Symposium on:

Information and communication technologies and mobile Health: Lessons learned and challenges for Latin America and the World

March 20 - 21
Lima - Perú

Symposium
Information and communication technologies and mobile Health: Lessons learned and challenges for Latin America and the World

On March 20th and 21st, 2015, leading Medical Informatics professionals from around Latin America, North America, Africa, and Asia had the unique opportunity to convene for a two-day conference to discuss challenges, lessons learned, successful experiences and propose solutions to improve the use of Information and Communication Technologies (ICT) and its application in health.

The *"Symposium on ICT and mHealth: Lessons learned and challenges for Latin America and the World"* was held in Lima, Peru and organized by the Andean Global Health Informatics Research and Training Center (QUIPU) with support from the Fogarty Iternational Center (FIC)/ National Institutes of Health (NIH) and the School of Public Health of the Universidad Peruana Cayetano Heredia (UPCH).

Meeting attendees from 11 countries, representing the government, academic health institutions, research centers, and industry, gathered to discuss topics of interest on successful experiences in mobile health, health information systems, maternal and child technological innovations, training programs for ICT and global health, interoperability, ICT applications in various fields of health and nursing informatics.

The following link provides access to the meeting agenda, list of speakers, publications on twitter and access to recordings of the presentations: www.mhealthsymp.andeanquipu.org

This symposium was aimed to all health professionals, or professionals of other disciplines whose actual responsibilities are directly or indirectly linked to the field of health, and who are as well interested in initiatives, researches or projects in relation to the field of Mobile Health and Biomedical Informatics. The other objectives were to share and disseminate experiences, success stories and lessons learned from researchers, business and policy makers involved in projects about information and communication technologies and mobile health in Latin America Asia and Africa; and to discuss funding opportunities, collaboration and training in the field of mobile health, promoting North-South and South-South collaborations between researchers and representatives of public and private institutions invited to the symposium.

Highlights
- Participation of over 115 attendees representing 11 countries.
- 42 Peruvian and international speakers and moderators.
- On-line Twitter discussion using the hashtag #mhealthla

Panel 1: Strategies, challenges, and lessons learned in the development of eHealth projects
Moderator: Walter Curioso
Panelists: Patricia Mechael (HealthEnabled), David Novillo (PAHO), and Sherrilynne Fuller (University of Washington)

Dr. Walter Curioso was the first to be trained in the field of Biomedical Informatics at the University of Washington after graduating from the Universidad Peruana Cayetano Heredia as a medical surgeon. He is currently the Director for Evaluation and Knowledge Management for the National Science and Technology Counsel (CONCYTEC). This panel focused on discussing

lessons learned and next steps in the field of digital health. In summary, the biggest challenge remains training qualified personnel in both eHealth and mHealth, and specifically cross train individuals in bioinformatics and health research to bridge the existing knowledge gap. We cannot think about ICT without considering national and regional policies.

Dr. Patricia Mechael is the Policy Lead for HealthEnabled; Her presentation was entitled, *"The good, the bad, and the ugly of mHealth: lessons for the emerging field of digital health"* When she first began her PhD research in Egypt in the early 2000s, the cell phone penetration rate was about 3%. Some of the challenges early on were that many pilots were being tested using the same technology with little coordination or collaboration, leading to "pilotitis." Many thought that mHealth could magically solve problems but the reality is that mHealth is only as good as the systems and the people it connects. Lessons learned included that the most successful programs have been simple and focused on one or two problems in a systematic and thoughtful way. Remaining questions are who will pay for mHealth interventions? How will they be evaluated and monitored? Lastly, who and how will they be kept up to date? The use of technology will only increase from here on out and our challenge will be to equip personnel with the skills necessary to use the technology effectively.

David Novillo is the Advisor for Knowledge Management and Organizational Learning for the Pan American Health Organization (PAHO). He presented on "*eHealth policies in Latin America: challenges and lessons learned.*" In 2005, the WHO defined eHealth as the cost-effective and secure use of ICT in support of health and health-related fields. Given how much the environment and the field have changed, it may be time to revaluate this definition. Dr. Novillo went on to describe the WHO and PAHO's work in the field of eHealth, particularly their role in promoting the development of national eHealth standards that include processes to protect the confidentiality and security of personal health data. He presented results from a 2013 WHO survey of member states that found that the most significant barrier is the lack of qualified individuals in the field of eHealth, and no longer a lack of infrastructure for eHealth. Fostering an environment of intersectoral collaboration is essential to ensuring sustainability, and creating a legal framework is equally important. Finally, an investment plan is needed so that resources are allocated to promote development, and a continual evaluation of outcomes.

Dr. Sherrilynne Fuller is a professor of Biomedical and Health Informatics at the University of Washington School of Medicine. Dr. Fuller has led several large-scale research and development projects in the areas of biomedical and health informatics, telemedicine and information technology. She was a contributor to the development of EpiVue, an open source data visualization tool for public health. She presented on specific challenges in low resource settings, where although eHealth technologies are rapidly evolving, a robust evidence base is lacking and very few eHealth experts are available to collaborate with researchers in the appropriate use of eHealth. She discussed an NIH Fogarty International Center funded training program at the University of Nairobi, the ICT Tolls into Research Program that was designed to help address this challenge. This online course aims to improve the quality and impact of research outcomes by training health researcher to use ICT tools appropriately in the conduct of health research.

Panel 2: Health Information Systems in Asia and Latin America
Moderator: Sherrilynne Fuller
Panelists: Jaranit Kaewkungwal (Mahidol University Thailand), Javier Vargas (MINSA Peru), and Mario Ruiz (Seguridad Social de Costa Rica)

Dr. Sherrilynne Fuller from the University of Washington moderated this panel, which covered several health systems in Southeast Asia and Latin America and their progress in developing health information systems. A common theme was that people are a key challenge and not the technology per se, since it is the users of the systems that determine its success. Nonetheless, data is essential in the prevention and treatment of disease, and the development of HIS can lead to important cost savings. Even though the world is more alike than different, getting local, regional and national systems to communicate is not easy, but it is essential.

Dr. Jaranit Kaewkungwal is an Associate Professor in the Department of Tropical Medicine at Mahidol University, Thailand and the Director of the Center of Excellence for Biomedical and Public Health Informatics (BIOPHICS). Dr. Kaewkungwal presented on "*Health Information Systems in Thailand and other Southeast Asian Countries.*" Universal health care is provided with an estimated 99.5% of the population having access to health protection coverage. This hierarchy is similar to those of Lao, and Cambodia. While the systems of data collection may differ by hospital and region, Thailand has established a national standard health records consisting of 43+ files for the standardized reporting health information at the individual and aggregated level. In Thailand, every citizen has a unique ID card with a chip that registers them in the system and assists in tracking where patients are seeking care. They are moving towards a National Health Information System that would facilitate the sharing of health data across information systems enabling the monitoring of who received health services and where, who provided the services, as well as what specific care was provided. He closed by describing the use of mHealth technology in malaria surveillance to where community health workers visit patients' homes to help capture and follow-up on cases of malaria at the community level using mobile phones and GIS.

Dr. Javier Vargas is currently the General Director for the Office of Statistics and Informatics at the Peruvian Ministry of Health (MOH). Dr. Vargas presented on the "*Health Information System of Peru,*" he walked us through the timeline leading to important developments in Peru's HIS. Despite progress, the HIS infrastructure need to be improved; health facilities need an internet access and an adequate number of computers, databases need to be backed up, and personnel should be trained to ensure the quality and security of patient data. Health law 26842 established that the MOH would be responsible for proposing norms, standards and procedures for health-related data collection and reporting, as well as with providing technical support for health information systems. Recently, the health reform law called for the implementation of a integrated health information system (REUNIS), MINSA is charged with its design and implementation. This will be facilitated by the national citizen identification registry (RENIEC). These improvements will help ensure that more citizens receive quality healthcare regardless of their location and that their out of pocket spending for health care is minimized.

Dr. Mario Ruiz is currently the Deputy Executive Director of the San Vicente de Paul Hospital in Costa Rica. He presented on "*Universal health coverage in Costa Rica and its eHealth strategy.*" He began by outlining the structure of Costa Rica's health system and the existing challenges, which include lack of standardized clinical guidelines, long wait lists for health services, a fragmented health system, and an increasing burden of chronic diseases such as obesity. With this in mind there has been a shift to a value-based system composed of integrated practice units, measurement of outcomes and costs, bundled payments, integrated systems of care, and the development of an information technology platform. Its eHealth strategy is based on electronic health records (HER), specifically the development of a digital personal medical record, telemedicine, mHealth, eLearning, continuing education on ICT, with an emphasis on interoperability.

Keynote Lecture on Consumer Health Informatics- Designing from the inside out: Opportunities for patient engagement in ICT and mHealth
Presenter: Dr. Andrea Hartzler (Group Health Research Institute)

Dr. Andrea Hartzler is a researcher at the Group Health Research Institute where she promotes patient participation in health management through innovative tools such as interactive websites for patient-provider communication, algorithms to match cancer patients with peer mentors, and mobile apps that assist doctors in quickly responding to their patients' needs. Her lecture introduced user-centered design (UCD) methods, which engages stakeholders such as patients, providers, caregivers, and health systems leaders, in a participatory design process that considers what users need and how they will interact with the technology. By including stakeholders in the design process, it helps people notice and improve the environmental, social, and behavioral conditions that influence their health, while also developing technical tools that are both visually appealing and functional. UCD is collaborative, formative/iterative, and flexible. It begins with the assessment of users' unmet needs, this understanding is then used to specify design requirements, a prototype is built and then tested with users to determine its effectiveness. Dr. Hartzler then discussed her work in the HealthWeaver Project, an mHealth intervention designed for and with breast cancer patients at the University of Washington. Through their longitudinal field study they found that patients needed help with managing information "on the go," they the created a web based and mobile app where patients could access their health information when needed and connect with a peer support network. In closing she described how patient-generated health data will to big data analytics, allowing for more personalized care, enhanced self management support, health promotion, and a better understanding of disease and wellness. In summary, UCD is a rich approach to diverse patient engagement, it prepares mHealth interventions for implementation and minimizes costly mistakes and unintended consequences.

Panel 3: Technological innovations in Maternal and Child Health
Moderator: Daniel Aspilcueta
Panelists: Magaly Blas (School of Public Health and Administration - UPCH), Liem Nguyen (Institute of Population, Health and Development Vietnam), and José Pérez Lu (School of Public Health and Administration - UPCH)

Dr. Daniel Aspilcueta moderated this panel; he is currently the Coordinator Health Strategy for Reproductive Health for the Ministry of Health. The presentations demonstrated how ICT can be used to increase outreach to remote communities in Peru and Vietnam, communities that are usually excluded from health systems. Within a short time period, cell phones have become ubiquitous, and ICT gives us the tools to reach populations in a targeted fashion to link them to quality health care while improving communication between patients and health workers. The health provider is more responsible and available; geography and education, which used to be barrier are being torn down by technology.

Dr. Magaly Blas finished her MPH and PhD in Epidemiology at the University of Washington. She is an Associate Professor at School of Public Health and Administration. She presented on her current project funded by Grand Challenges Canada— "*Mama River: A maternal and child health promotion program for remote communities in the Peruvian Amazon."* In contrast to cities where family planning services, prenatal care, and hospital births are readily accessible; the communities living in Peruvian Amazon can be up to a day's boat ride away from health care facilities. 90% live in extreme poverty, 81% of women give birth at home and 71% have had an unplanned pregnancy. Mama River will leverage the existing resources that include the Amazon Hope Program which sends 2 boats to these communities to provide health care, the MOH, and

RENIEC which registers infants and determines what social programs their families are eligible for using community health workers and mobile technology. The Mama River program will train traditional midwives to use smartphones (widely available in Peru) to collect information from pregnant women at their communities and to schedule antenatal care visits by the medical ship staff. It will alert the medical vessel whenever a high-risk pregnancy is identified and send reports when a birth occurs, making civil registration and administrative follow-up more effective.

Dr. Liem Nguyen has been Deputy Director of the Institute of Population Health and Development in Vietnam since 2009. Currently, he is implementing a pilot intervention study using mobile phones to improve maternal health and child health in a mountainous province in Vietnam. Dr. Nguyen presented on *"Improving maternal and perinatal care for ethnic minorities in Thai Nguyen, Vietnam through an integrated eHealth and user-provider interaction model"* Ethnic minority women (EMW) in Vietnam have high fertility and disproportionately high infant and maternal mortality rates; due to poverty, remoteness from poor quality health centers and limited prenatal care. Given this context and the expansion of low-cost mobile phone service in Vietnam, mHealth holds great potential to mitigate these barriers by applying technology in improving RH service delivery and building demand for quality natal care. Mobile phones are used to follow their health status, to send reminders of important actions for reproductive health (RH), to encourage women to use RH services while also reminding then of dangerous signs, and support in their treatment when necessary. Capitalizing on these benefits, the current project will determine whether integrated use of a newly available Health Management Information System (HMIS), low-cost mobile technology, and a user-provider interaction model can lower infant mortality and improve health among EMW and their newborns.

Dr. José Pérez-Lu is a physician certified in Biomedical Informatics and Master in Global Health Sciences Epidemiology Research. He currently chairs the Committee for Standardization 129 Health Informatics INDECOPI. Today Dr. Perez-Lu presented on "*WawaRed-Peru: Reducing health inequities and improving maternal health by improving information systems in health.*" WawaRed is a project aimed at increasing access to health systems for pregnant, low-income women through the use of text messages. The initiative began in Callao with the promotion of rapid syphilis testing during prenatal visits and the creation of a web based electronic medical record. The EMR reduced the redundant collection of data for the various forms required by the Ministry of Health by using one standardized form to automatically generate the required reports. The EMR could be accessed by other health facilities once women switched centers. With years of experience the time for data collection has been reduced to 5 minutes with healthcare workers overwhelmingly in support of the EHR. Communication with patients was integrated into the system with SMS reminders, as well as educational and motivational messages. The next phase was creating a "labor history," allowing the progress of labor to be shared between clinics and hospitals immediately. A randomized controlled trial of SMS messages included over 1000 women and found that timely prenatal visits increased by 10% while also increasing the number of women who attended 6 or more prenatal visits. However, this was most effective in women living close to health centers. These results led to WawaRed Rural where they communicated using voice messages in either Spanish or Quechua per the women's request. While they are still completeing the evaluation process, in depth interviews indicate that these messages had a profound effect on women's wellbeing. One woman described feeling comforted as if her mother was calling her and reminder her to take her pills. WawaRed Peru is now helping to generate standards for interoperability for EMRs in Peru in other areas of health care.

Panel 4: Towards the Creation of a National Electronic Health Record System
Moderator: José Pérez-Lu
Panelists: Martha Cajaleón (Ministry of Health - Peru), Fernando Véliz (National Office of Electronic Government and Information Technology - Peru), Juan José Castillo (Committee for Standardization 129 Health Informatics INDECOPI), Laura Patiño (INDECOPI)

Dr. José Pérez-Lu moderated this panel that focused on the process and progress in the development of a national electronic medical record system in Peru. In summary, Peru has a strong regulatory framework in place that in conjunction with its national citizen identification system places it in the optimal position to initiate the roll out of a national EHR system. However, a need remains for a stronger emphasis on the development of a health specific information system, and the relevant legal framework.

Martha Cajaleón serves in as Coordinator of Information Technology and Communication in the General Office of Statistics and Information for the Ministry of Health. Ms. Cajaleón presented on the "*National electronic health record system: RENHICE.*" In May of 2013 law 0024 was passed calling for the creation of a national EMR system, known as RENHINCE. The idea was to create a structure so that existing medical records can be uploaded to a standardized central system. With the patient's permission, their medical record would then be accessible at any health center they seek care at, thus aiding in the disease diagnosis and cost containment by optimizing the use of resources and reducing redundancy in testing. RENHINCE will be a system to access EMRs, not to store them. A central objective of RENHINCE will be to protect personal information by limiting who can access individual records and requiring a digital signature.

Fernando Véliz is currently a legal adviser at the national Office of Electronic Government and Information Technology of the Presidency of the Council of Ministers (ONGEI-PCM). Mr. Véliz joined us to discuss, "*technical and legal issues in the implementation of a national Electronic Medical Records system.*" ONGEI is responsible for the implementation of the national policies on electronic governance. Given technology's constant evolution, the law focuses on the needs of the citizens, namely around privacy concerns. At the national and regional levels initiatives have begun to measure key indicators to evaluate ICT programs. Mr. Véliz laid out a vision of an eGovernment that provides services online such as eHealth, eJustice, eVoting, eTaxes, etc. Central to advancement in this field will be the issue of interoperability and the security of data, particularly in regards to digital signatures. An eHealth system needs to be accessible to both patients and health care workers while ensuring the quality and data of clinical data. He described the state Interoperability Platform (PIDA) which is available free of charge to public entities that provide services and are associated with the nationals information system. PIDA provides the technology infrastructure that allows for the electronic provision of services and the online exchange of data between state and local agencies through the internet, mobile phones, and other means available. He closed by saying that it is not the patients who have to adapt, but the services and health professionals that must adapt to the use of technology.

Juan José Castillo is currently a health information systems analyst and came to discuss his work with the "*Technical committee for the standardization of health information,*" at the Health Informatics and Technology Development Office of the General Office of Statistics and Information (MOH). Mr. Castillo presented a history of the efforts to standardize health information in Peru, within the context of a legal framework and with the oversight of the Peruvian Agency for Standardization (OPN) which oversees the CNB-INDECOPI. Standardization is key to ensure successful transfer of technology in the country by emphasizing quality and security. The development of new technologies will increase the

competitiveness of every sector and facilitate commercial transactions. However, the implementation of a national EHR and health information system requires the adoption and regulation of standards to ensure compliance. This system of standardization is being developed in alignment with international agreements and norms by the Technical Standards Committee for Health Information.

Laura Patiño is a lawyer working with the Commission on the Standardization and Control of non-Tariff Trade Barriers in INDECOPI. Ms. Patiño presented on "*the digital signature for electronic medical records.*" Ms. Patiño began her discussion by highlighting the main differences between paper health records and EHR, these included availability of information, durability of records and changes, and increased value based on the quality of information. Digital signatures imbue EHR with a degree of confidentiality and portability. In addition the benefits already outlined by other panelists, Ms. Patiño pointed out to the legal benefits of EHR (e.g. clear and legible dates and complete information). She expanded on the mechanisms in place to ensure security, the most important of which is the digital signature. In contrast to electronic, a digital signature uses cryptography characterized by public and private asymmetric keys, thereby providing evidence to origin, identity, and status of an electronic document or transaction. The private and public keys are linked in that what's coded with a private code need a public code to be unlocked and accessed, and vice versa. For EHR, each patient will need a digital certificate and public key, their private password, and a cryptographic card, along with software that would enable digital signatures.

Panel 5: Funding Opportunities for ICT Projects in Global Health
Moderator: Magaly Blas
Panelists: Walter Curioso (Concytec-Peru), Ana Peña-Doig (APEC), Chaitali Sinha (IDRC), Laura Povlich (Fogarty International Center / NIH)

Dr. Walter Curioso, the director of Evaluation and Knowledge Management at CONCYTEC, the National Counsel on Science, Technology, and Innovation in Technology, presented on "*Projects relating to knowledge management and funding opportunities*". Cienciactiva is an initiative designed to promote the growth of Peru and generate human capital by funding scientific and technological research contributing toward solutions for problems hindering business and social development (www.cienciactiva.pe). "Ideas Audaces" is a partnership between the governments of Canada and Peru, through Grand Challenges Canada. Dr. Curioso also discussed DINA, a national directory of researchers and innovators that showcases the resumes and research of Peruvians engaged in ICT, both at home and abroad (www,dina.concytec.gob.pe). It is linked to RENIEC to provide biographical information, SUNEDU that houses licensing and titles, SCOPUS and MEDLINE which are well known article databases. Finally, he introduced ALICIA (an open access national digital repository of science), technology, and innovation publications by Peruvian investigators (www.alicia.concytec.gob.pe/vufind/).

Ms. Ana Peña-Doig currently works in the Directorate of APEC and specialized forums, responsible for the issues of the Committee on Economic and Technical Cooperation (ECOTECH). Ms. Peña-Doig presented on "*opportunities for cooperation within APEC.*" Peru is a member of the Asia-Pacific Economic Forum for Economic Cooperation (APEC). Its next meeting with be hosted by Peru next year. APEC functions according to consensus, and works in a voluntary fashion. Every country has the same voting rank within APEC and the same capacity to influence the forum's agenda. Since 1993 >2,000 projects have been implemented, as part of a joint effort to promote sustainable economic development in the Asian-Pacific region. For Peru, a project would mean transforming political objectives into concrete results

and agreements into tangible benefits. Funding supports publications, investigations, meetings, workshops and seminars. Projects must be proposed in collaboration with a state entity and they should be completed within 2 years of approval. Funding tends to focus on commerce and the economy but the criteria include relevance, effectiveness, sustainability, efficiency, and impact.

Chaitali Sinha is the Senior Program Officer at IDRC Canada, their areas of interests are health information systems, e-health and mobile systems, evaluation and gender studies. The IDRC manages research projects with an emphasis on issues related to Health Information Systems. In particular, IDRC is involved in health systems research imbalances in decision making power with the goal of allocating resources to reach the most vulnerable. In order to do this, it is necessary to understand the intricacies of the health system. IDRC funds an initiative called SEARCH which supports projects that explore the ICT to strengthen health systems in developing countries.

Laura Povlich is the Program Officer at the Fogarty International Center (FIC) of the National Institutes of Health in the United States. She manages a group of technology-related grants, including research programs and mobile health eCapacity. For the past 15 years, Fogarty has invested in ICT in global health research through a Bioinformatics training program. Recently they have developed research education program called eCapacity, that takes a different approach to ICT training. Rather than training experts in informatics, the program aims to train researchers in low and middle income country researchers how to to develop. Another Fogarty funding opportunity that we recently developed is our Mobil Health Research Initiative, with the intention of building evidence based for the use of mobile technologies to improve global health problems to establish mhealth research capacity and develop a network of interdisciplinary teams. G11 HIV training program, broadly concerned with infrastructure but can include ICT. The National Institute of Nursing Research has two ongoing funding announcements that solicit research proposals that utilize mHealth tools in the improvement of effective patient provider communication, adherence to treatment and self-management of chronic disease in underserved population, and foreign researchers are eligible to apply. The final NIH funding option is a submission of investigator initiated research application. There is also the Savings Lives at Birth Grand Challenges (USAID, BMGF, GCCanada) due March 27th.

Panel 6: Training programs for Global Health Informatics research
Moderator: Carol Hullín
Panelists: Paula Otero (Hospital Italiano de Buenos Aires), Fernando Suárez (Universidad Javeriana de Colombia), Richard Scott (University of KwaZulu-Natal), and Patricia García (School of Public Health and Administration - UPCH)

Dr. Carol Hullín is a Doctor of Medical Informatics from the University of Melbourne, she completed a postdoc in Artificial Intelligence. Dr. Hullín moderated this panel discussion that presented training programs in Biomedical Informatics in Latin America and South Africa.

Dr. Paulo Otero is a professor in the Department of Medical Informatics at the Hospital Italiano de Buenos Aires, in their Residency Program in Medical Informatics, and he is chair of the International Medical Informatics Association (IMIA) Working Group on Education in Medical Informatics. Dr. Otero presented on *"Translational Informatics for Global Health: An Argentina-Oregon Collaboration."* He began by introducing us to the Hospital Italian de Buenos Aires where 6 years ago decided to digitalize data with the goal of capturing information as it was being collected. They have since then established a multidisciplinary training program in health informatics that is focused on the capacitation of clinicians and researchers in the use of

informatics for clinical research. It began with training exchanges with the Department of Medical Informatics and Clinical Epidemiology at OHSU in Oregon. They then developed an introductory 16 week course on biomedical informatics and health systems, they have postdoctoral fellows training who also complete their own research projects, and there is now an option to pursue a Masters in Health Informatics. Recently, they have become a WHO center of excellence in knowledge management.

Dr. Fernando Suárez is a medical geneticist at the Institute of Human Genetics at the Pontificia Universidad Javeriana, Colombia and he is currently a professor and unit director for cytogenetic and molecular diagnosis at the Institute of Human Genetics. Dr. Suárez's presentation was titled, "*Enhancing research informatics capacity for health information in Colombia- ENRICH.*" While information technology has existed in Colombia for decades, only recently has it been applied to the field of health services research. Virtuopolis, a virtual city created based on census data to provide a practice environment for biostatistics techniques, was the beginning of a Fogarty collaboration between Pontificia Universidad Javeriana and the University of Pittsburgh. Clinicians, engineers, and researchers could train at the Department of Biomedical Informatics at the University of Pittsburgh, pursuing either a Master's degree or Doctoral degree. He also shared his experiences with the EHR Canguro project, designed to facilitate the follow-up of premature newborns in ambulatory kangaroo programs (due to the lack of sufficient incubators in hospitals to meet the needs) and allow for the collection of data for clinical research. Additionally, they have designed web based and mobile accessible best practice guidelines for clinicians (www.gpc.minsalud.gov.co).

Dr. Richard Scott is the chief executive (CEO) of the company NT Consulting - Global e-Health Inc. He is a telehealth professor at the University of KwaZulu-Natal in South Africa. Dr. Scott discussed the global shortage of health care providers; for example Peru has 0.92 physicians per 1,000, while South Africa has 0.76 physicians per 1,000. eLearning can help mitigate this problem. eLearning encompasses synchronous and asynchronous uses of multi-media tools such as video/audio conferencing, radio, smartphone, or even television. It can be better characterized as distributed learning given the many ways in which students can connect (dial-up, cable, fiber optics, or wifi), both web-based and mobile-based forms, and the use of computer assisted instruction. Due to the shortage of physicians in South Africa, there are hospitals completely run by nurses; only about 50% of health care worker posts are filled. Given the failure of previous approaches to filling the gap of qualified clinicians, a new African Model has been developed, whereby the learning is moved rather than the learners. However, eLearning does not come without glitches, particularly because you cannot teach online as would would face to face. With eLearning you are more of a guide rather than an instructor. Dr. Scott outlined the 8 steps of e-Health strategy development that ultimately reduce the costs of implementation. The most important step is to select technologically appropriate and culturally sensitive solutions.

Dr. Patricia Garcia is currently the Dean of the School of Public Health in the Universidad Peruana Cayetano Heredia (UPCH) and the director of QUIPU. QUIPU, the Andean Global Health Informatics Research and Training Center, was funded by the National Institutes of Health and the Fogarty International Center in 2009, but the work to build a critical mass of individuals in the field began in 1999 with the support of the University of Washington (UW). Thus, QUIPU was launched to train researchers in the field of bioinformatics and health information via a Masters and Doctorate program at UPCH in partnership with UW, to promote research in biomedical informatics by creating funding opportunities, and thereby to foster collaboration in the region by creating and expanding a networks of researchers in the field. QUIPU also led to the creation of the Peruvian Association of Biomedical Informatics. North-

South and South-South collaborations have been crucial to QUIIPU success. Many lessons have been learned along the way, including that eLearning is both an attractive and feasible method of building capacity. The key was to create a critical mass of trained profession in Peru. Future plans include continuing the Masters in Biomedical Informatics at UPCH, offered a Certificate program 100% online, and to continue to share experiences with other institutions to strengthen the existing network of research. (www.andeanquipu.org)

Panel 7: Projects supported by the QUIPU Advanced Mentored Research Awards in Biomedical Informatics
Moderator: Miguel Egoavil
Panelists: David Requena (School of Science - UPCH), Alicia Alva (School of Sciences-UPCH), Tommy Prado (INCOR EsSalud), Roger Ocón (HNAL MINSA)

Miguel Egoavil is a graduate of the Master of Biomedical Informatics and member of the Committee for Standardization 129 INDECOPI Health Informatics. Dr. Egoavil moderated this session which presented various projects from UPCH students in the field of biomedical informatics, at various stages of implementation, on topics ranging from tuberculosis, to pediatric intensive care, bacterial vaginosis and cervical cancer.

David Requena is a geneticist and biotechnologist and he ispart of the Bioinformatics Laboratory and School of Science and Philosophy at UPCH. He presented on his work titled, "*TBRed: SMS against tuberculosis.*" Mr. Requena described current TB regimens, which during the first 2 months require 4 medications daily except for Sundays. After 2 months patients transition to twice a week until they complete their 6 months of treatment. This transition coincides with adherence difficulties. For his project he conducted a survey of mobile phone accessibility in the region, and focus groups which revealed barriers to adherence that included: shame, discrimination, self-efficacy, money, time/distance, feeling healthy, and lack of knowledge. Patients expressed an interest in reminders with encouraging messages. The messages were validated in the field, and they are now conducting a randomized control trial to measure the effectiveness of SMS reminders and educational/motivational messages in improving adherence for drug sensitive TB in Peru.

Alicia Alva has developed diagnostic software based on pattern recognition and the implementation of applications for remote diagnosis of diseases affected vulnerable populations with limited resources (Including tuberculosis, bacterial vaginosis, cervical cancer, among others). Today she presented her work on "*Soft-Warmi: Evaluation of an automated software in the diagnosis of Bacterial Vaginosis.*" 1 in 3 women have had bacterial vaginosis (BV), although in most cases it is asymptomatic and goes undiagnosed. This is important because BV portends an increased risk for sexually transmitted infections, premature labor in pregnant women, and may contribute to infertility. The current standard for diagnosing BV is subjective as it requires a trained technician to evaluate the sample under a microscope, but there is no national standard for training lab technicians in this procedure and while overall most technicians lack these skills, this is exacerbated in rural areas. To address this problem Dr. Alva developed an automated software (Soft-WARMI) that amplified the microscopic image sent using a mobile phone, and uses pattern recognition to make a diagnosis within minutes. Soft-WARMI has been compared to the gold standard at the University of Washington and found to have a sensitivity and specificity of 92%, significantly higher than the current standard of practice.

Dr. Tommy Prado is a pediatric intensive care physician, a physician at the National Institute of Cardiology (INCOR) EsSalud. Dr. Prado presented on "*Electronic medical records to improve decision making processes in the pediatric intensive care unit (PICU).*" In Peru, congenital heart

disease causes 3% of deaths in infants, meanwhile 40% of deaths result from congenital malformations. The objective of Dr. Prado's project was to evaluate the contribution of EHR to decision making in the PICU, and how the implementation of an EHR could improve data collection. Outcome measures included: completeness and correctness of records, reliability of ICD-10 coding, and decision making (based on qualitative work). Dr. Prado is designing the electronic medical record in conjunction with PICU staff and using Epi Info, an open source software for the design. He hopes that in addition to improving the quality of the clinical data and patient care, that the EHR will promote and facilitate research by making data more accessible. Thus far, his results indicate that the EHR significantly increased the proportion of complete admission notes and discharge summaries compared to the paper records.

Dr. Roger Ocon currently works for the Gynecologic Oncology Department at the Hospital Nacional Arzobispo Loayza. Dr. Ocon was the last presenter, he shared his work on "*Validation of acetic acid and visual inspection using an image captured and sent using a smartphone for cervical cancer screening.*" In Peru, cervical cancer is the number one cancer killer of women. Pap testing has not decreased the incidence of cervical cancer in Peru, women have problems getting a pap, and once collected it is difficult to get results which can take months to process. Visual inspection with Acetic acid (VIAA) has been used in resource limited settings, but there is high inter and intra observer variability, thus its sensitivity ranges from 14-95% and specificity from 14-98%. A major advantage of VIAA is that it can be used in areas with limited access to health care professionals and it provides immediate results allowing for immediate biopsy and/or treatment. Dr. Ocon proposed combining a "cervicograph," a magnified photograph of the cervix with VIAA to get photographic inspection with acetic acid (PIAA). A pilot project is under way to test the validity of this approach to cervical cancer screening whereby a trained midwife would perform the PIAA, send the image via SMS, which would then be read by a trained professional providing an immediate response to guide management and treatment.

Panel 8: Application of ICT in Health
Moderator: Willy Lescano
Panelists: Luis Menacho (School of Public Health and Administration - UPCH), Sara LeGrand (Duke University), Patricia Ordoñez (University of Puerto Rico Río Piedras), Mirko Zimic (School of Science - UPCH)

Andres (Willy) Lescano has a PhD in Epidemiology and the Global Disease Control from the School of Public Health at Johns Hopkins University, as well as a Masters in Biostatistics and Health Policy. He is the head of the Department of Parasitology and the director of training for the Public Health Research Centre for Tropical Diseases of the United States Navy base in Peru, and associate professor at UPCH. Dr. Lescano introduced and moderated this session, which covered several initiatives directly applying ICT to solve health problems.

Luis Menacho received his medical degree from UPCH and a Masters in Public Health from the University of Washington. Dr. Menacho presented on his work, *"Facebook as a tool to promote HIV testing."* Facebook is the most used social network in the world. 85% of Peruvians that are online use Facebook, and 50% use it on their cell phone. Facebook includes several features that can be adapted for health messaging such as chat, pages and groups. Facebook has already been used in health research, for example for the recruitment of participants through advertisements (which can be targeted by demographic group, location, or specific populations like LGBT). It has been used to study particular populations such as smokers or people living with HIV/AIDS, to understand their interactions, needs, motivations and barriers. Weight loss and physical activity interventions have also been delivered via Facebook. Dr. Menacho then discussed his own work with HOPE (harnessing online peer education) a randomly controlled

trial evaluating a peer educator intervention delivered via Facebook on the uptake of home HIV testing. It was first piloted in Los Angeles, California, and then scaled up in Peru among men who have sex with men. In Lima, the outcome was HIV testing at Epicentro (since home HIV testing is unavailable). Peer educators were in charge of secret Facebook group and expected to post at least twice a week on the group wall and send participants 2 messages/chats per week. 17% of the participants in the intervention group were tested for HIV, a statistically significant difference from the 7% in the control arm that were tested.

Sara LeGrand is an Assistant Professor at Duke University's Global Health Institute and the Center for Health Policy and Inequalities Research. Dr. LeGrand's presentation focused on "*leveraging technology to improve HIV prevention and care among young men who have sex with men in the United States.*" Dr. LeGrand presented healthMpowerment.org, a mobile phone and online intervention for young black men who have sex with men (YBMSM) aged 18-30 designed to reduce risky sexual behaviors and promote health and wellness. They created an online social network that encourages positive norms and relationships between HIV+ and HIV-YBMSM. The platform includes a customizable avatar and profile, newsfeed with updates, inspirational quotes that change each login, points that can earned for activity on the site, and later used to buy HMP swag (condom wallets, t-shirts, backpack, free HIV home testing and GC/CT home testing kits). There's an Mpower yourself section with health education articles specifically written for this population. Importantly, users vocalized a desire for a social networking component, so there's a section called "getting real" (with videos, audio, poetry etc. around predetermined topics which users can suggest) other users can like or comment on posts. There is also a discussion forum. Ask Dr. W section integrates the ability to interact with a healthcare provider. A pilot trial found a reduction in social isolation and depression and that the intervention was highly acceptable. They then developed a smartphone ART adherence app which allows for higher individual tailoring, greater interactivity, integration of gaming theory. Epic Allies (the name of the app) targets YMSM ages 16-24 in the US. Based on qualitative work, they created a story line as part of a superhero theme. Users are able to set customized medication reminders and complete a daily survey reporting on ARV adherence and tracking other related behavior. They can gain points by reading the daily dose newspaper related to HIV and ART adherence (and answering questions correctly).They are in the final beta testing phased and will be conducting a randomized controlled trial in 14 sites in the adolescent clinical trial network.

Patricia Ordoñez, has an MS and PhD in Computer Science from the University of Maryland. Dr. Ordoñez presentation was titled, "*Spurring innovation in Health Informatics in Latin America and the Caribbean.*" Dr. Ordoñez founded the Symposium of Health Informatics for Latin America and the Caribbean as a major step in linking computational scientists and medical providers through international collaboration. At SHILAC 2013 she introduced the "Big Think," born out of the idea of getting publications in three languages to facilitate the sharing of ideas. The big think brought together diverse groups of clinicians and computer scientists to define the problems, and brainstorm on possible solutions that would be voted on. Once they came up with a solution, then a hack-a-thon could be organized (e.g. Random Hacks of Kindness, National Day of Civic Hacking, Central America Domestic Violence hack-a-thon have brought people together from all around the world). Her idea is to promote research, interdisciplinary and international collaboration. Then they will bring clinicians and engineers to participate in the hack-a-thon. The online Sana course on health informatics will be offered to participants. The purpose of the even is to develop a project with a global network of partners, and to serve as an incubator for implementation (e.g. HackingMedicine). The proceedings will be published in SCOPUS in collaboration with LACCEI.

Dr. Mirko Zimic is currently the head of the Laboratory of Bioinformatics at the School of Science UPCH. As the last presenter of the panel, he discussed the *"Evolution of the telediagnostic system for tuberculosis and its applications to other illnesses."* Tuberculosis (TB) kills someone every 15 seconds. We know that poverty causes TB and TB exacerbates poverty in a vicious cycle. In Peru, the diagnosis of multi-drug resistant TB (MDRTB) can take months. Researchers at UPCH designed a test that could detect MDR within 7 days. This is significant because patients are 26 times more likely to be cured if diagnosed with resistance before they are started on a 1st line regimen. The MODS method (Microscopic-observation drug susceptibility) was a faster, cheaper, and more sensitive test for MDRTB that only required a lab technician and a special microscope. Dr. Zimic and others worked to create a prototype microscope that cost less than $500 (compared to $8,000) that could take pictures and store the data. However, the process took too much time. So then they designed a system that would electronically read the plate (Automated MODS 99.4% sensitive 99.7% specific). The breakthrough came with the development of a software that could detect TB on slides based on the structures formed by the TB bacilli on days 7-10 using pattern recognition. They have now developed a web based platform that allows the lab to login and upload their information and pictures, and have the software respond in 30 seconds (this is later verified by 3 experts who take no more than 3 days). The technology has been approved for field testing recently Callao and Trujillo after demonstrating proof of concept (99.8% concordance between software and remote expert).

Panel 9: Interoperability and Standards in e-Health
Moderator: Henry Garcia
Panelists: Diego Kaminker (HL7 International), Pablo Pazos (CaboLabs), Joaquin Blaya (OpenMRS), Daniel Luna (Hospital Italiano de Buenos Aires)

Mr. Garcia has a Masters in Software Engineering with over 8 years of experience in implementing business. Mr. Garcia moderated the panel which focused on the topic of interoperability. The presenters agreed that while standards may be more costly up front, they are much more cost-effective when considering scale up and sustainability. Interoperability benefits patients and health care providers directly, but not the institutions and vendors investing in the technology (these are competing economic interests. Semantics is the biggest obstacle to interoperability.

Diego Kaminker is a member of the Board of Directors for HL7 International and founding member of HL7 Argentina. Mr. Kaminker is responsible for dissemination of a new open access and free HL7 in Latin America and Spain called FHIR, which is suitable for mobile health, which was the topic of his presentation today. FHIR stands for Fast Healthcare Interoperability Resources, it is a draft standard describing data formats and elements and an Application Programming Interface (API) for exchanging electronic health records. The standard was created by Health Level Seven International (HL7). FHIR builds on previous data format standards from HL7 but uses a modern web-based suit of API technology (including HTTP-based, HTML, JSCON, XML, OAuth, and ATOM). Its purpose is to facilitate interoperation between prior health information systems, to make it easy to provide health care information on a wide variety of devices from computers to cell phones and tablets. It also allows for third-party application developers to provide mHealth apps which can be easily integrated into existing systems.

Pablo Pazos is an engineer specializing in Health Informatics Computing, a Qualified Member of the openEHR Foundation, Coordinator of the Community of openEHR in Spanish. Mr. Pazos presented on *"openEMR: the open standard standard for future proof EMRs."* openEHR is an

open standard specification in health informatics that describes the management and storage, retrieval and exchange of health data in electronic health records. In *open*EHR, all health data for a person is stored in a "one lifetime", vendor-independent, person-centred EHR. In software the only constant is change. Mr. Pazos discussed several challenges to interoperability of EMRs including the high costs associated with this, the lack of emphasis on using and maintaining data (rather than uploading it), and the lack of foresight into what to do when the technology changes and the data needs to be migrated. openEHR is an open access program, completely free, who's focus is on the management and use of clinical information (closer cousin to methodology). It's strength is its dual model of interoperability and maintenance. There is open access to clinic knowledge available in the software.

Dr. Joaquin Blaya is currently the Director of OpenMRS. Open MRS is an EHR for the world that was developed because organizations used multiple systems and none of them talked to each other; each wasted resources in reinventing the wheel. The purpose was to create a common infrastructure. It was created as modules to allow for easy adaptation of the system. It is now used in over 50 countries, including 5 national-level primary care implementations and 2 national-level hospital implementations (Kenya and Bangladesh). It allows Google map integration for MDRTB tracking and facilitates research data coordination, and can act as a central database to facilitate health data exchange. Dr. Blaya then went on to discuss his use of OpenMRS to tackle diabetes in Chile. MiDoctor connects a patient's cell phone to their EMR via automated phone calls, tailored information via SMS, and alerts health center of any responses that require attention to ensure patients receive personalized and appropriate care. An evaluation of MiDoctor showed a reduction in HA1c of 1.3 points in 1 year (which is comparable to some drugs).

Dr. Daniel Luna is the Head of the Department of Health Informatics at the Hospital Italiano Buenos Aires. Dr. Luna discussed about "*Information systems based on interoperability standards.*" Interoperability is dependent on the maturity of the market and national policies. He described the process by which they used HL7 for syntax interoperability and then interoperability semantics were made with data dictionaries/master files and definitions. Some of the trouble they ran into was using doctors to code, in the end they had the physicians outline their definitions which were then transferred to the software. That was the user can use their vocabulary and the computer worries about "translating" it to the relevant codes. The concept of units of information is intuitive to doctors because they are used to working with documents/modules, this is similar to the idea of working with documents within the EMR (HL7) and file system for storage. Each session includes a series of actions that are archived, such as orders for labs or imaging, prescriptions, consults etc. will be stored as one medical session. Interoperability at human level requires portability and that it can be opened using available software, which requires a universal format, and should be able to separate out needed sections. Finally, this technology much be accessible on mobile devices to both physicians and patients.

Panel 10: Nursing Informatics
Moderator: Patricia Garcia
Panelists: Xaily Gavilondo (Departamento Tecnologías de Información - ENSAP), Hugo Leonzio (Hospital Universitario de la Fundación Favaloro), Erika Caballero (Finis Terrae - Chile)

Patricia Garcia moderated this panel on nursing informatics with a focus on Latin America.

Xaily Gavilondo is an Assistant Professor at the National School of Public Health Department of Information Technology and Telecommunications. She joined us to discuss the topic of *"Nursing*

informatics in Cuba." In the 1980s computation was introduced into the field of nursing in Cuba as part of their capacity building strategy. In 1990, a strategy for the systematization of the national health system was developed and a Masters in Health Informatics was created. Cuba joined the International Medical Informatics Association Nursing Informatics working group (IMIA-NI) in 2001. A list serve was created to discuss the website, what kind of skills training was needed, and to organize an annual meeting. In 4 years the network has a website that is updated weekly, a blog, and active list serve, a book, a scientific journal, has organized several scientific meetings, workshops and symposiums, and interchanges with international networks of nurses in IT. They are involved in the capacity building of nurses in the use of informatics though trainings, courses, and diplomas. Ms. Gavilondo is in the process of developing a virtual diploma in nursing IT. One of several goals is to develop the field of telenursing and mHealth in Cuba. Potential areas for the application of mHealth include education, monitoring and adherence of treatment, data collection, emergency management, and information systems. A major obstacle remains that smartphone access is limited in Cuba.

Dr. Hugo Leonzio is a Member of the Research Department of the University Teaching and Research Hospital, Favaloro Foundation, Buenos Aires, Argentina. Dr. Leonzio walked us through the history of "*Nursing informatics in Argentina."* It started in 1993 when Dr. Leonzio enters the University Hospital of Fundacion Favaloro and creates the Department of Research and Informatics in Nursing. It began with the development of a system for managing medical stocks. This led to the creation of the Association of Medical Informatics in Argentina and later the Association of Nursing Informatics of the Argentina Republic (ADIERA) in 1994. Until 2001 their focus was on education (computer literacy and computer programming, English lessons, and nursing informatics), organizing events, creating material on nursing informatics and the publication of articles. Researchers in Argentina eventually created the FAENET Network, which was an infrastructure to manage the nursing informatics networks in Argentina using monthly virtual meetings and annual meetings, with regional working groups. They are now working with nursing networks to develop websites and Facebook groups to facilitate collaboration and information sharing. Dr. Leonzio has researched the use of ICT in post cardiac surgery patients that live more than 50km from a health care facility, and found that the use of ICT (cell, email, skype, and moodle for patient education) significantly improves communication with provides and patients' quality of life.

Erika Caballero is a nurse with experience in academic management in the health sector. She has a Masters in Instructional Design, and has extensive experience in the development of health information systems and educational software. Ms. Caballero shared her experiences in "*Nursing informatics in Chile.*" She emphasized that in general there has been an absence of input sought from nurses in the design of existing EMR systems. This is particularly evident when considering their work flows, terminologies, etc. And yet 70% of services in health care are performed by nurses, meaning that much of care is going uncoded and thereby not being billed. The biggest barrier has been the lack of communication between clinicians and IT specialists. She discussed her work with a home based ICT intervention for home bound patients. It began with the evaluation of the spiritual and family well-being, which allowed them to discover that the biggest concern of patients was loneliness and the fear of death. This allowed them to tailor their intervention to support patients and their family members.

SYMPOSIUM:
INFORMATION AND COMMUNICATION TECHNOLOGIES AND MOBILE HEALTH: LESSONS LEARNED AND CHALLENGES FOR LATIN AMERICA AND THE WORLD
March 20 21, Lima Peru

MARCH 20TH 2015

8:00	Registry	
8:45	Welcome	*Patricia Garcia*

PANEL 1: STRATEGIES, CHALLENGES AND LESSONS LEARNED IN THE DEVELOPMENT OF E-HEALTH PROJECTS
Moderator: Walter Curioso

9:00	The good, the bad, and the ugly of mHealth: Lessons for the Emerging Field of Digital Health	*Patricia Mechael*
9:20	EHealth policies in American region: Lessons learned and challenges	*David Novillo*
9:40	eHealth for Health Research: Challenges and Opportunities in Low Resource Settings	*Sherrilynne Fuller*
10:00	Discussion and questions	

10:20	**Break**

PANEL 2: HEALTH INFORMATION SYSTEMS IN ASIA AND LATIN AMERICA
Moderator: Sherrilynne Fuller

10:35	Health Information Systems in Thailand and Other South-east Asian Countries	*Jaranit Kaewkungwal*
10:55	Health Information Systems in Peru	*Javier Vargas*
11:15	Costa Rica Universal Health Coverage and eHealth Strategy	*Mario Ruiz*
11:35	Discussion and questions	

11:55	**PRESENTATION: Designing from the inside out: Opportunities for patient engagement in ICT and mHealth**	*Andrea Hartzler*

12:25	**Lunch**

PANEL 3: TECHNOLOGICAL INNOVATIONS IN MATERNAL AND CHILD HEALTH
Moderator: Daniel Aspilcueta

13:30	Mama River: A maternal and newborn health programme for remote communities in the Peruvian Amazon	*Magaly Blas*
13:50	Improving maternal and perinatal care for ethnic minorities in Thai Nguyen, Vietnam through an integrated eHealth and user-provider interaction model	*Liem Nguyen*
14:10	WawaRed-Perú - Reducing health inequities and improving maternal care by improving health information system	*Jose Perez Lu*
14:45	Discussion and questions	

PANEL 4: TOWARDS THE CREATION OF A NATIONAL ELECTRONIC HEALTH RECORD SYSTEM
Moderator: Jose Perez-Lu

15:05	National Register of EHR - RENHICE	*Martha Cajaleon*
15:25	Technical and legal issues in Implementing the National Register of EHR	*Fernando Veliz*
15:45	Standardization Technical Committee on Health Informatics	*Juan Jose Castillo*
16:05	The Digital Signature for the EHR	*Laura Patiño*
16:25	Discussion and questions	

16:45	**Break**

PANEL 5: FUNDING OPPORTUNITIES FOR PROJECTS USING ICT FOR GLOBAL HEALTH
Moderator: Magaly Blas

17:00	Concytec-Peru	*Walter Curioso*
17:20	Terms of cooperation within APEC	*Ana Peña-Doig*
17:40	International Development Research Center – IDRC Canada	*Chaitali Sinha*
17:50	ICT and Global Health at NIH	*Laura Povlich*
18:00	Discussion and questions	

MARCH 21ST 2015

8:00   Registro

PANEL 6: TRAINING PROGRAMS FOR GLOBAL HEALTH INFORMATICS RESEARCH
Moderator: Carol Hullín

Time	Title	Presenter
8:30	Translational Informatics for Global Health: An Argentina-Oregon Collaboration	*Paula Otero*
8:50	Enhancing Research Informatics Capacity for Health Information in Colombia - ENRICH	*Fernando Suarez*
9:10	Shared Distributed Learning for Developing Medical Informatics Capacity in Africa	*Richard Scott*
9:30	QUIPU: The Andean Global Health Informatics Research and Training Center	*Patricia García*
9:50		Discusión y preguntas

10:10   **Break**

PANEL 7: PROJECTS SUPPORTED BY THE QUIPU ADVANCED MENTORED RESEARCH AWARDS IN BIOMEDICAL INFORMATICS
Moderator: Miguel Egoávil

Time	Title	Presenter
10:25	TBRed: SMS against TB	*David Requena*
10:45	Soft-Warmi: Automatic evaluation software for the diagnosis of bacterial vaginosis	*Alicia Alva*
11:05	UCINET: The electronic medical record to improve decision-making in the pediatric intensive care unit	*Tommy Prado*
11:25	Diagnostic Validity of an image VIA sent by MMS to cervical cáncer screening	*Roger Ocon*
11:45		Discusión y preguntas

12:00   **Lunch**

PANEL 8: ICTs FOR GLOBAL HEALTH PROJECTS
Moderator: Willy Lescano

Time	Title	Presenter
13:15	Facebook as a tool to promote HIV testing	*Luis Menacho*
13:35	Leveraging technology to improve HIV prevention and care among young men who have sex with men in the United States	*Sara Le Grand*
13:55	Spurring Innovation in Health Informatics in Latin America and the Caribbean	*Patricia Ordoñez*
14:15	Evolution of the TB remote diagnosis system and its extension to other diseases	*Mirko Zimic*
14:35		Discusión y preguntas

PANEL 9: INTEROPERABILITY AND STANDARDS IN E-HEALTH
Moderator: Henry García

Time	Title	Presenter
14:55	HL7 FHIR: The future is today	*Diego Kaminker*
15:15	openEHR: open standard future proof: Aspects of interoperability and modifiability:	*Pablo Pazos*
15:35	Examples of eHealth and mHealth using international platforms	*Joaquin Blaya*
15:55	Information Systems standards interoperability based	*Daniel Luna*
16:15		Discusión y preguntas

16:35   **Break**

PANEL 10: NURSING INFORMATICS
Moderator: Patricia Garcia

Time	Title	Presenter
16:50	Nursing Informatics in Cuba	*Xaily Gavilondo*
17:10	Nursing Informatics in Argentina	*Hugo Leonzio*
17:30	Nursing Informatics in Chile	*Erika Caballero*
17:50		Discusión y preguntas

18:10	Conclusions	*Patricia Garcia*