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Leveraging Advances in Health IT

to Prevent and Combat the Spread of Avian Influenza and other Infectious Diseases

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Prepared By:
The National Bureau of Asian Research
1301 Pennsylvania Avenue, NW Suite 305
Washington, D.C. 20004
Tel: 202-347-9767 Fax: 202-347-9766
Email: nbr@nbr.org Website: www.nbr.org

Produced For:
APEC Secretariat
35 Heng Mui Keng Terrace Singapore 119616
Tel: (65) 6891-9600 Fax: (65) 6891-9690
Email: info@apec.org Website: www.apec.org

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Leveraging Advances in Health IT

to Prevent and Combat the Spread of Avian Influenza and other Infectious Diseases

2 August 2009 | Singapore

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Summary

On 2 August 2009 stakeholders representing science, medicine, policy, public health, and industry assembled in Singapore to share experiences and ideas around leveraging advances in health information technology (HIT) in order to prevent and combat the spread of infectious diseases. A repeated theme was that information technology (IT) is a means, and not an end, to a healthier world. Needs assessment is the first step; prioritization of identified needs the second; and technology is the thread that binds them. Participants identified key areas of interest, which included organized data/standards, and clear lines of communication as foundational to the process. Case studies demonstrated that IT systems for health care can be used to address a range of challenges, including H1N1 outbreaks.

Challenges to effective uptake and scale-up of HIT

Funding constraints	In the end, access to resources and funding determine investment decisions and the speed and reach of HIT development.
Different levels of development	Varying levels of infrastructure, communication, and human and economic resources make for unequal development and capabilities within and between APEC economies.
Interoperability	Where there is no comprehensive strategy or no resources to finance/incentivize implementation of strategy, isolated pockets of localized policy and procurement plans develop, making integration and interoperability at a future date challenging.
Diversity	Without organization and standards in definitions, data, and collection methods, it is difficult to streamline HIT updates at the domestic, let alone international, level.
Need for incentives for…	*Health care workers* - This involves changing habits and human behavior. It also involves changing organizational culture. Finding the right balance between autonomy and accountability is a key challenge. *Policymakers* - HIT must be linked to health care decision-making, but first policymakers need to understand the benefits of investing in HIT (benefits must be concrete, simple, and demonstrate efficiencies and cost-savings); they also need to be armed with appropriate arguments to support issues in front of the media. *Patients* - For health care recipients to be motivated to learn how to take full advantage of the benefits available, they need to understand the cost-saving, and time-saving, and life-saving possibilities offered by HIT.
Cultural and behavioral patterns	Language, location/isolation, tradition, values, the reputation of health facilities, and family needs and priorities all play into decisions to adopt or reject new IT approaches for health care systems.

Benefits

Saves time and money	The potential returns on investment are significant. HIT can: save time and resources by connecting systems and people; enable the smooth flow of information; prevent duplication of effort; connect diagnosis with treatment; connect treatment with payment; and increase overall capacity and productivity.
Provides tools to respond to trends	HIT systems empower early detection, enable remote medicine, reduce chances of error, and can help scale healthcare for resource-poor settings.
Enhances communication	HIT offers the tools necessary to more effectively network together science, medicine, policy, public health, and industry for a healthier and more secure world.
Offers flexibility	As systems shift toward a model that is more standardized and integrated, they are increasingly able to adapt to new situations.
Creates a framework	HIT promises to serve as an effective platform on which to bring together the four phases of healthcare—prediction, diagnosis, treatment, and disease monitoring.

Key recommendations

Seminar participants considered the challenges and opportunities HIT represents by keeping the question in mind, "what does this mean for us?" Discussion took place in the context of the recent H1N1 outbreaks, which have captured political interest and support for exploring new options to better prevent, detect, and manage infectious diseases.

Out of seminar discussions, a challenge arose for APEC to:

- **Take advantage of this moment of opportunity** when the interest and influence of policymakers is aligned with health needs to develop domestic and international health systems equipped to prevent and combat disease through effective use of HIT.

- **Build Health Information Exchange** (HIE) between APEC economies. There is a need to develop **data standards** with consideration of technical compatibility within identified **priority areas**, such as bio-surveillance, cross-border care, and epidemiology. Data aggregation will benefit medical research, and can be used to develop technical guidance to share data on disease outbreaks.

- **Cultivate political leadership**; learn how to speak "politician". This includes clearly demonstrating the value of HIT with simple and "quick win" solutions.

- Develop better **procurement strategies**. This will help reduce waste, minimize inefficiency costs, and institutionalize interoperability.

- **Explore collaboration** between APEC sub-fora including the Health Working Group (HWG), E-Commerce Steering Group (ECSG), the Life Sciences Innovation Forum (LSIF) and other relevant APEC sub-fora to better integrate the resources and expertise represented in APEC.

LSIF discussion

LSIF continued the discussion on HIT; additional concerns primarily focused on guidance for health data sharing with regards to privacy and security of information. It was recommended that emerging HIT efforts:

- Develop guidance frameworks for privacy and security of health data sharing
- Coordinate with existing work & authorities
- Incorporate emerging technologies
- Prioritize information medicine (remote patient monitoring)
- Take advantage of environment and climate change surveillance technologies
- Explore potential uses of emerging technologies to improve patient outcomes

Key Judgments for Ministers and Leaders LSIF VII

Health information technologies ("Health IT"), deployed appropriately and in a coordinated and sustained way offer significant potential to bring efficiencies to health systems and to improve patient outcomes by facilitating a reduction in medical errors, more effective diagnoses, more efficient and effective health service delivery mechanisms, monitoring and motivating compliance with treatment and preventive health regimes (e.g. "info-medicine"); and, importantly, health information exchange and cross border cooperation that can also be applied in times of potential or existing disease outbreaks. The emerging, sensor-based "info-medicine" is of particular relevance to managing health for ageing and remote population groups. There are important policy and regulatory considerations that need to be addressed collectively, including: patient and data privacy; protocols for data exchange; health data standardization; the legal basis for Electronic Health Records; and, liability associated with telemedicine.

A number of APEC economies (e.g. Hong Kong China and Singapore) have invested significantly in Health Information Technology (Health IT), largely in the form of Electronic Health Records. Others (e.g. Japan) are developing "info medicine" systems to support prevention and treatment compliance regimes in specific population groups. Economies are finding that health processes are facilitated and enhanced by Health IT, for example in: diagnosis; medical decision support; error and risk reduction; improved access; efficiency gains/resource control; claims and reimbursement; compliance; infectious disease surveillance (e.g. SARS); and, adverse incident reporting and analysis. Information technology also is positioned as a resource management and planning tool to enable health authorities to not only track disease but predict demand and position supplies.

However, there are significant gaps and barriers to successful deployment. These include: the need for a common language and framework to measure the value of the investments in Health IT and communicate these to payers and other stakeholders; solo practice support; technical support; data standards and interoperability; and, legislation and policy on privacy and electronic data. LSIF considered that APEC was well positioned to address these areas because of the scope of its relevant working groups, including the Health Working Group and the E-Commerce Working Group and its focus on regional economic integration.

It was suggested that APEC LSIF, in cooperation with other APEC groups, explore the possibility of a developing a Health Information Exchange (HIE) framework, prioritized on improved patient outcomes, disease management, crisis response and improved economic outcomes. Components of the framework would include: data standardization; privacy and security guidance; patient identity management; and, technical guidance for data sharing for research. APEC also could examine the beneficial uses of emerging technologies in remote monitoring; behavioral modification and measurement; and the impact of environmental factors.

Accordingly, LSIF recommends the establishment of a small cross-cutting issues group in APEC to discuss and coordinate priorities in the development of mechanisms, frameworks and guidance on the role of information and communications technologies in health systems to facilitate and enhance the exchange and use of health and information and related data for improved patient outcomes, disease management and crisis response. In so doing, the issues group would review and draw on the *APEC Digital Prosperity Checklist* and the *LSIF Enablers of Investment Checklist*, where appropriate.

Source: LSIF VII final report

On 2 August 2009 The National Bureau of Asian Research (NBR) together with The Healthcare Information and Management Systems Society (HiMSS) Asia Pacific coordinated "Leveraging Advances in Health IT to Prevent and Combat the Spread of Avian Influenza and other Infectious Diseases" on behalf of the APEC Health Working Group (HWG) and in association with the APEC Life Sciences Innovation Forum (LSIF). The goal of the seminar was to identify how HIT can combat infectious diseases and improve health care by:

- sharing information on the benefits of HIT;
- identifying barriers and solutions to implementation; and
- encouraging increased multi-disciplinary collaboration.

Dr. Chong Yoke Sin, CEO, Integrated Health Information Systems (IHiS), gives the keynote presentation.

Representatives from thirteen economies participated, including stakeholders representing science, medicine, policy, public health, and industry. Delegates came from health ministries, ministries of science and technology, centers for disease control, ministries of foreign affairs and trade, health and information technology companies, and research institutes.

Why Health IT?

Why does HIT matter? The allure of HIT lies in is its potential to help bring together the four phases of healthcare—prediction, diagnosis, treatment, and disease monitoring. Moreover, HIT can help connect science, medicine, policy, public health, and industry, leveraging current capabilities and comparative strengths for maximum results. HIT matters because it is a capacity enhancer.

We are familiar with the phrase "disease has no borders." Responses to disease, however, do. These borders are health systems, described by one participant as "fiefdoms of cardiologists, tribes of healthcare workers." These borders also include insufficient (access to) information, inadequate channels of communication, inability to understand different priorities due to disparate data sources or definitions, etc. These borders mean that while diseases spread, treatment and response efforts may be slow to follow.

To compound matters, we live in an increasingly interconnected world, defined by the transnational flow of capital, products, people, and pathogens. In such a world, the limitations of healthcare systems quickly become limitations to global economic development. In other words, a disease outbreak could hurt the global economy.

To prevent and combat disease, we must create the capacity to detect, identify, and contain it at the source. That source will likely be Asia, where most of the economic growth and population growth in the coming years is predicted to occur, and where the initial strains of emerging infectious diseases are often first

identified. Developing health infrastructure that allows for interoperability at the local, domestic, regional, and international level when we need it has never been more important. Properly implemented, health IT can help dissolve healthcare system borders.

Strengthening capacity to address infectious diseases is anticipated to have a strong overall impact within APEC, simultaneously strengthening market structures and institutions, and creating an environment conducive to investment and technology development and human capacity building. Successful deployment of HIT to unlock data can improve disease prevention, surveillance, and treatment, as well as facilitate communication and reduce healthcare and other costs.

APEC Leaders and Ministers are committed to strengthening cooperation and building regional capacity to minimize health-related threats. Yet, APEC economies are advancing at varied stages of economic development, with unequal access to resources. By considering examples from various APEC economies, seminar participants were able to both explore the transferability of successful HIT projects and consider how to use technology to scale healthcare for resource-poor settings.

APEC economies: Leveraging IT for disease outbreak detection and management

Defining priorities: Despite the promise of HIT, competition within political agendas for resources necessitates prioritization. A few important priorities discussed include the need to standardize data and data collection; the need for electronic medical records; and the need for effective early warning systems.

Quality data was repeatedly highlighted as the basic building block of effective health policy and healthcare. Without data, there is nothing to work with, and no need for IT to transmit the information. Data must be collected and organized so that meaning and trends can be unlocked, and so that IT can enhance organizational work flow.

How well data is standardized and organized determines interoperability between systems once empowered by IT. Interoperability of data is critical for effectiveness. Hong Kong, China

Building a framework for health care

Health information technology offers a framework that can facilitate a much-needed shift in the structure of health systems nationally and internationally to ensure that medical care is safe, effective, and focused earlier in the disease process. Such a framework has the capacity to bring together comprehensive patient data with the most current evidence-based medical knowledge and state-of-the-art diagnostics. This would enable more proactive, personalized care that is not only more likely to produce results, but also more cost-effective.

In order to reach this goal, however, HIT systems must become interoperable. Without portability and transparency of health information, the fragmentation that characterizes today's healthcare systems will only be carried forward. Aligning the disparate interests of stakeholders, however, with the policies and the technology needed to accomplish interoperability takes careful analysis of potential barriers in order to overcome them. It was these challenges and opportunities that the APEC HIT seminar participants considered.

For more information on HIT as a framework for health systems, please visit: http://www.pacifichealthsummit.org/downloads/HITCaseStudies/HIT_2007.pdf

demonstrated this point recently. The use of IT in the Hong Kong, China public system is at 100%, with data interoperable across 160 institutions. This meant that in early 2009, when 34,000 people had been in contact with contaminated Allopurinol tablets, authorities were able to track them down within an hour of discovering the problem.

The reverse is also true. Where there is lack of interoperability between data elements, negative consequences abound. These include the inability to factor relevant information into diagnoses; issuance of incorrect treatments; duplication of effort; and inability to respond in a timely manner to new developments, just to name a few.

The next priority discussed was the importance of a functional electronic medical record. Medical records directly link to data on population health (such as immunization records), which in turn can inform the direction of research and of decision-making. Medical records also directly link to healthcare payment systems.

Finally, both organized data and electronic medical records empower economies to

Learning from Singapore: EMRs and Interoperability

Singapore's health system is comprised of both public and private services, and is divided into five geographically focused clusters which serve the continuum of community hospitals and general practitioners. In an effort to consolidate health IT between providers, the Integrated Healthcare Information Systems (IHiS) was incorporated in July 2008 from the Ministry of Health Holdings Pte Ltd with the vision of being the trusted technology partner in health.

Singapore developed two major electronic medical record (EMR) systems, which it now uses to provide seamless access to records throughout public healthcare institutions. The advantages now available, thanks to IHiS and the consolidation of Singapore's IT system for hospitals, include connectivity of systems and people (IT staff belong to the same organization); smooth flow of knowledge and information; shared infrastructure allowing for EMR exchange across clusters; and joint business and clinical intelligence tracking systems. These technology advances have led to the reduction of adverse drug events, an increase in accuracy of care, a central repository for all medical record types (labs, pharmacy, radiology, rehab, etc), increased capability for research informatics, and the development of a platform for personalized medicine. Additionally, HIT enables Singapore to adapt to new situations, a point emphasized by their management of the H1N1 outbreak. Even with only partial interoperability between public and private healthcare providers, the case for EMR was strong. IT applications already developed by National Health Group (NHG) hospitals were used to create a toolkit tailored to track the spread of H1H1, allowing an emergency team to respond quickly to detected trends. The toolkit also connected diagnosis with treatment.

Finally, in acknowledgment of the role of policy, it should be noted that decisions were made to prioritize a few behind-the-scene factors for success. These included: 1) clinician-led programs (this increases the level of buy-in from doctors, nurses, and pharmacists); 2) certified and experienced IT staff in healthcare (who consider perspectives from both users and patients); and 3) a balance of bottom-up and top-down approaches ("institution before cluster for user requirements and cluster before institution for implementation").

better develop effective early warning systems. Such systems enable preventative action as well as quick responses to emerging threats.

Responsibility of political leaders: Priorities within an economy tend to parallel changes in political leadership. As priorities change, new collection and analysis requirements are added, often without removing the old ones. This makes for massive amounts of information, much of which may not be used.

If time were taken to determine what information is actually relevant, resources could be reallocated, representing cost savings *and* enabling technology to transfer only the necessary information to decision makers. In this way, technology could support collection and analysis and thereby improve information flows.

Once data is available in a usable format, it is still the responsibility of leaders to make connections between data, health outcomes, and appropriate policies. The ways in which policymakers interpret information could mean life or death. For example, two pregnant women may lose the same amount of blood giving birth. If one of them is anemic, however, she is more likely to die without institutional care. In other words, even if her medical records are available within one system, unless that information is available, properly analyzed, and action taken it may make no difference to her. High-risk cases need to be identified and policies established in advance, so that plans can be quickly put into place for crisis situations.

At the highest level, government sets the stage of policy that we must examine. If systems exist but they have no policy or political will to support them, then those systems become ineffective and irrelevant.

HIT in use: One example of creative leveraging of HIT can be found in Viet Nam's use of cell phones. Considering that Viet Nam is a populous economy about 3,000 kilometers long and composed of many mountainous and remote areas, it quickly becomes apparent that access to health centers and treatment can pose a serious challenge. Likewise, inadequate infrastructure makes it difficult to detect, monitor, and respond to disease outbreaks. Cell phones, however, increasingly offer alternative solutions. Widespread throughout Viet Nam, cell phones can provide a platform for long-distance support. This support might include: data collection, reporting, patient consultations, transmitting images and results, human management, training, monitoring and/or informing responses to disease patterns and outbreaks. Cell phone numbers could

China HIT Case Study

Healthcare is fast rising as a percentage of China's GDP, with HIT spending growing even faster. Since China has witnessed first-hand how "information islands" result in fragmentation, duplicative systems, and poor integration between diverse software systems – and consequently decrease return on investment – they are firm supporters of an integrated approach to HIT.

The focus of future HIT development in China includes electronic health records; regional health information networks; and better integration of systems within individual hospitals, including agreement upon standards to support IT progress, and better management of change so that the Chinese hospitals operate more efficiently.

For more information, please visit: http://www.pacifichealthsummit.org/downloads/HITCaseStudies/Economy/ChinaHIT.pdf

also be used for identification purposes (for example, in immigration forms).

Another tangible example of IT in use was seen in Hong Kong, China's reaction to the SARS outbreak in 2000. Thanks to having already connected public health systems through electronic medical records (EMR), Hong Kong, China was able to quickly program software called e-SARS for registering all suspected and confirmed cases. This allowed them to report developments in real-time to the authorities. They shared data first with the Department of Health, then with universities for research purposes, and finally with the police. The police already had an expansive geographic information system (GIS), as well as a sophisticated people-to-people relationship system. Criminal research tools were therefore transformed into a SARS surveillance system. This hybrid of established capabilities produced immediate results, and set precedence for the use of HIT in combating infectious disease.

Communication and trust across and within borders: As the above cases demonstrate, human communication is integral to effective use of IT. Whether relating updates to the public, exchanging information between scientists and politicians, or transferring records or other data within the healthcare system itself, if people do not want to communicate, information technology is useless.

Just how important human communication is was seen when in 2007 the first case of human Avian Influenza on the Laos-Thai border was identified. Thanks to established relationships, healthcare workers were able to call each other, without having to first go through bureaucratic approval, and exchange visits to investigate the disease.

Similarly, when H1N1 influenza broke out in one developing economy, local officials actually first heard about the case through an email from a long-time colleague from elsewhere in the region. Through subsequent phone/Skype conversations, they were able to put plans into action.

A more organized example of relationship-based infrastructure mentioned by another participant is the Mekong Basin Disease Surveillance (MBDS) Network, which includes Southern China, Viet Nam, Laos, Cambodia, Thailand, and Burma/Myanmar. Each economy, the participant explained, is responsible for coordinating some aspect of the network, such as capacity building, border health, etc. For the first three years of the network, implementers on the ground did not trust each other or share information. But in 2009, after the fifth year of the system's existence, these practitioners had established trust and are now close colleagues who call and share information with ease. They learn about disease outbreaks from each other faster than from media or from official reporting systems. The takeaway is that using HIT effectively is as much about trust, which takes time to build, as it is about effective technology.

Mekong Basin Disease Surveillance (MBDS) Network Case Study

In an effort to collaborate on disease and outbreak management, all six Mekong economies participate in:

- Cross-border information exchange
- Joint outbreak investigation and response
- Development and implementation of protocols
- Training of healthcare personnel

For more information, please visit: http://www.pacifichealthsummit.org/downloads/HITCaseStudies/Functional/MBDS.pdf

Participants argued that regional coordination based on relationships, informal emails, and calls, must be protected and maintained. These methods

are not, however, sufficient in and of themselves. Infrastructure for data exchange needs to be developed into a more comprehensive system. This is where HIT adds value.

Communicating to the public: Moving beyond detecting and monitoring diseases, APEC economies struggle with how to update the public and drive prevention programs. What are the best ways to get information on the latest developments of vaccines or the severity of outbreaks around the world to the public? How much information should be shared so that populations are informed and prepared, but not unnecessarily alarmed?

Thailand HIT Case Study

Thailand has discovered that without sufficient benefits and incentives to compensate for the cost required to build a common system for data sharing, hospitals will remain unenthusiastic.

Thailand faces a number of challenges, primary among them being:

- The need for unwavering political commitment
- Public anxiety regarding privacy and security of information
- A shortage of IT professionals

The government has already contributed significant financial resources to addressing these concerns and to developing HIT, but recognizes the need to allocate further funding to propel implementation, as hospitals cannot and will not cover the costs themselves. An EMR exchange network remains in development, with potential for progress.

For more information, please visit: http://www.pacifichealthsummit.org/downloads/HITCaseStudies/Economy/ThailandHIT.pdf

From the citizen's perspective, this transfer of knowledge is often media-driven. But among seminar participants, some felt that given the public's tendency to panic, it is important to prevent the media from "over-communicating." Panelists recommended that politicians should be well prepared to provide coordinated, top-line messages to the public to mitigate the effects off "over communication" by the media. How economies make use of data to inform citizens real-time without being biased by media interpretation continues to be a challenge.

Barriers to HIT implementation in combating infectious disease

Seminar participants listed a few barriers to HIT adoption, and considered possible solutions to these barriers in developing a disease response system focused on prevention.

Cost: The initial investment required for successful implementation of HIT can be prohibitive. Therefore, the temptation to build "islands of technology" where the resources and political will present themselves is a common theme among both developing and developed economies. While "something" may well be better than "nothing," unless thought and foresight are given to the subsequent stages of development, the risk of creating incompatible systems and decreasing long-term return on investment is very high.

Rationalization behind data elements: While a top priority, interoperability is also a leading challenge. There are many different perspectives on standards. Unless APEC economies identify a common language through which to discuss standards, it was argued, little can be accomplished domestically, let alone internationally. Informal emails and calls are not a sufficient foundation for regional health infrastructure. If information

standards for exchanging a minimum amount of information for events of potential significance were developed, that would be a tremendous accomplishment.

In identifying a standard platform for data collection, transmission, and analysis, it is useful to consider related factors such as environmental conditions and pollutants. It is equally important to govern what *not* to include.

Simplicity: As the discussion progressed, the importance of simplicity was stressed: simplicity in language, simplicity of ideas, in selection of standards, and in process. As one participant put it, if you want to make tangible progress on a proposal, "write it for my grandma."

Healthcare is naturally complex. Proper use of HIT can simplify processes and improve workflows by connecting systems and people. To create buy-in from stakeholders, however, the benefits need to be obvious. Policymakers, for example, need to ensure a functional surveillance system within the economy before even thinking about IT. Physicians can only be concerned with a functional surveillance system if adequate disease detection and treatment tools are in place. To prevent an outbreak, communities need to be able to contain infection at the local level. For that, good early warning systems are critical. If the system is not known or accessible, practitioners will not use it. Without cooperation, progress cannot be made. HIT solutions need to simplify practioners' lives, not complicate them.

Distribution of resources: Given the uneven distribution of capabilities and resources in the Asia-Pacific, solutions need to be multi-faceted. Some of the participants considered training and communication technologies to be of primary importance. As demonstrated by the H1N1 epidemic, regional meetings can be canceled due to travel prohibitions. If alternative methods such as video conferencing are available, then training and planning can continue.

Participants also discussed which types of tools were most worthy of immediate investment. On this front, attention was given to prioritizing tools that can help identify and react to epidemics based on current patterns, rather than resorting to lessons learned from previous epidemics. Since Ministry of Health (MOH) reactions often determine interventions, health officials equipped with new technology could respond more appropriately to new situations. For example, health workers could use cell phones with cameras to transmit diagnostic data and images to the right people. This would provide direct access to health developments in rural areas, which have been traditionally difficult to track.

Procurement/vendors: Even if political leadership is secured and stakeholders are on board, transformation of IT systems still depends on vendors, and procurement can be a challenging path to navigate.

Current procurement models can be a source of consternation for both vendors and consultants. These models were often originally designed for procuring roads and infrastructure—in other words, for procuring capital, not operational capabilities.

Additionally, trying to get a new vendor is difficult. While stakeholders need to be

involved in the procurement process to ensure adoption of the most appropriate technologies, economies face funding constraints, and may have to choose vendors based on their means to pay for their product. However, the potential of IT adoption to create new jobs to make the operation self-sustaining should be an important factor for consideration. Then, there is the issue of technology transfer. As previously discussed, interoperability of systems for the transfer of data is a must. If a vendor is very protective about their technology, the added value of their technology can be severely decreased. One proposed solution voiced was to insist on data portability within the original request for proposal before purchasing the product.

Non-traditional surveillance opportunities: As conversation shifted back to the use of systems and technology, the point was made that new IT systems and innovations must be leveraged for the broader context; they should not be seen as isolated with a single purpose, as they can have many unexpected positive and unintended applications.

Particularly in more developed countries, tools, such as the Google search engine, can be (and is informally being) used as the new predictor of influenza outbreaks. Similarly, Twitter can be used as an epidemiological tool. What is important when using these types of technologies is identifying patterns.

Using such methods, it is possible to predict outbreaks three to four weeks before formal public health reporting, as was done by the Pan American Health Organization (PAHO) in the case of the outbreak of H1N1 in Mexico. By themselves, "rumor technologies" represent high sensitivity, but low specificity. In other words, these "rumors" can't be solely relied on. Yet if IT bridges are created to link them with public health infrastructure and traditional indicators for surveillance, new and powerful surveillance networks could be formed.

Global policy context / H1N1 Influenza

In conclusion, H1N1 influenza offers a second chance. That statement may sound absurd on first hearing, but what participants were really saying is that H1N1 influenza aligns incentives for policymakers to back the development of HIT infrastructure in the region. Why? Because fear of the consequences of a pandemic make people willing to share information, economies willing to allocate resources, and politicians ready to pay attention.

Another assertion made that may sound equally counter-intuitive was that recent plagues and outbreaks, including SARS, were *not* actually major public health events. Why? Because they were actually more important as *economic* events.

This claim that the *economic consequences* of most recent outbreaks are significantly more important than the health consequences is a serious one. The lack of any single international health agency addressing the movement of pathogens is as strong a support to this claim as any; the issue is simply too political. Cooperation between governments can sometimes be compromised due to concern about potential negative financial impacts. For example, when H1N1 influenza emerged in Mexico, initial international responses had a negative effect on tourism to the degree that the situation nearly developed into a diplomatic incident. Thankfully, when stakeholders were finally able to talk and clarify the facts of the outbreak, the situation was resolved.

As Mexico's story highlights, sharing information and working together towards preventing and combating the spread of infectious diseases is not only important

for public health reasons, but can help minimize economic impact and disruption. Therefore, early information sharing and international cooperation during a health crisis should be a high priority. Participants concluded that HIT is a necessary component of any effective solution, and that if Ministers of Health joined together behind this cause, they could achieve meaningful progress towards and developing interoperability in health infrastructure and dissolving healthcare borders.

Additional HIT case studies

Additional research on health information technology can be found in the Pacific Health Summit Health Information Technology Lab HIT Briefing Book (http://www.pacifichealthsummit.org/downloads/HITCaseStudies/HIT_2007.pdf).

Individual economy case studies include:

China HIT Case Study .pdf

India HIT Case Study .pdf

Japan HIT Case Study .pdf

New Zealand HIT Case Study .pdf

Singapore HIT Case Study .pdf

Chinese Taipei HIT Case Study .pdf

Thailand HIT Case Study .pdf

United Kingdom HIT Case Study .pdf

United States HIT Case Study .pdf

Viet Nam HIT Case Study .pdf

About the sponsors

This Health Working Group (HWG) project, organized in collaboration with the Life Sciences Innovation Forum (LSIF), was coordinated by The National Bureau of Asian Research (NBR) in association with The Healthcare Information and Management Systems Society (HiMSS) Asia-Pacific. The United States co-sponsors included China, Korea, Viet Nam, and Thailand.

The National Bureau of Asian Research: NBR's Center for Health and Aging has extensive experience in convening outcome-oriented, cross-sectoral meetings on leveraging IT advances for better health outcomes, with particular focus on infectious diseases. NBR is well positioned to provide this service to APEC's HWG, having crafted targeted workshops with this same focus in Beijing, Mumbai, Singapore, and Tokyo, as well as having worked with the people implementing and driving HIT adoption in APEC economies on a series of unique case studies, now used as course material in a number of HIT programs in universities worldwide. Case study authors include the Vice Minister of Health for China and the Director of the China CDC, the President of the Thai Medical Informatics Association, HIT directors at Viet Nam's largest children's hospital, as well as many other key stakeholders. NBR also serves as the Secretariat for the Pacific Health Summit, which focused on pandemic influenza in 2007 and drug resistant tuberculosis in 2009. For more information see www.nbr.org.

Index of key words

Electronic Health Record (EHR): Real-time patient health record with access to evidence-based decision support tools used by clinicians to aid in decision-making. Te EHR can automate and streamline a clinician's workflow, ensuring that all clinical information is communicated. EHRs can also prevent delays in response that result in gaps in care and can support the collection of data for uses other than clinical care, such as billing, quality management, outcome reporting, and public health disease surveillance and reporting.
See EMR.

Electronic Medical Record (EMR): An online version of a patient's medical chart created in a hospital or ambulatory setting, where information is entered either digitally or scanned into the record from a paper-based source. See EHR.

Health Information Exchange (HIE): The electronic mobilization of healthcare information across organizations through shared infrastructure between organizations. Shared community-level information services are built once for many users. Examples include results deliver, historical patient information (such as a prescribed medication diagnoses), and other health information, which are supported by regional implementation of technologies. These technologies may include document sharing registry, secure Web portal, healthcare terminology translation tools, a master patient index (MPI), authentication and authorization infrastructure, and products that aggregate information from multiple sources.

Health Information Technology (HIT): The application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of healthcare information, data, and knowledge for communication and decision making. Examples of HIT include electronic health record systems, radiology information systems, picture archiving and communication systems, laboratory information systems, administrative and billing systems, and workflow systems.

Interoperability: The ability of disparate HIT systems to share patient information effectively and to use that shared information to create a lifetime patient record that is the basis of patient-centered care.

Personal Health Record (PHR): A single source of medical information maintained by a patient, in either electronic or paper form. PHRs can include information that is recorded by the patient (rather than by a provider), such as exercise routines, dietary habits, or daily glucose readings.

Telemedicine: Involves the electronic exchange of medical information between different sites in order to provide care to the patient. Telemedicine includes consultation between providers, diagnosis, and even treatment—for example, allowing intensive care specialists to monitor remote or rural hospital ICUs.

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Prepared By:
The National Bureau of Asian Research
1301 Pennsylvania Avenue, NW Suite 305
Washington, D.C. 20004
Tel: 202-347-9767 Fax: 202-347-9766
Email: nbr@nbr.org Website: www.nbr.org

Produced For:
Asia-Pacific Economic Cooperation
35 Heng Mui Keng Terrace Singapore 119616
Tel: (65) 6891-9600 Fax: (65) 6891-9690
Email: info@apec.org Website: www.apec.org