

## Improving Access to Diabetes Care in Rural Honduras

Honduras



John Piette

**Organization type:**

nonprofit/ngo/citizen sector

**Budget:**

\$100,000 - \$250,000

Website:

<http://www.med.umich.edu/quiccc>



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### Project Summary

#### Elevator Pitch

**Concise Summary: Help us pitch this solution! Provide an explanation within 3-4 short sentences.**

We are developing a model for telehealth support via cell phones to diabetes patients in very low income communities. Patients receive the health education they need, while families and clinical teams receive information to support the person's self-care. The service is free to patients and accessible in areas with no infrastructure for managing a large telehealth program.

#### About Project

**Problem: What problem is this project trying to address?**

Patients with diabetes and other chronic health problems need weekly or even daily support to understand their condition and self-care needs, and to identify problems in early, reversible stages. Healthcare teams are often understaffed and unable to provide this between-visit support. All of these problems are far more serious in under-developed countries. As a result of inadequate healthcare access, patients experience serious complications and early death. Family and friends represent an untapped resource, but most lack the information they need to understand the patient's condition and what they can do to help. Cell phones are now common in developing countries, but most areas lack the technologic resources and staffing to take advantage of patients' cell phones as a communication link between face-to-face encounters with the patient's clinical team.

**Solution: What is the proposed solution? Please be specific!**

Most telehealth services require patients to use special devices or have access to the internet. Organizations providing these services need the expertise and infrastructure to maintain the software, hardware, and other resources. All of these requirements make current approaches inaccessible to very low income patients in under-developed countries. We have created a program that addresses these problems with a "cloud computing" model, allowing clinics and patients in very low-income areas of the world to access the service at a distance. Because computing resources are centralized regionally or even globally, cloud computing dramatically reduces the burden and cost for providing this type of service within a developing country. The diabetes content for the program was developed with a unique collaboration between health services researchers in the U.S., experts in behavior change and telecommunication across Latin America, and clinicians in rural Honduras. In the summer of 2010, 90 diabetes patients in rural Honduras used the program for six weeks, completing weekly automated health assessment and behavior change calls via their cell phones. Patients' clinical teams and family caregivers received automatic updates and suggestions by email and a specially designed voicemail service after each patient assessment call. We found that the system is reliable, usable by patients with very little education or training, and can improve their access to health information and diabetes self-care support. To our knowledge, this is the only project of its kind to develop and test such a system internationally - and we know of no other work that has done so in an area with such a severe lack of healthcare infrastructure as in rural Honduras. The service is designed to be cost-free to patients, very low-cost for health systems, and flexible enough to be applied in developing countries to other health priorities, such as asthma, neonatal health, and malaria.

### Impact: How does it Work

**Example: Walk us through a specific example(s) of how this solution makes a difference; include its primary activities.**

In 2009, we surveyed 624 chronically-ill adults in North Central Honduras. On average, respondents had less than five years of education and one in four were illiterate. Nevertheless, 78% reported having a cell phone, and 84% reported having either a mobile or "land-line" phone. Patients who reported having to cancel an outpatient appointment due to transportation problems were more likely than other patients to report access to

voicemail (69% versus 49%) and text messaging (63% versus 54%). Patients who reported underuse of medications due to cost pressures also were more likely than other patients to report voicemail access (67% versus 40%) and text messaging (64% versus 48%). In 2010, we conducted the first international study of a low cost service designed to bring diabetes self-management support to this under-developed region. Ninety patients enrolled in the program and received weekly automated assessment and behavior change calls via their mobile phones. Despite significant telecommunication barriers, calls were successfully sent via our server in Michigan and patients completed roughly 65% of their weekly assessments. At follow-up, patients reported important improvements in their diabetes care and health status, and many experienced large improvements in their blood glucose control. Patients' clinical team was enthusiastic about the service's success, and was able to make important changes in patients' medical management despite a scarcity of staff and other resources. Family caregivers reported that they were more confident supporting the patient's disease management as a result of receiving information about diabetes and the person's healthcare needs using the specially designed voicemail system.

#### About You

##### Organization:

Program on Quality Improvement for Complex Chronic Conditions

##### Section 1: You

###### First Name

John

###### Last Name

Piette

###### Email

[jpiette@umich.edu](mailto:jpiette@umich.edu)

###### Website URL

<http://www.med.umich.edu/quiccc/>

###### Organization

Program on Quality Improvement for Complex Chronic Conditions

###### Country

, MI, Washtenaw County

##### Section 2: Your Organization

###### Organization Name

Program on Quality Improvement for Complex Chronic Conditions

###### Organization Phone

734-936-4787

###### Organization Address

300 North Ingalls, Room 7D12, Ann Arbor, MI 48109

###### Organization Country

, MI, Washtenaw County

#### Your idea

##### Country and state your work focuses on

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##### Website URL

<http://www.youtube.com/watch?v=tWW5lf-wUZk>

#### Innovation

##### Do you have a patent for this idea?

#### Impact

##### Actions

We developed the content for a diabetes self-management support program delivered via cell phones with input from more than 50 physicians, nurses, and behavior change experts. The content was translated into Spanish and pilot tested with Spanish-speaking immigrants in Western Michigan, USA. The technologic infrastructure was developed with specialists in open-source telecommunications programming for low-cost international calling. Prior to implementing the program in rural Honduras, we surveyed more 600+ patients in the target community to identify their mobile phone resources, interests, and needs. We also have met regularly in person and via frequent Skype calls with community leaders in Honduras, local clinicians, and international experts in chronic illness telehealth to get their input on program development. In 2010, we successfully piloted the program in Honduras with 90 patients. That study showed very positive outcomes as measured by patient interviews, physiologic tests, quantitative surveys, and electronic tracking of patients' responses to the automated calls.

## Results

We have found that despite these Honduran patients' very low incomes and limited educational attainment, roughly 80% have access to mobile phones. More than 80% reported interest in receiving automated telehealth support for their disease self-management. In our system testing, Honduran clinicians were able to enroll patients via the website, generate patients' weekly automated diabetes support calls, and generate automatic feedback via email, fax, and voicemail for clinicians and patients' family caregivers. Patients were very enthusiastic about using the system and completed roughly four assessments over their six weeks of participation in the study. At follow-up, many patients reported significant improvements in their health and diabetes self-care, and many experienced a substantial improvement in their blood glucose levels. Clinicians used the feedback reports to identify patients needing additional follow-up, health education, and medication changes. Family caregivers reported that the system was easy to use and that they were able to provide more effective support for their patient-partner.

### **What will it take for your project to be successful over the next three years? Please address each year separately, if possible.**

In the next year, we hope to conduct a larger community-based trial in Honduras to evaluate the service's longer-term impacts on diabetes patients' glycemic control, self-care behaviors, and use of health services. To do that, we need to identify funding from NIH global health initiatives, international foundations, or private businesses (multiple applications are in process).

Over the next two years, we need to make further advances in understanding how to provide this service on a large international scale using robust telecommunications approaches and a sustainable business model. A huge advantage of cloud-computing is that the content for disease management programs can be developed by experts anywhere in the world. Low-income communities can share telecommunication resources – dramatically decreasing their costs. With this service, healthcare workers can increase patients' access to health information between face-to-face visits without managing the infrastructure making the service possible. Ultimately the provider of the service should be outside of the University of Michigan, e.g., in a non-profit organization dedicated to the program, an international relief organization, a national governmental agency, or a telecommunication provider with a strong commitment to improving community health. We also need to develop and test options for transferring the communication platform to smaller, portable hardware environments such as a laptop or even an iPhone. All of these challenges are highly addressable, but will require even closer collaborations with telecommunication experts than we have established to date, including large telecommunication companies in Central America.

In year 3 and beyond, we need to establish a strong business model for the program, and broaden the content-base so that we can address other high-priority conditions such as asthma, neonatal complications, and mosquito-borne diseases. We need to establish an advisory council with expertise in social entrepreneurship, and market the results of our work to national governments and other potential sources of financial support. Working groups will be required to develop the content for messaging to patients, family caregivers, and clinical teams that is linguistically appropriate and improves patients' care without further burdening already scarce clinical resources.

### **What would prevent your project from being a success?**

Funding for international projects such as this one tends to be fragmented, short-term, and scarce. To date, we have been very successful leveraging in-kind personnel support from our excellent partner organization in Honduras (Yojoa International Medical Center), as well as the support of students from our university School of Public Health, and small amounts of discretionary funding available to the applicant. We are actively pursuing a very broad approach to seeking funding for the next phases of work, including support from: (1) US National Institutes of Health grants for global initiatives; (2) grants from relevant private foundations and businesses such as from Cisco Systems, Vodafone, and the Gates Foundation, (3) national government funders in Mexico, and (4) partnerships with private companies that have a social service arm and serve the geographic area where our projects take place, such as TIGO, the large telecommunication company in Central America.

Developing a creative telecommunication program for disease management will have limited impact on health outcomes if patients have no access to resources such as medications or glucose monitoring supplies. We are continuing discussions with local clinical leaders, patients, and groups such as the International Diabetes Federation so that the services we develop give realistic advice to patients for practical ways they can improve their health status given the very real shortages of health care resources in under-developed countries.

### **How many people will your project serve annually?**

1001 10,000

### **What is the average monthly household income in your target community, in US Dollars?**

\$100 1000

### **Does your project seek to have an impact on public policy?**

## Sustainability

### **What stage is your project in?**

Operating for 1 5 years

### **In what country?**

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### **Is your initiative connected to an established organization?**

Yes

### **If yes, provide organization name.**

Yojoa International Medical Center ([www.yimc.org](http://www.yimc.org))

### **How long has this organization been operating?**

More than 5 years

### **Does your organization have a Board of Directors or an Advisory Board?**

Yes

### **Does your organization have any non-monetary partnerships with NGOs?**

No

**Does your organization have any non-monetary partnerships with businesses?**

No

**Does your organization have any non-monetary partnerships with government?**

Yes

**Please tell us more about how these partnerships are critical to the success of your innovation.**

Yojoa International Medical Center (YIMC) is the Community Development arm of Yojoa Community Investments, a socially responsible community corporation. YIMC is recognized by the State of Honduras as a provider of community services in the region. In collaboration with YIMC, we are exploring opportunities for program expansion within Honduras and elsewhere in Latin America. We have met with the leadership from the Honduran Health Ministry as well as with the country's president, Portfirio Lobo Sosa. We are in dialogues with a major Honduran telecomm company about sustaining this program through their social responsibility unit. I recently traveled to Bogotá Colombia to present this project at a meeting of telehealth experts, and in August 2010 I traveled to Ecuador where public health groups would like to adopt the program on a limited scale. We have established a pilot study in Nuevo Leon Mexico, and I would like to significantly increase work with our partners throughout that country. This diversity of international initiatives is just what we would hope for in developing a cloud computing approach designed to increase access to healthcare information internationally.

**What are the three most important actions needed to grow your initiative or organization?**

Further development and testing of the program: While our results to date have been very encouraging, we need to continue soliciting feedback from patients, community leaders, and clinicians in very low income communities so that we can be sure that the services we are developing have the greatest possible benefit and likelihood for being sustained over the long term. It also will be important to expand beyond diabetes to include fully developed versions of the programs which currently are in process including: management of heart failure, depression, and public health programs for mosquito-borne illnesses.

Development of a sustainable plan for scaling and financing: Once the program moves beyond the development phase, it will need a longer-term and scalable delivery plan. Several options are possible as part of governmental services, large private healthcare systems, international aid groups, and (at least in part) self-financing by patients and their families. As part of this process, we need to further evaluate alternative technologic platforms for delivering the program locally and regionally, by (for example) creating specialized applications (apps) for smart phones and developing versions of the program that can deliver calls from a simple desk-top or laptop computer with a connection to the telephone system.

Marketing: Based on my experience as an academic researcher, I strongly believe that all of the abovementioned work will be useless without a systematic and aggressive effort to communicate about this program to potential stakeholders at the local, national, and international levels. Several videos included with this application are examples of one resource we plan to use, and our group has extensive expertise in producing attractive high-quality written materials that inform potential users about the program and how it may help them. In 2010, I will have personally traveled to Honduras, Mexico, Ecuador, Colombia, and Guatemala to share information about what we are accomplishing. These visits are both an essential part of the program's marketing plan, and are building a network that will make our future dissemination efforts even more effective

**The Story**

**What was the defining moment that led you to this innovation?**

I have been developing low-cost telehealth tools for chronic disease management in vulnerable populations for over 15 years. Six years ago, I began collaborating with disease management experts in Chile and Mexico. Because of that, I became a regular user of Skype and other resources for low-cost international calling. One day I was talking with a colleague about how amazing I thought these new services for low-cost international communication were. I suddenly realized that the programs we were developing for chronic disease patients here in the U.S. did not have to stop at our country's borders. Instead, I realized that we had developed the unique expertise, international collaborations, health services research experience, and technologic infrastructure that would allow us to develop an international resource for improving between-visit support for chronic conditions via patients' cell phones and Voice over IP (VoIP) technology.

**Tell us about the social innovator behind this idea.**

My passion is developing low-cost solutions that can improve access to care for vulnerable patients living with chronic diseases. I have a special commitment to impoverished communities in Central America, that resulted in part from the role model of my aunt, a Catholic nun who died fighting for people's rights in El Salvador at the beginning of the 1980's. I am fluent in Spanish. Through frequent travels in Latin America, I have develop a unique network of international collaborators that has helped to hone my vision and fuel my enthusiasm for this work. I am an epidemiologist and Professor in the Division of General Internal Medicine at the University of Michigan, so I bring strengths to understand the challenges of chronic illness care in resource-poor healthcare systems and in the scientific methods for evaluating program impacts. I am the Director of the Program on Quality Improvement for Complex Chronic Conditions, and since 2007 have been a Visiting Professor of Nursing and of Medicine at the Universidad Catolica in Santiago, Chile. I have strong collaborative relationships throughout Mexico, including with the largest insurer of public employees in the country, and major research groups in Mexico City and the Autonomous University of Nuevo Leon. I regularly lecture on telemedicine and chronic illness care in Mexico and elsewhere in Central and South America.

Prior to coming to Michigan in 2001, I was a VA Scientist and faculty member at Stanford University in Palo Alto, California. There, I developed one of the first systems of automated telephone monitoring and behavior change support for English- and Spanish-speaking diabetes patients in safety-net healthcare systems. In a randomized trial, we demonstrated that such services can improve patients' self-care, symptoms, depression, and blood glucose control. Also during that period, I watched as large numbers of Bay Area technology firms developed high-tech resources for disease management that were simply too complicated and costly to be used in the real-world. From that experience, I developed a clear vision for developing resources that could be used with little or no training, little or no technologic resources, and a very low per patient (marginal) cost.

My grassroots entrepreneurial spirit goes beyond my professional life. I'm a beekeeper, and several years ago established Dancing Crane Honey Farm, as a local non-profit organization producing honey and using the profits to support international charities. Dancing Crane produces roughly 800 pounds of honey per year. To date, we have donated roughly \$20,000 to national and international organizations.

**How did you first hear about Changemakers?**

Friend or family member

**If through another, please provide the name of the organization or company**

I was referred by Clay Cooper, who is an Ashoka consultant and was involved in establishing this competition.

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**Source URL:** <https://www.changemakers.com/empower-patient/entries/improving-access-diabetes-care-rural-honduras#comment-0>