Improving the Health of Hispanics Using Mobile Technology
A Roadmap to Reach and Impact America’s Fastest Growing Population
September 2011

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The Hispanic Population and Healthcare Challenges.

Numbering over 50 million, Hispanics are the fastest growing demographic group in the U.S. They have higher rates of certain chronic conditions (e.g. diabetes), but lower rates of medication use and adherence compared to non-Hispanic whites.

Mobile Health (mHealth).

mHealth is one of the fastest growing areas of health and technology. mHealth leverages the near ubiquity and high use of mobile phones. Even simple text messaging interventions have been able to significantly increase medication adherence.

Mobile and Smartphone Use Very High Among Hispanics.

Nearly 50% of Hispanics own a smartphone (compared to 27% for non-Hispanic whites) and a higher percentage of Hispanics (25%) have used their mobile phone to search for health information than non-Hispanics (15%). Hispanics are more trusting of mobile-delivered messages and more receptive to receiving text reminders and health related messages than non-Hispanics. In short, the opportunity for deploying mHealth with Hispanics is immediate and significant.

Potential Impact of mHealth Interventions with Hispanics.

As an example of the potential clinical and economic benefits of administering mobile-based initiatives with Hispanics, we examined the impact of a mobile-based intervention with Hispanic diabetics. If the intervention were able to increase medication adherence by only 10% among just 10% of the 3.4 million diagnosed Hispanic diabetics, this would equate to increased drug costs of over $30 million, but a net cost savings due disease-related medical costs of over $183 million annually.

Roadmap for Deploying an mHealth Initiative.

Many clinicians and marketers are intrigued by mHealth, but are not sure how to implement it. In this white paper we offer a simple, five phase roadmap for designing and launching an mHealth initiative into the Hispanic community.

Interactive Demo.

We include a functioning demo that incorporates text messaging (SMS), mobile voice (IVR) and mobile web (mWeb) components. To launch the mobile demo, text “HOLA” to 34343 (message and data rates may apply).

Summary and Conclusions.

Mobile technologies offer tremendous potential for improving healthcare access, individual behaviors and outcomes among Hispanics. Marketers and other health communicators seeking to deliver solutions to the Hispanic audience should consider incorporating mobile in their overall strategies.

Mobile is no longer where Hispanics may be going in the future- it’s their health information platform of choice - today!
Introduction

In this paper, we review the promise and potential of mobile-based technologies for overcoming barriers to accessing healthcare and improving the health of U.S. Hispanics.

We start by providing a description of the U.S. Hispanic population, both in terms of their tremendous population and economic growth, as well as the health-related challenges they face due to high rates of certain chronic conditions, poor care compliance, and a shortage of culturally-capable providers.

Because mobile is a relatively new and constantly evolving technology, we then define and describe mobile health, often referred to as “mHealth”. We examine the use of mobile technologies among U.S. Hispanics and offer a case study of the potential impact mHealth could have on increasing medication adherence among Hispanic diabetics.

Many in healthcare see the promise of mHealth, but simply don’t know how to go about actually doing it, or even where to start. In this paper, we offer an actionable Roadmap for Deployment for launching an mHealth initiative into the Hispanic community and also provide an interactive demo that will allow readers to test a simple, real world mobile-based solution targeting Hispanics.
The Hispanic Population and Their Healthcare Challenges

Numbering over 50 million, Hispanics are the largest minority population in the U.S. and the fastest growing of any demographic group in the country (Census, 2011). Between 2000 and 2010, the U.S. Hispanic population grew by over 46.3% and accounted for over half (56%) of the country’s population growth during the past decade (Census, 2011).

Hispanics are also a large and growing economic force, with total buying power of $1.1 trillion (Selig Center for Economic Growth, 2011; IBIS World, 2011), which is larger than the entire GDP of Mexico (CIA World Fact Book, 2011). These Hispanics are retaining their language and culture more than any other immigrant group.

U.S. Hispanics have high rates of obesity and certain chronic health conditions. The age-adjusted prevalence of diabetes among Hispanics is significantly higher (at 12.3%) than non-Hispanic whites (7.1%) (CDC 2011), yet Hispanics have worse quality of care measures than non-Hispanics (AHRQ, 2011). Medication non-adherence is also higher among Hispanics compared to non-Hispanic whites (Compton et al., 2010).

These disparities are due only in part to financial pressures and lower rates of health insurance (Frankenfeld, 2010); they are also a result of poor communication between providers and patients as well as a poor understanding of care instructions and the healthcare system in general (Compton et al., 2010), and poor pharmaceutical compliance and adherence, in particular (Jie, 2010).

Offering linguistically appropriate and culturally-relevant health information and programs to Hispanics have been shown to significantly improve utilization and outcomes. In a large study of diabetics, for example, medication adherence among Hispanics of Limited English Proficiency was higher if the provider was Hispanic or spoke Spanish (Traylor, 2010).

Mobile technologies have the potential to deliver personalized, highly tailored communications over a platform that is widely used and highly trusted by Hispanics.
Defining mHealth

With the recent and rapid emergence of mHealth, the scope and definition of the field is still evolving. For the purposes of our analysis, we narrowly define mHealth below.

Mobile health (mHealth) leverages audience preference for mobile communication to optimize health status across populations and bring efficiencies to healthcare delivery. mHealth incorporates mobile messaging (text and voice), mobile web, and native apps, in an independent or integrated manner depending on the audience, to address clinical, operational, or commercial priorities.

The chart below (Figure I) provides an overview of the advantages and limitations of the mobile channels. The advantages and limitations are compared to the email channel as a reference. A discussion of the advantages of an integrated mobile strategy is provided later in the paper.

Figure I: A Comparison of Mobile Channels

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Benefit</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proactive</td>
<td>Passive</td>
<td>Passive</td>
</tr>
<tr>
<td>SMS</td>
<td>mWeb</td>
<td>Native Applications</td>
</tr>
<tr>
<td>• Immediate (97% of text messages are opened and read within 5 minutes)</td>
<td>• Rich media content support</td>
<td>• User experience</td>
</tr>
<tr>
<td>• Ubiquitous reach</td>
<td>• Secure delivery (HTTPS) of customized content</td>
<td>• Leverages native device features</td>
</tr>
<tr>
<td>• HTML5 is expected to allow mWeb to replicate native application experience</td>
<td>• Advanced IVR (Text to Speech and Automated Speech Recognition) can be expensive</td>
<td>• Least ubiquitous</td>
</tr>
<tr>
<td>• Character limitation</td>
<td>• Access: Some users may not have capability (device limitation or no data plan)</td>
<td>• Least ubiquitous</td>
</tr>
<tr>
<td>• Message storage on the device</td>
<td>• Passive engagement can translate to declining use post download</td>
<td>• Fragmented device market increases expense</td>
</tr>
</tbody>
</table>
Mobile communication can bring value across the fundamentals of healthcare delivery, from access to outcomes. The diagram below (Figure II) depicts the pathway to a clinical outcome for a patient or healthcare consumer. Beginning with access and continuing along the clinical path to an outcome, mobile communication can play a role in engaging, directing, and motivating patients towards improved health.

**Figure II: The Fundamentals of Healthcare Delivery**

![Diagram](HolaDoctor | 3Cinteractive | Mobile Health for Hispanics)

For example, direct-to-patient mobile communication can be deployed to:

1. Drive patients into a health system for evaluation (access and diagnosis),
2. Equip patients for a surgery, pharmaceutical, or therapy intervention (intervention),
3. Educate and motivate patients to adhere to the intervention (behavior modification),
4. Assess and determine the health status of patients (decision support and outcomes), and
5. Redirect patients back to their physician for routine check-ups or for further evaluation based on health status (access).

In retail pharmacy, for example, mHealth has been shown to change behavior and improve clinical outcomes. Text message reminders have been shown to change health behaviors and improve medication adherence by 10% to 20% across a range of conditions (Lakkis et al., 2011; Krishna et al., 2009; Petrie et al., 2011; Liang 2011).

In Hispanics, adherence to chronic medications is even lower than the general population, mostly due to language and cultural challenges. For example, in a study of over 1.8 million elderly patients with diabetes, Hispanics were 37%, 45%, and 41% more likely to be non-adherent to oral hypoglycemic, anti-hypertensive and statin medications, respectively, than non-Hispanic whites (Yang et al., 2009). These disparities were due only in part to less health insurance.

There is a growing body of evidence that mHealth can change behavior and improve clinical outcomes. Text message reminders have been shown to change health behaviors and improve medication adherence by 10% to 20% across a range of conditions (Lakkis et al., 2011; Krishna et al., 2009; Petrie et al., 2011; Liang 2011).

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- Assess and determine the health status of patients (decision support and outcomes), and
- Redirect patients back to their physician for routine check-ups or for further evaluation based on health status (access).

In retail pharmacy, for example, mHealth has been successfully deployed to reduce first fill abandonment and improve adherence to pharmaceutical regimens. With respect to first fill abandonment, **one-third of all prescriptions written are never filled.** (Peterson et al., 2003). Yet, first fill abandonment represents only the front-end of the challenge. Patients who fill their first prescription are very likely to discontinue their therapy within the first year, **with 50% of patients no longer taking their chronic medication within six months after the initial fill** (McHorney, 2009).

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Hispanics are very active users of mobile both as a means of communication and as a resource for gathering health information. **Eighty-seven percent of Hispanics own a mobile phone** and are more likely to own a smartphone (45% for Hispanics, versus 27% for whites). One in four Hispanics that access the Internet do so via their mobile phone (Mintel, April 2011). Hispanics are more likely than any other ethnic group to look up health information on their mobile phone (25% for Hispanics, versus 19% for blacks and 15% for whites) (Pew Internet Data, Sept 2010).

**Hispanics are highly receptive and trusting of health-related text messages.** For example, in a study of text messaging for enhancement of testing and treatment for tuberculosis, human immunodeficiency virus, and syphilis, Hispanic subjects were more likely to feel that text message reminders for appointments or medications were helpful than white subjects (Person et al 2011). In another study testing three different text messages for immunization reminders, Ahlers-Schmidt et al, (2010), found that Hispanics preferred those messages with more detailed information (e.g. about the immunization itself) compared to non-Hispanic whites.
Potential Clinical and Economic Impact: What can we expect?

We quantified the potential benefits of mobile health with Hispanics diabetics. There are approximately 3.4 million Hispanics with diagnosed diabetes and another 2 million with undiagnosed diabetes in the United States (CDC 2011; Institute for Alternative Futures, 2011). A large (n=137,277) study of patients under 65 years of age found that a 20% increase in drug utilization among diabetics is associated with an annual $177 incremental drug cost, but a $1,251 reduction in disease-related medical costs, for a net annual savings of $1,074 (Sokol et al, 2005).

Using these figures, if mobile-based interventions are able to increase medication adherence by 10% among just 10% of the 3.4 million diagnosed Hispanics, this would equate to increased drug costs of over $30 million, but a net cost savings due disease-related medical costs of $183 million annually.

In the next section, we offer a roadmap for how healthcare organizations can design and deploy an mHealth initiative into the Hispanic community.
**Roadmap for Deployment:**
Launching mHealth into the Hispanic Community

Designing and launching an mHealth initiative into the Hispanic community requires alignment between the organization or brand priorities and the mobile tactics. A successful mobile initiative will achieve strategic and tactical alignment by applying the necessary discipline across the five phases of mobile campaign development. The phases include:

I. Priority Assessment
II. Building the Patient’s Mobile Journey
III. Program Design
IV. Program Submission to the Mobile Carriers
V. Application Engineering and Testing

Additional detail regarding the phases of the campaign development process is provided below.

**Phase I: Priority Assessment**

When considering the deployment options for mobile communication into the Hispanic community, organization and brand leaders should begin by identifying and ranking the priorities for the organization or the brand, irrespective of mobile communication. This process will enable the organization to execute mobile tactics to the Hispanic consumer consistent with the organization’s overarching strategy. The questions below serve as a quick reference to assist with framing the organization’s priorities.

**Key Questions**

**Priority Assessment**

What are the clinical, operational, and commercial priorities for the organization or brand?

Which of the above represent the most important priorities (force ranked)?
**Phase II: Building the Patient’s Mobile Journey**

After the healthcare organization has assessed their priorities, the patient’s mobile journey is developed to optimize mobile channel deployment relative to the desired engagement with the patient and the desired clinical, operational, or commercial outcome.

### Key Questions Building a Patient’s Mobile Journey

Given the priorities identified in Phase I, what conversation is required to engage and motivate the patient towards the desired outcome?

How do cultural beliefs and barriers to optimal care differ for Hispanics (vs. the general market)? How do these differences impact the conversation?

Within the Hispanic community, what are the unique subgroup (Mexican vs. Puerto Rican) cultural elements that require recognition in the patient’s mobile journey?

How does mobile channel preference across and within the Hispanic community impact the deployment of mobile communication?

What are the metrics required to assess the overall impact and the influence of the mobile initiative at each phase of the patient’s mobile journey?

After addressing the above key questions, the patient’s mobile journey can then be developed to identify the tactics required at each important phase of the relationship. The journey also permits the opportunity to establish the communication objectives, the tactical deployment and the Key Performance Indicators (KPIs) for each phase of the patient’s mobile journey.

The following grid highlights the opportunities for mobile channel deployment across the patient’s journey with a chronic medication, beginning with pre-treatment and continuing to secondary adherence. In the following example, primary (i.e. increased adherence) and surrogate (i.e. total mobile population) Key Performance Indicators (KPIs) are identified for each phase of the journey to ensure measurement of campaign performance relative to program goals. Note the emphasis on text messaging and mobile web as a result of the community’s preference for these mobile channels.
### Figure III: Phases of the Patient’s Mobile Journey

<table>
<thead>
<tr>
<th>Pre-Diagnosis</th>
<th>Searching for Tx</th>
<th>Engage MD</th>
<th>Primary Adherence</th>
<th>Secondary Adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Increase disease awareness</td>
<td>· Support the MD encounter</td>
<td>· Improve the MD/patient dialogue</td>
<td>· Motivate first fill</td>
<td>· Motivate primary (first refill) and secondary adherence</td>
</tr>
<tr>
<td>Mobile population; overall and by campaign</td>
<td>Meantime to engage MD and mobile platform activity, including migration to web content</td>
<td>Percentage of patients who self-report taking medication</td>
<td>First fill percentage for enrolled mobile population (relative to overall and vs. the non-mobile population)</td>
<td>Coupon execution, total and by segmented patient type</td>
</tr>
<tr>
<td>· Invite patients into a mobile conversation via POC marketing, web, and TV/print promotion</td>
<td>· Direct patients to mobile web education via mobile text</td>
<td>· Mobile web interface can include “Important questions for your doctor”</td>
<td>· Enroll patients in the mobile database via POC marketing, call center or online patient support, and web</td>
<td>· Adherence messaging, to patient and caregiver</td>
</tr>
<tr>
<td>· Execute mobile HRA to equip potential patients with a mechanism to assess their risk status</td>
<td>· When appropriate, execute a physician locator to assist with identifying a specialist</td>
<td></td>
<td>· Deploy mobile marketing research to segment population by adherence profile</td>
<td>· Deploy mobile coupons to cost-sensitive segment at appropriate intervals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>· Deploy mWeb to support wellness promotion, disease/condition education and product education (SMS to mWeb to drive mWeb activity)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>· Use SMS to connect patients to the call center to support product-related and reimbursement inquiries</td>
<td></td>
</tr>
</tbody>
</table>
Phase III: Program Design

The program design phase aligns the priorities and the desired engagement identified in the patient journey with the mobile channel or channels required to optimize engagement and maximize ROI. To support the desired engagement, content must be accessed, repurposed, or developed to support the mobile conversation with the target audience. Assessing existing marketing assets (i.e. print, TV, online media) is important to determine the potential for conversion to the mobile conversation. With the Hispanic audience, the process for culturally adapting and translating content to Hispanic communities is initiated during the program design phase. Guidance on how to translate and culturally adapt healthcare content for more effective engagement and outcomes is provided in the HolaDoctor companion white paper, Cultural Adaptation for Health (Schroeder, 2011).

In the Hispanic population, given the affinity for text messaging and mobile web, a strategy that incorporates the “active engagement” offered by text messaging with the rich-media content of mobile web represents a preferred approach for the Hispanic audience.

Phase IV: Program Submission to the Mobile Carriers

Following completion of Phases I, II and III, the mobile technology provider (i.e. 3Cinteractive) will submit the scope of the mobile campaign to the wireless carriers (i.e. AT&T, Verizon, etc.). A five or six digit short-code is required to launch and execute the mobile messaging (SMS/MMS) effort. The short-code enables the brand to communicate across all mobile device operating systems and carriers. The short-code provisioning process can take as long as 12 weeks.

The provisioning process includes responding to questions from the carriers and addressing program alterations as recommended by the mobile carriers. The mobile technology provider should be competent in the nuances related to the carrier submission process and equipped to support the dialogue with the carrier regarding program compliance.

The 8 to 12 week short-code provisioning process provides the opportunity to build and integrate the mobile components that will complement the mobile messaging effort. For example, the provisioning phase can include the build-out of the mobile web component, integration of IVR assets into the messaging software, and testing for compatibility across the mobile channels. The mobile web provider (i.e. 3Cinteractive) should have a distinct competency in delivering a mobile web presence that can be executed across all handsets and device types—feature phones, smartphones and super phones.

Phase V: Application Engineering and Testing

Application engineering is required to coordinate the interface between the client organization and the mobile technology platform. The KPIs and the data elements serve as a critical reference during this phase to ensure:

1. Integration of the appropriate data elements,
2. Formatting and testing, and
3. Reporting is consistent with the objectives of client leadership.

Deployment of a test plan prior to launch of the program helps ensure the delivery of appropriate data elements from the client to the mobile technology provider. The testing effort also ensures that the mobile platform is appropriately and efficiently integrated into client assets, such as patient support call centers that may be integrated and leveraged in the broader strategy.
Compliance and Adherence Demo

To illustrate the potential for mobile technology to improve communication with Hispanics, we created a demo that incorporates messaging (SMS), mobile voice (IVR) and mobile web components for improving adherence to a pharmaceutical regimen.

To launch the mobile demo, text “HOLA” to 34343 (message and data rates may apply). The option to experience the demo in English or Spanish will be given at the initiation of the program. Solutions can also be designed to incorporate other mobile technologies such as native applications and location-based services when business priorities support use of these deployments.
Summary and Conclusions

Mobile technologies show unique flexibility and tremendous potential for improving healthcare access, individual behaviors and outcomes among Hispanics. In addition to health outcomes and costs, the U.S. Hispanic population embodies a nearly $1 trillion economic engine, larger than the entire GDP of Mexico (CIA WorldFact Book, 2011). Marketers seeking to deliver solutions that grow brand awareness and optimal healthcare utilization would be wise to incorporate mobile in their overall strategies.

Mobile is no longer where the Hispanic population might go in the future – it’s their health information platform of choice - today!
About the Authors

**HolaDoctor®** (www.holadoctor.net) is a global leader of Hispanic Health programs, translation, marketing, consulting and related services for healthcare businesses and Hispanic consumers. Since its founding in 1999, HolaDoctor® has developed and operates over 500 multilingual healthcare websites; translated over 100 million words of healthcare content; built a database of over one million Hispanic consumers with their individual health profiles; and developed evidence-based obesity prevention and education programs that have been implemented at a state-wide level. Today, with offices in the United States and Latin America, HolaDoctor® delivers innovative, technology-driven and culturally appropriate solutions to the global marketplace.

**Dr. Dirk G. Schroeder** is the Executive Vice President at HolaDoctor as well an Associate Professor of Global Health at Emory University. He is an expert in Hispanic and multicultural health, with a particular focus on leveraging technology to deliver engaging and effective healthcare solutions. Dr. Schroeder oversees HolaDoctor's Research and Consulting division, has lived and worked throughout Latin America and Asia for more than two decades and is fluent in Spanish and Indonesian. He received his ScD and MPH degrees from Johns Hopkins University and a BA with honors and distinction from Stanford University.

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**Barry Hix** is a healthcare executive with over 20 years experience serving public and private companies in the pharmaceutical, healthcare delivery, and medical device industries. Hix’s experience includes leadership positions in general management, commercial strategy, reimbursement, and policy. Today, Hix serves as the General Manager of Healthcare Solutions for 3Cinteractive, helping 3Ci’s healthcare clients to deploy mobile communication technology into healthcare markets to support clinical, operational, and marketing priorities. Hix holds a B.S. in Industrial Management from the Georgia Institute of Technology, a MBA in Marketing from Georgia State University, and a Masters in Public Health from Emory University.

**3Cinteractive®** (www.3Cinteractive.com) provides integrated mobile software and services that help businesses communicate with consumers on their mobile device. Our mobile business solutions improve efficiencies by extending operational and CRM processes to the mobile channel. 3Ci’s cloud-based mobile platform – Switchblade® – allows businesses to deliver a rich consumer experience on any mobile device or carrier, using integrated mobile technologies such as messaging, voice, mWeb and smartphone apps. And our XaaS services suite makes it easy for businesses to deploy and maintain effective mobile business solutions. 3Ci processes billions of mobile transactions per year – supporting mission critical business processes for clients across industries.

**Vinnie Fiordelisi** brings more than a decade of experience in public relations and marketing to his role as 3Cinteractive’s Director of Corporate Communications. He is responsible for leading 3Ci’s internal and external communications strategies- including media relations, corporate communication, marketing communications, and digital media. Prior to 3Ci, Fiordelisi served as the Director of Talent Services at Neostar Sports & Entertainment, a leading sports marketing firm. He worked directly with a number of professional athletes, focusing on creating and maintaining the desired brand image of each client and enhancing their careers through maximizing endorsement and appearance opportunities, broadcast negotiation, public relations, and promotional management.

**Dr. Kenneth Thorpe** is the Chair of Health Policy and Management at Emory University, and one of the country’s foremost experts on healthcare systems and healthcare reform. He was one of the chief advisors to the Administration on the Affordable Care Act and currently heads the Partnership to Fight Chronic Disease. He is a strategic advisor to HolaDoctor.
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