [confidential] information or data for non-public health purposes, such as litigation, discovery, or court order, must be granted only to the extent required by law.


**National Governance**

National organizations at all levels of the healthcare system and international organizations must identify a confidentiality and security officer (CSO) to be ultimately responsible for the confidentiality and security of HIV information within that organization.

All funding organizations should comply with these standards and have an obligation to make a portion of the funding available to implement them, sufficient to assure adequate protection of the data collected and used, and to require that maintaining these standards are a condition for funding of any implementing partners or agencies.

**Types of data**

- **Personal Identified Data**: individual level information that includes personal identifiers such as names and addresses. These data are generally obtained at the point of care.

- **Pseudo-anonymized Data**: individual level information stripped of certain identifiers, like names, addresses, etc. This identifying information [is often] replaced with a randomized identifier or key.

- **Aggregated Data**: such data are based on aggregating individual level information, obtained from communities, health facilities, or data warehouses, into an aggregated “indicator”.

- **Non-Personal Data**: all levels need to deal with information on facilities, geographic data, information on drugs and drug supplies, and other logistic or reference information.
Next Steps

Use existing or develop audit and evaluation tools to determine status on:

- National governance on data security and confidentiality
- Confidentiality and security guidelines, policies, and procedures
- Actual use of data at clinics, NGOs, and MOH

Use evaluation results and recommendations to inform the 3 or 5 year national M&E plan and include steps to assess the ongoing status of these items.

Interim Guidelines on protecting have been published by UNAIDS

Technical Guidelines: Protecting the Confidentiality and Security of Patient Information

Security and Confidentiality Policy Principles
To assure that health data are used to serve the improvement of health, as well as the reduction of harm, for all people, healthy and not healthy. Pursuing this goal involves an ongoing process of refining the balance between: (a) maximizing of benefits – benefits can and should come from the wise and fullest use of data; and (b) protection from harm – harm can result from either malicious or inadvertent inappropriate release of individually identifiable data.

Organizational Policies and Procedures
Within each country, institutions must develop guidelines to ensure confidentiality and security of HIV-related information, covering all levels operative within that country’s or institution’s healthcare system, and the different types of data collected, stored and used. Such a policy document must be in writing and widely distributed, available both in paper and electronic formats. To ensure that all authorized individuals remain knowledgeable about the security policies, every individual with access to confidential HIV data must attend data security training at regular intervals.

Collection of personally identifiable data
When such data are collected, decisions regarding which personal data are to be collected and stored must be based on the medical needs of the patient, the requirements of public health, and the requirements of program monitoring and evaluation. The use of individual data for program monitoring and evaluation or research must be covered by culturally appropriate statutory legislation with explicit individual consent, statutory sanctioned measures to use individual data without explicit patient consent, or a combination.

Storage of confidential data
Procedures should be in place to monitor the use of the system where the data are stored in order to detect potential or actual security breaches. Threat or disaster analyses need to be performed to assess potential events which could increase the risk of inadvertent release of data or the destruction of these data at sites housing HIV data, such as acts of vandalism, fires, earthquakes, or typhoons. Appropriate preventive measures need to be taken. All removable or portable equipment need to be properly secured within facilities – room or cabinets – which are locked and appropriately monitored. Identification tags must be applied to fixed and portable equipment, so as to facilitate the creation and maintenance of an up-to-date inventory and to allow detection of equipment losses. All data stored need to be backed up, usually at physically separate facilities, to prevent loss or damage to the stored data, and to enable data recovery in the event of natural disaster or other data loss.

Use of data
When data are to be used in a pseudo-anonymized form, they should be stripped of personal identifiers as soon and as close as possible to the actual source of the raw information.

Workspace for individuals with access to medical records or HIV program information must also be situated within a secure area.
When data are transferred electronically, data in transit need to be encrypted using appropriate protocols. This may include message encryption, use of secured sessions, secured internet lines, or two-factor authentication.

**Dissemination of Information**
A written data use policy should exist and be reviewed at regular intervals. This needs to define the purpose and uses of HIV data, outline which data elements can be released and for which purpose, and must include provisions to protect small denominator population.

With increased use of mapping tools for geographic display of data analyses, data release policies must take special care not to indirectly identify individuals via too precise location on geographical displays, i.e., they must incorporate available geographic masking techniques for display of confidential information.

Access to HIV information for non-public health purposes, for instance for legal issues, should be granted only in circumstances involving the threat of imminent danger of grave physical harm to individuals or populations.

**Disposal of Information**
If old records are going to be kept, they will need to be stored ensuring full confidentiality and security of HIV information.
If records are to be destroyed, both paper and electronic records should be destroyed, including all data backups.

Written data archival and disposal policies should be produced.
Tools for Interoperability: Indicator and Measurement Registry, SDMX-HD, Health Ingenuity Exchange

Alvin B. Marcelo, MD
Philippine Health Insurance Corporation

Interoperability is the ability to [1] exchange data with external systems without losing or adding meaning, [2] exchange data and pursue active purposeful discussions, and [3] understand each other. There are various types of interoperability: business, information, application and technology interoperability. Presented are some tools for interoperability:

Health Ingenuity eXchange (www.hingx.com). Addresses business interoperability; it is a website that can store resources along different dimensions - by topic, by type of user, and by country.

WHO Indicator and Measurement Registry. This website where indicators are defined, created, and stored. It is a tool specially meant for epidemiologists, and allows user to search indicators or define indicators.

SDMX-HD, Statistical Data and Metadata Exchange for the Health Domain is a technical standard for defining indicators so that external databases can submit data in a consistent format.

IMR and SDMX-HD: How it works

1. Epidemiologists define INDICATORS using IMR. They then EXPORT the SDMX-HD.
2. SDMX-HD is given to health IT. They go to the database (EHR) to get the DATA and make it follow the rules embedded in the SDMX-HD (from #1).
3. DATA is sent to the epidemiologist and it arrives in a format that they can open in Epi-info, Excel, or any statistical software they are familiar with.

How are these useful? IMR and SDMX-HD can be used for exchanging indicators between two ministries (of Health) as well as collecting data from disparate databases. In both cases, the SDMX-HD serves as the standard which constrains the data format from the ministries or from the disparate databases.

Details of tools, and applications, of the following were discussed further, in-depth:
- HingX.org / hingx.com
- WHO’s Indicator and Measurement Registry (https://extranet.who.int/IndicatorRegistry/)
- SDMX-HD.org
- OpenHDD (webapp.pharmaccess.org)
- WHO-ITU National eHealth Strategy Toolkit
- Improving Civil Registration
- DHIS2.org
Integration & Interoperability – DHIS2 experience

Knut Staring, PhD
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The HISP / Health Information Systems Programme produced DHIS 2, District Health Information Software, an open source web server developed since 2004. It is a tool for collection, reporting, analysis and dissemination. Core development was funded by Norad, and spearheaded by the Norwegian Research Council with Partners: ECOWAS, WHO. Country project implementation is funded from USAID, GIZ, Danida and others.

DHIS2 can be accessed at http://dhis2.org

DHIS2 is intended to contribute to strengthening national health information systems. It is an action-oriented multidisciplinary research, which also put premium on capacity building of partner communities. HISP enabled collaboration with international masters programs PhD students from three continents into what is the DHIS Academy (East Africa, West Africa, Asia). DHIS2 fosters distributed software development in Norway, Viet Nam, India, Ireland, and Tanzania. It footprint: DHIS2 is used in over 20 countries and 10 Indian states. Implementation in Punjab, Kenya, Uganda and Zambia were described briefly.

DHIS2 allows data entry for a wide range of health information, including stocks and logistics. It is a flexible patient tracking system; it has analysis and reporting functionality. DHIS2 has extended its reach from the districts and hospitals, to clinics, to community health workers and the communities they serve. It has evolved towards shared, open infrastructures (as backbone). DHIS2 embeds principles of Stakeholder alignment, openness and sharing data and knowledge, and no silos.

Internal and external integration was described. The Kenya National Health Data repository was discussed, with special note of its capacity to integrate with iHRIS and OpenMRS. See its eHealth Architecture below.
National Health Identification

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#1
The national health ID, if containing no data, and if dispensed sequentially throughout the country, poses no confidentiality risks, and can be used at all levels in the country to help identify the source of a particular data item without posing any confidentiality risk.

In fact, it enhances confidentiality of patient data. The alternative is to use the patient name, picture, birth date, etc. to identify patients. All of these alternatives pose risks to patient confidentiality.

#2
The number will be in use for 200+ years, so size it appropriately. If the number is used as a “universal ID” it will be in use 500+ years due to being utilized in large financial and land (real estate) transactions, which are typically recorded within the legal system for a very long time. Numbers should never be re-used within 100 years of a person’s death.

#3
When considering the ID to be universal (multiple uses such as financial identifier, passport ID, etc.) versus health only, consider that a universal ID may be very difficult to achieve and it places the ID holder at significant risk. For example, if using the same ID for banking, the number plus a few pieces of personal knowledge may enable someone to empty bank accounts, apply for benefits, or perpetrate other fraud.

#4
Avoid embedding any data in the number. The data will change and probably invalidate the number or require ID translations or versions, which are at best difficult and very expensive to maintain.

It’s not a matter whether reference data will change, it’s only a question of when it will change. At the point of time of data changes, which might include location information, etc., all numbers that have been issued could be invalid.

Also, if some of this data include any personal identifiers (birthdate, sex, etc.), some amount of privacy information will be publicly displayed.

#5
Consider over what period of time (years) that you would like to see the number issued, and how you can register persons in that period of time. A schedule could be from 2-10 years. Registration points could include during pregnancy, at birth, at issuance of drivers license, in the hospital OPD, passport registration, police departments.

#6
Data silos are already in place, typically at the facility level, but possibly at the section level within a facility. For a national identifier to be useful in collating disparate health records, all current location information must be identified and numbered in a standardized way at the national level.

For example, if the health ID number is be issued at birth, and tied to all health records (laboratory, multiple clinics, birth, death, etc.) standardized reference datasets for birth items, clinical encounters, demographics,
death reasons, etc. should be considered as part of the effort.

#7
Implementation of the identifier will probably require electronic indexes (registries) as well as printed numbers, such as labels for file folders and paper records. The index will need to allow linkage to civil registration numbers for birth and death records, etc.

#8
If possible, use a check digit at the end of the ID in order to catch many keypunch mistakes. A check digit is computed from the other digits in the number, and almost always keeps a simple keypunch mistake from proceeding further.

#9
It is impossible to have good data in a national data warehouse or national aggregated data systems without a strong patient identification system in place. To support aggregated information, strong de-duplication methods must be utilized, which require a reliable national health ID implemented within a national health registry to tie together the numerous health IDs which are in existence. Accurate regional and national data aggregation requires an accurate health ID to justify the data and allow for precise de-duplication.

#10
The Health Identifiers can be utilized by paper based printouts, such as a printed registry, as well as an ID card. If an ID card is used, the ID portion has to be integrated into the patient management systems at the point of service.

Cards can contain a combination of printed information, possibly including a picture, and possibly including electronic health information and biometric identification information.

All cards have to be re-issued periodically, and the costs of “smart cards” will be much higher than a “dumb card”.

Final, #11
Consider the scope of the project – Is it practical to develop a “universal ID” for citizens and VISA holders? Should an identifier be for health use only? (Separate from financial and other uses) What are the practical political issues that surround multiple ministries having buy in and their agreement about a “universal ID”, national registries, and sharing identifiers across ministries.

Discussions
Taiwan has a good national ID system for its nationals as well as foreigners who would stay in the country beyond 30 days. Taiwan has a single payor of health insurance since 1995. It developed its national ID and gave out paper IDs beginning 1998, and in 2000, smart cards were distributed. These cards can be used in any health facility; it has a 64kb e-chip that stores information for the past six encounters; only the physician, who has her/his own card reader, can see this clinical information.

Comment: A very important feature there is the federal level policy: the mandate is set.

Other examples are given: In Costa Rica, they have three IDs for persons born in the country, persons in transit, and foreigners who come in and stayed or are Peruvian residents. Transactions are tracked and reported weekly. In Brazil, anyone will get a health card, which is unique to the individual. This is a public service of Brazil. In South Africa, there is a public and private health sectors; the country also has national ID system. In Guatemala, there are four ID systems: for the police, army, MoH and insurance.
Bangladesh wants to learn from India: almost all states would have implemented its unique ID by 2016; all IDs would have links with each other with the use of RSVI. Multiple IDs can happen but with the option of linking. Efforts now are in full registration or census to create lifetime IDs. In Bangladesh, voters IDs are given to citizens who are at least 18 years old; up to 80% of all adults have this. Two types of IDs are being proposed; the first, a national ID with photo, again linked to your voting responsibilities. The other is being considered by the MoH, with the intention to link it to the national ID and driver’s license, through date of birth. The use of biometrics was considered, and has spurred debate.

Comment: A secure ID gives a sense of identification. There should be a body - maybe the national population registry - that should advocate for a national ID in Bangladesh. The ID is power! Yet unfortunately, each Ministry has its own stake.

Mongolia wants to study this concept of and how to develop a national health ID – we will discuss this at the national level.

Comment: AeHIN can consolidate a one-page survey of countries and brief descriptions of national IDs, especially in the health sector.
Moving Forward
Making a Difference
Workshop Keynote Address

**Disruptive Innovation and Interoperability: Friends or Foes?**

**Dr. Timothy Evans**
James P. Grant School of Public Health
Brac University, Bangladesh

Drowning in Data. Problems besetting many country health information systems are iterated: multiple parallel demands for data, information goes up and never comes down; key consumers of information not being served: Policy makers, Programmers, Providers, and the People.

Is there a Problem? In the recent years, mHealth solutions have abounded. Yet it has brought about another type of 'ailment' – mHealth pilotitis. The situation is so, such that an “mHealth moratorium” in Uganda has been called. mHealth and m4Development, which use mobile communication technologies, are called disruptive innovations.

Disruptive innovation is “a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves ‘up market’, eventually displacing established competitors (Clayton Christensen). They are “faster, better, cheaper”! Examples of disrupter and disruptees are provided. The second concept, interoperability, is described: the ability of different systems/organizations to work together across Technologies, Organizations and Borders. Interoperability requires “public goods” or “common standards” that are agreed on and adhered to. It also needs languages and lexicons, for example, the ICD. Interoperability requires methods and measures.

**Friend or Foe?**

**Disruptive Innovation and Interoperability – the Foe perspective**

Interoperability becomes a constraint to DI when it gets in the way of the free market and consumer choice, when it discouages new entrants and innovation. Interoperability, here, makes the DI more costly, slower and not necessarily better. On the other hand, DI becomes a constraint to Interoperability when it challenges the value of common standards and definitions. Likewise, when DI are fragmented, and independent efforts inhibit desired outcomes such as “portability”; “continuity” or “sustainability”.

**Disruptive Innovation and Interoperability – the Friend perspective**

Interoperability is a friend to DI when it provides a necessary platform for markets to thrive, encourages new entrants and innovation, and decreases costs e.g. no need to re-invent the wheel. DI is a friend to Interoperability when DI creates the demand for common standards and definitions, and when DI can provide the “solutions” for desired outcomes such as “portability”, “continuity” or “sustainability”.

65
MOVE IT – Bangladesh, Monitoring Vital Events using IT, is described as an example of how DI and interoperability can be better friends. MOVE IT is a new health strategy to “scale-up” maternal child health services. It is “results focus” requiring investment in information. MOVE IT – Bangladesh is implemented in the context of Digital Bangladesh where innovative use of digital technologies such as eHealth and mHealth is advocated. It is aimed at universal registration of all pregnant mothers and their newborns. It implements a unified electronic information system that tracks: Vital events (births, deaths, cause of death), non-fatal health events (complications), and coverage of priority services (antenatal, natal, postnatal care). It is a multi-sectoral movement among the government, private sector, including Brac University, and non-government organizations. The critical elements in its implementation were described in detail (see Figure 18).

Managing DI and Interoperability. What is the evidence?
How does one evaluate outcomes of interoperability? Is there better health or health system (because of interoperability)? Is there more and better e-/m-/d- innovation for health? Are there new entrants? Is there growth in markets? Are there lower prices? Is there a positive Return on Investment (ROI)? Do benefits of interoperability outweigh the costs? Conversely, how does one evaluate outcomes of DI? Is there better health or health system (because of DI)? What is the gold standard methods for evaluation – randomized control trials for ICTs be valid? How does one avoid implementer/owner bias? There is a need for institutional capacity for evaluation as well as Health Technology Assessment. In both cases, there is an urgent need to agree on standards and methods for evaluation as well as build institutional capacities for such. Presented were benefits of interoperability.

Managing DI and Interoperability. Evidence shows that the way to move this forward is with good governance. It has to be participatory and Pluralistic – i.e. Government, Non-Government, Private-for-Profit sectors in the local as well as global arena. There is a need for convening and collaborative capacities, Establishment of and adherence to Rules and Regulations (inclusive of incentives).

Steer and negotiate (not command and control)
AeHIN Workshop Summary

Alvin Marcelo, MD, FPCS (Philippines) & Boonchai Kijsanayotin, MD, PhD (Thailand) Chair & Co-Chair, Executive Committee, AeHIN

This organizational and first workshop of AeHIN was able to bring us – with different backgrounds, from various countries – together as a community of eHealth / HIS / CR-VS champions. We were able to get inputs to the AeHIN Strategic Plan. We heard about / learned about Tools we can use. We had Country discussions; we talked about Membership and stewardship. We planned for Activities and next steps.

Inputs to the AeHIN Strategic Plan. We want more discussions on Information use, how to create an enabling environment for eHealth, on building blocks of HIS including, but not limited to, data dictionary. We want to learn more about Advocacy for eHealth.

Tools and Techniques. Emphasized in this AeHIN workshop is the need for the health sector-wide Enterprise architecture. There are existing Health informatics training but the need for developing capacities in the eHealth space is still huge. We learned about country eHealth master plans and about Coordination/consortia with multi-sectoral stakeholders.

More Tools. Now we know better- although not enough - about the WHO-ITU National eHealth Strategic Plan. We got an orientation on CRDM, Change management, Standards and unique IDs, mHealth. We learned about HingX.com and AeHIN.org

Country Discussions. Ingredients are available. We need the chefs. Coordination and leadership are critically needed; likewise, a dedicated core group with support for advocacy: “Create the opportunity for eHealth!”

AeHIN Membership
Country representatives have organized themselves into the Executives Committee of the AeHIN. Individual members and development partner members (currently open); but institutional members (for discussion). Presently, we are a general assembly of individuals and partners. Boonchai (Co-Chair, Thailand) and Alvin (Philippines) will steward till the next general assembly. They will lead in crafting a better engagement/membership policy

Activities and Next Steps
We continue the dialogue, please register at www.aehin.org. Please use eHealth-HIS-CRVS resources - documents, slides from this Workshop, and others; we will maximize the functionalities / capacities of www.hingx.org. Please explore this resource. Let's continue to meet via eLearning and eMeetings. Of immediate consideration are developing and conducting a regional crash course on eHealth for leaders in Asia, as well as exchanging experiences on the implementation of our locally designed national eHealth strategies, or how we implemented the WHO-ITU National eHealth Strategy Toolkit in our own countries. We'll take advantage of international gatherings: let us join national and international eHealth/informatics conferences, and if possible, we hold side meetings for AeHIN members.

We do need to study our Asia regional conditions better. AeHIN will consolidate country needs towards regional needs. Eventually we hope to do follow-up surveys to learn how each of you worked on our country eHealth priority actions.

Did I forget something? Suggestions and ideas are welcome
Workshop Evaluation

This evaluation is based on the feedback of only 40, or about 42.56% of total number of participants; at least one from the 19 countries represented in the Workshop participated in the evaluation, however.

Participants were generous in their assessment, essentially rating each of the items very highly or at least highly.

The most appreciated sessions were on the SEARO and WPRO regional perspectives on HIS-CRVS, the country status of HIS-CRVS, the WHO-ITU eHealth National eHealth Strategy Toolkit, change management processes and requirements, and the discussions on AeHIN's next steps. Important "take aways" from the workshop are the following: WHO-ITU eHealth Strategy Toolkit, networking with HIS-CRVS experts and counterparts from other WHO member countries, lessons on eHealth/ HIS/ CRVS systems governance and policy mainstreaming as well as the importance of informal leadership.

The AeHIN Workshop 'provided information and ideas that participants will share with their colleagues back home, increased interest in participating in AeHIN, promoted eHealth, HIS, and CRVS systems sharing, learning, and peer-to-peer assistance which tackle HIS/eHealth advocacy, policy, institutional readiness and planning challenges'. It also allowed participants to 'explored innovative techniques and tools to resolve eHealth, HIS, and CRVS technical issues, and promoted a new approach for strengthening HIS at country level.'

In terms of workshop logistics: 72.5% said that the time allotted for the workshop is "just about right". Participants were satisfied with the organization of the workshop, the venue and the networking opportunities. Comments listed to improve the workshop include: provision of more "how-to" sessions, focus on details how eHealth/HIS could help resolve MDG 1,4, and 5; more information on CRVS; and sessions tackling how can countries help each other - whether be it technical or financial means.

Dr. Portia Fernandez-Marcelo, Director of the National Telehealth Center (NTHC), University of the Philippines-Manila, facilitating the small group discussion.
Annexes
### Annex 1: AeHIN Strategic Plan 2012-2017 *Draft*

<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>ACTIONS</th>
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<tbody>
<tr>
<td>1. Build capacity for eHealth, Health</td>
<td>1.1 Implement national eHealth, HIS, CRVS strategies and plans.</td>
</tr>
<tr>
<td>Information Systems (HIS), and Civil</td>
<td>• Establish multi-stakeholder governance mechanism to advocate, coordinate, and manage changes and</td>
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<tr>
<td>Registration and Vital Statistics (CRVS) in</td>
<td>risks</td>
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<td>the countries and in the region.</td>
<td>• Apply best practices for assessment, strategic planning, costing, implementation plans, and</td>
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<tr>
<td></td>
<td>monitoring and evaluation</td>
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<tr>
<td></td>
<td>o eHealth – WHO-ITU &quot;National eHealth Strategy Toolkit&quot;</td>
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<td></td>
<td>o HIS – HMN &quot;Framework and Standards for Country HIS&quot;</td>
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<td></td>
<td>o CRVS – WHO-UQ &quot;Improving the quality and use of birth, death and cause-of-death information:</td>
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<td></td>
<td>guidance for a standards-based review of country practices&quot;</td>
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<td></td>
<td>1.2 Advocate for eHealth, HIS, and CRVS career paths to be addressed in annual sector budgets,</td>
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<td></td>
<td>training and work plans.</td>
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<tr>
<td></td>
<td>• Define ehealth/HIS/health informatics competencies for public health professionals in low and</td>
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<td></td>
<td>middle income countries</td>
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<tr>
<td></td>
<td>• Promote development of national associations and conferences for health informatics</td>
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<td></td>
<td>• Convene national workshops, conduct pre- and in-service training, and support international</td>
</tr>
<tr>
<td></td>
<td>exchanges and fellowships for eHealth, HIS, CRVS professionals and members of AeHIN</td>
</tr>
<tr>
<td></td>
<td>• Support inter-universities collaboration on curriculum development on e-health/HIS/health</td>
</tr>
<tr>
<td></td>
<td>informatics for undergraduate and graduate program</td>
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<tr>
<td></td>
<td>• Promote joint research/publication on ehealth, HIS, health informatics, and CRVS issues</td>
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<td></td>
<td>1.3 Promote eHealth, HIS, and CRVS among key non-health stakeholders (e.g., Bureau of Statistics;</td>
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<td></td>
<td>Ministries of ICT, Finance, Planning, Justice or Civil Registry; and private health providers)</td>
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<td></td>
<td>• Express call to action on eHealth, HIS, and CRVS to relevant multi-sector ministers in national</td>
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<tr>
<td></td>
<td>and international forums (e.g., World Health Assembly, high-level meetings, Regional Committee</td>
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<td></td>
<td>Meetings)</td>
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<tr>
<td>STRATEGY</td>
<td>ACTIONS</td>
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</tbody>
</table>
| 2. Increase peer assistance and knowledge exchange and sharing through effective networking. | 2.1 Convene regular multi-country conference and workshops consisting of policy makers and implementers.  
  - Promote eHealth, HIS, CRVS systems sharing, learning, peer-to-peer assistance  
  - Explore innovative techniques and tools to resolve eHealth, HIS, CRVS technical issues  
  - Promote standard frameworks, data sets, and platforms of standardisation and interoperability  
  
  2.2 Develop open eLearning platform and repository for AeHIN.  
  - Establish AeHIN Website ([www.aehin.org](http://www.aehin.org))  
  - Utilize the Health Ingenuity Exchange (HingX) ([www.hingx.org](http://www.hingx.org)) to access and share artefacts (such as open standards/open source infrastructure and solution stacks)  
  - Develop eHealth, HIS, CRVS map of activities across AeHIN  
  - Initiate AeHIN open ehealth academy  
  - Support the development of Centres of Excellences in ehealth, HIS, and CRVS in each country  |
| 3. Promote standards and interoperability within and across countries. | 3.1 Implement eHealth, HIS, CRVS best practices for systems and solutions planning, design, development, implementation, operations, and maintenance.  
  - Promote standardisation and interoperability of health systems (organizational and technological interoperability)  
  - Apply enterprise architectural approaches, such as the Collaborative Requirements Development Methodology (CRDM), to assess user needs, gather requirements, and design specifications  
  - Demonstrate country and regional interoperability of eHealth systems and solutions  
  - Implement programme management techniques for planning, costing, technical documentation, changes, risks, testing, quality assurance, operations, and maintenance.  
  
  3.2 Identify, develop, implement appropriate health data standards.  
  - Conduct country health data standards and interoperability workshops  
  - Conduct training on specific priority standards |
<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>ACTIONS</th>
</tr>
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<tbody>
<tr>
<td>4. Enhance leadership, sustainable governance, and monitoring and evaluation.</td>
<td>4.1 Establish and maintain an official interagency coordinating mechanism for eHealth, HIS, and CRVS management and oversight.</td>
</tr>
<tr>
<td></td>
<td>4.2 Enhance leadership skills, organisational development, change and risk management of eHealth, HIS, and CRVS.</td>
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<td></td>
<td>4.3 Expand linkages between public and private sectors.</td>
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<tr>
<td></td>
<td>• Develop partnerships, technical advisory, and consultative groups</td>
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<td></td>
<td>• Extend coordination at the sub-national level</td>
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<td></td>
<td>• Promote corporate social responsibility pilots, such as within the telecommunications industry</td>
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<tr>
<td></td>
<td>4.4 Provide or strengthen the legal basis and polices for improving eHealth, HIS, and CRVS systems and solutions.</td>
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<td></td>
<td>4.5 Conduct monitoring and evaluation to ensure that eHealth, HIS, and CRVS systems strengthening delivers according to health priorities.</td>
</tr>
</tbody>
</table>
Annex 2: Country Assessment: Strengths and Weakness of HIS-CRVS Systems

Country representatives were asked to work together and analyze their local situation, identify strengths and weakness or challenges to their eHealth/ HIS/ CRVS systems along the four strategies identified by AeHIN (Capacity building, Peer-to-Peer support, Standards & Interoperability, and Leadership & Governance of the eHealth/ HIS/ CRVS). Below is a gallery of some of the country output.

The list is not exhaustive and limited due to many substantive reasons. The gallery represent perceptions of only one up to three representatives per country. In terms of methodology, the participants were asked to fill out matrices only during the workshop breaks.

In general, most countries cited strengths and challenges in all four AeHIN strategic dimensions, although more weakness / challenges were listed. Among the strengths, up to 14 countries listed capacities in many dimensions of eHealth/ HIS/ CRVS – existing opportunities for training / education at the university level, infrastructure, eHealth systems at various levels of the health system. 12 countries cite that eHealth/ HIS/ CRVS governance structures exist. The following two dimensions were recognized as strengths to a lesser degree. Occasions for peer-to-peer support are cited by 10 countries. International standards on eHealth/ HIS/ CRVS are being used, cited at least by 10 countries.

With regards to weaknesses or challenges: 15 countries cited building capacity in many specific dimensions of eHealth/ HIS/ CRVS were listed, such as ICT, CRVS, and appreciation of standards. While international standards on eHealth/ HIS/ CRVS are being used in some eHealth applications, 14 countries cited the need for improvements, including setting in place national policies for standards and interoperability. Enhancing leadership and governance is also a priority among 13 countries. Multi-sectoral peer-assistance was cited only by 10 countries.
### Bangladesh

<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
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</thead>
</table>
| 1   | Capacity building on HIS/eHealth and CRVS           | Health MIS developed which includes urban primary health care, national ID data base developed, birth and death registration electronic database developed | ▪ Interoperability of different database  
▪ Data entry at local level are manual which then entered into electronic database |
| 2   | Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking | Project based coordination exist | National level coordination committee need to be develops to formulate a E-health strategy |
| 3   | Standards and interoperability                       | DH is introduced into system | Financial and human resource constraints need to overcome. More capacity building activities need to be undertaken |
| 4   | Leadership, sustainable governance, financing and M&E | Vision 2021 – “A digital Bangladesh” has already set at the national level. “Sustainability fund” has been formed at local government level for sustain fund for health sector. | Low priority of health by local government. Institutions need to be orient and motivate local elected representative |

### Bhutan

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<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td></td>
<td>Lack of technical expertise in the districts.</td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td></td>
<td>Lack of initiative and ignorance. Lack of network.</td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td></td>
<td>Lack of coordination with other countries.</td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td>Good governance GNHC(PLAMS)</td>
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</table>
## Cambodia

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<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>▪ Training materials&lt;br&gt;▪ HIS Web-based translation to PHD, ODs, RHs&lt;br&gt;▪ Developed mPRS</td>
<td>▪ Limited staff capacity on ICT&lt;br&gt;▪ Budget support on training&lt;br&gt;▪ Lack of human resource for profiling on CRVS&lt;br&gt;▪ Note yet apply computerized system</td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td>Assistance from central to PHD, ODs, onsite/call</td>
<td>No network establish with at country/region</td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td>▪ Interpreted database for some national program in HIS web based&lt;br&gt;▪ Standard reports from HC, HO2&lt;br&gt;▪ Standard core indicator</td>
<td>▪ No national standard use&lt;br&gt;▪ Not all database from national programs and other ministry interpreted HIMS</td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td>▪ stakeholder staking forums&lt;br&gt;▪ national HIS strategic plan/protocol&lt;br&gt;▪ M and E framework&lt;br&gt;▪ Data quality on occasions</td>
<td>▪ Regulation on HIS&lt;br&gt;▪ Limited multi stakeholder involvement</td>
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## China and Hong Kong

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<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>Have done training plan to improve capacity.&lt;br&gt;Great investment in HIS domain.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td>Yes we always get experts and implements together to discuss.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td>How implement standard for all relevant.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td>Government take great care about HIS now and invest a great money in this domain.</td>
<td>Implement plan well and improve the data quality.</td>
</tr>
</tbody>
</table>
### India

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<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>Already have vertical systems in place.</td>
<td>Integration of different systems.</td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td>Data definitions exist.</td>
<td>Need to be in place.</td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
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### Indonesia

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<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>HIS short course training.</td>
<td>Large disparity in district capacity geographical barriers.</td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td>Various mechanism for knowledge sharing assistance such as annual health informatics forum, social media forum, etc.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td>Initiative to use HL-7 and SDMX-HD. Some standard already used widely such as ICD 10, area code.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td>HIS steering committee involving multi-sectoral stakeholders</td>
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### Korea

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<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>Digital hospital (10 years) EHR for private clinic 99%</td>
<td>Lack of interoperability Middle scale hospital EHR</td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td>Ministry of health government leadership KOSMI</td>
<td>Legislation</td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td>Korean agency for technology and standard NHIC (insurance)</td>
<td>International interoperability and leadership</td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td></td>
<td>Restart</td>
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### Country: Lao PDR

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<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
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</thead>
</table>
| 1   | Capacity building on HIS/eHealth and CRVS | ▪ Training on using for MS (Register and Report)  
▪ Training on data use in south and Midterm parts. | Limited capacity building on HIS. No training on e-health and CRVS. |
| 2   | Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking | | |
| 3   | Standards and interoperability | ▪ Organization | Limited standard and interoperability. |
| 4   | Leadership, sustainable governance, financing and M&E | ▪ Organization  
▪ TOR for center unit  
▪ Strategy plan for HIS  
▪ Statistical law  
▪ SWC | CRVS law not yet enforce. |

### Country: Malaysia

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<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
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</thead>
</table>
| 1   | Capacity building on HIS/eHealth and CRVS | eHealth and HIS:  
▪ MINOS – central agency for ICT resource are developed.  
▪ Curriculum in university.  
▪ In house training – training in ICD | Need assistance in content and curriculum for masters and short course in health information.  
▪ Capacity building in data analysis.  
▪ Best practice in CRVS  
▪ Assistance and evaluation  
▪ Share country experience on strengthening CRVS  
▪ Output assistance and CRVS and next step |
| 2   | Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking | A network medical record office, strategies and IT and health care provider in various forum | |
| 3   | Standards and interoperability | ▪ Description on health information standards  
▪ HIS interoperability survey, yearly  
▪ Benchmarking criteria | Need to establish implementation of SNOWMED (Have established HL 7 and IHE) |
| 4   | Leadership, sustainable governance, financing and M&E | ▪ Long experience established implementation structure blueprint and National policies.  
▪ My HDW  
▪ National Health Informatics Committee  
▪ Health Informatics ... established in 2007 | |

77
### Country: Mongolia

<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
</table>
| 1   | Capacity building on HIS/eHealth and CRVS       | HIS and HMIS capacity building at the top level                | - Need to promote exchange programs of specialists among the regional countries  
                                              |                                                                 | - Capacity building on eHealth and CRVS-weak and need more support        |
| 2   | Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking | Infrastructure and ICT environment set up in Mongolia          | Networks are informed of the need for more efficient work in the Asia eHealth |
| 3   | Standards and interoperability                   | Development of HDD is just the beginning storage               | Need more support to develop standards and interoperability                |
| 4   | Leadership, sustainable governance, financing and M&E | MOH is in place of leadership role in multi-sectoral engagement | Interagency coordinating committee need to expand and discuss who will be held responsible. |

### Country: Myanmar

<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>Improving quality of health care delivery system.</td>
<td>Online data transmission system is not available at all over the country.</td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td></td>
<td>Need technical and financial support for better health information network.</td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td></td>
<td>Need to advocate with INGOs and local NGOs.</td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td></td>
<td>Develop partnerships, technical advisory and consultation groups, organizations development, change management.</td>
</tr>
</tbody>
</table>

### Country: Nepal

<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
</table>
| 1   | Capacity building on HIS/eHealth and CRVS       | 1. IT infrastructure available in all districts               | 1. Lack of national E-health strategy to guide/provide framework for integration of information systems  
<pre><code>                                          | 2. HMIS electronic report from all district                   | 2. CRVS is not priority program of ministry of local development           |
                                          | 3. Dedicate staff designated for HIS                    | 3. Lack of human resource for CRVS program throughout country          |
                                          | 4. Telemedicine program launched in 25 districts          | 4. Lack of technical / financial resources to launch E-health and CRVS programs |
                                          | 5. Coordination can be harmonized into VDC level for HIS   |                                                                          |
                                          | 6. HIS and CRVS.                                        |                                                                          |
</code></pre>
<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>Infrastructure, Technology available</td>
<td>More focused capacity building required.</td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td>Individual knowledge is high</td>
<td>Peer asset sharing, networking needs improvement</td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td>Knowledge of standards is there</td>
<td>Within country started but scattered across country.</td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td>Knowledge education, infrastructure is there</td>
<td>Governance and leadership is missing.</td>
</tr>
</tbody>
</table>

Country: **Pakistan**

Country: **Philippines**

Country: **Singapore**
<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
</table>
| 1   | Capacity building on HIS/eHealth and CRVS | ▪ Doctors qualified in health informatics are available.  
▪ Some medical record officers are trained on ICD10 use. | ▪ Higher level support for HIS is not adequate.  
▪ No strategic plan developed for HIS, E-health, CRVS.  
▪ No identified funds source to develop capacities of health staff in health information management. |
| 2   | Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking | | ▪ No adequate member of resource person to exchange/gain knowledge. |
| 3   | Standards and interoperability | | ▪ Standard/Interoperability within and across countries not defined.  
▪ Local death registration not trained. |
| 4   | Leadership, sustainable governance, financing and M&E | | |

**Country: Sri Lanka**

<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td></td>
<td>Systematic and sustainable mechanism to train curricular Health/Biomedical Informatics people.</td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td></td>
<td>Investment and knowledge in learning the choosing HI standards such as SNOMED-CT, HL7-CDA</td>
</tr>
</tbody>
</table>
| 3   | Standards and interoperability | Some health information standards have been successfully implement in the post people can see the value of create standards | National health information committee does not well participate by MoH.  
Not strong coordination secretariats |
| 4   | Leadership, sustainable governance, financing and M&E | Establishment of national health information committee which compose of inter-ministry agency | |

**Country: Thailand**

<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>Nation experts in health informatics become start collaborate to wrote on building HI capacity.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement (Collaborative approaches) / networking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td>Some health information standards have been successfully implement in the post people can see the value of create standards</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td>Establishment of national health information committee which compose of inter-ministry agency</td>
<td></td>
</tr>
</tbody>
</table>
**Country: Viet Nam**

<table>
<thead>
<tr>
<th>No.</th>
<th>AeHIN Strategies</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity building on HIS/eHealth and CRVS</td>
<td>Large curriculum doc, Training course</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Peer assistance and knowledge exchange through Multi-sectoral engagement / networking</td>
<td>Save time, learn experience, best practice countries</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Standards and interoperability</td>
<td>1. MOP consider standards and interoperability important.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Started to group make circle for med. Sector for HIT standards.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. International standard are promulgated.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. From central hospital apply (ICD10, HL7, PACK, DICOM)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Leadership, sustainable governance, financing and M&amp;E</td>
<td>TWG on HIS</td>
<td>Conduct M&amp;E</td>
</tr>
</tbody>
</table>

**SAW Matrices.** Participants were given an opportunity to assess their country HIS environment using AeHIN Strategies as criteria.
Annex 3: Country Priorities for eHealth/HIS-CRVS Strengthening in the Next Six Months

Country participants shared their experiences on their respective HIS implementation and what needs to be done in the coming months. Below is a list of technical assistance and support they prioritize to work based from six months to one year.

Country: **Bangladesh**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Formulating the National Steering Committee</td>
<td>1. Implementing OP operation plan on E-Health</td>
</tr>
<tr>
<td>2. Creating the National E-Health Strategy following WHO Guideline</td>
<td>- HIS operational plan</td>
</tr>
<tr>
<td>3. Setting up Steering group for implementing via Stakeholder meeting</td>
<td>- distribute ICT to all levels</td>
</tr>
<tr>
<td>- E-Health Steering meeting</td>
<td>- capacity building activity</td>
</tr>
<tr>
<td></td>
<td>- HR capacity building</td>
</tr>
<tr>
<td></td>
<td>- promote M-Health via mobile phone, including health service and E-Health</td>
</tr>
<tr>
<td></td>
<td>- feedback of monitoring and evaluation system</td>
</tr>
<tr>
<td></td>
<td>- policy making for covering public and private</td>
</tr>
</tbody>
</table>

Country: **Bhutan**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Improving infrastructure (require financial investment)</td>
<td>- Developing project documentation</td>
</tr>
<tr>
<td>- Establishing community of practice to share knowledge and experiences.</td>
<td>- Specification of the requirement.</td>
</tr>
<tr>
<td>- Sharing experience through meeting/workshop</td>
<td>- Sharing experience through meeting/workshop</td>
</tr>
</tbody>
</table>

Country: **Cambodia**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Developing the E-patient record system</td>
<td>2. Developing the E-patient record system</td>
</tr>
<tr>
<td>3. Extending from 10 hospitals to 90 targeted hospitals</td>
<td>3. Creating the policy and regulation of E-Health, included security of information</td>
</tr>
<tr>
<td>4. Creating the policy and regulation of E-Health, included security of information</td>
<td></td>
</tr>
</tbody>
</table>

Country: **China-Hong Kong**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Started the system few years ago</td>
<td>1. Steering Committee is core group to push forward the E-Health system to cover the private sector more than 80% as now the system is operating in all public sectors.</td>
</tr>
<tr>
<td>2. Setup Steering Committee already</td>
<td>2. Championing the promotion and encouraging others to use the E-Health system</td>
</tr>
<tr>
<td></td>
<td>3. Expanding to registration process of discharging of chronic patient.</td>
</tr>
</tbody>
</table>
### Country: **India**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identifying responsible agencies in MoH</td>
<td>1. Implementing identified approved plan</td>
</tr>
<tr>
<td>2. Form the small group to study and find the gaps, challenges (what we have,</td>
<td></td>
</tr>
<tr>
<td>what we need) set up action plan &amp; recommendation</td>
<td></td>
</tr>
<tr>
<td>3. Dialogue with policy makers to get commitment</td>
<td></td>
</tr>
</tbody>
</table>

### Country: **Indonesia**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Capacity building to support to move the using E-health, HIS and CRVS by</td>
<td>1. Peer assistance and knowledge exchange through</td>
</tr>
<tr>
<td>- module training in E-Health and HIS</td>
<td>Multi-sectoral engagement (Collaborative approaches) /</td>
</tr>
<tr>
<td>- training for manager in HIS</td>
<td>networking</td>
</tr>
<tr>
<td>- global fund for strengthening to support</td>
<td>- Plan to do national and to sub national level in order</td>
</tr>
<tr>
<td>- global fund district have involve</td>
<td>cover all agency</td>
</tr>
<tr>
<td>- ministry of education for E-learning</td>
<td>- Government initial to evaluate system</td>
</tr>
<tr>
<td>- training is part of university and generate excellence centre</td>
<td></td>
</tr>
<tr>
<td>- informal and formal communication to distribute</td>
<td></td>
</tr>
<tr>
<td>information and budget support</td>
<td></td>
</tr>
<tr>
<td>- in CRVS use sample area to implement and expansion</td>
<td></td>
</tr>
<tr>
<td>will have to evaluate in order to national level</td>
<td></td>
</tr>
<tr>
<td>2. Standards and interoperability within and across countries</td>
<td></td>
</tr>
<tr>
<td>- Telemedicine</td>
<td></td>
</tr>
<tr>
<td>- formulate from ministry of ICT to design strategy of standard that it is all</td>
<td></td>
</tr>
<tr>
<td>required form stakeholders.</td>
<td></td>
</tr>
<tr>
<td>- Some hospitals or health centers use same standard such as in some area use</td>
<td></td>
</tr>
<tr>
<td>ICD10 and in health centre use ICD9. It is planned to implement all area.</td>
<td></td>
</tr>
<tr>
<td>- Start to use more national standard such as LOINC</td>
<td></td>
</tr>
<tr>
<td>3. Leadership, sustainable governance and monitoring and evaluation</td>
<td></td>
</tr>
<tr>
<td>- support core team E-health and HIS committee to plane the road map</td>
<td></td>
</tr>
<tr>
<td>- strengthening secretariat to work with committee</td>
<td></td>
</tr>
<tr>
<td>- strategic plan to improve road map in E-Health, HIS and CRVS</td>
<td></td>
</tr>
</tbody>
</table>

**The priority of plan to do in Indonesia**

- Manage and plan to use standard as whole country
- Strengthening committee
- Plan to do mapping

**The factor to concern**

- Quality of data when use standard and assessment mechanism
- Infrastructure support because the moving of operation have infrastructure which it is barrier
- Main responsible to manage such as ministry of public health or ministry of ICT
- Unit cost for capacity building in E-health and HIS
### Country: Lao PDR

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Concept note/proposal (September 2012)</td>
<td>1. Start implementation capacity building</td>
</tr>
<tr>
<td>2. Share workshop summary and recommendation (October-November 2012)</td>
<td></td>
</tr>
<tr>
<td>3. Review of 5 year strategic plan (December 2012)</td>
<td></td>
</tr>
<tr>
<td>- Capacity building</td>
<td></td>
</tr>
<tr>
<td>- Peer-assistance</td>
<td></td>
</tr>
<tr>
<td>- Training (WHO/UNDP/etc.)</td>
<td></td>
</tr>
</tbody>
</table>

### Country: Malaysia

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidate electronic health data sharing between MoH and NRD on birth registration</td>
<td>1. Start up plan Malaysia Health Data Warehouse</td>
</tr>
<tr>
<td>1. Established committee to monitor implementation</td>
<td>- proposal paper PFI (private funding initiative) to start plan</td>
</tr>
<tr>
<td>- change management for labour room staff to enter data</td>
<td>- consultation in November to evaluate BOB (best of breed) and local technology based on prove of concept and other criteria</td>
</tr>
<tr>
<td>- monitor input through backend data monitoring</td>
<td>- letter of offer for PFI and MOU with MIMOS bhd.</td>
</tr>
<tr>
<td>- harmonized data finding and rectify</td>
<td>- Roll out start up plan</td>
</tr>
<tr>
<td>- forum to all stakeholder on program and finding</td>
<td>2. HIS interoperability summit 2013 (April 10-12)</td>
</tr>
<tr>
<td>- output / KPI – timely data integration</td>
<td>- confirm program and speakers</td>
</tr>
<tr>
<td>- evaluate improvement</td>
<td>- promotion of events 400 participants from public, private and international</td>
</tr>
<tr>
<td>- extension towards death registration data</td>
<td>- output</td>
</tr>
<tr>
<td></td>
<td>- public consultation on the Benchmarking criteria of HIS</td>
</tr>
<tr>
<td></td>
<td>- show case of interoperability product</td>
</tr>
<tr>
<td></td>
<td>- functional evaluation method on the interoperability</td>
</tr>
<tr>
<td></td>
<td>3. Benchmarking criteria version 3</td>
</tr>
<tr>
<td></td>
<td>- identify and appoint consultant</td>
</tr>
<tr>
<td></td>
<td>- develop methodology to evaluate and identify value</td>
</tr>
<tr>
<td></td>
<td>- conduct workshop</td>
</tr>
<tr>
<td></td>
<td>- present benchmarking criteria version 3 for public</td>
</tr>
</tbody>
</table>

### Country: Mongolia

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Seeking international working experiences &amp; best practices</td>
<td></td>
</tr>
<tr>
<td>2. Generate the knowledge e-Health and CRVS</td>
<td></td>
</tr>
<tr>
<td>3. Support &amp; engage regional peer learning approach</td>
<td></td>
</tr>
<tr>
<td>- improving capacity on data standard and interoperability</td>
<td></td>
</tr>
</tbody>
</table>
**Country: Myanmar**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Capacity building for data management</td>
<td>1. Improve data transmission system- National data warehouse</td>
</tr>
<tr>
<td>2. Basic software training</td>
<td></td>
</tr>
<tr>
<td>3. Advocacy skills</td>
<td></td>
</tr>
</tbody>
</table>

**Country: Nepal**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Assessment of health sector information system (HSIS) strategy in line with WHO e-Health strategy recommendation</td>
<td>Institutional set up for e-Health within health sector (strengthen capacity, advocacy, database management, etc.)</td>
</tr>
<tr>
<td>▪ Develop standards on</td>
<td></td>
</tr>
<tr>
<td>1. Health facility registry</td>
<td></td>
</tr>
<tr>
<td>2. Service provider registry</td>
<td></td>
</tr>
<tr>
<td>3. Unified coding system – HR, training, equipment</td>
<td></td>
</tr>
<tr>
<td>▪ System migration among different Health Information System to one unify portal &amp; allow information exchange between different system</td>
<td></td>
</tr>
<tr>
<td>▪ HR &amp; ICT capacity development: health informatics, sentinel surveillance, ICD-10</td>
<td></td>
</tr>
</tbody>
</table>

**Country: Pakistan**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Advocacy peer assistant sharing</td>
<td>▪ eHealth strategic</td>
</tr>
<tr>
<td>Governance &amp; leadership is missing</td>
<td>▪ More capacity building are required</td>
</tr>
<tr>
<td>▪ Governance &amp; leadership is missing</td>
<td>▪ Standard within country but scattered across country</td>
</tr>
</tbody>
</table>

**Country: Philippines**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Feed back and orient to management</td>
<td>▪ Identity unique id</td>
</tr>
<tr>
<td>▪ PHIN expansion</td>
<td>▪ Annual national + sub national e-health conference</td>
</tr>
<tr>
<td>▪ National e-Health strategic toolkit implementation support</td>
<td>▪ License for HL7, SNOMED, Rapid turnover of IT staff</td>
</tr>
<tr>
<td>▪ Short course such as e-learning system, sub-national e-health conference, training on standard LOINC, short course for leader and advance degree for upcoming leaders</td>
<td></td>
</tr>
</tbody>
</table>

**Country: Sri Lanka**

<table>
<thead>
<tr>
<th>Next Six Months</th>
<th>One Year or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>National strategic plan for HIS</td>
<td>1. Training of local death registrars</td>
</tr>
<tr>
<td>1. Appointment steering committee</td>
<td>▪ International standard (diagram and verbal autopsy)</td>
</tr>
<tr>
<td>2. Appoint sub committee</td>
<td></td>
</tr>
<tr>
<td>▪ Preventive</td>
<td>2. Training of MROS on application of ICD-10 and health</td>
</tr>
</tbody>
</table>
### Country: Thailand

<table>
<thead>
<tr>
<th><strong>Next Six Months</strong></th>
<th><strong>One Year or More</strong></th>
</tr>
</thead>
</table>
| **1. Capacity Building**  
- develop courses and e-learning courses in e-health, but challenge is not on people, but on the contents.  
- implement ONC curriculum, free of charge as platform to grow from non-systematic to systematic  
| **Use success stories to develop national policy and blueprint for data interoperability**  
**Pharmaceutical terminology focusing on reimbursement-related process (to make easier and more efficient process)**  
- multilateral MOU has already signed among the involved parties, but not at the National level. The objectives are to check eligibility of the Government’s health insurance.  
- e-government is setting at the government level policy.  
- set multi-sectoral engagement for setting up policy  |
| **2. Networking**  
- set networking (upstream, midstream, and downstream) called e-health involving MoPH, define minimum core set, use unique ID (M. Interior) , to register and promote by M. of ICT.  
| **3. Standards and interoperability**  
- currently MoPH has defined its own standard dataset consisting of 43 + 17 attributes. 43=payment, promotion process. Chronic, community 17=referral system  
- pilot in five provinces and plan to be applied to other 22 provinces in Thailand  
- the MoPH is the leader with the help from M ICT, ETDA for regulations for privacy info + authorized for verification process and M. ST to have a blue print for hospital information system development and enterprise architecture development  
- recent Activities done so far  
- –M. ECT’s Web registry (to be done in end of 2012) focusing on e-citizen  
- EGA (to use cloud) infrastructure to guarantee the security and privacy for e-government  
| **4. Leadership and sustainability**  
- trend to access the e-health from home or work  
- shift to citizen focus mode  
- move to better service and save cost  
Priority: Success stories in reimbursement cases  |

### Country: Viet Nam

<table>
<thead>
<tr>
<th><strong>Next Six Months</strong></th>
<th><strong>One Year or More</strong></th>
</tr>
</thead>
</table>
| **Establishing community practice.**  
**Develop short course on a specific topic, e.g., using MS excel, or MS access, using public health data**  
**Establish meeting/workshop to rise awareness on eHealth and health informatics.**  
**Develop short handout to present the ideas and concepts about eHealth.**  
**Develop website to be a portal to share knowledge.**  
| **Establish standards**  
**Establish short course for policy maker at different levels from hospital to national level.**  
**Develop and publish guideline in Viet Namese.**  
**Translate English training material into Viet Namese.** |
Country participants from Indonesia led by Prof. Anis Fuad of the AeHIIN Scientific Committee.