ICT for Health Program Takes New Direction

Since early 2008, we have been re-shaping and formalizing our Information and Communication Technology (ICT) for Health Program. This article highlights a key moment in the program’s development when, in June of this year, Heather Zornetzer and William Avilés participated in a conference on Health Informatics in the developing world, held in Durban, South Africa.

As Heather Zornetzer, SSI’s ICT Program Coordinator and William Avilés, Director of Informatics at SSI-Nicaragua, sit down for their interview, they blow out a huge breath of air. They just returned from Durban, South Africa, where they participated in a congress related to health informatics in the developing world. “It was a really fascinating week,” Zornetzer said leaning back. “An incredible opportunity - we learned about many different developments in the ‘ICT for Health’ arena. We haven’t yet had time to digest the dozens of ideas that we’ve come back to Nicaragua with,” Avilés said with a smile.

SSI was interested in participating in the congress in order to learn about what others around the world are involved in and to share experiences from Nicaragua. The congress was a combination of three conferences - Health Informatics Service Architecture (HISA), the Open Source Healthcare Alliance (OSCHA) South Africa Chapter, and the OpenMRS consortium (MRS = Medical Record Systems). It lasted five days, with 8-10 hours of formal presentation sessions, workshops and discussion groups per day, as well as several hours of informal networking and ideas exchange outside of the scheduled congress events.

Capacity-Building Program Makes Science Available to Developing Country Researchers

It was another busy year for the Scientific Capacity-Building Program. We held workshops in Bolivia, Ecuador, Namibia, Nicaragua, and Panama, awarded small grants to researchers from Ecuador and Nicaragua, and sent material aid to Ecuador, El Salvador, Guatemala, Nicaragua, and Panama. The training cycle got off to an early start with a manuscript-writing workshop in Quito, Ecuador, in January. Twenty-six participants from various local institutions learned the skills needed to transform their data into publishable material. With hands-on coaching, they produced manuscripts that after a few rounds of editing by SSI volunteer scientists were ready for submission. We expect to see several of these manuscripts published in relevant international or local journals. The second workshop, which took place in March in Panama City, Panama, trained 22 local scientists in grant-writing. Designed to provide trainees with the skills they need to pursue financial support for future research projects, our proposal-writing workshops are instrumental in guaranteeing the sustainability of the scientific endeavors of developing country researchers.

In April, we held our first-ever workshop in Windhoek, Namibia, which was co-sponsored by WHO-AFRO and the CDC and trained 11 scientists from throughout the African continent in manuscript-writing. Because the workshop was so well received, our Scientific Director, Maria

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Team Member and Board of Directors Update

In our tenth year anniversary, we have a lot to report in our personnel department. We are very pleased to announce the internal appointment of Josefinna Coloma as Executive Director. Josefinna, a native Ecuadorian, has worked with Eva Harris in transferring scientific capacity to Latin America since 1992. She has a BS in Biology from the Catholic University in Quito, Ecuador and a PhD in Microbiology and Molecular Genetics from the University of California, Los Angeles. Josefinna helped envision SSI and has served on its Board of Directors since 2000. Josefinna has also served as SSI’s Program Director and Treasurer.

We are also happy to introduce you to several wonderful new team members:
- **Marlon Buitrago.** Prior to joining SSI, Marlon, a native Colombian, worked for walmart.com and Park Lane Hotels International. As our Accounting Consultant, Marlon is ensuring the smooth functioning of our Finance Department.
- **Shauna Giddings.** As our Financial Consultant/Controller, Shauna is overseeing our Finance Department. Shauna comes to SSI with a wealth of international non-profit experience. She previously worked as Room to Read’s Chief Financial Officer.
- **Aubree Gordon.** A doctoral student at UC Berkeley, Aubree has played an integral role in numerous studies of dengue and influenza in Nicaragua. As our Influenza Program Director, Aubree continues this important work.

- **Kate Standish.** Based in Nicaragua, Kate is the new Project Coordinator for the Pediatric Dengue Cohort Study, where she is responsible for the on-site management of the project. She comes to SSI after finishing a Fulbright Fellowship studying HIV risk factors among injection drug users and sex workers along the U.S.-Mexico border in Tijuana. Kate has rapidly integrated herself in the many projects at SSI-Nicaragua and is warmly welcomed by the entire Nicaragua team.
- **Heather Zornetzer.** As our Information and Communication Technology (ICT) Program Coordinator, Heather is facilitating the process of defining the ICT initiative in close collaboration with both the California and Nicaragua SSI offices. Earlier this year, Heather, who is currently completing an MPH at UC Berkeley’s School of Public Health, spent 4 months in Nicaragua working with the ICT team.

In addition to the new faces, one of our most dedicated team members, **Nicole Fitzpatrick** has moved on to follow new paths. Nicole joined us in 2006 when she became the Project Coordinator for the Pediatric Dengue Cohort Study. Based in Managua, Nicaragua, Nicole did a great job managing the project on-site and making sure it met the Pediatric Dengue Vaccine Initiative study objectives. Nicole will be missed by her co-workers and friends at SSI-Nicaragua. We wish her the best of luck in her new endeavors.

Our Board of Directors also saw some changes this year. We said goodbye to Board Member Deborah Lans and welcomed Sondra Schlesinger. Deborah resigned after a move to Seattle prevented her from taking an active role on the board. Sondra, who has extensive experience in virology and science policy, was one of our most enthusiastic and dedicated volunteer grant and manuscript reviewers before joining the board.

Pediatric Dengue Cohort Study Has Another Successful Year

Now entering its fifth consecutive year, the Pediatric Dengue Cohort Study in Nicaragua is reaping the benefits of the previous four years of incredible dedication and innovation on behalf of the entire study team. As with any task, practice makes perfect; thus, the continuous evaluation and improved quality control efforts have paid off, and the study is running more efficiently than ever. The 2007-2008 dengue season was a very busy one, with the study capturing 64 confirmed cases of dengue in children ranging from 3 to 12 years of age. This wrapped up in January 2008 with interesting results: significantly more severe cases than any other study year, and a transition from one clade to a new one within dengue virus serotype 2 responsible for the great majority of the infections. In partnership with the Broad Institute and UC Berkeley, full-genome sequencing and phylogenetic analysis is being performed on all the viruses from the study.

The annual month-long blood sample collection period concluded in August, and the team demonstrated their ever-improving talent in recruiting participants to report to the Health Center at the appointed time and in collecting and managing over 3,800 study participants and blood samples. The Nicaraguan Ministry of Health’s National Virology Laboratory has now finished analyzing these samples together with samples collected from the previous year to determine the number of seroconversions (denoting those children who were exposed to dengue virus during the intervening year).

Finally, the Pediatric Dengue Vaccine Initiative (PDVI) team is thrilled to welcome Kate Standish as the new PDVI Project Coordinator, and to wish Nicole Fitzpatrick a wonderful career and continuing ties to Nicaragua.
Influenza Study Begins to Outline Seasonality

There is one question that picks at the mind of Aubree Gordon, Influenza Program Coordinator at SSI. Does the flu have clear seasonality in Nicaragua? It is the main question of the prospective Influenza Study launched by SSI and the Nicaraguan Ministry of Health in 2007. In the study, which is based on the same cohort of 3,800 children as the Pediatric Dengue Cohort Study (PDCS), the staff collects nasal and throat swabs from children, unlike the PDCS, which collects blood samples. "It's a painless procedure for collecting the samples," Aubree said. If the children meet the criteria and have been sick for four days or less, a nasal and throat swab is collected at the Health Center and sent to the National Virology Laboratory for testing, while a second sample is collected for rapid testing in the Health Center's Clinical Laboratory. The children and families wait for their results, which help dictate what further medical care is needed. The study started a year after a large outbreak of influenza in 2006 that resulted in many cases of pneumonia. "In Managua alone, there were 40,000 cases of influenza-like illness and 14,000 cases of pneumonia in two weeks time," she said. "That made me realize that it was a pretty major problem in Nicaragua, and I also realized that nobody was studying it." At the time, the Nicaraguan National Virology Laboratory had not been able to test for influenza. Now, Aubree said, there is speculation by the US Centers for Disease Control and Prevention (CDC) that the Virology Laboratory has one of the best capacities for testing influenza in Central America. "The majority of surveillance studies have concluded that there was no seasonality of influenza in the tropics. However, in Nicaragua, we've seen what looks like very clear seasonality."

Respiratory diseases, particularly pneumonia, have overtaken diarrheal diseases as the number one killer of children in developing countries. And most cases of pneumonia start with a viral infection such as influenza. Defining the seasonality of influenza in Nicaragua will lead to answers to two questions. The first is what vaccine to use, as there are two types - one developed for the Southern hemisphere and one for the Northern hemisphere. The second question is when to vaccinate. "It has to do with predicting which strain is going to circulate. What goes on in the Southern hemisphere is going to affect the Northern hemisphere the next year and vice versa," Aubree said. The data collected thus far points to using the Southern vaccine. "This is because it is the one available for vaccinating people in April and May, which appears to be the prime time to vaccinate in Nicaragua," explains Aubree. "We are also performing full-length sequencing of influenza virus isolates, which should also help to clarify which vaccine is a better match. Of course, multiple years of data and data throughout the region will be needed to truly answer which vaccine is the best for Nicaragua."

Numerous other scientific questions can also be addressed through the influenza study. For instance, one theory states that the tropics act as a reservoir for influenza. The influenza virus never disappears from the human population; it may just move into the tropics until the conditions are right for another flu epidemic in temperate zones. "The idea is that if you can control influenza in the tropics you can help control the flu worldwide," Aubree explained. "If the tropics do act as a reservoir, then to design the influenza vaccine, it would be especially important to monitor the tropics because that would provide an indication of what type of influenza is going to emerge the next year." Whether or not seasonality in the tropics will answer a health problem for the entire world, the study is an exciting step forward in the epidemiology of influenza and it has provided invaluable support for the Nicaraguan Ministry of Health and management of respiratory diseases in Nicaragua.

Note: We would like to thank Promega and Qiagen, whose generous donations have made this work possible.

Capacity-Building Program..... continued from page 1

Elena Peñaranda, was invited by the CDC to continue working with the group to finalize the manuscripts with the help of a team of volunteer editors. In June, there was another first when we launched a special-topic workshop on bioinformatics in Managua, Nicaragua. The workshop, which was developed by Board Member Christine Rousseau in coordination with Matt Henn from the Broad Institute of Harvard and MIT, was partially sponsored by NeTropica. The workshop successfully trained 27 participants in how to access public-domain data and use phylogenetic programs to perform bioinformatics analysis on sequences generated from local viral genetic material. At the end of the workshop, which focused on both dengue and HIV viral sequences, the participants had learned how to conduct their own analyses. In July, we returned to Panama with a workshop on manuscript-writing that was co-sponsored by SENACYT. To conclude the 2008 training cycle, a final manuscript-writing workshop took place in Cochabamba, Bolivia, in October and was co-sponsored by the Pan American Health Organization. In addition to the workshops, we awarded small grants to Gabriel Trueba from Ecuador and to Sonia Valle and Betzabé Rodríguez from Nicaragua. Gabriel received a grant for his research study titled "Outbreak of leptospirosis in Ecuador in association with the El Niño Southern Oscillation (ENSO)". Sonia and Betzabé each received a small grant to complete the research for their Masters theses, degrees which are being sponsored by SSI via a generous donation from long-term supporter Ernie Ludy. Sonia’s study is on the alimentary preferences of triatomines (the vector of Chagas’ disease) via blood meal identification, while Betzabé’s project focuses on molecular diagnosis of malaria in Nicaragua.
Thank You to Our Volunteers and Donors

**VOLUNTEERS.**


**DONORS.**

ICT for Health Program 

The opportunity to participate in the congress represented a turning point in SSI’s work with ICTs. Originally, informatics solutions were developed and implemented based on the need for better information management requirements for dengue studies that SSI and Ministry of Health (MINSA) partners have been collaborating on since 2004. Much of the initial support, motivation and innovation behind the use of ICTs came from Dr. Guillermima Kuan, Director of the Centro de Salud Sócrates Flores Vivas and Dr. Ángel Balmaseda, Director of the National Virology Laboratory at the Centro Nacional de Diagnóstico y Referencia. Both, as key end-users of information for decision-making in their respective roles, worked directly with SSI’s ICT team to design and test various databases and tools to meet their specific needs. As was emphasized again and again at the Durban conference, this is a story that has occurred in parallel in many countries.

“… We have had people in these isolated silos all over the world developing public health informatics systems without knowing what others in similar situations have been doing to meet the same needs... the result is the existence of multiple parallel systems where limited resources have been invested in duplicate efforts. There really hasn’t been a good forum for people working on the same issues of information management for health in the developing world to share information and experiences - what has worked, lessons learned,” Zornetzer said.

For Avilés, the conference was useful as an opportunity to work with the international community of informatics specialists on both technical and implementation aspects. He had a chance to participate in technical trainings, brainstorming sessions, and breakout groups with counterparts from South Africa, Rwanda, Uganda, Kenya, Malawi, Tanzania, Canada, the United States, Pakistan and Malaysia. Now, SSI’s ICT team, in collaboration with MINSA partners, are strategizing to determine the most useful, applicable and appropriate information management systems to help meet the needs of the various end-users of the many tools and databases in use and under development.

“Stakeholder input on what would work best here is key. It won’t just be William and I sitting down and deciding what’s best.” Zornetzer said. Ideas under consideration include testing new patient health records and laboratory and epidemiology data collection techniques - possibly using mobile applications - as well as trying out open-source web-based systems for the storage and management of that data.

“Contributing to the open-source public health informatics forum is a role that we are realizing that SSI, outside of the PDVI projects, can play in capacity-building for informatics in public health. We were originally just trying to meet our own information management needs for the PDVI project but now we realize that sharing our lessons-learned is a role that SSI may be uniquely able to play, particularly in Latin America.”

Zornetzer and Avilés were sponsored to attend the congress by the South Africa OpenMRS consortium. “It’s normally three separate conferences and three separate groups,” Zornetzer explained. “This was a chance for all three to come together (nearly 500 participants), and share perspectives from each stakeholder group - the technology and informatics side, the healthcare service provider “implementer” side, and the public health policy and planning side.”

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Zornetzer and Avilés, along with the rest of the ICT team, are trying to balance the exciting potential for testing out new technologies and tools in health informatics with the fact that along with new opportunities come many challenges. “Although we have a great team working on informatics, we have some issues to work on - capacity-building specifically - in the short term,” Avilés said. For example, although the team has a wealth of talent and experience, and they have done an incredible amount with very limited resources, the team needs additional systems programming support. Avilés expanded, “One of the immediate benefits of having participated in Durban is the network of contacts that I made with programmers in other parts of the world. I can send an email to a list-serve and ask for support on a specific software issue and I’ll have 3 answers within ½ hour from 3 different perspectives from around the world. This is the direction the community of global public health informatics is going in - boundaries have been removed in terms of access to information and collaboration between people working to solve problems in the developing world.”

One immediate project that SSI is contributing to is the launch of an interactive website where both informatics engineers and health informatics implementers in the developing world will share their experiences in building and using open-source “eHealth” tools. The idea is that this website - which was launched at the Public Health Informatics 2008 conference hosted by the University of Washington on Sept 18-19 - will reduce the amount of duplication and increase the access to eHealth information for others working at this health informatics interface in resource-limited settings. “SSI is now much more active in this global conversation,” Avilés said. “It’s another thing that is coming out of this. Capacity-building in the area of ICT for Health is something for the future, part of our ICT Program’s new direction.”

Dr. Oscar Ortega uses barcode identification to access the electronic records of a patient in the PDVI cohort study
Scientists Without Borders

In an effort to coordinate science-based activities in the developing world, SSI has partnered with Scientists Without Borders (http://scientistswithoutborders.nyas.org). The initiative, which was launched by the New York Academy of Sciences, uses a web portal to coordinate scientific efforts with the aim of addressing health problems in the developing world. The quality of the database, which connects people and projects based on need and available resources, depends on the number of profiles it contains. If you are a scientist or if you represent an organization or project, please take a moment to sign up for this important tool. Remember that as the database grows, so does its potential impact!

**2008-09 Operational Budget**

**Total Budget: $1,415,000**

![Resource Allocation Pie Chart]

- **46%** Nicaragua Dengue Cohort Study
- **16%** Hepatitis C in Egypt
- **10%** Capacity Building
- **10%** ICT for Health
- **9%** Administration and Fundraising
- **5%** Other
- **4%** Influenza Project

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- **Josefina Coloma** - Executive Director
- **Maria Elena Peñaranda** - Scientific Director
- **Marlon Buitrago** - Accounting Consultant
- **Shauna Giddings Schmitz** - Financial Consultant
- **Aubree Gordon** - Influenza Program Coordinator
- **Sonia Noboa** - Administrative and Finance Associate
- **Kara Nygaard** - Program Manager, Hepatitis C Project
- **Martine Zoer** - Fundraising and Publicity Consultant
- **Heather Zornetzer** - ICT Program Coordinator

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**SSI-Egypt**

- **Mar-Jan Ostrowski** - Egypt Program Consultant

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**SSI-Nicaragua**

- **Kate Standish** - PDVI Project Coordinator
- **Mirtha L. Monterrey** - Head Administrator
- **William R. Avilés** - Informatics Director
- **Douglas J. Elizondo** - Informatics Assistant Director
- **Óscar D. Ortega** - Quality Control Director
- **Aldo B. Rocha** - Accountant
- **José Ramón Cisneros** - Administrative Assistant

And the many doctors, nurses, lab technicians, drivers and administrative assistants who participate in our work.

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**SSI News Editor:** Josefina Coloma, Nicole Fitzpatrick, Aubree Gordon, Kathleen Gordon, Eva Harris, Sonia Noboa, Kara Nygaard, Mar-Jan Ostrowski, Maria Elena Peñaranda, Christine Rousseau, Martine Zoer, and Heather Zornetzer

Thanks to all who contributed.

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