Maternal & Newborn Health: Text4baby San Diego
Evaluation Overview: October 2011-October 2012

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Executive Summary:

The National Latino Research Center at California State University, San Marcos and the University of California, San Diego Department of Reproductive Medicine, with support from the Alliance Healthcare Foundation, conducted an evaluation of the text4baby service in San Diego County from October 2011 to October 2012.

Evaluation methods included key informant interviews during Phase 1 and a telephone survey administered in three phases, Phase 1 (October 2011), Phase 2 (April 2012), and Phase 3 (October 2012) to text4baby users in San Diego to collect (1) demographic information about the users, (2) user satisfaction and interactivity with the service, (3) knowledge gained and/or behavior change among users, and (4) cultural and linguistic appropriateness of the Spanish messages for San Diego users. The telephone survey was administered to 631 unique text4baby users in San Diego (521 English-speaking users and 110 Spanish speaking users).

Text4baby is a free mobile health (mHealth) information service that provides pregnant women and new moms with information via text message on their health and their baby's health and connects them with health resources. Women enroll by texting 'Baby' (English) or 'Bebe' (Spanish) to 511411.

Our findings indicate that text4baby is increasing users' health knowledge, facilitating interaction with their health providers, reminding them of their appointments and immunizations and improving their access to health services. Below is a summary of survey findings:

Overall:

Text4baby is helping users remember appointments and immunizations:
- o **65% reported that text4baby helped them remember an appointment or immunization that they or their child needed (N=625)**

Text4baby is increasing access to health and information resources:
- o **40% of participants reported that they called a service or phone number that they received from a text4baby message (N=625).**
- o These messages range from perinatal and infant care services such as breastfeeding and post-partum support lines, teratogen information, low-cost health services to product safety, poison control, and infant immunization information lines.

  Participants without health insurance are more likely to call a number, 50% of participants without health insurance reported calling a service number compared to 36% those with insurance (p=.003).

Text4baby is informing women of medical issues:
- o **74% of participants reported that text4baby messages informed them of medical warning signs that they did not know (N=626)**

Text4baby is facilitating communication with medical providers:
- o **67% of participants reported talking to their doctor about a topic that they read on a text4baby message (N=626)**

The average text4baby participant in San Diego County:
- o is 27.4 years old
- o has an annual household income between $20,001 and $30,000
- o has 3-4 persons living in their household, including children
- o has 1-2 children (including this pregnancy)
- o is a high school graduate
- o has health insurance-
- o gives the service a satisfaction rating of 8.7 out of 10

In general, results from the evaluation provide clear evidence of the positive impact that text4baby is having on users in San Diego. These findings have significant implications for demonstrating the feasibility and impact of the text4baby program and mobile health interventions more broadly.

Overview of Text4baby

The text4baby program was launched nationally on February 4, 2010. Text4baby is a FREE bilingual (English/Spanish) mobile health (mHealth) information service that provides pregnant women and new moms with babies under age one with health tips and resources via text message. Individuals can enroll in the free service by simply texting 'Baby' (English) or 'Bebe' (Spanish) to 511411 or via online using enrollment buttons available on text4baby and partner websites.

In an effort to help address poor maternal and child health in the United States the National Healthy Mothers, Healthy Babies Coalition (HMHB), a nonprofit organization with a 30-year history of supporting health education for mothers and babies, and Voxiva, Inc., an international mobile health leader, and came together to design text4baby. With support from founding partners including, CTIA - the Wireless Foundation, the Grey Healthcare Group, and the founding sponsor, Johnson & Johnson, the service was made available to users nationally.

In addition to founding partners, text4baby is dependent on a vast and growing network of individuals and organizations, including the White House Office of Science & Technology and the Department of Health & Human Services, that are helping to deliver critical health and safety information to pregnant women and mothers with infants around the country. Individuals and organizations can partner with HMHB to join this network that is working together to create healthier communities.

The service seeks to improve the health of babies and mothers by providing users of all races, ethnicities, education, and income levels with better health information and faster access to care. The text4baby service is one tool in addressing poor birth outcomes. The program has four main goals:

Table 1: Goals of Text4baby Program

Goal 1	Demonstrate the potential of mobile health technology to address a critical national health priority: maternal and child health.
Goal 2	Demonstrate the potential of mobile health technology to reach underserved populations with critical health information.
Goal 3	Develop a base of evidence on the efficacy of mobile health interventions.
Goal 4	Catalyze new models for public-private partnerships in the area of mobile health.

Messages

Health tips are delivered via text message to enrolled users. HMHB developed the (160 character) text-length messages and coordinates content review in collaboration with leading federal agencies, health care providers, major medical associations, and national nonprofit organizations, including the Centers for Disease Control and Prevention (CDC), American Congress of Obstetricians and Gynecologists (ACOG), American Academy of Pediatrics (AAP), and Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN).

Enrolled can users receive over 250 messages with the most critical information that experts want pregnant women and moms with infants under one to know. Messages cover a range of topics critical to maternal and child health, including:

- Labor and delivery
- Nutrition
- Breastfeeding
- Safe sleep
- Prenatal care
- Infant care

- Oral health
- Immunization
- Mental health
- Smoking cessation
- Developmental milestones
- Exercise

- Family nonviolence
- Safety
- Physical Activity
- Injury Prevention
- Substance Abuse
- Car Seat Safe

Customization of Text4baby San Diego

Text4baby offers a customizable version of the service for state and local health departments and health plans. In an effort to make the service more effective for users in San Diego County, the San Diego text4baby coalition partnered with HMHB to modify a subset of the messages to direct users to local services and resources and send ad hoc broadcast messages to its users. Customization was orchestrated by coalition members and funded by the Alliance Healthcare Foundation.

Study Methodology

The National Latino Research Center at California State University, San Marcos and the University of California, San Diego Department of Reproductive Medicine, with support from the Alliance Healthcare Foundation, conducted an evaluation of the text4baby service in San Diego County from October 2011 to October 2012. During the first phase, October 2011, key informant interviews were conducted to provide the guiding framework for the broad telephone survey. The telephone survey was administered during Phase 1 (October 2011), Phase 2 (April 2012), and Phase 3 (October 2012) to text4baby users in San Diego to collect (1) demographic information about the users, (2) user satisfaction and interactivity with the service, (3) knowledge gained and/or behavior change among users, and (4) cultural and linguistic appropriateness of the Spanish messages for San Diego users.

All currently active San Diego text4baby users received a text message asking them to complete a telephone survey for evaluation purposes. Participants who volunteered to participate in the survey did so by calling a specified number and completing the survey using their cell phones Participants were directed to a phone survey, which was administered in the original language in which the text4baby messages were received by the user. Data were collected in English and Spanish.

The telephone survey was administered to 631 unique text4baby users in San Diego (521 English-speaking users and 110 Spanish speaking users) and captured socioeconomic and demographic measures for the participants, their experience with the service and the knowledge and behavior changes that users attribute to the service.

Participants completed the survey in English or Spanish, according to their own preference. 83% of participants completed the survey in English and 17% of participants completed it in Spanish. These figures roughly match the percentages of users who sign up for English messages (87%) vs. Spanish messages (13%) in the total active text4baby userbase in San Diego County.

National Text4baby Database

Evaluation of the customized text4baby service in San Diego County utilizes the national text4baby enrollment database created and managed by Voxiva, Inc. This database tracks and monitors data on enrollment, completion and cancellation, user-reported reason for cancellation (as of February 2012), referral source (as of February 2012), and descriptive data from various questions asked through the mobile platform. The database provides access to real-time enrollment data to outreach and customized partners. San Diego evaluators worked closely with the national partners - Healthy Mothers, Healthy Babies Coalition and Voxiva, Inc. - to access enrollment data for the San Diego text4baby program and coordinated directly with the database management team to prepare and send text messages to participants related to evaluation activities.

Analysis

Descriptive statistics, including frequencies, percentages and means, were prepared and chi-square tests were used to examine data for associations. Ninety five percent confidence intervals with correction for continuity are reported for single proportions/percentages.

San Diego Text4baby Survey Findings:

Overall (cumulative analysis from Phase 1, 2, and 3) evaluation findings indicate that text4baby is increasing users' health knowledge, facilitating interaction with their health providers, reminding them of appointments and immunizations and improving their access to health services. Program participants report significant benefits from the free text messaging program, text4baby:

Demographics

The survey collected demographic variables to gain a better understanding of who enrolls in the program.

| Table 2: About the Average San Diego Text4baby User	
Age	is 27.4 years old (SD=6.84)
Income	has an annual household income between $20,001 and $30,000
Household Size	has 3-4 persons living in their household, including children
Parity	has 1-2 children (including this pregnancy) (SD=1.5)
Education	is a high school graduate
Satisfaction	gives the service a rating of 8.7 out of 10

Ethnicity

Survey respondents were asked: "Which of the following ethnicities best describes you?" Over half (54%) of survey participants report being Latino/Hispanic and 28% report being White. Figure 1 displays the self-reported race/ethnicity of all telephone survey participants, which is comparable to the distribution of ethnicities in the County, with a greater proportion of Hispanic/Latinos (54%) than Whites (28%).

Excluding individuals in the Spanish speaking protocol, the ethnicities of English-speaking survey respondents were as follows: 45% Hispanic/Latino, 34% White, 9% Asian, Pacific Islander or Hawaiian, 8% African American, 3% Other, and nearly 1% as Native American (N=516).

Figure 1: Ethnicity of Survey Participants (N=626)

Income

Survey participants were asked: "What is your annual household income?"

The Annual Household Income chart (Figure 2) displays the percent breakdown of participants who provided their income level (N=480). The mean annual household income reported by participants was $20,001 - 30,000, with nearly half (45%) reporting an annual household income below $20,000. Furthermore, of those who provided their income level (N=480), 80% reported an annual household income below 40,000.

Figure 2: Annual Household Income of Survey Participants (N=480)
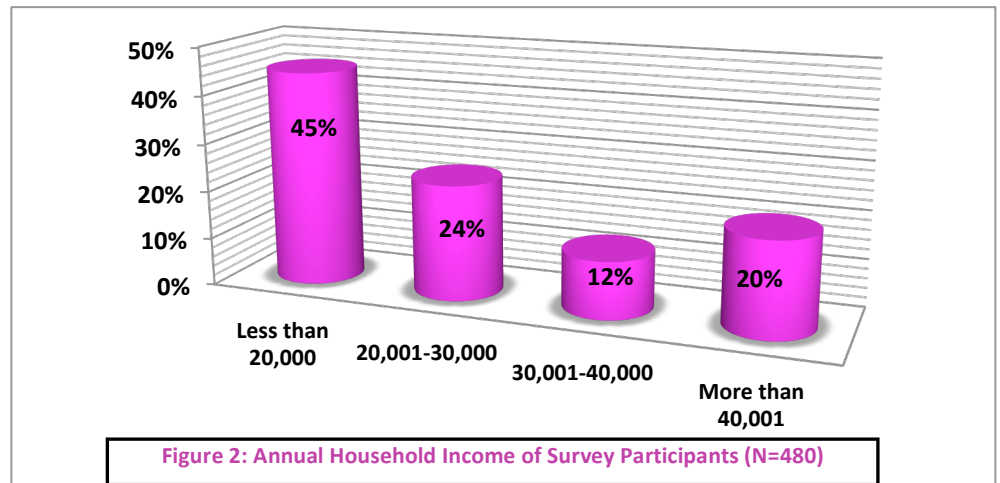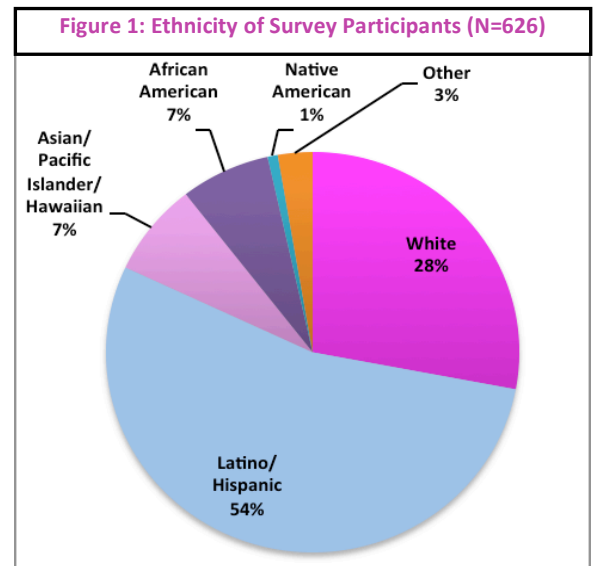
Parity& Family Size

Survey participants were asked: "Including this pregnancy, how many children have you given birth to?" Respondents reported an average of 1-2 children (Mean=1.5 SD=1) including their current pregnancy (N=630).

Survey participants were asked: "Including children, how many people live in your household?" The majority of survey respondents reported having 3-4 persons (Mean=3.66 SD=1.84) living at home (N=625).

Health Insurance

Survey participants were asked: "Do you have health insurance?" 74% CI (70.04, 77.05%) of respondents reported having health insurance (N=631).
Survey participants were asked: "Do you have Medi-Cal?" 46% CI (41.71, 49.62%) of respondents report having Medi-Cal/Medicaid (N=631).

Education

Education was asked in two parts, survey participants were asked: "Are you a high school graduate?" (N=630), if they answered "yes" they were asked: "Are you a college graduate?" (N=516). 18% of respondents report having less than a High School diploma; 82% report being high school graduates; and 37% are college graduates.

Table 2: Overall Significant Survey Findings	
Text4baby are getting important health reminders:	65% CI (61.38, 68.99%) reported that text4baby helped them remember an appointment or immunization that they or their child needed (N=625).
Text4baby is increasing access to health and information resources:	40% CI (36, 43.81%) of participants reported that they called a service or phone number that they received from a text4baby message (N=625). Health Insurance: 50% of participants without health insurance reported calling a service number compared to 36% those with insurance (p=.003). Medi-Cal/Medicaid: 47% of participants who reported being Medi-Cal (Medicaid) recipients reported calling a service number compared to 33% of those not receiving Medi-Cal (p <0.001)) These messages range from perinatal and infant care services such as breastfeeding and post-partum support lines, teratogen information, low-cost health insurance and health services to poison control and infant immunization information lines. This suggests that individuals who have health insurance may already have more access to information from their insurance providers, while, for individuals who are not insured, text4baby is providing direct access to significant health and support resources for themselves and their children.
Text4baby is informing women of medical issues:	Text4baby regularly instructs users in recognizing/identifying medical warning signs, relevant to their stage of pregnancy. 74% CI (70.47, 77.47%) of participants reported that they acquired new knowledge about one or more pertinent medical warning signs from text4baby (N=626).
Text4baby is facilitating communication with medical providers:	67% CI (63.51, 71%) of participants reported talking to their doctor about a topic that they read on a text4baby message (N=626). Learning about medical warning signs via text4baby messages was associated with a tendency to talk to one's doctor about a topic on a text4baby message, p < .001. 83% of participants who learned about medical warning signs talked with their doctors, while only 56% did among of participants who did *not* learn about medical warning signs. These data suggest that the information provided by text4baby messages strengthens relations with one's healthcare provider, by promoting communication with one's medical provider.

Cultural and Linguistic Appropriateness:

In order to assess the cultural and linguistic appropriateness of the Spanish messages, Spanish-speaking users were asked various questions regarding the content, clarity, and use of language employed in the messages (N=110). **87.3%** CI (79.24, 92.61%) of participants enrolled in the Spanish text4baby service reported that the words and phrases used in the service were familiar to them; 94.5% CI (88.3, 97.77%) reported that the Spanish used in the messages was correct. Further, 94.5% CI (85.74, 96.58%) reported that the content included in the messages was clear and understandable. These data suggest that the text4baby service is culturally and/or linguistically appropriate for Spanish-speaking users in San Diego.

Satisfaction

The telephone survey asked participants to rate their satisfaction with the text4baby service on a scale from 1—10 (1=Bad, 10=Great). The average rating provided by respondents (N=618) was 8.7 out of 10 (Median= 10).

Conclusion:

In general, results from the evaluation provide clear evidence of the positive impact that text4baby is having on users in San Diego. These findings have significant implications for demonstrating the feasibility and impact of the text4baby program and mobile health interventions more broadly.

The demographic data captured from the survey informs us that text4baby is reaching its target audience, which includes underrepresented community residents from minority groups and lower socioeconomic statuses. While low-income women have the least access to prenatal and maternal services, the broad majority have access to cell phones. By providing women with tailored health information, text4baby is increasing their access to health information and knowledge, informing interaction with their health providers, reminding participants about appointments and immunizations, and improving their access to health services. As a result of the text4baby service, users in San Diego report that they are more informed about their pregnancies, more likely to attend appointments and get immunizations, better prepared to interact with their health providers, and they and their babies have more access to the health services they need. Evaluation findings affirm that the text4baby service is positively reaching pregnant women, new moms, and others who are *getting information about caring for their health and giving their babies the best possible start in life*, thereby achieving the goal of the National Healthy Mothers, Healthy Babies Coalition and text4baby partners.

The National Latino Research Center at California State University, San Marcos is a dynamic university-based research center bridging the university community to local, state, and national organizations. Specializing in research on Latino populations, the Center designs tailored research studies and innovative projects to fit a broad range of critical topics and needs. Principal Investigators: Arcelan Nunez-Alvarez, Ph.D. and Konane Martinez, Ph.D.

University of California, San Diego (UCSD) Department of Reproductive Medicine delivers comprehensive, quality care that is responsive to the needs of the San Diego region as a whole and of the local community. The UCSD Department of Reproductive Medicine trains medical students, residents, and fellows; and expands medical knowledge through clinical and basic research. Principal Investigator: Yvette LaCoursiere, M.D., M.P.H.