As technology becomes more pervasive in our world, it is also reshaping healthcare. With the enactment of the American Recovery and Reinvestment Act of 2009 (ARRA), there has been an increased focus on how technology can be used to make healthcare more accessible and cost-effective. Specifically, the ARRA provides financial incentives to healthcare providers, including health center program grantees, to implement electronic health records (EHRs). However, the “goal is not adoption alone but meaningful use of EHRs – that is, their use by providers to achieve significant improvements in care” (Blumenthal & Tavenner, 2010). According to the Health Resources and Services Administration (HRSA) website “effective use of electronic health records is a must for safety-net health care providers. Implementing Health IT can improve the quality and safety of patient care.” The purpose of developing a health information technology infrastructure is to improve care coordination, engage patients and their families, ensure adequate privacy and security, reduce health disparities, and improve population and public health.

Those same goals apply to all means of technological applications and investments in healthcare. Around the U.S. and the world, innovative solutions like mobile health applications and technology-based telehealth infrastructure are improving access to care through increased patient-provider communication, self-management and homecare, preventative health solutions and improved public health.

This issue of *Migrant Health Newsline* highlights various examples of how health centers and health organizations are seeking to apply innovative solutions to address the needs of the communities they serve and improve access to care. Also included are several resources to facilitate the implementation of technological solutions in the health center and health organization setting.

### Exploring the Power of mHealth for Accessible, Affordable and Quality Healthcare for Farmworkers

*By Viraj Bhise, PhD Student, School of Public Health, University of Texas Health Science Center at Houston*

The healthcare industry globally is being bombarded with consumer-focused, technology-based transforming innovations. Recent advances in information technology and communications infrastructure have opened up new and unique opportunities to deliver care to inaccessible populations. Innovative healthcare delivery models involving the use of cell phones, hand-held devices and tablets, or “mHealth”, have been tremendously successful in providing care in remote areas of Africa, South Asia and South America. mHealth is defined as the use of mobile and wireless devices to improve health outcomes, healthcare services and health research. Most of these models are geared toward improvement in delivering care, enhancing operations, changing behavior and regulating performance. Surprisingly, most Western European countries and the United States have been relatively slow in adapting these innovations. Nevertheless, the nation-wide coverage of cellular networks, the widespread use of the cell phone and the relatively low costs of implementing such technologies make mHealth an attractive proposition for delivering care in more remote locations to populations who lack access to care, such as migrant and seasonal farmworkers in the United States.

An mHealth application refers to a technology enabled two-way communication platform that can share health related information to enable delivery of diagnostic, preventive, curative or health promotional services. Most mHealth applications use text or SMS-based systems, data capabilities (GPRS, 3G or 4G), USSD modes (Unstructured Supplementary Service Data) or a combination of these. Most of these models are supplemented by a web application using the internet. Though there has been some progress in adapting technology for delivering care to farmworkers, we are a long way away from addressing this population’s need.

Migrant and seasonal farmworkers in the

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United States face the enormous challenges of working in a hazardous industry and having limited or no access to healthcare services. Linguistic and cultural differences from the majority population, low educational attainment, frequent moving, inadequate transportation, financial strains, lack of health insurance, lack of documentation, and a limited number of health care facilities are enormous challenges in delivering care to this population. A recent study by Price et. al. (2013) amongst farmworkers in South Carolina suggested that 81% of the farmworkers owned a cell phone, of which almost 50% were smartphones. The survey also highlighted that all farmworkers who owned a cell phone were willing to use mHealth applications. Successful mHealth-based healthcare delivery models particularly from Asia and Africa can provide valuable lessons in delivering cost-effective healthcare services to the migrant farmworker population.

Tele-care and tele-diagnosis (providing healthcare care or a medical diagnosis remotely) are areas that have shown tremendous potential for primary care. For instance, World Health Partners, a non-governmental organization in India, provides healthcare delivery services to a remote population using technology enabled clinics or “Sky Clinics”. Patients visiting these clinics connect to trained physicians and healthcare professionals more than 1000 miles away, using audio-visual technology like Skype™. These consultations also include remote examinations using a specialized stethoscope, electrocardiograms, imaging and prescriptions. Similar technologies can significantly enhance access for farmworkers.

Chronic disease management is another domain where mHealth can be applied. Text-based or Integrated Voice-Response Systems (IVRS), involving either an automated call or a text to the patient, are being used to enhance medication adherence, regular follow-up, and health promotion and education. Peritoneal Dialysis (PD) is a home-based procedure conducted by patients with severe kidney disease using mHealth. The PD remote monitoring system connects geographically isolated patients and facilitates constant communication with the medical staff. The use of such real-time patient monitoring, image capturing, video-conferencing and real-time patient monitoring for physicians have contributed to better health outcomes, especially in rural patients (Nayak, Karopadi, Antony, Sreepada & Nayak, 2012).

Community Health Worker (CHW) mHealth models have also been very popular in other parts of the world. For instance, Aman Foundation in Pakistan uses an innovative tablet-based platform to deliver health services to more than 50,000 people with the help of trained CHWs. Patients are able to receive a high quality of care right at their door step using a tablet application in their language of choice. The application incorporates clinical decision support and uses simple algorithms to aid in diagnosis and treatment. It also enables real-time data collection and captures Geographic Information System (GIS) coordinates to obtain regional trends. Such “e-health governance” models can enable real-time disease surveillance, epidemic management and enhance well-being in any population. The model has had a positive impact on maternal and child health, infectious diseases and chronic disease management. Implementing similar CHW-based models for migrant farmworkers will be the way forward. One benefit could be the real-time monitoring and surveillance of occupational injuries and poisoning.

Understanding the limitations and challenges of designing and implementing mHealth solutions for any population is crucial to the success of an mHealth program. An intricate analysis of the community’s needs and defining the scope of the mHealth application are foundational to long term sustainability and effectiveness. Other areas requiring attention are user preferences and attitudes towards technology, training requirements, payment and reimbursement mechanisms for tele-care, and liability management. Nevertheless, the extremely low initial and maintenance cost of mHealth makes it extremely attractive. Implementation and deployment related costs and project data from some community-based interventions have been as low as $1 per individual.

A well-coordinated effort between healthcare providers, farmworker organizations, technology developers and policy makers is needed to promote further implementation of mHealth innovations that will improve access and delivery of care to migrant and seasonal farmworkers. Such innovations can lead to a more equitable and cost-effective health care system for all.

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For more information, contact Viraj Bhise.
Reaching Out With Technology: Telehealth Assists Farmworkers
By Mary Zelazny, CEO, Finger Lakes Community Health

Francisco, a 46 year old migrant farmworker, was almost blind. His uncontrolled diabetes had caused several health problems, including his rapidly deteriorating eyesight that had jeopardized his ability to work. Francisco came into our health center hoping that the doctor would be able to help him. Once the provider evaluated Francisco, he immediately ordered that a diabetic retinopathy image be done to determine the extent of the damage to his retina. The image was taken right at the health center and transmitted to an eye specialist to interpret. The following day, the eye specialist notified the health center provider that Francisco needed emergency laser surgery if his eyesight was to be saved. Francisco and his advocate from the health center made the trip to the ophthalmologist where emergency laser surgery was done. Francisco’s left eyesight was saved; but he lost vision in his right eye. If he had waited even a couple of weeks, he would have lost his vision completely. The retinopathy equipment that was used on Francisco at the health center utilizes telehealth technology to connect the patient to an eye specialist that is hundreds of miles away.

In most rural communities across the United States, the lack of access to quality healthcare has created health disparities due to a shortage of primary care providers, specialists and other clinicians available to provide routine healthcare services. According to a study done by UnitedHealth Center for Reform and Modernization (2011), “rural Americans already are more likely to suffer from chronic health conditions and face greater difficulty accessing quality healthcare than urban counterparts.” Migrant and seasonal farmworkers, most of whom reside in rural areas, are subject to those same disparities, but with additional barriers such as lack of transportation, language, difficulty navigating the healthcare system, and isolation. Studies conducted over the last decade have consistently demonstrated that telehealth technology is a tool that can bridge that gap for rural communities, providing a link to the more urban centers where most of our healthcare resources reside. The Rural Assistance Center defines telehealth as “an umbrella term for delivering health services and information using electronic methods. It can include physicians discussing a patient’s illness by telephone, video conferencing between health facilities, and even remote surgical procedures” (RAC, 2014).

Finger Lakes Community Health (FLCH) serves an area that covers several counties of Western New York State. Named for the eleven long narrow lakes which run north and south, the lakes essentially dissect the area into strips of farmland, often making travel a challenge. Sometimes, the only way to access points on the opposite side of the lake is to travel the entire distance to the northern or southernmost point and head up or down the other side. In many cases, a resident finds themselves 5 miles from a village, pharmacy or clinic, but an hour or more away by car. The area’s unique geographical characteristics create tremendous transportation and access issues.

The Finger Lakes region generates 1.2 billion in agricultural sales, on 6,417 farms, requiring approximately 15,000 migrant and seasonal farmworkers to provide the manual labor necessary to harvest crops (New York State Office of State Comptroller, 2010). These farms are often a great distance from larger towns and cities that offer a wider range of healthcare choices and specialty care providers. When a farmworker is referred to a specialist for further care, the challenge to complete that referral hinges on transporting the patient and ensuring that there is interpretation available for that visit. Additionally, having no insurance and earning poverty level incomes leaves farmworkers vulnerable. For these very reasons, safety net programs such as FLCH are essential to farmworkers and their families.

In order to address the many challenges in providing comprehensive health care for farmworkers, Finger Lakes Community Health has developed a robust telehealth network. The Finger Lakes Telehealth Network (FLTN) emerged from an effort to address the difficulties that arise when a farmworker patient is referred to a specialist for on-going care. Rather than having to drive a patient to the urban provider office, which often results in the patient losing a day of work and pay, FLTN has developed collaborative relationships with several key specialty practices to use technology to conduct the clinical visits. The ability to use technology to provide access to services with

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the use of video conferencing equipment and diagnostic tools between a specialty care provider and a patient has shown cost savings in the form of reduced travel and improved health outcomes. Using telehealth, the patient is able to return to the health center near them, where they are known and feel safe, and still be seen by a specialist who may be 50 or 500 miles away.

The model that FLTN uses is focused on three major components to build a sustainable and effective telehealth program. First, the issue of broadband or high speed internet is critical as video streaming demands much higher levels of internet capacity to transmit video images, which can be a particular challenge in rural communities. Secondly, the FLTN focuses on the necessary video equipment, diagnostic peripherals and other technology that would be used to do the actual transmission of each visit. The third and most important component is program development, which includes working with each specialty care provider to develop a mutual work plan that incorporates the needs of the specialist, the primary care provider and the patient. A resource manual for each specialty area has been developed by FLTN that includes policies, procedures, and consent forms in multiple languages, patient and provider satisfaction forms and emergency and safety policies and procedures that might be required, particularly in working with behavioral health services.

So far, FLTN has implemented telehealth programs in psychiatry, ENT, counseling, nutrition therapy, pediatric neurology, HIV/AIDS care, pulmonology, diabetic retinopathy, pediatric dentistry and interpretation services. The relationship between the primary care providers and the specialty care providers results in more completed referrals and higher satisfaction scores by both the patients and the providers. The opportunity for primary care providers to virtually attend the specialty care visit gives them the chance to learn and interact with the specialist on potential new therapies and difficult cases. The telehealth program creates many savings for health centers including reduced travel for health center staff and fewer “no shows” for appointments. The most important benefit, however, are the improved health outcomes that have been documented for farmworker patients due to increased access to care through the Finger Lakes Telehealth Network.

Telehealth is ultimately about collaboration and building relationships with others, be it the patient, health center staff, the specialist providers or other health centers. Collaboration and support are essential to the success of telehealth. In implementing telehealth, it is critical to establish a provider champion who will advocate for the program because there will inevitably be resistance from already overburdened clinical staff. If a health center is interested in learning more about telehealth, they should connect with another health center or community partner that is already using telehealth in their practice. FLCH is available to work with other health centers interested in telehealth by offering best practices, lessons learned and advice on how to utilize this technology to improve access to care for one of the most vulnerable populations we serve, migrant farmworkers.

Finger Lakes Community Health, founded in 1989, is a provider of healthcare for agricultural workers. FLCH has expanded services to provide comprehensive healthcare for everyone with numerous locations in the region. Finger Lakes Community Health strives to ensure high quality, comprehensive healthcare in the communities they serve with an emphasis on underserved and special populations.

For more information or to inquire about FLTN resource manuals, contact Mary Zelazny.
On any given day, a Community Health Worker (CHW), or Promotor(a) de Salud, may collect client or patient data while talking to a community member about a health topic, presenting a health education session, performing a census in their community, or making a referral to a health or social service agency. When completed on paper, the data collection task can take hours, especially when the CHW may be required to enter the data into a computer for analysis and reporting.

Building on its 30 years of experience designing and implementing CHW programs targeting underserved and isolated communities, MHP has proudly joined the forefront of technological advancement in health program evaluation. In 2012, MHP began the implementation of a new project to utilize smartphone technology to strengthen its CHW program evaluation processes. The goal for this project was to shift MHP’s CHW data collection and evaluation processes to the digital age, thereby eliminating the use of paper forms, improving the data management system and diminishing time spent on data coding and entry. As members of minority and underserved communities, CHWs naturally possess the cultural and linguistic tools needed to effectively reduce barriers to health services. Now, through the Promotores Connect project, they are also equipped with cutting-edge technology to streamline workflow, improve efficiency, limit error and, most importantly, maximize time spent interacting with community members.

Promotores Connect is a collaborative effort between MHP and Dimagi, a social enterprise specializing in IT solutions for health workers around the world. As a first step, Dimagi customized its already existing smartphone application for health data collection, CommCare, to the specific needs of MHP’s CHW programs. MHP then adapted its paper forms to the newly customized digital data collection app, purchased smartphones for CHWs, and began the process of training them on how to use the smartphone and application. Once trained, CHWs began to use the smartphones in the field to input data as they did their work. The app can collect dates, numbers, text and many other types of data. When CHWs submit data through the app, it gets transmitted to a HIPAA-compliant web-based server where Program Coordinators can access and download the data to Excel or another third party application to analyze the data in real time. The app also allows CHWs to work offline and automatically sends submitted data when a network service becomes available. This process reduces travel time for the CHWs to the office (for example, to make copies of paper forms or to submit forms to Program Coordinators), which allows for them to maximize time spent interacting with the community. It has also decreased the amount of time Program Coordinators spend on data coding and entry by two-thirds, allowing them to dedicate more time to data analysis and program supervision.

After implementing Promotores Connect within its own programs, MHP wanted to examine how the project would translate in the health center setting. In 2013, MHP expanded Promotores Connect to two health centers, Hudson River Healthcare (HRHCare) in New York and Community Health Partnership of Illinois (CHP). MHP provided each participating health center with five smart phones and access to the data collection app. MHP adapted the app to accommodate HRHCare and CHP’s CHW program data collection forms. Additionally, the health centers were able to access the web-based database to track and analyze data collected by their CHWs. Each health center received in-person trainings on how to use and incorporate the smartphone, app and database into their programming and ensured that five CHWs utilized the smartphone and app in their community outreach.

While the Promotores Connect projects at HRHCare and CHP will end in June 2014 due to funding restrictions, both organizations now possess field-tested knowledge and experience of how technology can best be integrated into their CHW programs. Some of the highlights from the health center projects include more complete program data collection, improved ability to supervise CHWs, and quicker access to data on services provided. MHP hopes to use the lessons learned from the health center projects to inform future initiatives and promote the use of innovative technology in CHW programs. MHP is also committed to sustaining the Promotores Connect project within its own current and future CHW programs and has fully integrated the use of smartphone technology into all agency direct service programming. Looking forward, MHP would like to assess the potential compatibility of mobile technology and Electronic Health Records and use technology to strengthen the relationship between clients/patients and CHWs.

The introduction of new technology into any organization or program
requires investment in support infrastructures such as equipment, technology development, and most importantly, dedication of staff time to appropriately train, supervise, and support frontline users. However, as U.S. healthcare meets the digital age, incorporating technology into outreach work keeps CHW services relevant and available in an increasingly technological context. Merging community-based outreach with technological innovation provides the opportunity to attain prompt reporting of encounters with clients or patients, access to online health information and resources in the field, and more complete and effective data collection, which can lead to more accurate measurements on the outcomes and impacts of CHW interventions.

MHP is a national non-profit that builds on community strengths to improve health in underserved communities. Using the Community Health Worker or Promotor(a) model, MHP provides culturally-appropriate health education and outreach, and sustainable community development to farmworker, migrant, border and other underserved or isolated communities throughout the nation.

For more information, please contact MHP.

Resources on Health Technology

NCFH has compiled the following resources in an effort to aid health centers in learning about and implementing health information technology programs. Visit the links to learn more about each resource or contact Dahlia Ture for more information.

HRSA Health Information Technology Toolboxes

HRSA provides a library of resources on technology in healthcare including implementing health IT programs. Toolboxes are available for such topics as Health IT Adoption, Telehealth, Clinical Quality and Performance Measures, and Health IT for Rural Health Providers. Also available are past HRSA Webinar recordings on various health IT topics, including Tips for Using EHRs to Improve Quality of Care and Health Outcomes and Budgeting for Health IT.

National Association of Community Health Centers (NACHC) Resources

NACHC provides several resources and publications related to technology in health care. Publications include Using Health Information Technology to Improve Quality, Telemedicine and Health Centers: The Doctor is Online, and Strategies to Minimize Legal Risks Related to Health Information Exchange. Documents are free but may require a NACHC online account.

NACHC also offers health centers a resource that can help expand the IT workforce. The new Healthcare Information Management Systems Society (HIMSS) JobMine ® is open to all NACHC members and HRSA grantees to post job openings, search resumes, and take advantage of career development services.

HRSA Telehealth Grant Programs

Telehealth is the use of electronic information and telecommunications technologies to support long-distance clinical care, patient and professional health-related education, public health and health administration. There are three types of telemedicine. Store-and-forward telemedicine involves acquiring medical data and transmitting it from the patient site to a physician located at a distant health care facility. Real time telemedicine is a consultation where both parties are at different sites but interacting at the same time through video conferencing. Through real time telemedicine, physicians are able to examine the patient by asking questions and using electronic diagnostic equipment. Telemetry is the remote measurement and transmission of patient data to a provider for analysis and decision making, like remote monitoring equipment used in home health and intensive care programs. HRSA provides three grant opportunities to fund Telehealth programs: Licensure Portability, Telehealth Network and Telehealth Resource Center.

Free Data Visualization Software

Health center staff and public health workers who may not have a background in information technology often have a need for simple tools that allow for the analysis, visualization, and reporting of data using epidemiologic methods. Such tools can provide compelling visuals for telling your patient population’s story and applying for grants. The following is a list of free data visualization software:

- **Tableau Public** is a free data visualization tool for beginner to intermediate level experience. All maps are saved to the cloud and can be embedded on websites.
- **Batch Geo** provides free mapping software with limited customization options. Beginner skill level.
- **Epi Info** is a free software tool for health professionals to use in data analysis, visualization and reporting. Suggested for intermediate skill level. The software is available in 13 languages, including Spanish.
- **Quantum GIS** is a free and open source geographic information system that allows you to create, edit, visualize, analyze and publish geospatial information. The software is recommended for advanced experience levels.
Many opportunities exist for improving health outcomes among agricultural workers through innovative technological solutions to old problems. Utilizing its experience in technical training and assistance, NCFH is working with various partners to address the needs and concerns of health centers around the country in regards to providing quality healthcare to agricultural workers. NCFH is currently working on developing innovative solutions for the following challenges that have been presented by health centers.

**Identifying patients who work in agriculture can be challenging and time-consuming.** Often over-burdened, health center staff find that the varying and changing definitions of agriculture can be complex and the information needed to identify patients as agricultural workers can be difficult to correctly obtain from a patient. Patients who work with animals, on fish farms, or have retired from agricultural work may not consider themselves agricultural workers.

NCFH is in the early stages of developing a robust electronic application that would allow patients to self-identify as agricultural workers, including those that struggle with literacy or language. This app could be used by outreach workers or front-desk staff and verbally administered to a patient on office computers or smart phones, or it could be used in the field on a smart phone or tablet computer during mobile clinics, health fairs, and other outreach events. A health center could also install a tablet or touch screen computer near the front desk allowing patients to utilize the app themselves. The app will guide the patient or staff member through the basic questions essential to identifying agricultural workers and would allow patients to identify the industry they work in, the type of work they do, and whether they migrate for work or work on a seasonal basis. Photos, illustrations, and recorded audio will assist patients with limited literacy skills. The app will be developed in English and Spanish, with the potential to be developed in other languages, such as Creole and Mixtecan languages, depending on health center needs. This application would provide busy staff with chronic disease. This system will allow the safe transfer of medical records, giving providers in both health centers access to these patients’ health care history. In addition to providing appropriate follow-up and case management, providers can avoid medication interactions, duplications of tests, and unnecessary medical interventions. This will lead to higher quality of care for these patients, as well an improvement in the health centers’ clinical and performance measures and objectives for meaningful use.

NCFH’s goal for this project is to test a long-term solution to the continuity of care challenge faced in providing health care to migrant farmworker patients. NCFH hopes to expand the network to more health centers over time and build a system that will allow for more complete knowledge of agricultural worker health outcomes, reduction of health care costs, and higher quality health care. Training and TA on the HIE will be provided to other health centers with migratory patients after the pilot test.

While technology is not the solution to every problem, it does have the potential to impact health disparities in a positive way. Agricultural workers can particularly benefit from health records transfer, improved care coordination and informed health care providers who are aware of their occupational status and the associated health hazards and risks. NCFH will continue to work with a variety of partners to address key issues facing providers and their patients and looks forward to finding more ways to better utilize technology to improve the health and well-being of agricultural workers across the country.

If your health center has suggestions for technological solutions or would like more information about these projects, contact Bethany Boggess.