

Knowledge Sharing Workshop 2010

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1 Executive Summary

A sharing of knowledge workshop took place at the Islambad Club in Islamabad, Pakistan on the 29th and 30th of September 2010. This event was jointly organized by eHealth Association of Pakistan (eHAP), the Agha Khan University (AKU), and LIRNEasia. The objective was to share our eHealth experience in relation to the Real-Time Biosurveillance Program (RTBP) carried out in India (IN) and Sri Lanka (LK) and for the Pakistan (PK) counterparts to share their eHealth project lessons learned. A wealth of knowledge was shared and developmental strategies were discussed between the government, academia, other research institutes, non-governmental organizations, and private sector participants (Appendix A, section 2.2).

Day 1 of the workshop's focus was on disease surveillance and disaster management with *Day 2* addressing the mHealth, Telehealth, and eLearning space. It was evident that all disciplines needed to identify the disparities and improve the equity by building multiple information systems and identifying multiple information sources for efficient and effective delivery of health services in every day life and during crises through an Information Communication Technology (ICT) paradigm catalysis.

The present focus, in many countries, is on the surveillance of key communicable diseases (i.e. WHO mandated notifiable priority diseases), with which 50% of the epidemiological events can be managed. The present day paper and postal (courier) systems do not provide the much needed timeliness and accuracy of information for real-time decision and control. Public health information is digitized at the district level health departments in IN, PK, and LK. However, there are latencies in the data arriving from the point of care to the district health departments. Moreover, the sector require proper ICT tools to improve the utility of the collected data and analytic capabilities within the institutions. At present countries like India, Pakistan, and Sri Lanka do not possess the institutional culture of utilizing data or are less inclined to being data driven organizations.

A commonality across IN, PK, and LK is that physicians, medical officers, and nurses are reluctant to engage in the digitization process. None of the projects had assessed the social or institutional approval of the interventions through a Technology Acceptance Model. A main reason to refuse the technology by the healthcare workers was the overwhelming daily patient volumes and routine work. Therefore, new human capacity must be bundled with the eHealth technology. Thus, there is a need for eHealth capacity in IN, PK, and LK, which can safely be generalized to all developing countries in the Asia Pacific.

Strategies, policies, and legal frameworks must be reformed before eHealth can take full effect and be institutionalized. Health informatics paper forms and registries are legal documents. Personal Health Records cannot be uniquely identified by National Identity Card numbers and also cannot be made a requirement for patients to produce; especially from those who are victims of disasters. A person's unique health identifier must be a combination of several attributes independent of an institutional document. Privacy and protection of information is another crucial element of the entire recipe.

Access to affordable ubiquitous communication infrastructure is a barrier to promoting eHealth in PK. GPRS or 3G services in PK are unaffordable or unreliable in many rural areas. However, this was not the same experience in Tamil Nadu, India and Sri Lanka.

Those projects that had conducted an economic analysis were showing promising benefits and efficiency gains. The marginal costs for the introduced technology is relatively small compared with other elements of the interventions. A problem that researchers face is the absence of proper budgets or costing information for the health programs or institutions. Governments budgets are usually dispersed and managed as a whole and not categorical.

The eHealth solutions developed for daily use must also be ready to use during catastrophes. Disasters usually cripple all infrastructure including health facilities and communications. The ill-fated critical infrastructures must be replenished for business continuity and disaster recovery. Therefore, mobility and portability are essential properties that designers must consider when developing eHealth systems. Disease surveillance systems should be deployed to monitor Internally Displaced Persons in the camps, specialized healthcare should be provided through mobile telehealth, services and resources should be well managed (or coordinated), so on and so forth.

The two days of knowledge sharing and dialogue concluded with eHAP drafting a eHealth strategy by identifying the initiatives and responsible actors. The Director General of Health - Dr. Rashid Jooma, requesting that eHAP produce a paper defining the required legal framework and asking all eHealth initiatives begin providing solutions to combat priority public health issues such as Hepatitis that is inflicted upon 15% of the Pakistani population. Director of Health Management information Systems - Dr. Syed Mursalin commended the RTBP and expressed interest in creating an opportunity for adopting parts of the technology in Pakistan.

2 Summary of the presentations and discussions

2.1 Health Information Management systems In Pakistan

Ministry of Health was implemented a National Health Information System in Pakistan with the goal of supporting the information needs of the Healthcare Managers by ensuring timely availability and use of accurate information at sub-district, district, provincial and federal levels. Ministry of Health receives health information through main two ways

1) Routine Management Information Systems

- National HMIS/DHIS.
- Management Information System – LHWs

2) Supporting MIS Systems

- MISs of National Health Program (Malaria, Tuberculosis, AIDS, Polio/EPI, Hepatitis)
- Studies / Surveys by PMRC, NIPS, Pop. Census.
- Studies / Reports Development Partners (eg. MICS/UNICEF).

2.2 National Health Management Information System (HMIS) - Pakistan

Overview:

A countrywide facility-based Health Management Information System (HMIS) was developed in Pakistan in the early 1990s. This effort was initiated by the Basic Health Services Cell, now the

national HMIS Cell of Ministry of Health. Provincial Health Departments also fully shared this participatory development process. International agencies like USAID, UNICEF and WHO extended both technical and financial support. Ultimate objective of this initiative is to assist mid- and senior health managers in making informed decisions. Subsequently, the Family Health Projects of the World Bank supported the establishment and institutionalization of HMIS in all the provinces. This system has now been implemented in a phased manner and more than 90% primary health care facilities report under this system. The HMIS data are originated at the first level care facilities: Rural Health Centre, Basic Health Unit, Dispensary, Sub Health Centers, First Aid Post, MCH Centre, and OPD of Hospital.

Data Transmission

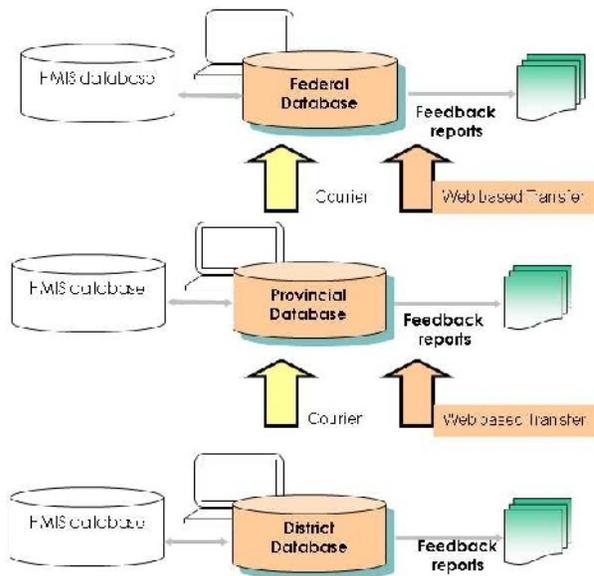
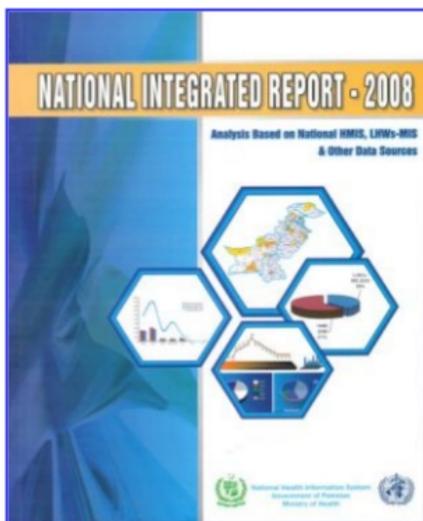


Figure 1: HMIS data flow diagram

Then these data flow directly from the peripheral health facilities to the District Computer Centers, then to the Provincial Computer Centers. Ultimately, the information reaches the National HMIS Cell on computer diskettes where it is analyzed through HMIS software and also through Statistical Package of Social Sciences (SPSS) (Figure 1). The data is analyzed at the district level but seldom at the facility level.

HMIS is designed to provide information on service related indicators such as facility utilization rate, referrals, immunization, maternal care and family planning. In addition, it also provides information by age on 18 priority diseases with 15 Communicable diseases. Data collection process is paper based and manually operated. (Figure 1)

National HMIS Cell has produced several feedback reports derived from National HMIS Data. (Figure 1)



Incidence of Infectious Diseases , by Year



Patient Inflow



Figure 2: HMIS standard reports

Gaps in present HIMS

- National consolidation, analysis and the feedback of this data is being delayed
- due to time and the distance involved between health facilities and the Provincial or the National HMIS Cell.
- Unacceptable delays in reporting.
- District managers transmit information to the provincial level without establishing a feedback loop with the facilities.
- The quality of data needs improvement and should be available timely for decision makers.
- Most of the time, planning and management decisions are taken without relevant information and there is culture of non-evidence based decision making.
- Excessive quantity of data is now being collected with little being analyzed particularly provincial and district levels.

Current focus of the Ministry of Health

- Transition from HMIS to District Health Information System.
- Building Capacity of Health Managers in information analysis and use.
- Comprehensive study National MIS/ HMN-WHO.
- Support for the Development MIS for Human Resources Database, HRH Observatory.
- Strengthening of Existing Health Institution Database and Linkages with GIS.
- Promotion and Use of available innovative Information Technology Options for Health System.

2.3 Lady Health workers Program (LHWP)

Overview

LHWP is an important community based Data Source for the Health information system in Pakistan. It aims to:

- Improvement of maternal health.
- Improvement of newborn and child health
- Provision of family planning services
- Increase immunization coverage
- Improvement in nutritional status
- Integrate Vertical Health Programs.

LHWs are contract workers who live and work in the communities that they serve. LHWs are provided with both full-time and in-service training; and they are supervised by Lady Health Supervisors (LHSs) and provided with support from nearby first level care facilities (FLCFs). The programme is embedded in the Ministry and Departments of Health. LHWs and LHSs are recruited on contract, but staff in the Federal, Provincial and District Programme Implementation Units (FPIU, PPIUs and DPIUs) are deputed from the Ministry and Department of Health. Key policy and budget decisions are taken by the Secretary of Health in conjunction with the Planning and Development Division and the FPIU. Most operational decisions are taken by PPIUs and DPIUs. (Figure 6)

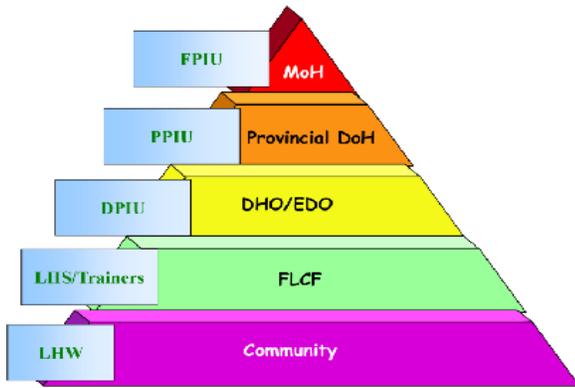


Figure 3: Organizational Structure – Lady Health Workers Program

Table 1: Human resources allocated for LHWP

Province	Lady Health Workers	Lady Health Supervisor
Punjab	50,141	1,907
Sindh	22,730	779
KP	13,851	471
Balochistan	6,702	241
AJK	3,135	127
Gilgit Baltistan	1,324	59
FATA	1,462	42
ICT	341	13
Total	99,686	3,639

LHWP is implemented in all districts and regions of the Pakistan with 90% reporting compliance at each level demonstrated in figure 6. Nearly 100,000 LHWs cover 55% of the population in Pakistan. (Table 1). LHWs are maintaining several registries and responsible for regular basis reporting (Figure 4). They gather all health planning data and disease surveillance data at community level. Because of the heavy paperwork there is a delay in delivering Health information to the relevant authorities. (Figure 5)

- I. Area Map
- II. Community Chart
- III. Family Register
- IV. Treatment Register
- V. LHW Diary
- VI. Monthly Report
- VII. MCH Card
- VIII. Referral Slip

Figure 5: Data collected by LHWs

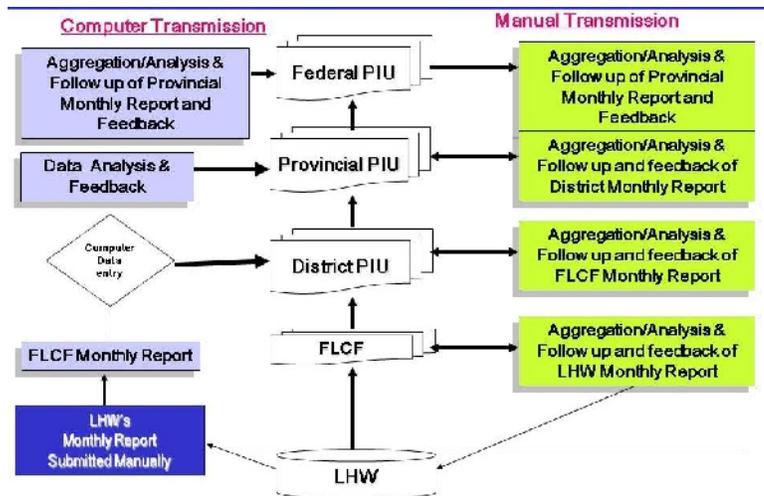


Figure 4: Data transmission in LHWP

Current focus

Because of excessive paper works and unacceptable delays, Computer based Health Information project has been launched. It maintains above manual records up to date by a computer software called “LHW MIS”(Lady Health Worker Management Information System) (Figure 7) and transmit data through internet.

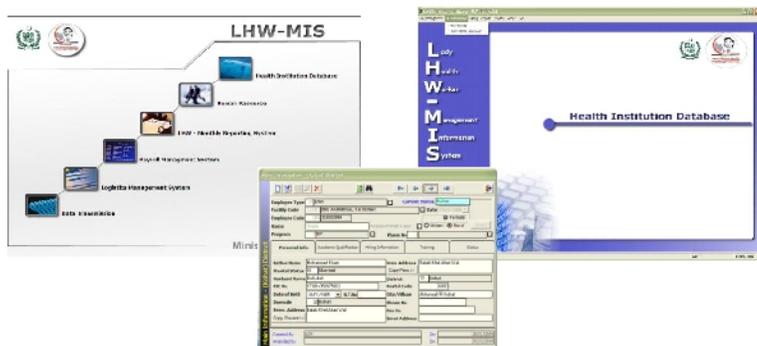


Figure 6: Lady Health Worker Management Information system

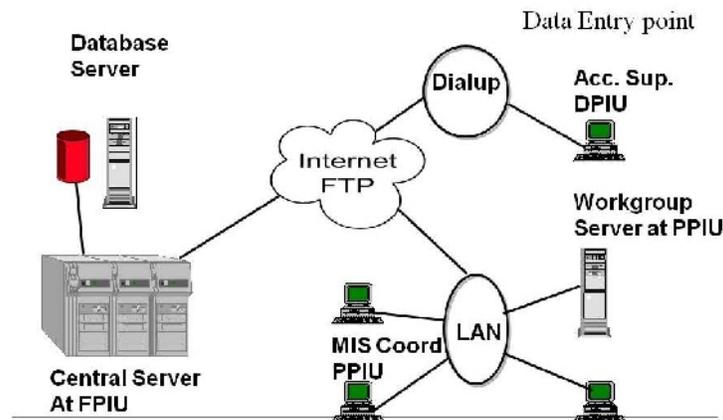


Figure 7: LHW MIS data transmission in

2.4 eHealth In Disaster Management

Pakistan has a several experiences of catastrophic events caused by Natural Disasters. In 2005 there was a devastating incidence of Earthquake leading to 86,000 deaths and 69,000 injured. Currently also country is suffering from floods and post flood effects badly. Therefore several eHealth related projects were aimed in Pakistan to face these chaoses efficiently and effectively.

8.1.1 Telemedicine approaches in Disaster –

- Mobile Telemedicine Units in AJK, NWFP – Well equipped mobile telemedicine vehicles move to the disaster areas and link the tertiary care hospitals for the expertise and management via satellite connectivity.
- Telemedicine in Step Down hospitals- Remote telemedicine hospitals link with step down hospitals through satellite for the management and follow up of the patients.
- Telemedicine Training of Paraplegics – This project provide multidisciplinary approach to the paraplegics through telemedicine. Paraplegics are trained to use the system and they are followed up remotely.
- Tele psychiatric –In disasters psychiatric impact is neglected as most of the time the attention is paid for the organic disaster. Therefore addressing psychological impact is crucial in disaster management. Tele psychiatric project provide solution for this by giving opportunity for the patients to consult expertise through telemedicine linking affected areas with Health centers through satellite connectivity.

2.5 mHealth approaches in Disasters

Data collection and Mapping – “PakReport”

People with access to working mobile phones can text message 3441 and relay their first-hand information of the flood's ravaging effects. PakReport also makes use of media monitoring to gather data. Once the information is submitted to the platform, a team of administrators and volunteers collaborate to place the information on the map. Past initiatives like PakReport, based on the Ushahidi platform, has provided useful information for various players.

Early warning system

Sahana alerting Module used as an early warning system for disease outbreaks and health related incidences in Real Time Biosurveillance Project 2 in India and Sri Lanka was introduced in the workshop. Capabilities of SAM in near real time alerting through multiple channels like SMS, Emails, Web ect. in disasters, interoperability and user friendliness were presented. Important of adhering to Standards like Common Alerting protocol was highlighted. Evaluation methodology and the results also demonstrated.

2.6 Discussion

- As SAM uses the everyday using and available technologies like mobile phones for alerting, the cost of implementing is minimum.
- As Sahana is an Open Source Software for early warning, it can be easily adopt to the system.
- RTBP team agreed to share the technology to help in flood catastrophe.
- Role of human elements as a barrier in scaling of these project were discussed. Lacks of training skills, Intuitiveness of the users were more important in sustainability.
- Need of capacity building was highlighted

2.7 mHelath for Data Collection

Today mobile phones are getting more and more poplar in the South Asian region. (Figure 8). As this is a user friendly, low cost , less power dependent and freely available technology, it can easily adopt to the health system.

Mobile phones are used as an efficient method of collecting demographical data by Village Health Nurses and Volunteer health Workers for the disease surveillance in India and Sri Lanka in Real Time Biosurveillance Program. The experiences and the evaluation finding on mHealthsurvey mobile phone application as a data collecting tool were demonstrated.

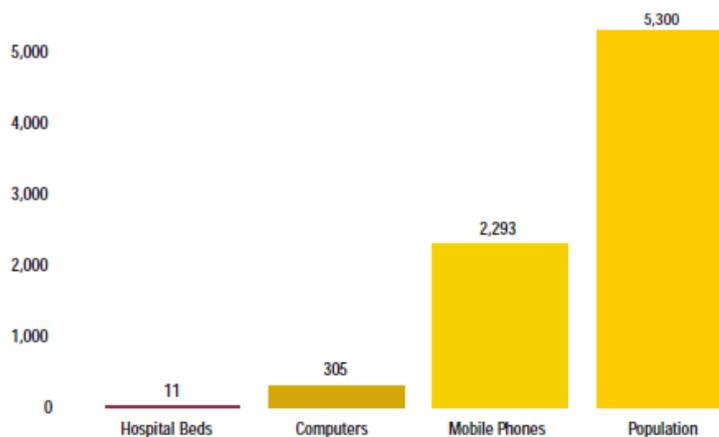


Figure 1. Technology and health-related statistics for developing countries (millions).⁴

Figure 8: Technology and health related statistic for developing countries.

Findings reflect the Importance of using simple freely available technology cost effectively. Use of mobile phones to collect data for the data management and Health Records using Open MRS is also highlighted during this session.

2.8 Discussion

- Interested in adopting mHealth experiences for data collection in Pakistan.
- Community Health Workers and Lady Health Workers are identified as key persons in digitizing data.

- Identifying other methods of data digitizing also emphasized.
- Poor Literacy and language are identified as the barriers.
- Introduction of SMS translator or Voice translator proposed as the solution.
- Interested in Voice based data collection methods
- Necessity of National mHealth policy was highlighted as there no mHealth Policy in Pakistan.
- Important of using mobiles more and more in field of health is emphasized as other fields are far away from using mobiles effectively
- Importance of Legislations for electronic data collection is also highlighted.
- Patient's rights for the data need to be secured.

2.9 ICT tools for Case or Event based outbreak detection

T-Cube Web Interface, a web based statistical analytical tool which used for the pattern recognition in outbreak detection in Real Time Biosurveillance project was demonstrated. Ability of detecting unusual patterns spatio-temporally makes decision makers life easier for prompt preventive measures. Evaluation framework with the results was presented and it revealed the high appreciation level in technology acceptance in the piloted countries, Sri Lanka and India.

2.10 Discussion

- As HMIS system is lagging in timely event reporting and no event detection, health officials were more interested about the statistical analytical methods.
- The importance of web based technology rather than client based , was emphasized.
- As this is no further a license free software, Health officials were brought up the question of cost associated with using the software.
- Interested about the capacity building in event detection using TCWI.

2.11 Telemedicine projects

National Rural Support Program – Holly Family Hospital.

Under this project Holly Family Hospital was linked to 4 rural telemedicine centers in Kshushab, Pindi Gheb, Gujarat and Attock. All these remote centers are well equipped with the digitizing technologies like electronic cameras, otoscopes, e stethoscopes, ECG machines ect. well trained technical officers are performing examinations on referred patient to these centers and lively available to main centre at Holly Family Hospital. All most all expertise including dermatology, Cardiology, Nephrology, ENT ect. consulted remotely using telemedicine during their routine clinics. Follow up of patients also done thorough this system.

Project HOPE

This is the first telemedicine project piloted in Sindh District. HOPE connects a tertiary care center in

Karachi to Secondary Care Centers in Rural Sindh. Process When the Patients present at district hospitals, they are seen by local referring Doctors. EMR is created & MP is used to acquire & transfer medical information. Specialists see the patients in real time through VC and also look at medical

reports either through the EMR or paper. Both Hub & Spokes are managed by Technical staff. Patients may be referred physically to JPMC if needed.

Teleconsultation at Gilgit Baltistan. - This is a web based telemedicine project.

eLearning at Holy Family Hospital

Virtual Training Lab- virtual training for the mini surgeries and laparoscopies are performed.

2.12 eHealth Policies

Need of a National policy of eHealth is highlighted by the director General of Health Services highlighted the necessity of a National Policy for eHealth at the end of the workshop. He emphasized the importance in coordinating eHealth pilots and researches rather than conducting seldomly. He requested from eHAP to be a coordinator in this case. Importance in absorbing Real Time Biosurveillance Project was also highlighted by him and request Agha Khan University and eHAP to arrange the initiatives for it.

3 Real Time BioSurveillance Project for Pakistan.

As the Pakistan disease surveillance system is manual, Paper based process, health officials were delighted to know about the RTBP as another paradigm. Due to the geographical, literacy and economical distribution in the country, all participants were interested about a cost effective and robust methodology for disease surveillance. As RTBP provides the solution for their requirements, Health officials requested to pilot the project specially in rural areas of the Pakistan. Agha Khan University and the eHAP will facilitate for the arrangements. .

4 APPENDIX A

4.1 Program

Day 1- September 29, 2010		
9:00-9:30	Inauguration Ceremony	Speeches by: 1. Secretary Health 2. Dr. Asif Zafar Malik 3. Dr. Shariq Khoja/Dr. Hammad Durrani
9:30-10:00	eHealth response in Disaster	Dr. Asif and Dr. Shariq
10:00-10:30	Standardized public health alerts with Sahana messaging module	Mr. Nuwan Waidyanatha
10:30-11:30	Break and Group Photo	
Current Epidemiological Systems in the region – Gaps, Opportunities and Challenges		
11:00-11:30	HMIS System in Pakistan	Dr. Mursaleen
11:30-12:00	Indian Integrated Disease	

	Surveillance Program	Dr. Chamindu Sampath
12:00-12:30	Sri Lankan surveillance and notification system	
12:30-1:00	Group Discussion What are the gaps in the present system? What are the existing system expenses? What actions are taken to reform the system? Does government see value of ICT in epidemiology? What initial conditions must be in place before ICTs can be introduced?	
1:00-2:00	Lunch	
Quality and timeliness of clinical data digitization		
2:00-2:30	Clinical Data digitization in Pakistan	Dr. Mursaleen
2:30-3:00	digitizing outpatient disease and demographic data in India and Sri Lanka	Mr. Nuwan Waidyanatha
3:00-3:15	mHealth experience in Pakistan	Dr. Shariq Khoja
3:15-3:45	Group Discussion What methodologies have been used to measure the robustness of the data collection technology? What are the acceptability level of the technology by frontline health workers in the urban and rural settings? What are the policy implications of introducing technology at the health facilities and with health workers? Are their requirements for ontologies and standards in data digitization?	
3:45-4:00	Break	
Reliability of ICT tools for case-based or event-based outbreak detection		
4:00-4:15	Pakistan Perspective	
4:15-4:30	T-Cube Web Interface acceptability, usability and implementation challenges in India and Sri Lanka	Dr. Chamindu Sampath
4:30-5:00	Group Discussion What are the pros and cons of case-based and event-based outbreak detection? How do you practically measure or gather evidence on the reliability of event detection? What are the capacity requirements for the introduction of ICT based event detection? What are the acceptability levels of ICT for event detection by national health departments?	

4.2 *Participants*

- Dr. Rashid Jooma (Director general health)
- Dr Azfar Saeed (Director Pakistan Telecommunication Authority)
- Dr. Bushra Hussaan, (Assistant director, National Disaster Management Authority)
- Dr. S M Mursalin from National HMIS Cell
- Dr. Asif Zafar Malik (Professor of Surgeon Holy Family Hospital)
- Dr. Haroon Khan (Consultant in Pathology,PIMS)
- Dr. Zakiuddin Ahmed
- Dr. Shariq Khoja
- Mr. M. Tariq Badsha (Member of Ministry of IT)
- Dr. Abdul Wahah (Assistant Professor of Psychiatry)
- Mr. Aamil Matta (CISCO)
- Dr.Azar Zaheed
- Mr. Nazeer Ahamad (Chairman of eHealth (pvt)Ltd.)
- Mr. Shahid Azhar Ansari (Project Director, Technology Incubation Center, COMSAT)
- Mr. Azim Husain (Chief Opperating Officer, COMSAT)
- Mr. Saadia Shabeer (Senior Project officer)
- Mr. Imran Ahamad (LHW programme, MIS officer)
- Mr. Nuwan Waidyanatha (Senior Researcher,LIRNEasia)
- Dr. Chamindu Weerasinghe (Research Assistant, LIRNEasia)