

List of Abstracts

1) Factors for successful adaptation of handheld digital devices for health systems in low-income countries - Empirical review of eight projects from Asia and Africa

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Abstract

Introduction: With recent technological advancement, there is growing interest in using handheld digital devices (HDD) such as smart phones and personal digital assistants, for global health projects in low-income countries. Some examples of the application include field data collection, disease surveillance, and diagnostic algorithm for case management. We conducted an empirical review of eight global health projects that used HDD in low-income countries to distill major factors that enhance success of such applications. The findings will inform projects that are considering application of HDD. This research was conducted as part of landscape analysis for the Optimize: Immunization Systems and Technologies for Tomorrow—a WHO-PATH collaborative project funded with grant from the Bill & Melinda Gates Foundation.

Methodology: We identified 33 projects that used HDD in low-income countries between 2001 and 2008 through interview searches and literature reviews. Eight projects were selected for review to provide diversity in project purpose, specific purpose of HDD, and geographical region. We reviewed each project in terms of funding agency, types of hardware, operating system and system architecture, costs, challenges of implementation, and outcomes. Additionally, we conducted key informant interviews with four experts in application of HDD for health care projects in low-income countries.

Results: Key success factors included articulation of need of e-health solutions at the project's design phase, needs-based selection of hardware, attention to user language and literacy, realistic expectations of software development, availability of infrastructure such as electricity, and concentrated and continuous involvement of direct and indirect stakeholders from the design phase.

2) Engaging an Ecosystem of Open Source Solutions in the Achievement of the Millennium Development Goals for Health

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Abstract

The strategic use of information and communication technology to support the achievement of greater efficiency, quality of care, and improved health outcomes has become a focal point of the Millennium Villages Project (MVP). MVP, which operates in 14 village clusters in 10 countries in Africa (See <http://www.millenniumvillages.org/>), has prioritized key interventions that target the achievement of the Millennium Development Goals for Health and a broad range of e- and mHealth technologies to create an ecosystem that can be leveraged to achieve them. The Millennium Global Village-Network (MGV-Net) provides the infrastructure backbone for the implementation of OpenMRS and Open Source mHealth applications. This poster aims to use

early experiences in the development, pilot testing, and early implementation of a vital statistics registry that captures births and deaths for real-time monitoring and decision-making to highlight the opportunities and challenges of an ecosystem approach to eHealth. This system enables both direct input of data to OpenMRS and data collection and uploading through a java-enabled mobile phone platform. A pilot test of the full system is underway in the Millennium Village Cluster in Ruhiira, Uganda.

3) Global HRIS Strengthening

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Abstract

To ensure that the right health care providers are in the right places with the right skills, countries require current, accurate data on human resources for health (HRH). A strong human resources information system (HRIS) enables health care leaders to quickly answer key policy and management questions affecting health care service delivery.

An HRIS is an integrated system for managing information used in HR decision making. A complete HRIS links all HR data from the time professionals enter pre-service training to when they leave the workforce. Many countries already use an HRIS but rely on data that exist in paper form and are stored in different agencies. Putting in place a centralized electronic HRIS achieves the following:

- Improves the accuracy and currency of HRH data
- Tracks people as they move through the health workforce system
- Decreases the labor required to maintain the HRIS
- Enables managers to quickly aggregate, analyze and use data

The Capacity Project has developed free, Open Source HRIS solutions to supply health sector leaders and managers with the information they need to assess HR problems, plan and evaluate solutions, and use data to lead and manage. Our software is distributed under the General Public License (GPL), which means anyone can download our products, use and customize them with no licensing fee.

4) Building a Simpler Clinician Experience in OpenMRS

Authors: Yaw Anokwa, Christian Allen, Chase Yarbrough, Hamish Fraser

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Abstract

Open Medical Record System (OpenMRS) is a community-developed, open-source, enterprise framework that provides a free and flexible system for resource-constrained environments. Our OpenMRS deployment supports two district hospitals and five health clinics in rural Rwanda and is used for tracking over 6000 HIV/TB patients. Unfortunately, the time and training clinicians need to find key patient data using the existing OpenMRS interface has limited the use of the system in directly improving patient care.

To address this problem, we have implemented two features that enable a simplified interface for doctors and nurses. The Patient Lookup Module is used by clinicians to log into OpenMRS and search for patients by name, cohort or location. Once a patient is found, the Patient Summary Module presents only important information like previous diagnoses, symptoms, drug orders, lab tests, alerts and notes in an easy to read, printable format. These two modules were developed iteratively with significant involvement from clinicians and were designed to minimize the complexity of existing interfaces.

Both modules are currently being phased into the clinical workflow at all seven sites in Rwanda. We are also piloting the use of touch screens for clinician input and barcode scanners to scan patient IDs to further simplify the clinician experience.

5) An Innovative Tool for Supporting Quality of Care and Program Reporting: The Haiti HIV Electronic Medical Record Project

Authors: Patrice Joseph[1], Rachele Cassagnol[2], Edieu Louissaint[3], Bill Lober[4], Steve Wagner[4], Christina Quiles[4], Jean Solon Vallès[1], Rogès Lamothe[2], Don Rock Pierre Alexis[5], Nancy Puttkammer[4], Perri Sutton[4], Rachel Labbé Coq[2]

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Abstract

The Haiti Ministry of Health (MSPP), the U.S. Centers for Disease Control and Prevention (CDC), and the International Training & Education Center on HIV (I-TECH) began an HIV electronic medical record system, called iSanté, for Haiti in 2005. The goals of iSanté are to: 1) promote high quality HIV care through readily accessible patient data; 2) ease program monitoring and case surveillance through automated facility reports; and 3) support evidence-based treatment guidelines in Haiti.

The Haiti project first created standardized paper records for HIV treatment programs. Web-based retrospective batch data entry was implemented, followed by migration to a point-of-care data entry interface at some sites where the system is hosted on local servers. Patient data are replicated automatically to a secure central repository to support an integrated national view of care delivery, and to provide off-site backup. Priority next steps include developing interfaces to electronic laboratory and pharmacy systems and creating VCT and PMTCT modules, to expand the utility of the system.

The flexibility of iSanté system architecture has been critical to its scale-up success. As of June, 2008, iSanté is used at more than 30 clinics, capturing records for approximately 20,000 unique patients. Strong investment in IT infrastructure and personnel for data entry, data quality, and IT support was required. In return, the system can markedly decrease time to generate monthly facility reports, and can provide clinicians with instant patient care summaries to guide decision-making. Our experience confirms the importance of locally-felt value for successful system scale-up.

6) Changing the Paradigm of Using Health Information for Better Results

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Abstract

As public health programs in developing countries, especially those dealing with HIV/AIDS, have expanded and matured, monitoring and evaluation systems have evolved in order to fulfill necessary reporting requirements. Much effort is expended to collect population and facility-based data. However, field implementers commonly note that this information is often not used effectively, if at all, for decision-making, a lost opportunity to improve the quality of decisions. Population and health information are valuable not only to decision makers in health but to a wide range of stakeholders, such as policymakers, public health professionals, NGOs, clients and others. When these stakeholders use this information for evidence-based decisions, they help to improve overall health care by increasing the health system's ability to respond to health needs at all levels.

One contributing factor to the lack of use of health data is that often data gathering and analysis are undertaken without a clear focus on the use of the information and with little consultation with those who might benefit from it. This paper describes recent experience in enhancing evidence-based decision making through a change in the paradigm of how data are collected, analyzed, disseminated and used through what we call the "data demand and information use (DDIU)" approach. The DDIU approach takes as a starting point that evidence-based decision making is enhanced by creating a sound demand for population and health information; collecting and analyzing population and health data; making information available to decision makers; and, finally, facilitating the use of information to improve health system performance. To facilitate this paradigm shift, a DDIU conceptual framework was developed and set of supporting tools and approaches to aid policymakers and stakeholders use information were developed. The DDIU framework explains the context in which decisions are made and how this context influences the demand for data, the use of information, and the collection and availability of data. The framework also covers the key determinants for the successful use of population and health information. Supporting DDIU tools include the Decision Calendar, Information Use Mapping, and the Constraints to Data Use tools, among others.

7) Public Health Information Infrastructure for Tribal Communities in Orissa, India:

Understanding the Cultural Factors

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Abstract

Improving public health information infrastructure (PHII) is a major challenge in developing countries. It is a greater challenge in marginalized communities that rely on traditional medical knowledge and practice for their health care. The concept of health and illness are perceived differently in these communities. Their information needs, sources and behavior vary accordingly. PHII projects have to be planned, designed and implemented taking into account the information seeking behavior of the people in these communities. Further, the role of traditional medicine and the associated belief systems is important in planning health information interventions.

The goals of this poster presentation would be three-fold:

1. Illustrate the concepts of health, disease, and illness as perceived by the tribal people of Orissa, India.
2. Highlight the health and health information-seeking behaviors of the tribal people.
3. Present their attitudes towards modern medicine and modern medical practitioners.

The understanding of health information-seeking behaviors of the tribal population would aid in better planning of health information infrastructure to support public health services in these communities. The presentation seeks to promote a discussion of possible strategies and steps to develop a PHII in such marginalized and resource-constrained communities.

8) Geographic Information Systems (GIS) Mapping to Track HIV Infection Rates in Thailand Using Data from Royal Thai Army Recruits 1991-2007

Authors: Sutchana Tabprasit, Nucharee Thongsen, Ekachai Sununtarod, Kitisuk Seakam, Narongrid Sirisopana, Sorachai Nitayaphan, Suebpong Sangkharomya, Carl J. Mason, Julie A. Pavlin

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Abstract

The use of public health information systems has never been more important than in detecting and monitoring infectious disease outbreaks and for evaluating their control measures. Thailand has experienced great success in decreasing rates of human immunodeficiency virus (HIV) infections since the onset of the epidemic. One important measure of HIV rates in the general Thai population comes from the Royal Thai Army (RTA), where all new male recruits are tested for HIV infection. Approximately 60,000 men are recruited into the Army each year, providing a unique random sample of mostly 21 year old men throughout the country. Although recruited from their home province, information is captured on the province and district of residence for the last 2 years. The RTA has maintained a confidential database of HIV infections linked to area of residence since 1991. The rate of HIV infection in this population has declined from 3.0% in 1991 to 0.5% in 2007.

The Armed Forces Research Institute of Medical Sciences (AFRIMS) in Bangkok, Thailand has previously published GIS maps to demonstrate both HIV prevalence in this population throughout the country and the change in prevalence by location from 1991 to 2000 (Torugsa K et al., *Emerg Inf Dis*, 2003;9(7):881-3). We expand this surveillance to 2007 and include the impact of education level and urban vs. rural residence on rates. Analysis of these data demonstrates the use of public health information and analysis systems to support the dissemination of knowledge to improve population health.

9) Global public health surveillance network (GPHSN) based on distributed grid computing technology

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Abstract

Global public health surveillance network, promoting international situational awareness and disease surveillance, has technology needs that must enable efficient, timely and secure flow of relevant information about diseases with serious public health impact, and must address agreed upon International Health Regulations (IHRs). Such a network requires an information architecture that can operate across international boundaries, with robust security, interoperability, the ability to handle large datasets, and economic sustainability.

The grid computing environment offers low-cost high-capacity resources, high-bandwidth networks and mass storage systems that address many of these issues. Specifically, Data Grids provide services and infrastructure to aggregate distributed, heterogeneous data storage and network resources, and data-intense applications, to achieve unified, secure and reliable access to data maintained by individual organizations within a grid. Grid technologies also provide open-source, collaborative frameworks that can operate internationally by creating a global network of grids, enabling federation of databases and services. Thus, distributed computing has the potential to provide a unique solution for achieving the global situational awareness and surveillance goals.

Various data grid architectures, differing in technology models, have been developed and deployed across the world. The US CDC, academic, domestic, and international partners are analyzing the health-related grid models and initiatives to identify those which best serve the global surveillance needs based on the IHRs. The feasible models will be based on the core principles of: long-term sustainability, low barrier to entry; standards-based; reusability; collaboration; open source; and federated infrastructure. This research will potentially inform the development of the GPHSN model.

10) A tool for supporting Laboratory Services: the Haiti Laboratory Information System Project

Authors: John Wesley Nelson[1], Jacques Boncy[2], Rachele Cassagnol[1], Rachel Labbe Coq[1], Rikérdy Frédéric[1], Rogès Lamothe[1], William Lober[3], Christina Quiles[3], Paul Schwartz[3], Perri Sutton[3]

Affiliations: [1] International Training & Education Center on HIV (I-TECH), Haiti; [2] Haiti National Public Health Reference Laboratory; [3] I-TECH, University of Washington, Seattle, WA USA

Abstract

In 2007, the International Training & Education Center on HIV (I-TECH) in conjunction with the Haiti National Public Health Reference Laboratory (LNSP) and the U.S. Centers for Disease Control Global AIDS Program (CDC-GAP) began developing a laboratory information system (LIS) in Haiti. The goals of the LIS are to: 1) support Good Laboratory Practice; 2) support program monitoring through reliable data collection; and 3) ensure timely and accurate laboratory information to support treatment and prevention of HIV/AIDS and other diseases of public health importance.

I-TECH provides assistance for LNSP to convene a LIS working group (LISWG) comprised of representatives of LNSP, CDC-GAP, I-TECH and other local stakeholders. The LISWG serves as the decision-making body throughout the process of LIS implementation. This group has assessed

data management processes and laboratory needs, setting priorities for LIS adoption in Haiti.

Following the assessment, which revealed inadequate and inefficient processes for managing information in clinical laboratories, the LISWG decided a first step in the development of an electronic LIS is the implementation of standardized paper-based registries and tools for tracking specimens and results, and to encourage uniform best practices. The paper tools will facilitate laboratory adoption of a standard data management workflow, and also serve to inform specifications for electronic LIS. The LISWG review of LIS software options concluded with the choice to develop a Haiti adaptation of OpenELIS, an open-source program developed by the Minnesota Public Health Laboratory and the Association of Public Health Laboratory (APHL), which has been implemented in Viet Nam.

11) Integrative Medical Informatics based Decision Support System for Promotive, Preventive & Curative Healthcare Management

Author: Medha Dhurandhar

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Abstract

Being the backbone of any country National healthcare needs to be robust, affordable & far-reaching. According to a WHO report, 42%-70% of worldwide population has used integrative medicine at some point. With today's high stress-induced lifestyle & its impact on the health status, a major technological shift is emerging away from the pure Allopathic treatment to Integrative Medicine, which emphasizes more on prevention than cure. Here we discuss design and development of an Integrative Medical systems based integrated Decision Support System offering a suite of applications covering Encyclopaedia, Constitution Assessment; Diet, Nutrition & Lifestyle Decision Support; Disease Diagnostics & Treatment, and Personal Health Information Management System. Primary objective is to advocate promotive, preventive & curative healthcare management. Target end-users include Govt., NGOs, hospitals, researchers and public at large. Export-import utilities developed for data exchange help boost collaborative research & consultancy. System deploys Data Mining techniques for trend/predictive analyses to help manage outbreaks & generate evidence-base for efficacy, safety of such medical systems. Deployment is through internet, public kiosks, mobile phones with a block-district-state-centre-based hierarchical model. Besides empowering physicians in giving personalized treatment, such cost-effective tools with knowledge repositories can also help educate households on health hazards and promotive & preventive healthcare measures. Inclusion of non-allopathic practitioners ensures major chunk of e-Health records especially in the developing countries. With holistic view of data & availability of such effective tools policy-planners & practitioners can form proactive strategies & do rapid decision-making for reduction in morbidity, mortality rates and improvement in quality of life.

12) A Process for Developing Collaborative Portals for International Biomedical Research Collaborations

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USA; [2] Seattle Biomedical Research Institute, Seattle, WA USA

Abstract

Biomedical researchers working with international research partners in low-resource countries struggle to collaborate effectively. The overhead of managing these collaborations can leave participants frustrated and interfere with scientific progress. Collaborative portals, accessible via internet browsers, can reduce the financial and logistical burden of international research collaborations.

At Fred Hutchinson Cancer Research Center and Seattle Biomedical Research Institute, information services teams comprised of librarians and computer programmers are developing collaborative portals using Microsoft Office SharePoint Server. These portals are designed to provide international research teams with a shared space for collaboration.

As librarians trained in user needs assessment, we have focused on developing portals that meet the basic needs of our users. These needs fall into the following categories:

1. Communication
2. Collaboration
3. Artifact organization and recall
4. Tracking of progress, tasks and transferred materials

A portal that meets those four basic needs will provide much-needed support for research scientists, allowing them to spend less time on managing their collaborations and more time moving their science forward.

Our poster will focus on the process of developing a collaborative portal to meet those needs, taking into account local technology infrastructure as well as the technology skill levels of all users. We will explain the iterative development process we follow to create a portal, from the user needs assessment through usability testing and the development of a communications, training and roll-out plan.

13) Using Open Source Tools for Implementing Laboratory Information Systems in Vietnam: Experiences with Developing Strategic Partnerships and Building Scalable Solutions

Authors: Reshma Kakkar[1], Michelle M. Meiggs[2], Bao An[3], Cuong Quoc Nguyen[4], Long Van Nguyen[1], Gary L. Jones[5], Christina Tamondong[5], Steven S. Yoon[6], Ritu Shrivastava[1], Mitchell I. Wolfe[1]

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Abstract

Use of laboratory data for making informed decisions about patient care is critical; effective management of these data have proved challenging in Vietnam with redundant paper-based methods dominating. The increased demand for laboratory services with the substantial scale

up of HIV/AIDS case identification, care and treatment but limited technical infrastructure and human capacity in laboratories has required laboratories to look for data management solutions that are appropriate and sustainable.

Taking advantage of strong IT capacity in Vietnam's private sector and the rapid diffusion of computer technology, an open source laboratory information system (LIS) developed by a consortium of state laboratories in the US was selected by US and Vietnam governments and a Vietnam vendor chosen for localization and customization. The MOH was receptive as this approach allowed for the use of non proprietary tools and enabled technical decisions to be made in-country.

The LIS has been successfully implemented at two sites and 40 laboratory staff have been trained in its use. The commitment of the MOH has been crucial. The implementation process has created a cadre of experts in Vietnam in a unique position to further enhance the LIS tool, expand its use nationally and integrate it with other healthcare systems using affordable, in-country resources.

Laboratories considering LIS should evaluate partnerships with in-country software developers and international counterparts to use open source tools. This has resulted in greater flexibility in implementation and building in-country capacity in Vietnam. Additionally implementing through MOH partners has been critical for system acceptability and growth.

14) Building a mobile phone-based support tool for community health workers

Authors: Brian DeRenzi, Neal Lesh, Anita Katusiime, Alex Kakama, Gayo Mhila, Patricia Mechael, Tapan Parikh, Gaetano Borriello

Affiliation: Computer Science & Engineering, University of Washington, Seattle, WA USA

Abstract

Community health workers (CHWs) can play a vital role in serving poor and rural populations. For these populations, home visits from CHWs are often the only contact with the national health system. CHWs are typically in the best position to promote preventive care and convey important health information. However, CHWs often receive little medical training, have high turnover, and rarely have their knowledge reinforced or supervised once they are working in the field. They also typically lack effective tools required to maintain the longitudinal records required to provide effective care. Finally, while living in the communities they serve is the key to the effectiveness of CHWs, it also makes community health programs extremely difficult to organize and manage.

We present CommCare, a phone-based application designed to support CHWs during home visits. CommCare will include household visit tracking, data collection support, management of follow-ups, health protocols and a day planning section to help the CHW manage his/her day. With CommCare, CHWs can capture and aggregate the data they collect remotely while enabling supervisors to visualize and manage the activities of the CHWs in the field. We will present the findings from two months of field-based development of CommCare at the Millennium Villages Project (MVP) in Ruhira, Uganda. We will report on focus group sessions with CHWs

from BRAC and Pathfinder in Tanzania as well as the CHWs in Uganda. We will also discuss the interface for managing household visits and day plans that will arise from our planned participatory design working closely with 3-5 CHWs in Uganda.

15) Can an Electronic Medical Record System Improve Health Care in Lusaka, Zambia?

Authors: Gordon Cressman, Chris Kelley, Eileen Reynolds, Niamh Darcy, Pablo Detefanis

Affiliation: Research Triangle Institute International, International Development Group, Research Triangle Park, NC USA

Abstract

The Bill & Melinda Gates Foundation funded development of a networked electronic medical record system for public health facilities in Lusaka to improve health care and provide valuable data for health surveillance and research.

A mixture of technologies was used to interconnect 24 public health clinics and the referral hospital for data and voice communications. A centralized data center was developed within a non-governmental organization. Electronic patient records and referral systems were developed using open source software in close collaboration with Zambian and American clinicians and physicians. Local personnel were trained to support the system. More than 800 medical personnel were trained to use the software. Senior medical advisors and researchers are using the data to monitor adherence to treatment protocols, to coach clinical teams, and to monitor health and treatment trends.

The integrated patient records and referral system has been in used since February 2006. All 24 clinics and the referral hospital now use the system to provide health care to more than 155,000 patients. More than 5,000 new antenatal patients are registered in the system each month. Results indicate that automated rules-based care and supportive supervision have improved the quality of care. While overall availability of the data and voice communications network has been high for extended periods, lightening, extended power failures, and contention for technical support personnel posed challenges. Ongoing adjustments include development of offline operation, use of low power computing equipment, and integration of new international standards.

16) Evaluation of a Short-Messaging System (SMS)-Based Telemedicine Service in the Philippines

Authors: Alex I. Gavino, Pia Athena P. Tolentino, Alexandra Belle S. Bernal, Alvin B. Marcelo

Affiliation: National Telehealth Center, University of the Philippines, Manila, Philippines

Abstract

The Philippines is the 'texting capital of the world' with more than one billion text messages being sent daily through its three cellular networks. A previous telemedicine project which deployed workstations and broadband to satellite health facilities was not accumulating enough referrals from the field to the central operations facility to justify the investments. A post-project analysis revealed that the technology was not responsive to the workflow of the physicians as well as intrusive to their accustomed methods. It also had several network interfaces which could fail at any point in time. The central operations team decided to recognize the cultural

aspects of telereferral in the Philippine healthcare system as well as use technology that is well fit to the relatively low-tech conditions of the field physicians. This paper describes a six-month experience of a short messaging system (SMS)-based between thirty-four field doctors with that of a central telehealth facility. Parameters such as message/referral quality, field doctor satisfaction, and central expert satisfaction, among others, were measured.

17) Electronic Patient Records for Child Immunizations in Ghana's Sene District

Authors: Anthony Ofori[1], Anthony Draye[2]

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Abstract

In Ghana's Sene District, Dr. Anthony Ofori of the Ghana Health Service realized that for tracking children through the standard round of immunizations, the district's information system had many costs but did not improve service delivery. The cumbersome, paper-based data collection created inefficiencies in service delivery and did not improve decision making or performance analysis. The district began an information systems project to improve the situation.

For the child immunization program, the district wanted to answer two crucial questions:

1. At the district level, the administration wanted to know how many children had completed the full round of immunizations.
2. At the community level, the nurses who delivered the immunizations wanted to know which children had not completed the full round and were in danger of dropping out of the program.

The district decided that a system of electronic patient records which contained each child's immunization history would most efficiently provide answers to these crucial questions. With the aid of an information technology consultant, the district deployed PDAs to the nurses who administered child immunizations. The nurses received training on creating the patient records on the PDA, searching for a child's record, and updating the record as new immunizations were administered. Regular synchronization of the PDAs with a central database for the district enabled quick and accurate reports of district-wide performance.

Future work will build on the foundation of the electronic patient record system to include PDA-based programs for tracking antenatal visits, family planning activities, births, and postnatal care.

18) Using an electronic medical record system in a rural HIV clinic in Uganda to identify and track patients lost to follow-up in real time

Authors: Nicholas Musinguzi[1], Elvin H. Geng[2], David R. Bangsberg[2], Nneka Emenyonu[2], Bosco Mwebwesa Bwana[2], Winnie Muyindike[1], Jeffrey N. Martin[2]

Affiliations: [1] Mbarara University of Science & Technology, Mbarara, Uganda; [2] University of California, San Francisco USA

Abstract

Electronic medical records systems (EMRS) can help HIV treatment programs in resource-limited settings (RLS) produce monitoring and evaluation indicators in real time. Here we describe feasibility and outcomes of using an EMRS in identifying and seeking patients

lost to follow-up. **Methods:** Using an open-source medical record system (OpenMRS) in a HIV treatment program in Mbarara, Uganda, we captured all clinic visits by patients taking antiretroviral therapy. Monthly query of the database identified patients who were absent from clinic for at least 6 months and deemed “lost.” A health care educator then sought for these patients in the community. Predictors of death among those lost and sought were analyzed with a Cox model. **Results:** Between July 1, 2006 and September 1, 2007, 829 of 3628 patients who started antiretrovirals after January 1, 2004 were lost. The cumulative incidence of loss was 15.7% at one year. The tracker determined vital status in 111/128 (87%) patients sought, of which 32 were dead (cumulative 1-year incidence of 31%). The most common reasons for loss were lack of transportation (50%), lack of money (35%), child-care (27%) and work responsibilities (22%). Among those lost who were sought (n=128), a Cox model found that adjusted for sex and age, a baseline CD4+ T-cells rise of 50/cc3 conferred a 38% reduction in the hazard for death (p=0.008). **Conclusions:** EMRS can be used in RLS to strengthen monitoring and evaluation of HIV treatment programs by identifying lost patients and those at highest risk of death in real time.

19) The Mosoriot Medical Records System: Experiences in supporting and maintaining an electronic medical record system for clinical use and public health practice in rural Western Kenya

Authors: Chrispinus J. Simiyu, Joseph K. Rotich, Terry J. Hannan, Wilson W. Odero, Lameck O. Diero, John K. Bii, Burke W. Mamlin, John E. Sidle, William M. Tierney

Chrispinus J. Simiyu[1], Joseph K. Rotich[3], Terry J. Hannan[2], Wilson W. Odero[4], Lameck O. Diero[3], John K. Bii[3], Burke W. Mamlin[2], John E. Sidle[2,3], William M. Tierney[2]

Affiliations: [1] Academic Model for Prevention and Treatment of HIV/AIDS (AMPATH), Moi University, Eldoret, Kenya; [2] Indiana University School of Medicine and The Regenstrief Institute, Indianapolis, IN USA; [3] Moi University schools of Medicine & Public Health, Eldoret, Kenya; [4] Maseno University School of Public Health & Community Development, Kenya

Abstract

Introduction: Mosoriot Medical Records System (MMRS) was developed by the collaboration between Moi University Schools of Medicine and Public Health and Indiana University School of Medicine.

Objective: We describe our experiences in supporting and maintaining the MMRS.

Methods: MMRS was first installed in a rural health center in Western Kenya in 1999. The facility is also a sentinel surveillance site for HIV. The entire design and implementation process was participatory, with a multi-disciplinary team comprising healthcare professionals, facility administrators, record-keepers, informaticians and programmers. MMRS is used for clinical care, public health practice and research. It has evolved to include new components like epidemiologic research in trauma, acute respiratory infections and HIV care. It also provides reporting functionality for the Ministry of Health.

Results: MMRS stores data on antenatal care, child welfare, family planning, immunizations, labs, billing, medications, injury surveillance and other diagnoses. Challenges in supporting and maintaining the system include funding, changing data reporting needs, changing leadership at

the facility, inadequate infrastructure, lack of resident technical support personnel and limited government support. Despite these challenges, the MMRS has been in continuing operation for 7 years and contains over 350,000 visit records for 101,000 patients.

Conclusion: Successful implementation of an electronic medical records system in resource-constrained settings should focus on empowering the locals to support the system, and employing appropriate technologies that can be supported locally. Participatory approach to implementation enhances end-user interest and potential for system sustainability.

20) E-Learning for Health for Community Health Workers in the Philippines

Authors: Alvin B. Marcelo, Hypte Raymund V. Aujero

Affiliation: National Telehealth Center, University of the Philippines, Manila, Philippines

Abstract

The Philippines, composed of 7107 islands, is suffering from inequitable resource distribution, specially in the health sector. Aside from the remoteness and isolation of thousands of communities and the concentration of health professionals in urban centers, migration of health workers particularly physicians and nurses add to the burden. It is therefore the community health workers, called barangay health workers (BHW), that bear the brunt. These BHWs, often volunteers and lacking formal health education, are the front liners in giving basic health care in their communities and are also the foot soldiers of the government in implementing and monitoring its various health-related programs.

The University of the Philippines' National Telehealth Center (NThC) whose mandate is to apply Information and Communication Technology in delivering health care in underserved areas, utilized E-learning or "remote professional learning and competence monitoring" in capacity-building of the BHWs. With these workers in mind, NThC partnered with USAID, and the UP Multimedia Center to produce short instructional videos on initial management of childhood poisoning, tuberculosis, stroke, and avian flu. These videos are available for downloading at NThC's website (www.telehealth.ph). Special screenings were arranged with five communities in various provinces wherein the participants were able to have a live open forum with a specialist on the topic from the Philippine General Hospital through the internet using Skype (www.skype.com). Pre-test, post-tests, and surveys given in these screenings showed that the e-learning activity is an effective way in enriching their knowledge and skills.

21) Challenges, Opportunities and Lessons Learned: Piloting Multi-Institutional Implementation of Information and Communication Technologies (ICT) for Health in Nicaragua

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Abstract

Since 2004, various low-cost Information and Communication Technology (ICT) components for improved public health have been developed, tested, and implemented in Managua, Nicaragua, in collaboration with the University of California, Berkeley, and the Nicaraguan Ministry of Health, including the National Epidemiology and Surveillance Branch, the National Center for Diagnostics and Reference, Managua's regional public health system, the national pediatric reference hospital and the public sector health center, Centro de Salud Sócrates Flores Vivas. Here we present challenges, opportunities and lessons learned from the use of the following ICT components: 1) GIS mapping of patient populations to facilitate home-visit follow-ups during both annual disease surveillance sampling, the annual vaccination campaign, and high-risk pregnancy check-ups; 2) Handheld personal data assistants (PDAs) to facilitate paperless data entry and patient record and biological specimen verification and tracking (using unique identification numbers and barcode scanning); 3) In-clinic patient identification and verification systems (fingerprint and barcode scanning) linked to electronic medical records, allowing for streamlined access to clinical history and patient information; 4) Low-cost communication systems between the various team members and sites involved with clinical, laboratory and epidemiological studies; 5) Electronic document back-up (digital scanning) and double data entry for improved quality control; and 6) Computerized information management systems with linkable modules for information access and control by multiple end-users. These systems are being expanded and developed as open source web-based platforms to facilitate streamlining the national immunization system, monitoring high-risk pregnancies and chronic diseases, and developing a national laboratory information management system.

22) A new approach to bridging the gap between ICT software component developers and international development fieldworkers in the health sector

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Abstract

Tremendous innovation is going into the development and implementation of new information and communication technology (ICT) applications for health care in low-income regions, especially in the open source software development community. While these ICT components can have substantial positive impacts on health outcomes, a significant challenge has resulted from the sheer volume of software solutions now available: organizations and institutions working in the health and development sector have a difficult time finding and assessing the utility of a particular software solution and determining how mature, useable, or scalable it may be. Here we present and solicit feedback on eHealth.OurExchange.org as an attempt to address this problem. eHealth.OurExchange.org will provide a dynamic, collaborative, user-friendly website forum where software developers and fieldworkers in the health and development sector can share

their successes and failures about the life cycle of various open source software solutions (from development to implementation and evaluation). The goal is to promote communication and synergy between communities using or developing ICTs for health, and avoid wasting time and limited resources on duplicate efforts. eHealth.OurExchange.org can serve these various user groups in a variety of ways: software developers describing their technologies in detail and getting feedback on how to improve them; health care providers and fieldworkers in international development publishing and extracting “lessons learned” from others in similar positions; and funders and program managers assessing risks and rewards of investing in various kinds of solutions.

23) AIDS Mortality Clusters in Texas Counties: The Application of Public Health Informatics in Improving Health by Identifying Health Disparities in Demographic Groups

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Abstract

Background: In 2000, HIV infection surpassed other diseases to become the world’s leading infectious cause of adult mortality. More than 90% of deaths happened in poor resource settings in the world due to high cost of highly-active antiretroviral therapy (HAART) and lack of health infrastructure necessary to use HAART. In the U.S., AIDS is a major health concern with increasing mortality in Texas paralleling national trends. This study sought to analyze spatial and temporal trends of potential clustering of HIV/AIDS mortality in Texas counties, and determine if detected trends vary by demographic groups across different time periods. **Method:** Spatial and Temporal Scan Statistics were employed to determine excessive geographic and time trends of AIDS mortality in 254 Texas counties between 1999-2003, verify whether excess mortality existed and its potential continuation to the present. **Results:** In the 5 year study period 5,266 deaths attributable to HIV/AIDS occurred in Texas. Several mortality clusters were identified. In Hispanics, excess mortality existed between 2002-2003 in Central to Southeast Texas(Centered in Austin County). Several likely mortality clusters occurred in the past (1999-2000) in two racial groups. Blacks had the highest mortality rate in Harris and Anderson Counties. Whites had the highest in Dallas County, followed by Southeast Texas (Centered in Chambers County). **Conclusion:** AIDS mortality disparities of spatial and temporal variations exist in diverse populations in Texas. Applying public health informatics tools such as spatiotemporal analysis can improve health in low resource areas by detecting or predicting likely mortality clusters.

24) Open Source Public Health Information Systems in Moçambique and Zimbabwe

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Abstract

Public health information systems are often difficult to implement in developing countries, among other things, because of the lack of computerized information systems to collect, collate, integrate and transmit health information. Free and open source software (FOSS) and systems have several advantages relevant to developing countries including potential cost reduction and, perhaps most importantly, a meaningful contribution to development and capacity building. We have initiated the Open Architecture, Standards and Information Systems (OASIS) for healthcare project to develop infrastructure supporting public health information systems. The OASIS project aims to promote the adoption of open standards for healthcare and incorporation into systems using open architectures and interfaces and open source software. We are presently working on the adoption of open standards and are developing an OASIS FOSS Interoperability Laboratory (FOSSIL) to develop and document well-defined interfaces between open source applications. To date, we have integrated OpenMRS, an open source electronic medical record application (www.openmrs.org) with DHIS (District health Information System) version 1.4 (www.hisp.org) and are working on others. We are also developing local African capacity by offering scholarships to African developers to work on relevant modules for OpenMRS in a program which is similar to the Google Summer of Code. Here we describe the results of initial work carried out in Moçambique and Zimbabwe.

The OASIS project is supported by a grant from the International Development Research Center (www.idrc.ca), Canada.

25) Information Needs and Watering Holes: Lessons from 25 countries

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Abstract

Where do people go to find information? What sort of information do they most require? What kind of information do people look for using Information and Communication Technology (ICT)? How can we best improve people's access to information through the use of ICT? What information around health do people seek? Where do they go to find it?

These are the kinds of things, our landscape study of 25 countries answers. Based on fieldwork in 25 developing countries across the world, we aim to understand how diverse populations can and do access and use ICT to improve their lives along with factors affecting the availability and use of ICT.

In partnership with local research partner teams we conduct primary research to first map the public access to ICT landscape in each country and then to engage in a comparative analysis of the nature of public access in our sample countries. Through this process we outline the factors such as physical access to technology, affordability of technology, training available, social and

cultural factors, local and political environment that influence the use of public access venues that offer information, particularly through ICT.

Our study is unique in that we focus on two kinds of venues – ones where information is a core function (e.g. libraries) whether or not they provide access to ICT; and other venues that provide public access to ICT but where information is not the core function (e.g. telecentres and cybercafés)

Through this study we can effectively map the information needs of people and where they go to find this information and provide recommendations to strengthen these institutions providing public access to ICT.

26) PakPHIN - Pakistan Public Health Information Network

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Abstract

The Pakistan Public Health Information Network (PakPHIN) is an integrated Healthcare IT environment that provides Disease Surveillance and Disaster Response, covers both Chronic and Acute care environments, and is designed for both connected and isolated operations.

PakPHIN consists of:

1. A Central Code Server (CCS), a central control and communication node designed to allow authorized users to manage the overall capabilities of the PakPHIN system. CCS controls what the PakPHIN users can and cannot do and includes portal functionality such as sections to list events, personalized contact lists for each user, forums where users can discuss important issues and challenges and exchange knowledge.
2. Report and Relay Server (RRS) which allows authorized users to generate statistical reports based on data from ELM, MRS nodes and provides rich reporting capabilities.
3. Disease Reporting Module (DRM), designed to collect the patient demographic and clinical information to enable large scale disease surveillance. The DRM is used exclusively for disease and injury reporting.

27) Integrating health research information systems with routine patient care

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Abstract

International health development projects that fail to integrate with existing health systems often implement vertical information systems (HISs), compete for resources and attention, ignore local needs, and become unsustainable. Health research projects in low-resource settings must avoid similar pitfalls and use research funds in support of sustainable development. Successful research projects consider the impact of their operations on routine patient care and routine HISs during and beyond the duration of the research, realizing that there is significant common ground

between health research and routine patient care.

These are lessons learned through the International Epidemiological Databases to Evaluate AIDS - Central Africa research project, which has been monitoring patients under ARV treatment in the Democratic Republic of Congo, Cameroon, and Burundi since February 2007. This project initially sought to abstract data from existing medical records, but such paper forms or electronic records were either lacking or the data in them was of poor quality. Participating facilities embraced the introduction of the project's research data collection forms and electronic Data Management System (DMS) as they improved the accuracy of patient data. Many health facilities voluntarily decided to adopt these instruments as their routine medical record system.

DMSs intended for research should also provide data outputs to meet basic routine clinical information needs and donor agency requirements. There are strong synergies between research HISs and routine patient HISs. The first can be used to improve routine patient care, while strengthening the latter supports the future availability of data for research purposes.

28) HealthQuilt - A Texas Health Information Exchange in the Greater Houston Area Center

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Abstract

The HealthQuilt (Health Quality and Interoperability Laboratory for Training) Project is among the first pilot projects in the state of Texas that addresses Health Information Exchange. HealthQuilt is funded to pilot a prototype health information exchange for the City of Houston and Greater Harris County area. The purposes of the HealthQuilt project are to develop a 'network of networks' communication model, equip fifty health homes with standards of practice to address challenges of health data exchange, including issues of manual data input, disparate data sources, and duplicate records and health information. The HealthQuilt Project applies a systematic 'health home' model implemented in three levels. The first level provides community emergency education tools and awareness of the 2-1-1 system for emergency preparedness by increasing enrollment in the 2-1-1 "Ride to Safety" program and developing methods to make core health information available during a disaster. Level two focuses on the exchange of information from discrete systems for multi-site viewing availability (e.g., laboratory information, imaging) and integration of data from clinical systems into a public reporting system (immunizations). The third level is a total quality management program that includes physician practice based CME and peer review, 24/7 availability of information, a model for on-demand specialty care access to practitioners, and an assurance of outcomes collection from a patient centered approach. HealthQuilt affords an opportunity for technical proof of concept for establishing a sustainable health information exchange in Houston.

29) Public Health Information System for Child Delivery in an Institutional Setting in Rural India

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Abstract

Every year, India accounts for more than 20% of the global maternal and child deaths, and also records 20% of births worldwide. The maternal mortality ratio in India is 540 maternal deaths per 100,000 live births, rising to 619 in rural areas. The maternal mortality ratio is especially high in rural India, with 619 deaths reported per 100,000 births. (1) We propose a health information system to support and promote institutional child deliveries in rural India. The objectives of the information system would be to register pregnant mothers, to monitor and track their health status, to assist health workers in providing screening and referral services, and to support policy development. The goal of the system is to increase institutional births and to enable continuum of care in rural India.

We will present the detailed scope of the system, requirements analysis for designing and developing the system and the barriers for implementing and using such a system. The presentation will include stakeholder analysis, use case perspectives and scenarios, and potential issues and obstacles. The current state of the system in terms of flow of health services and health care data would be presented along with the data and information flows with the implementation of the proposed information system.

(1) http://www.unicef.org/india/health_1341.htm