

Promoting Maternal and Child Health Through Health Text Messaging

An Evaluation of the Text4baby Program

Final Report



U.S. Department of Health and Human Services
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Glossary

AAP	American Academy of Pediatrics
ACOG	American Congress of Obstetricians and Gynecologists
CDC	Centers for Disease Control and Prevention
CHC	Community Health Center
CHIP	Children's Health Insurance Program
CMS	Centers for Medicare & Medicaid Services
EHR	Electronic Health Record
FFY	Federal Fiscal Year
GED	General Education Development Certificate
HCCN	Health Center Controlled Network
HHS	U.S. Department of Health and Human Services
HMHB	National Healthy Mothers, Healthy Babies Coalition
HPPS	Healthy Pregnancy and Parenting Survey
HRSA	Health Resources and Services Administration
MCH	Maternal and Child Health
mHealth	Mobile Health
MOU	Memorandum of Understanding
n.a.	Not Applicable
n.s.	Not Significant
NYC DOHMH	New York City Department of Health and Mental Hygiene
OECD	Organisation for Economic Co-operation and Development
OSTP	White House Office of Science and Technology Policy
PSA	Public Service Announcement
SIDS	Sudden Infant Death Syndrome

TAG	Text4baby National Evaluation Technical Advisory Group
UDS	Uniform Data System
USDA	U.S. Department of Agriculture
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children

Executive Summary

Background and Objectives

Text4baby™ is a free text messaging program for pregnant women and new mothers with an infant up to one year of age, designed to improve maternal and child health (MCH) among underserved populations in the United States. It takes advantage of increasing cell phone ownership in the United States and the increasing popularity of text messaging. It is the first free national health text messaging service, made possible through an arrangement between The Wireless Foundation and most U.S. mobile operators. Text4baby provides evidence-based, critical health and safety information targeted to traditionally underserved pregnant women and new mothers who are in need of services but are often beyond the reach of the health care system. The Text4baby program was implemented through a public-private partnership led by the National Healthy Mothers, Healthy Babies Coalition (HMHB), a national coalition of MCH professional organizations; Voxiva, a mobile health (mHealth) company that provides the Text4baby software platform; The Wireless Foundation, representing the wireless carriers; and Grey Healthcare Group, which provides public relations and media support. Johnson & Johnson is the founding sponsor, providing direct financial and in-kind support to operate the program. The U.S. Department of Health and Human Services (HHS) is the lead federal government partner, assisting with outreach, developing and approving message content, and supporting an evaluation of Text4baby. More than 1,000 outreach partners support the promotion of Text4baby at the national, state, and local levels. The goal of the evaluation was to assess the implementation and effectiveness of Text4baby, with a particular focus on women receiving health care from safety net providers.

Methods

The Text4baby evaluation used a mixed-method approach to understand both the national roll-out of Text4baby and the experiences of diverse communities. The national components—stakeholder interviews and secondary data analyses—characterized the implementation and evolution of the Text4baby program. The community components—safety net consumer survey, key informant interviews, and consumer focus groups—assessed Text4baby participation, satisfaction, use, and effects at the local level. Four community health centers (CHCs) were selected to assess the implementation of Text4baby in a safety net setting; each of the CHCs receives partial funding from HHS. Even though a data-driven approach guided selection of the four CHCs, the findings are not generalizable to all CHCs, all communities with CHCs, or all populations served by CHCs. Moreover, in the absence of a control group or external comparison group, the evaluation cannot attribute differences between and among groups to the impact of Text4baby, although significant differences may suggest associations with Text4baby participation status.

Results

When the Text4baby program was developed in 2009 and launched in 2010, implementation through a public-private partnership was considered an innovative approach for the federal government's involvement in a new program. Stakeholders universally agreed that the Text4baby public-private partnership facilitated a faster implementation timeline than would have been possible under sole public or private sponsorship. Private sector stakeholders also noted that federal government involvement lent credibility to the program. In addition, stakeholders acknowledged that Text4baby relies on in-kind contributions, voluntarism, and philanthropy, which are essential to the sustainability of Text4baby and may also be central to the success of future public-private partnerships in mHealth and public health.

Text4baby is the largest health text messaging program in the United States in terms of the number of subscribers and messages sent. Since the program's launch in February 2010, more than 830,000 people have ever signed up for Text4baby. Enrollment in the Text4baby program was lower than expected nationally and within the four CHCs participating in the evaluation. Within the four CHCs, the Text4baby participation rate ranged from 2 to 16 percent. Most women receiving prenatal care in the four CHCs had never heard of Text4baby and, among those who had, many decided not to sign up because they had other sources of health information or because they were not comfortable with text messaging. The participation rate was substantially higher in the CHC with strong provider support, Text4baby posters on display in clinic waiting rooms, and direct involvement of a statewide MCH coalition in promoting Text4baby. This model of multilevel promotion and integration may hold promise for expanding the reach of Text4baby in the future.

The low enrollment in Text4baby made it challenging to assess the effectiveness of the Text4baby program and, in particular, its effect on health behaviors and outcomes. Despite this limitation, several interesting findings could inform future efforts to promote health information and enhance health knowledge during pregnancy including the following:

- Text4baby subscribers were significantly more likely than women who never heard of Text4baby to report receiving information on high-priority health topics during pregnancy. The data suggest that women who never heard of Text4baby are hard to reach with health information in general.
- Based on their composite responses to four questions regarding knowledge of recommended health practices, Text4baby subscribers exhibited a significantly higher level of health knowledge than the two other groups of prenatal care users (women who had never heard of Text4baby and women who had heard of Text4baby but did not sign up).

Conclusions

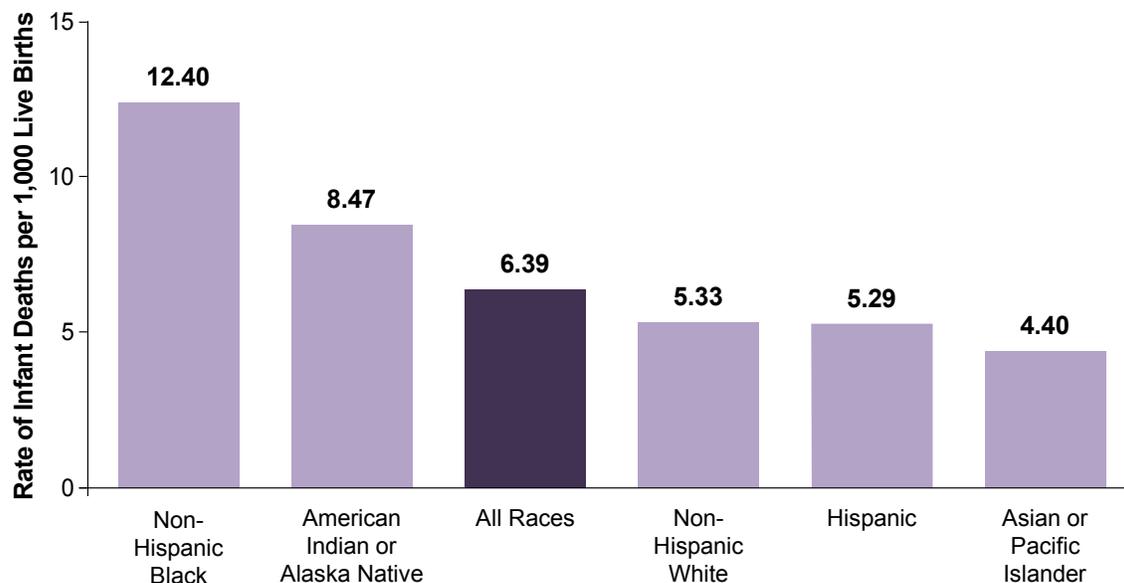
The results of the Text4baby evaluation suggest that health text messaging can provide evidence-based messages within a public health framework and augment other sources of health information to promote health knowledge among traditionally underserved populations receiving prenatal care in safety net provider settings. Moreover, women who signed up for Text4baby valued the program: 99 percent of the Text4baby subscribers who received prenatal care from the four CHCs indicated they would recommend Text4baby to a friend or family member. The findings suggest that integration of Text4baby with the delivery of prenatal services in existing health programs offers the potential to expand access to health information during pregnancy and improve knowledge about significant public health topics. The low enrollment in Text4baby made it challenging to assess the effectiveness of the Text4baby program, and in particular, its effect on health behaviors and outcomes. Further research is needed to obtain a more definitive assessment of the effect of Text4baby on health behaviors and outcomes. In addition, the viability of the Text4baby business model for future health text messaging programs (that is, reliance on in-kind contributions, voluntarism, and philanthropy) should be considered further.

I. Introduction

The health of mothers, infants, and children is a determinant of the well-being of a nation, both now and in the future (Healthypeople.gov 2013). Specifically, a nation's infant mortality rate is a leading indicator of the health of its population (Singh and van Dyck 2010). Evidence indicates that infant mortality rates have declined over the past decade, from 6.91 per 1,000 live births in 2000 to 6.87 in 2005 and 6.05 in 2011 (MacDorman et al. 2013). The declines were largest among non-Hispanic black women. Nevertheless, disparities by race/ethnicity persist, with more than a two-fold difference between non-Hispanic black women (12.40 per 1,000) and non-Hispanic white and Hispanic women (5.33 and 5.29 per 1,000, respectively) (Mathews and MacDorman 2013; Figure I.1). Moreover, despite recent improvement in the U.S. infant mortality rate, progress has not kept pace with that in other developed countries (Singh and van Dyck 2010).¹ To improve the well-being of the nation, reduction of infant deaths is a high priority for the United States, with a special emphasis on reducing disparities by race/ethnicity and income (Secretary's Advisory Committee on Infant Mortality [SACIM] 2013).

Continued progress in reducing infant mortality rates in the United States requires a multifaceted innovative strategy, including "new, culturally congruent social marketing messages and modern communication strategies" (SACIM 2013). The Text4baby™ program is a novel communication strategy developed to help address the high rate of infant mortality in the United States (Text4baby 2013). The Text4baby program provides free text messages to pregnant women and new mothers to help them have healthy pregnancies and healthy babies. This report describes the results of an evaluation of the Text4baby program.

Figure I.1. Infant Mortality Rates, by Race and Ethnicity of Mother: United States, 2009



Source: Mathews and MacDorman 2013.

Note: Within the Hispanic population, the infant mortality rate for 2009 was 4.47 for Central and South American mothers, 5.12 for Mexican mothers, 5.77 for Cuban mothers, and 7.18 for Puerto Rican mothers.

¹ The U.S. ranking among the 34 industrialized countries of the Organisation for Economic Co-operation and Development (OECD) fell from 27th in 2000 to 30th in 2005 and 31st in 2011 (OECD Health Data 2013). The OECD average in 2011 was 4.1 per 1,000 live births across the 34 countries, with the United States ranking ahead of only 3 OECD countries (Chile, Turkey, and Mexico).

A. Background and Context for the Text4baby Program

Infant mortality and other adverse birth outcomes—such as low birth weight and preterm births—are more prevalent among underserved populations, including teens and those from low socioeconomic groups (SACIM 2013). These populations are less likely to enter into prenatal care early in their pregnancy, to have adequate health insurance coverage, and to exhibit recommended health behaviors. Thus, various public and private initiatives have been developed to promote and reinforce recommended health behaviors and connect women with recommended care.²

The SACIM (2013) recommended six “big ideas” to provide a framework for future efforts to reduce infant mortality. One of the recommended strategic directions is to “redeploy key evidence-based, highly effective preventive interventions to a new generation of families.” The Text4baby program is part of a new generation of health text messaging programs that take advantage of increasing cell phone ownership in the United States and the increasing popularity of text messaging.

In 2013, 88 percent of women in the United States owned a cell phone (Rainie 2013), and among women who owned a cell phone, 81 percent used it for text messaging (Duggan 2013). In other words, 71 percent of women both owned a cell phone and used it for text messaging. Men in the United States were slightly more likely to own a cell phone and use it for text messaging (75 percent). Communication via text messaging is more common among non-Hispanic blacks (79 percent) and Hispanics (77 percent) than among non-Hispanic whites (71 percent). The prevalence of text messaging among women and minorities provides a context for the development of Text4baby as an innovative health communications strategy for pregnant women and new mothers.

Health Behaviors that Reduce Infant Mortality

Stop smoking, especially during pregnancy.

Get recommended well-woman visits, prenatal care, and well-baby check-ups.

Every woman needs 400 micrograms of folic acid every day.

Breastfeed for the health of you and your baby.

Put babies to sleep safely: on their backs on a firm sleep surface with no soft objects in the sleep area.

Source: <http://mchb.hrsa.gov/infantmortality/>.

² For more information, see <http://mchb.hrsa.gov/infantmortality/> and <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Quality-of-Care/Maternal-and-Infant-Health-Care-Quality.html>.

B. What Is Text4baby?

Text4baby provides evidence-based, critical health and safety information targeted to traditionally underserved pregnant women and new mothers who are hard to reach by the health care system and in need of services (Whitaker et al. 2012). The Text4baby program was implemented through a public-private partnership led by the National Healthy Mothers, Healthy Babies Coalition (HMHB), a national coalition of maternal and child health (MCH) professional organizations; Voxiva, a mobile health (mHealth) company that provides the Text4baby software platform; The Wireless Foundation, representing the wireless carriers; and Grey Healthcare Group, which provides public relations and media support. Johnson & Johnson is the founding sponsor, providing direct financial and in-kind support to operate the program. The U.S. Department of Health and Human Services (HHS) is the lead federal government partner, assisting with outreach, developing and approving message content, and supporting an evaluation of Text4baby. More than 1,000 outreach partners support the promotion of Text4baby at the national, state, and local levels. Since Text4baby's launch in February 2010, more than 830,000 people have ever signed up for the program (Text4baby Tuesday, February 3, 2015).



About Text4baby

Moms & moms2b text BABY (or BEBE) to 511411 for free health & safety tips by text.

Text4baby provides FREE text messages to pregnant women and moms with babies under age one. Text4baby moms receive three weekly health & safety tips about developmental milestones, breastfeeding, nutrition, mental health, car seat safety, health alerts, and more!

Text4baby is a free service of the nonprofit National Healthy Mothers, Healthy Babies Coalition (HMHB), and was created in collaboration with Founding Sponsor Johnson & Johnson, and founding partners Voxiva, The Wireless Foundation, and Grey Healthcare Group.

Source: Text4baby Facebook Page.

Text4baby's ultimate goal is to improve maternal, infant, and child outcomes among underserved populations. Text4baby is the largest health text messaging program in the United States in terms of the number of subscribers and messages sent. It is the first free national health text messaging service provided through an arrangement with most U.S. mobile operators. To enroll in Text4baby, subscribers provide their due date (if they are pregnant) or infant's birth date (if they are new mothers), ZIP code, and language preference for receiving text messages (Spanish or English).

Text4baby delivers more than 250 messages that provide "the most critical information that experts want pregnant women and moms with infants under one to know."³ When women sign up, they receive a "starter pack" of six messages that provide basic health information and encourage them to connect to care. Using the due date or birth date, the system places subscribers in a messaging protocol to receive three text messages per week timed to the stage of pregnancy or age of the infant.

³ For more information on Text4baby message development and content, see <https://text4baby.org/index.php/about/message-content>.

The messages are designed to reflect public health priorities and to be both informative and actionable. They promote positive health behaviors (such as multivitamin use, healthy eating, and breastfeeding) and use of recommended services (such as prenatal care, well-child care, and smoking cessation programs), and provide information about how to apply for health coverage through Medicaid and the Children’s Health Insurance Program (CHIP). The message content is developed in collaboration with a broad-based constituency of medical, public health, and MCH experts to ensure that the content is medically accurate and supports health education, encourages behavior change, and promotes adherence to standard care protocols. Messages cover the following topics:

Prenatal Care	Breastfeeding
Safe Sleep	Oral Health
Immunizations	Labor Signs and Symptoms
Access to Health Care	Physical Activity
Safety	Birth Defect Prevention
Nutrition	Developmental Milestones

Since its launch, the Text4baby program has refined and enhanced message content with the introduction of new topics and interactive features designed to engage users more effectively and motivate specific behavior changes. Examples include appointment reminders for pre- and postnatal visits and well-baby visits as well as specialized modules that encourage women to apply for or re-enroll in Medicaid and CHIP. Approximately half the messages delivered now include links to mobile web pages and videos that may be accessed directly via smartphones (although a smartphone is not required to receive Text4baby messages).

In addition to receiving the standard three messages a week, active Text4baby users may receive at least one “alert” message per month with information related to safety updates or policy changes as well as urgent health and safety alerts that may be targeted to selected participant ZIP codes. Women who “graduate” from Text4baby when their babies reach their first birthday continue to receive alert messages. For example, Text4baby sent an alert about a pertussis outbreak in seven states (April 2012) and about new car safety seat guidelines (March 2011).

Subscribers may opt out of Text4baby at any time by responding “STOP.” They will no longer receive messages or alerts after they unsubscribe. Text4baby does not collect health information on its user population and adheres to a privacy policy that protects user data at registration. In addition, Text4baby does not include advertisements in message content.

“I never really spent a lot of time myself with children or babies at all. I was like the youngest in my family and I never had changed a diaper. I never even had any friends who got pregnant, and so I didn’t know hardly anything about that journey so I was just looking for as much information from as many different sources as possible.”

[Text4baby Subscriber]

“I know patients are using it because they refer to getting information through Text4baby and they have good knowledge of the pregnancy process and their care needs by stage of pregnancy, especially younger women, who are into wanting more knowledge about their pregnancy.”

[Health Care Provider, Community Health Center]

“One of the public-private partnership model’s strengths is that the program has caught on at a grassroots level in a very short period.”

[Federal Government Partner]

C. The Global Context for Mobile Health Interventions

Mobile health refers to the use of wireless technologies, such as cell phones, smartphones, tablets, laptops, and netbooks, for improving health. Text4baby is one of many mHealth interventions around the world. A recent inventory identified nearly 400 mHealth projects in more than 100 organizations.⁴ In a global context, mHealth interventions are used to strengthen health care systems by improving emergency referrals for obstetric care, providing support to community health workers and midwives in remote locations, delivering health promotion services to patients, and supporting remote data collection by community health workers (Tamrat and Kachnowski 2012). mHealth is considered an integral strategy for achieving the Millennium Development Goals related to improving maternal health and reducing child mortality (Mechael et al. 2010).

The launch of the Mobile Alliance for Maternal Action in 2011, a public-private partnership to improve women's health in developing countries, underscores the growing international attention to mHealth as evidenced by the use of innovative solutions to deliver health information to women about health behaviors and health care. Such information can help women experience safe pregnancies and deliver healthy babies. To date, evidence of mHealth effectiveness is scant (Boncana 2013; Parker et al. 2012).

In the United States, a wide range of mHealth interventions is underway to improve access to and quality of health care. HHS established a Text4Health Task Force in 2010 to promote the development, implementation, evaluation, and coordination of health text messaging programs in the United States.⁵ The Task Force has guided more than a dozen activities via health text messaging, mobile phone applications, and video streaming to improve health knowledge and promote healthy behaviors. As a partner in the implementation of Text4baby, HHS contributes to and approves all evidence-based text message content; engages in outreach to raise awareness of Text4baby; and sponsors an evaluation of Text4baby to build an evidence base of the effectiveness of health text messaging as a health communications tool.

D. Overview of the Text4baby Evaluation

In September 2010, the Health Resources and Services Administration (HRSA) contracted with Mathematica Policy Research to conduct an evaluation of Text4baby. Mathematica, and its subcontractor, Public Health Institute, evaluated the implementation and effectiveness of Text4baby, with a particular focus on women receiving health care from safety net providers. The Text4baby evaluation addressed research questions in five domains: reach, engagement, education, connection, and sustainability (Table I.1). These five domains may be used to gauge how well Text4baby achieved its goals of (1) enrolling the target population, (2) promoting partnerships, (3) providing critical health information, (4) connecting women to recommended care, and, (5) facilitating the scale-up and spread of Text4baby and other health text messaging programs. This report presents the results of the Text4baby evaluation.⁶

⁴ For more information on mHealth projects, see <http://www.mhealthworkinggroup.org/project>.

⁵ For more information on HHS Text4Health initiatives, see <http://www.hrsa.gov/healthit/txt4tots/>.

⁶ The Text4baby evaluation team also produced an environmental scan on "Using Health Text Messages to Improve Consumer Health Knowledge, Behavior, and Outcomes." The environmental scan is available online at <http://www.hrsa.gov/healthit/txt4tots/environmentalscan.pdf>.

Table I.1. Evaluation Domains and Questions for the Text4baby Evaluation

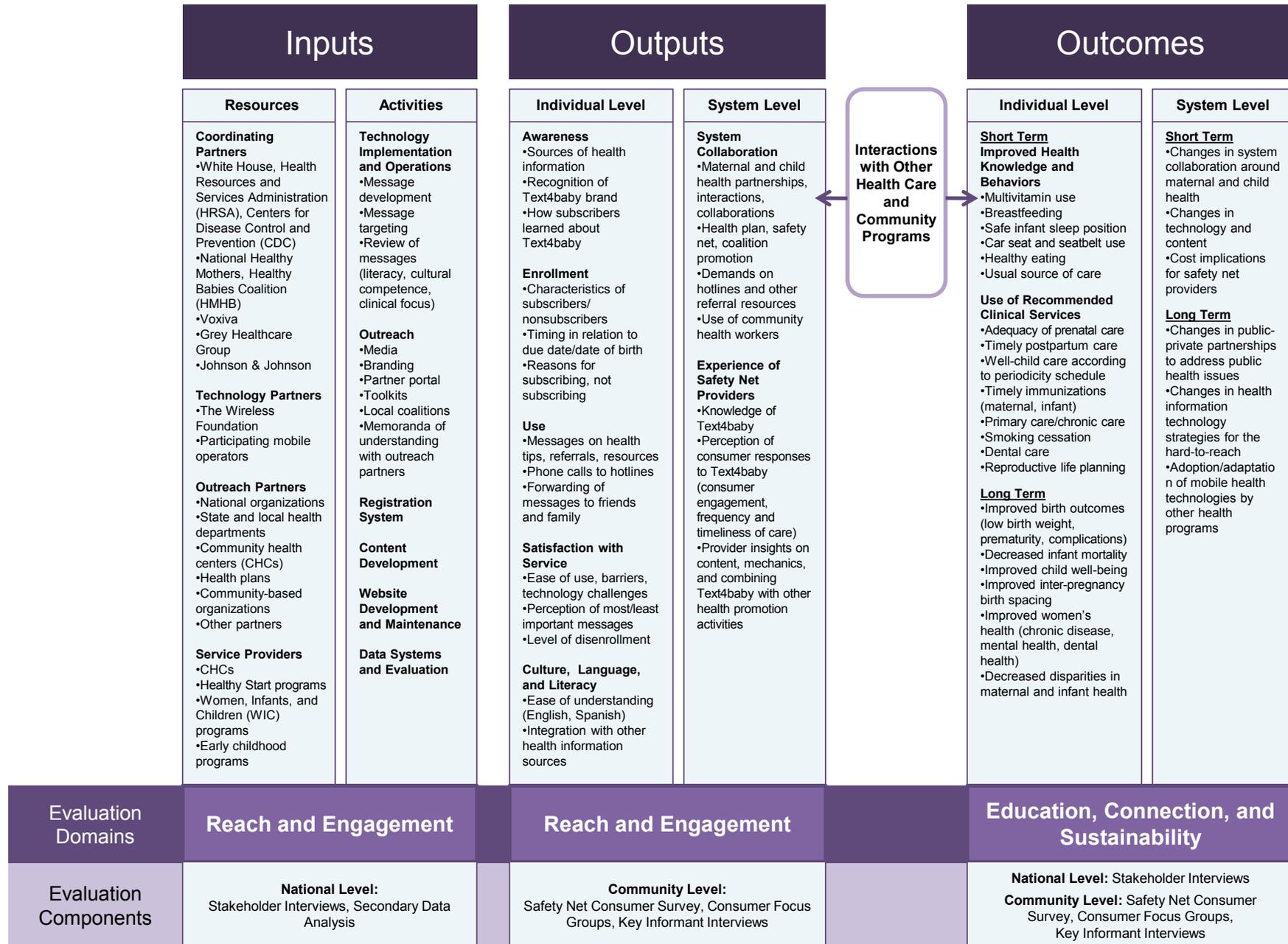
Evaluation Domains	Evaluation Questions
Reach	How well does the Text4baby program reach the target population at both the individual (consumer) and system (partner) levels?
Engagement	How well does the Text4baby program engage partners and consumers in the use of Text4baby, with a special focus on how safety net providers are affected?
Education	How well does the Text4baby program educate consumers to improve their health knowledge and behaviors?
Connection	How well does the Text4baby program connect consumers and providers to improve the use of services?
Sustainability	What are the implications for health text messaging programs to serve the target population across a range of public health issues?

Figure I.2 presents the conceptual framework guiding the Text4baby evaluation. The framework conceptualizes the Text4baby program’s inputs, outputs, and outcomes as follows:

- Program inputs include the resources (partners and providers) and activities involved in implementing Text4baby. As the first national Text4Health program, Text4baby will provide lessons that can help improve future health text messaging programs as well as public health initiatives operated under the auspices of a public-private partnership.
- Program outputs reflect how Text4baby is changing provider and consumer experiences in delivering and accessing care during pregnancy and a baby’s first year of life. At the individual level, outputs include levels of awareness of Text4baby, enrollment patterns, characteristics of subscribers and nonsubscribers (including their reasons for subscribing or not subscribing), use of Text4baby, and level of satisfaction. At the system level, the Text4baby program may influence MCH collaboration, particularly through enhanced outreach at the national, state, and local levels; increased demands on hotlines and other referrals; and changes in provider experiences (such as fewer missed appointments and more engaged consumers).
- Program outcomes are divided into short-term and long-term changes at both the individual and system levels. The conceptual framework shows that the Text4baby program interacts with other health care and community programs that can influence MCH outcomes.

Figure I.2 also aligns the program design (inputs, outputs, and outcomes) with the evaluation questions and data sources. It is important to note that the evaluation focused on individual- and system-level outputs and short-term outcomes that were available within the evaluation timeframe and data sources.

Figure I.2. Conceptual Framework for the Text4baby Evaluation



E. Components of the Text4baby Evaluation

The Text4baby evaluation used a mixed-method approach that relied on both quantitative and qualitative data sources.⁷ Data collection took place at the national and community levels in order to understand the national roll-out of Text4baby as well as experiences in diverse communities.

- The national components included stakeholder interviews and secondary data analyses. Stakeholder interviews were conducted with 8 implementation partners and 11 outreach partners to develop an understanding of Text4baby partner roles; program implementation, including product design, content development, outreach, and enrollment; and lessons learned. Secondary data sources included Text4baby enrollment and outreach partner data supplied by HMHB under a data-use agreement.
- The community components included a safety net consumer survey, key informant interviews, and consumer focus groups.⁸ These components provided an understanding of Text4baby participation, satisfaction, use, and effects at the local level.

A key feature of the evaluation was the selection of four communities to serve as local “laboratories” to assess how Text4baby was implemented in safety net settings. A data-driven approach guided the selection of four community health centers (CHCs). The selected CHCs were associated with a health center controlled network;⁹ had at least 960 prenatal care patients who delivered during 2009 (the most recent year for which data were available at the time of site selection); had at least 250 active, pregnant Text4baby subscribers and one outreach partner within 10 miles of the CHC; and had an operational electronic health records (EHR) system. The four CHCs are geographically and demographically diverse. Appendix A describes the CHC selection method in greater detail.

F. Text4baby Evaluation Partners

The Text4baby evaluation was a collaborative effort among numerous partners. The following partners contributed to the evaluation:

- Federal evaluation partners served on a Technical Advisory Group and guided the evaluation since its inception.
- Mathematica Policy Research and its subcontractor, Public Health Institute, conducted the evaluation under a contract with HRSA.
- The four CHC research partners assisted with the recruitment of pregnant women for the survey, facilitated EHR abstraction, and participated in key informant interviews.
- HMHB and Voxiva assisted in the evaluation by providing data on Text4baby enrollment and outreach partners. They also pushed out text messages through the Text4baby message platform to help the evaluation team recruit Text4baby subscribers for the focus groups.

⁷ The protocols used in the Text4baby evaluation were approved by the New England Institutional Review Board.

⁸ The Text4baby evaluation also included abstraction of EHRs for women participating in the safety net consumer survey who consented to release of their records. Analysis of EHR data is excluded from this report because of lack of comparability of EHR data across the four CHCs.

⁹ A health center controlled network includes a group of at least three safety net providers that collaborate on activities to improve the effectiveness and efficiency of health center operations, including health information technology.

G. Organization of the Report

The remainder of this report synthesizes results across the evaluation domains and data sources. Chapter II discusses the role of the public-private partnership in the implementation of Text4baby. Chapter III describes participation in Text4baby among low-income pregnant women while Chapter IV describes the women’s receipt of critical health information during pregnancy as well as their health knowledge and behavior. Chapter V discusses the lessons learned and implications of the evaluation results for the Text4baby program and other health text messaging initiatives. Chapter VI identifies the evaluation limitations and Chapter VII presents concluding remarks. Finally, Appendix A provides more detail about the evaluation methods. Table I.2 shows the organization of the analytic chapters (Chapters II through V) by the evaluation domains and data sources.

Table I.2. Organization of the Text4baby Evaluation Final Report by Evaluation Domain and Data Source

Component	Evaluation Domains ^a	National Stakeholder Interviews	Safety Net Consumer Survey	Key Informant Interviews	Consumer Focus Groups	Secondary Data Sources
Chapter II: Implementation of the Text4baby Program: The Role of the Public-Private Partnership	Reach Engagement Connection	√		√		√
Chapter III: Text4baby Awareness and Participation Among Women Receiving Prenatal Care from Four Community Health Centers	Reach Engagement		√	√	√	√
Chapter IV: Health Information, Knowledge, and Behavior Among Women Receiving Prenatal Care from Four Community Health Centers	Engagement Education Connection		√	√	√	
Chapter V: Lessons Learned About the Use of Health Text Messaging to Provide Health Information During Pregnancy	Reach Engagement Education Connection Sustainability	√	√	√	√	√

^a The evaluation domains are defined as follows:

Reach = how well the program reaches the target population at both the individual (consumer) and system (partner) levels

Engagement = how well the program engages partners and consumers in the use of Text4baby

Education = how well the program educates consumers to improve their health knowledge and behaviors

Connection = how well the program connects consumers and providers to improve the use of services

Sustainability = implications for text messaging programs to serve the target population across a range of public health issues

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II. Implementation of the Text4baby Program: The Role of the Public-Private Partnership

A. Introduction

When Text4baby was developed in 2009, the use of mobile phones to deliver health and safety information to pregnant women and new mothers was a novel idea in the United States. Launched in February 2010, Text4baby is the largest health text messaging program in the United States in terms of the number of subscribers and messages sent. It is accomplished through the voluntary contributions of its founding partners, founding sponsor, and more than 1,000 outreach partners. Together, they formed a public-private partnership that developed and implemented Text4baby. Lessons learned from the implementation of Text4baby can inform the design of future partnerships to support health text messaging programs and other mHealth interventions in the United States.

Public-private partnerships are a common and longstanding approach to addressing public health issues globally, but they are used less frequently in the United States (Barr 2007). They typically involve a written agreement between public and private sector agencies that specifies respective roles and responsibilities, shared objectives, and a governance structure (Mitchell 2008). To date, most public-private partnerships in health have focused on specific communicable diseases (such as HIV/AIDS, malaria, and tuberculosis); more recently, public-private partnerships have been established to address other issues, including chronic disease prevention, pharmaceutical development, and health delivery system change (Barr 2007; Christensen 2011; Easton 2009).

Among the major catalysts for the growth of public-private partnerships in health are the increasing complexity and scale of public health problems, recognition that the public and private sectors may be more effective in working together rather than alone in solving these problems, and the availability of resources to finance public health initiatives (Buse and Tanaka 2011; Christensen 2011). According to Mitchell (2008), “Public-private partnerships are increasingly seen as playing a critical role in improving the performance of health systems worldwide, by bringing together the best characteristics of the public and private sectors to improve efficiency, quality, innovation, and health impact of both private and public systems.”

The Text4baby public-private partnership is widely recognized as a driving force in the program’s development, launch, growth, and enhancement.

The major components of the Text4baby public-private partnership, as depicted in Figure II.1, include (1) committed founding partners and a sponsor that developed and launched the program and that continue to refine the product; (2) extensive networks of outreach partners, increasing in number and diversity every week, that promote Text4baby nationally and locally; (3) evidence-based messages developed collaboratively by government, academic, and clinical experts to gain credibility and trust among providers and consumers; and (4) technology that is simple to use and available at no charge to most cell phone owners

Figure II.1. The Four Key Components of the Text4baby Public-Private Partnership



with text messaging capabilities. Stakeholders universally agree that the public-private partnership accelerated the launch of Text4baby nationally and that the partnership is evolving as the program matures.

This chapter describes the origins of the Text4baby public-private partnership, its structure, and how it has evolved as the program has matured; the role played by the public-private partnership in meeting two key operational objectives—developing message content and conducting outreach and enrollment; partner perspectives on Text4baby program enrollment; and lessons learned from the Text4baby public-private partnership. The chapter draws on findings from the national stakeholder and key informant interviews as well as on secondary data on Text4baby enrollment and outreach partners provided by HMHB.

B. Origins of the Text4baby Public-Private Partnership

The vision for a public-private partnership model to deliver health information to pregnant women and new mothers via text messaging grew out of discussions in January 2009 between the Centers for Disease Control and Prevention (CDC) and Voxiva, a private mHealth technology company. The CDC and Voxiva were later joined by HMHB, a nonprofit organization that was designated as the lead partner. Federal government stakeholders indicated that it was important for a nongovernmental, nonprofit organization, rather than a commercial entity, to lead the effort.

Before the program launched in February 2010, additional organizations joined as founding partners: The Wireless Foundation was the industry representative for the wireless carriers; Grey Healthcare Group was the lead strategic marketing and brand advisory partner; and Johnson & Johnson was the founding sponsor. Other federal agencies joined the CDC at an early stage in the development of Text4baby, including the HHS Office on Women’s Health, HRSA, the U.S. Department of Agriculture (USDA), and the White House Office of Science and Technology Policy (OSTP). These agencies recognized the potential of text messaging technology to reach underserved pregnant women and new mothers, complementing other HHS and USDA activities that aim to connect with the same population. Likewise, Johnson & Johnson, the wireless carriers, and Grey Healthcare Group joined as founding sponsor and partners because they were drawn to the Text4baby mission and its focus on a high-need population.

Text4baby was piloted briefly in Virginia in late 2009 before its national launch. During summer 2009, the state health department established a Text4baby implementation team comprised of members of the pre-existing Infant Mortality Workgroup and other stakeholders. With a grant from a health insurance plan, the team began planning to promote the program. The pilot took place in a large private practice and four Healthy Start sites. State officials reflected on two important lessons learned from the pilot: (1) the need to include smaller wireless carriers in the program to broaden the availability of free text messages, and (2) the need for guidance on how to introduce the program to clinic staff and other partners.

“This was a really unique partnership. It was one of the first partnerships in which the government partnered with a nonprofit organization, in which the nonprofit organization and the other stakeholders took primary responsibility for the program.”

[Federal Government Partner]

“The government was incredibly catalytic as the convener and adding credibility to get Text4baby rolling.”

[Founding Partner]

“The public-private partnership has achieved getting something from concept to release on a time frame that absolutely could not have occurred within the federal government.”

[Federal Government Partner]

The New York City Department of Health and Mental Hygiene (NYC DOHMH) also expressed interest in serving as a prelaunch pilot site. With the Virginia pilot already underway, NYC DOHMH invited the Text4baby founding partners to a New York City Text4baby Coalition meeting in December 2009. More than 100 representatives of public and private organizations attended the meeting to discuss outreach and enrollment strategies in New York City. At that meeting, it became apparent to the founding partners that the program generated considerable interest. As a result, the partners decided to move quickly to a national launch in February 2010.

In January 2010, HHS and HMHB signed a memorandum of understanding (MOU) formalizing the Text4baby public-private partnership (Whitaker et al. 2012). The MOU specified three goals:

1. Demonstrate the potential of mHealth technology to address a critical national health priority for underserved populations
2. Contribute to an evidence base on the effectiveness of mHealth interventions
3. Create new models for public-private partnerships in mHealth

The MOU designated HMHB as the lead partner with overall responsibility for service delivery. It also specified three roles for HHS in overseeing a department-wide effort: (1) participate in the development, review, and approval of message content; (2) contribute to the promotion of and outreach for Text4baby; and (3) lead an external evaluation of the program. The MOU guides the federal role in the Text4baby public-private partnership.

C. Structure of the Text4baby Public-Private Partnership

Public-private partnerships in health vary along many dimensions, including scope, types of partners, level of commitment among partners, and types of health care objectives (Mitchell 2008). The Text4baby public-private partnership is national in scope;¹⁰ brings together a broad cross-section of government, nonprofit, and private partners; is committed to providing the program with both direct and in-kind resources; and is devoted to reducing disparities in infant mortality and preterm births by providing critical health information and resources to underserved women via innovative mHealth technology. The Text4baby public-private partnership involves three major types of partners:

1. **Founding Partners and Sponsor.** The founding partners and sponsor designed and implemented the Text4baby program. Each partner has made unique contributions to the program (Table II.1) and supports program implementation by maintaining and deepening relationships with key groups of outreach partners. As the lead partner, HMHB convenes quarterly steering committee meetings to define the program's high-level strategic direction. In addition, HMHB, Voxiva, Johnson & Johnson, and Text4baby program staff members hold regular conference calls to discuss day-to-day program operations. HHS is the lead government partner, which operated under an MOU with HMHB. In addition, the USDA and White House OSTP support HHS outreach and evaluation efforts.
2. **Text4baby Program.** As a program of HMHB, Text4baby staff coordinate outreach (including support for the activities of more than 1,000 outreach partners); manage the content development process; and oversee marketing, communications, research, and data management.

¹⁰ In addition, Text4baby has an international presence. Text4baby Russia was launched in February 2012 by the Healthy Russia Foundation (now called the Health and Development Foundation). More information is available at <http://www.healthynewbornnetwork.org/partner/health-and-development-foundation>.

3. Outreach Partners. The Text4baby public-private partnership includes a broad and diverse spectrum of public and private sector outreach partners at the national, state, and local levels. They pursue promotion and outreach activities to raise awareness and motivate pregnant women and new mothers to enroll in Text4baby. The founding partners facilitate relationships with specific partner groups, such as MCH professionals (HMHB), mobile operators (The Wireless Foundation), health plans (Voxiva), and media organizations (Grey Healthcare Group).

Table II.1. Roles of the Text4baby Founding Partners

Founding Partners	Type of Partner	Roles
HMHB	Nonprofit public health partner and host organization for the Text4baby program	<ul style="list-style-type: none"> • Overall responsibility for service delivery • All Text4baby sponsorship funds flow through HMHB • HMHB board advises the program on programmatic, fiscal, and legal matters • Mobilized its national network of coalition and grassroots organizations to support promotion and outreach efforts
Voxiva	mHealth technology partner	<ul style="list-style-type: none"> • Global experience in mHealth technology, strategy, and scale-up of mobile health solutions • Manages the program’s technical and service components as well as the relationship with health plan partners
Johnson & Johnson (founding sponsor)	Financial and in-kind support through its programs and staff	<ul style="list-style-type: none"> • Founding sponsor through a multiyear pledge that supports the development and management of the technical infrastructure and day-to-day operations • Assigns a corporate representative to the HMHB board to provide insight and input into internal decisions related to the program • Provides in-kind support to develop the Text4baby website and promote Text4baby within target populations served by its business units
The Wireless Foundation	Nonprofit organization representing the U.S. wireless carriers	<ul style="list-style-type: none"> • Formalized agreements with major wireless companies to waive text messaging charges for Text4baby messages • Provides in-kind contributions to Syniverse Technologies, which manages relationships with individual carriers • Funded production of two public service announcements for media campaigns
Grey Healthcare Group	Health care advertising, branding, and marketing agency; lead marketing and media partner	<ul style="list-style-type: none"> • Developed the program’s marketing strategy, including its logo, marketing materials, and website • Developed a multichannel strategy to build brand awareness among consumers • Explores new partnerships with emerging consumer media technology organizations to advance promotional strategies through digital media channels
HHS (lead government partner) ^a	Content development and outreach partner	<ul style="list-style-type: none"> • Jointly led development of the initial message content with HMHB according to an evidence-based framework and oversaw an HHS-wide effort to review and provide feedback on message content • Identifies channels to promote the Text4baby program to ensure regular dissemination of information to federal grantees and other key stakeholders • Convenes a federal technical advisory group with representatives from HHS, USDA, and OSTP to provide subject matter expertise on evaluation

^a Other government partners include the White House OSTP, U.S. Department of Defense Military Health System, USDA, U.S. Consumer Product Safety Commission, and Social Security Administration.

D. Organization of the Text4baby Program

The Text4baby program's infrastructure has grown in size and capacity to accommodate new and expanded functions that meet the program's evolving needs. When Text4baby launched, the program had three employees. With increased funding from Johnson & Johnson announced in November 2010, the program expanded to 8.5 employees. The Text4baby program coordinates two key activities of the public-private partnership—content development and outreach—led by a content manager and outreach manager, respectively. The Text4baby content manager works closely with medical associations and other partners in the ongoing review and revision of content as well as in the development of new content modules, such as flu vaccination and breastfeeding. The Text4baby outreach manager and coordinators engage, manage, and support partner relationships. The content manager also works closely with the outreach coordinators to ensure the alignment of partner activities with content development. In addition, the Text4baby director of marketing and communications works closely with the outreach coordinators to incorporate stories about the use of Text4baby by pregnant women and new mothers.

Management of the growing number of outreach partners has become increasingly structured and standardized. The program assigns an outreach coordinator to each partner by region and uses MOUs to formalize relationships with partners. Automated systems track partner outreach and enrollment activities on the Text4baby website. The outreach coordinators maintain regular contact with the outreach partners in their geographic regions and integrate information about partners' activities into media campaigns and marketing communications targeting the broader partnership (such as the Text4baby Tuesday newsletter). They also guide the development of practical resources that partners may use in their local outreach efforts. The program has developed fact sheets to help partners formulate strategies to build relationships with local organizations that also serve the target population (including Healthy Start, Medicaid, and the Special Supplemental Nutrition Program for Women, Infants, and Children [WIC]).¹¹

Partners indicated that the lack of a structured process for data collection and analysis has challenged the program's ability to assess the effectiveness of outreach activities. In response, the program hired a research manager to oversee Text4baby data collection, support analysis of program data regarding effective enrollment practices, identify potential triggers or mechanisms that may contribute to disenrollment, and develop insights into specific populations' user experiences. The research manager also oversees the data portal that provides partners with access to enrollment data for specific regions and/or populations to inform marketing strategies. Evaluation and research also influence message content, including the addition of new modules, refinement of existing messages, and introduction of new features.

¹¹ For more information on Text4baby and WIC, see <https://www.Text4baby.org/index.php/component/content/article/54-partners-get-involved/partners/397-t4b-wic>; for more information on Text4baby and Medicaid, see https://www.Text4baby.org/templates/bee_20/images/HMHB/CMSfactsheet.pdf.

E. The Role of the Public-Private Partnership in Message Content Development

As the Text4baby program has grown and matured, development efforts continue to enhance message content. One partner described the program's messages as its most valued asset. The messages are an asset in terms of both the quality of health information delivered to pregnant women and new mothers, and the credibility that the messages bestow on the program among external partner organizations.

Government participation in the content development process helped guide the selection of topics according to evidence-informed guidelines. HMHB and CDC co-led the drafting of message content, and a broad constituency of medical, public health, and MCH experts reviewed and revised the content to ensure that it was medically accurate, encouraged behavior change, and promoted adherence to standard care protocols. The draft messages underwent several rounds of internal review and testing among staff from federal government agencies and expert consultants representing organizations such as the American Congress of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP). Focus groups were conducted with the target population, but given the limited pilot period, cognitive interviewing about the English-language messages did not take place before launch.

From the outset, partners recognized the need for continual review and improvement of the product, including the addition of new content and introduction of interactive features. Following Text4baby's launch, the public-private partnership introduced a formalized governance structure that involves the federal government's ongoing review and approval of content modifications (led by the CDC). Although the messages were developed and revised through a public-private partnership, they remain proprietary and copyrighted by HMHB.

The content development process continues to evolve with the formation of a Content Development Council, which is made up of a broad representation of national health and medical stakeholder organizations and leading topic-specific experts and health organizations.¹² The Council will periodically review and revise the pregnancy and infant messages and provide guidance on topics of significance such as breastfeeding and prevention of early elective deliveries. The Council will formalize the process that permits partners to provide input to and approve content changes.

The underlying technology infrastructure has been refined to meet the growing demand for text messaging by scaling up hardware, software, and security elements (including connections to the carriers and Short Message Service aggregators). Voxiva, the program's founding technical partner, maintains responsibility for ensuring the program's technical ability to fulfill user expectations consistently and reliably as the service continues to mature. Voxiva has responded to user demands and fast-moving technology trends with the introduction of new features that provide greater interactivity to motivate specific behavior changes (such as appointment reminders) and that integrate with mobile web platforms to provide access to more detailed information (such as informational videos and fact sheets).

¹² For more information on Text4baby message content and development, see http://www.Text4baby.org/templates/bee_z_20/images/HMHB/t4b%20content%20factsheet%206.20.13final.pdf.

F. The Role of the Public-Private Partnership in Outreach and Enrollment

One founding partner characterized the initial approach to promotion and outreach as “let a thousand flowers bloom,” without much coordination of individual efforts. The program had not yet developed a long-term promotion and outreach strategy when the partners decided to pursue an aggressive timeline to launch Text4baby nationally. Over time, however, a series of cohesive promotion and outreach strategies emerged around the common goal of ensuring that every woman has access to information that will contribute to a healthy pregnancy and baby.

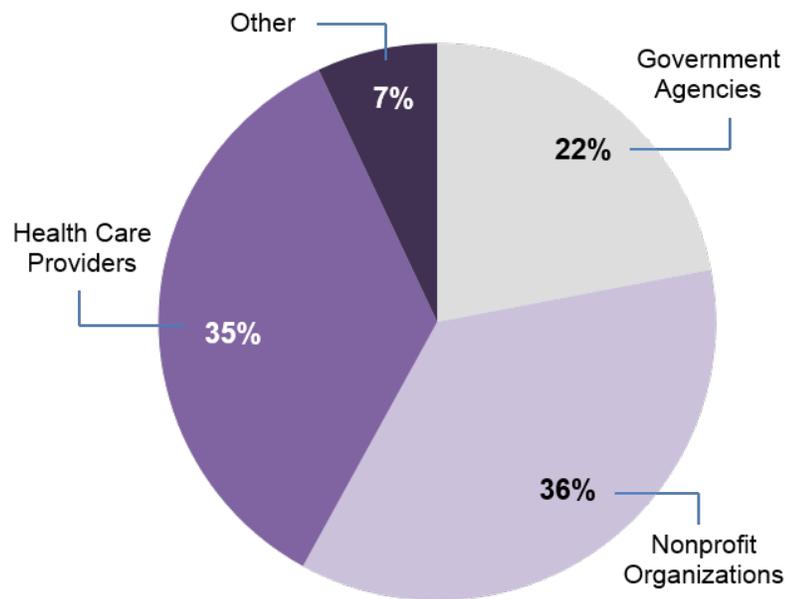
Promotion of the Text4baby program has relied on leveraging an expansive network of government agencies, corporations, academic institutions, professional medical associations, and nonprofit organizations at the national, state, and local levels; each network member makes a unique contribution to realizing a common goal of reducing health disparities and improving health outcomes among underserved women. As of July 2013, the Text4baby program’s more than 1,000 partners included government agencies (22 percent), nonprofit organizations (36 percent), health care providers (35 percent), and other entities (7 percent) (Table II.2; Figure II.2).

Table II.2. Number of Text4baby Outreach Partners, by Type of Partner, as of July 2013

Type of Partner	Number of Partners
Total Partners	1,048
Government Agencies (22%)	231
Federal government agencies	5
State government agencies	50
Healthy Start Programs and Coalitions	28
Head Start/Early Head Start Programs	9
County and city health departments	134
Local government agencies	5
Nonprofit Organizations (36%)	373
National nonprofit organizations	68
State nonprofit organizations	83
Local nonprofit organizations	222
Health Care Providers (35%)	370
Federally Qualified Health Centers	67
Hospitals, health care delivery networks, and clinics	192
Health plans	106
Health services management companies	5
Other (7%)	74
Colleges and universities	29
Local school districts	1
Businesses (including telecom carriers)	40
Media	3
Pharmacies	1

Source: Analysis of the HMHB Partner Database, as of July 24, 2013.

Figure II.2. Distribution of Text4baby Outreach Partners, by Type of Partner, as of July 2013



Source: Analysis of the HMHB Partner Database, as of July 24, 2013.

A common element across the efforts of all outreach partners is the voluntary nature of their contributions. The program has always recognized that, as a free service, Text4baby would have tremendous applicability nationally but that the network of outreach partners would face financial constraints in supporting promotion and outreach on a sustained basis. As a result, the Text4baby program developed and made available promotional materials to partners at no charge while offering them the flexibility to customize many of the materials (for example, by adding their own logo). Partner organizations typically use the preprinted promotional materials and resources (such as tear pads, posters, and flyers) to promote the service directly to pregnant women and new parents.¹³

The current Text4baby outreach strategy involves two main components: (1) a broad-based mass media strategy, and (2) a direct outreach strategy in collaboration with an extensive network of public health agencies, health care providers, and health plans.

- 1. Mass Media Strategy.** The use of mass media and popular culture promotes the Text4baby brand and marketing message and builds broad awareness at a population level. Media partners have incorporated the Text4baby brand into national television programming and have placed public service announcements (PSAs) in national and local television, radio, print, and film media. Social media and search technologies are newer media strategies that broaden the channels through which consumers may be reached.
- 2. Direct Outreach Strategy.** A three-pronged approach to building awareness and enrolling women in Text4baby includes (1) collaboration with state and local health agencies and their partners to embed Text4baby in public health initiatives; (2) integration with the outreach practices of health plans serving the target population; and (3) direct engagement of health care providers to integrate Text4baby into standard workflow practices during patient visits.

¹³ For more information on promotional materials available at the Text4baby media center, see <https://Text4baby.org/index.php/news/media-center>.

As part of its mission to reduce disparities in maternal and infant health outcomes, the Text4baby program has focused its mass media and direct outreach strategies on reaching diverse populations. For example, the program developed PSAs and other materials in Spanish, created a telenovela series, and featured Text4baby in Spanish-language shows and storylines on MTV. The program also partners with National Council of La Raza and other advocacy organizations to raise awareness of Text4baby in the Latina community. Within the African American community, Text4baby has partnered with national and regional magazines (such as *Ebony*) to promote the service, enlisted celebrities in media outreach through PSAs and blogs, and participated in state and local infant mortality coalitions. These and many other outreach initiatives are designed to raise awareness of and promote enrollment in Text4baby among the target population of underserved, high-risk women.

Table II.3 provides additional information on the Text4baby outreach components, including goals, strategies, and activities.

1. Mass Media Strategy to Promote Text4baby

Evidence suggests that the strategic promotion of the Text4baby brand and the dissemination of messages through mass media at the national level have yielded benefits. In particular, the integration of popular culture with pregnancy issues in media campaigns has correlated with spikes in Text4baby enrollment. During the launch of Text4baby, a promotional effort through MTV correlated with a spike in enrollment at the time that “16 and Pregnant” aired. Similarly, media coverage of the Text4baby program in a 2011 *New York Times* article correlated with a spike in enrollment.

The program reports that subscribers who register for messages in response to media campaigns tend to disenroll from the service at a higher frequency than subscribers from other sources. Nevertheless, partners acknowledged that media coverage, whether earned media, paid advertising, or product placement, still bolsters the larger outreach and enrollment effort. Text4baby is forming a marketing council to advise the program on strategy related to media outreach.

To reach the media- and technology-savvy members of the target population, Text4baby relies on social media and new technology to promote the program and engage subscribers. For example, Text4baby maintains a website (www.Text4baby.org), Facebook page, Twitter account, and YouTube channel. The program provides a range of promotional materials, such as PSAs for local television and radio media campaigns. Partners can also integrate digital tools that support direct enrollment in Text4baby, such as a web enrollment button, with their direct-to-consumer digital channels. In addition, Grey Healthcare Group has hosted media and technology summits that provide an opportunity to engage with media and technology leaders and educate them about the program as well as leverage their insights into cost-effective strategies for promotion and outreach efforts. As the partner base has grown, the program has developed guidelines to ensure consistent use of the Text4baby brand and logo.

Partners identified the lack of a dedicated marketing budget as a limitation in the program’s ability to support a comprehensive national media campaign to promote Text4baby broadly and create greater awareness among the general population. Partners believe that a dedicated marketing budget is required to support the program’s future enrollment growth. However, experience with Medicaid and CHIP suggests that promotion through a media campaign accompanied by a grassroots collaboration strategy can motivate women to enroll and sustain their participation (Williams and Rosenbach 2007; Stephens and Artiga 2013).

Table II.3. Components of the Text4baby Outreach Strategy

Component	Goal	Strategy	Example of Activities
Mass Media Strategy	To generate broad awareness and mobilize individual action, promotion, and outreach by leveraging the reach of traditional mass media to incorporate the Text4baby brand and marketing messages	Promote the Text4baby brand and marketing message and build awareness of the program at a population level through use of earned media, paid advertising, or product placement	<ul style="list-style-type: none"> • Coverage of Text4baby through national and local news media • Earned and paid public service advertising on television, radio, buses, cinema theaters, and billboards • Placement of Text4baby product messaging into standard television programming (such as MTV's "16 and Pregnant") • Placement of public service announcements on movie DVDs/Blu-Rays (such as "What to Expect When You're Expecting")
Direct Outreach Strategy			
Collaboration with Public Health Networks and Coalitions	To integrate Text4baby promotion and outreach into existing coalitions or networks at a state or local level to address priority issues in MCH	Place Text4baby in a public health framework and position the service as a free resource to facilitate health promotion and patient education activities for the target population in order to reduce health disparities	<ul style="list-style-type: none"> • Mobilization of community-based organizations and use of person-to-person outreach strategies at grassroots level • Placement of Text4baby promotional information with state birth certificate mailings • Partnership between Text4baby and the Centers for Medicare & Medicaid Services' (CMS) Connecting Kids to Coverage initiative to cross-promote enrollment in both programs • Annual Text4baby state enrollment contest to foster collaboration among organizations on outreach and enrollment
Collaboration with Health Plans	To integrate Text4baby outreach and enrollment into existing health plan member outreach and health education practices, especially health plans with significant Medicaid enrollment	Institutionalize Text4baby into the existing outreach practices and communication protocols of health plans serving the target population	<ul style="list-style-type: none"> • Inclusion of Text4baby promotional materials in health plan mailings to members • Integration of Text4baby with enrollment into health plans and tracking of engagement once enrolled
Collaboration with Health Care Providers	To leverage the personal influence of health care providers during regular interactions with patients or clients and to motivate women to enroll in and use the service	Introduce Text4baby into care protocols to motivate women to enroll in and use the service, such as by placing materials in waiting rooms, handing out flyers during the prenatal care intake process, or integrating Text4baby into health educators' communication protocols	<ul style="list-style-type: none"> • Promotion of Text4baby to medical professionals through leadership forums, journals, newsletters, and presentations • Provision of printed promotional materials to providers at no charge for dissemination in health clinics, waiting rooms, and hospital discharge packets • Incorporation of Text4baby into clinic visit, home visiting, and WIC program communication protocols during encounters with pregnant women and new mothers

Source: Synthesis of stakeholder interviews conducted by the Public Health Institute and Mathematica Policy Research for the Text4baby evaluation.

2. Direct Outreach Strategy to Promote Text4baby

To complement its mass media strategy, the Text4baby program conducts direct outreach to potential subscribers through collaborations with a wide range of organizations. Such an approach presents a low-cost and practical solution to building momentum in the face of significant resource constraints. The network of outreach partners continues to grow weekly as new organizations sign on to promote Text4baby. Founding partners have realized that Text4baby is easy to “sell.” The simplicity underlying its design, particularly the fact that it is free, makes it easy for organizations to agree to promote the program. The noncommercial nature of the message content also distinguishes Text4baby from many other education resources available to pregnant women and new mothers and has helped secure the support of programs that are committed to and engaged in promotion and outreach to underserved women, such as Healthy Start, Medicaid, and WIC. One promising approach has been to piggyback the promotion and outreach of Text4baby onto existing coalitions or networks that address high-priority MCH issues at the state or local level. For example, Text4baby outreach in Virginia was organized around an existing state infant mortality task force.

Despite the active involvement of health professional organizations (such as ACOG and AAP) in promoting Text4baby at the national level, the program’s visibility and momentum at the local level have been limited because many providers are not aware of Text4baby or the role they can play in promoting it. The Text4baby program is working closely with health plans and providers to embed Text4baby as a health promotion and patient education resource for their members. Yet, even when health plans and providers see the benefit of Text4baby as a patient education resource, they may encounter several barriers in actively promoting the program. Providers often indicated they need guidance on how to integrate Text4baby into their existing clinical practices and patient care protocols. In many health care settings, the responsibility for promoting Text4baby falls to health care providers other than the clinical staff, such as intake staff, health educators, and case managers. They often lack training in how to modify existing patient care protocols to accommodate the promotion of Text4baby.¹⁴ Providers also would like evidence of effectiveness to justify the investment of organizational resources in supporting the program.

G. Analysis of Text4baby Program Enrollment and Retention

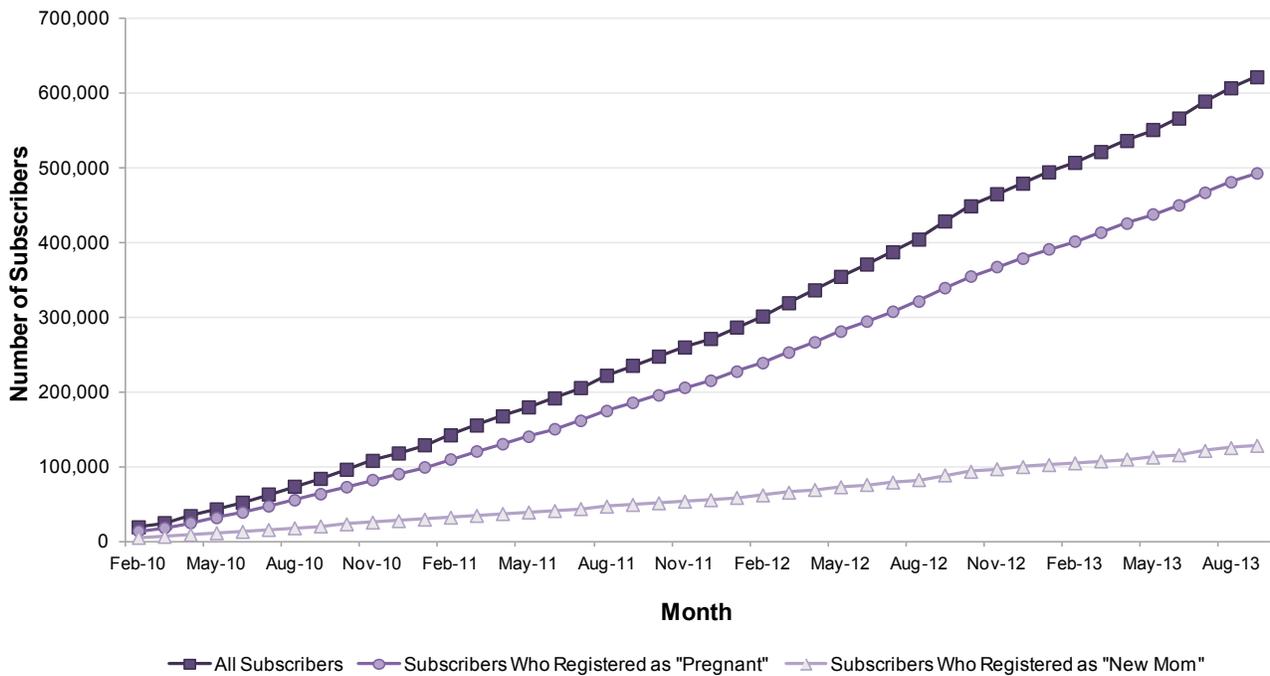
The evaluation included an analysis of national Text4baby enrollment and retention, based on registration data supplied by HMHB as of September 30, 2013. Figure II.3 shows the cumulative number of subscribers ever enrolled in Text4baby, by month, through September 30, 2013.¹⁵ In November 2010, the program set a goal to enroll “1 million moms” by the end of December 2012. The cumulative enrollment at the end of December 2012 was 480,000. Even though the program fell short of its goal, one federal government stakeholder called the level of enrollment “quite astounding” (see quote).

“From the initial conception as a pilot project to over half a million people participating in Text4baby, from that perspective, it can be seen as a success. . . . So you can see it as the glass half empty or the glass half full but if you look at the numbers, they are quite astounding.”
[Federal Government Partner]

¹⁴ In Russia, the implementation of Text4baby involved a health communications training program for all doctors who see pregnant women and mothers of newborns in order to raise awareness of the Text4baby program and encourage communications about the program (Parker et al. 2012).

¹⁵ The results are based on Mathematica’s primary analysis of enrollment data drawn from data supplied by HMHB. The file contained data for all subscribers enrolled from February 2, 2010, through September 30, 2013. The file included information on date of registration, due date (for those who were pregnant) or baby’s birth date (for those who enrolled or remained enrolled after their baby was born), and unsubscribed date (for those who texted “STOP” to discontinue the receipt of messages).

Figure II.3. Cumulative Number of Text4baby Subscribers, by Month and Protocol at Time of Registration, as of September 30, 2013



Source: HMHB, Participants Dataset, as of September 30, 2013, based on analysis conducted by Mathematica Policy Research.
 Note: Cumulative number of subscribers includes the number ever enrolled, including those who unsubscribed. Protocol at time of registration is defined according to whether the subscriber registered before the due date (“pregnant”) or on or after the birth date (“new mom”).

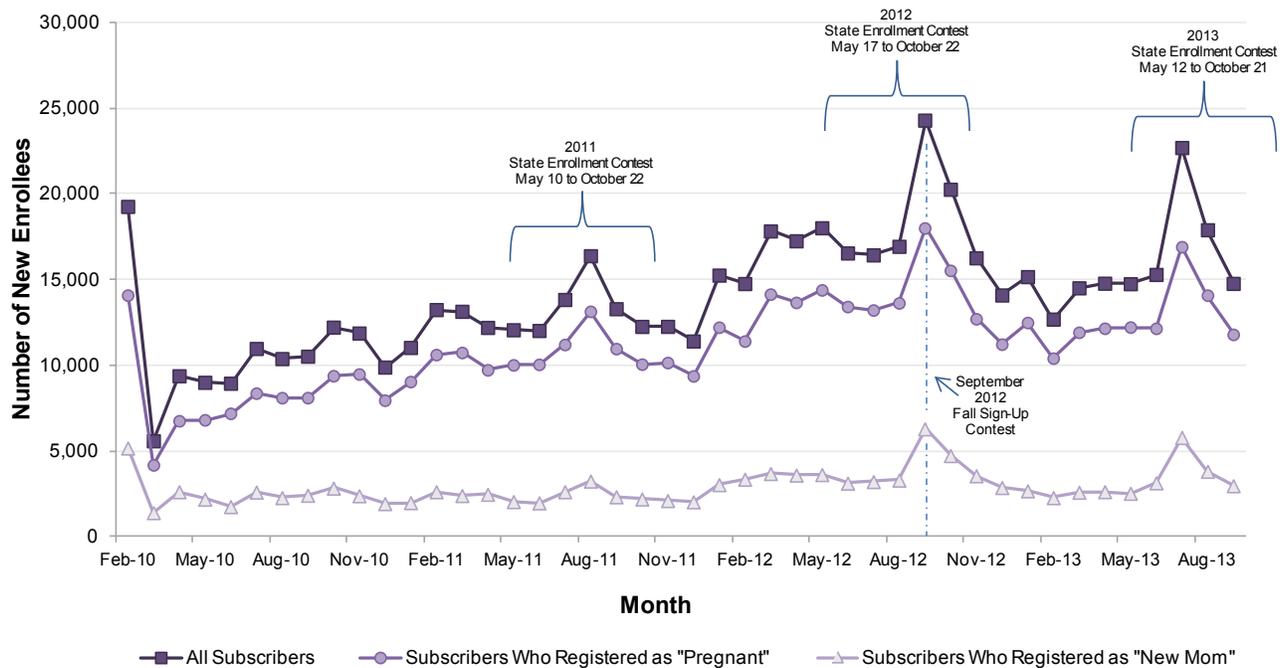
Little is known about the characteristics of Text4baby subscribers due to the limited information collected during registration. Of the 622,350 people who had ever signed up for Text4baby as of September 30, 2013, 79 percent initially registered for the pregnancy protocol (that is, they signed up before their due date), and 21 percent registered for the new baby protocol (that is, after their baby’s birth date).¹⁶ About one-third of all subscribers signed up during the first trimester of pregnancy (based on the due date/birth date provided at registration). About 5.5 percent registered to receive Text4baby messages in Spanish. As the next chapter discusses, many Hispanic women in the four CHCs prefer to receive text messages in English; therefore, the rate of participation in the Spanish-language protocol understates the level of participation among Hispanics. Early research suggested that about 40 percent of Text4baby subscribers resided in a medically underserved area, roughly proportional to the distribution of live births in such areas (Whitaker et al. 2013).

Figure II.4 shows the trend in the number of new subscribers each month. The number of new subscribers averaged about 14,000 per month, reaching a high of more than 24,000 in September 2012. The Text4baby program sponsored annual state enrollment contests from May to October in 2011, 2012, and 2013, and the number of new subscribers spiked during those periods as a result of the targeted efforts of outreach partners in each state.¹⁷ In September 2012, the single largest month of new enrollment, the program also held a fall sign-up contest to raise awareness about infant mortality (the contest winner received a year’s worth of baby products from Johnson & Johnson).

¹⁶ Some of these people were not pregnant or new mothers when they enrolled. The Text4baby program began collecting information on “type of user” in March 2013; of the 355,302 people providing information on their status as of September 30, 2013, 94.4 percent indicated that they were pregnant or new mothers; the rest indicated that they were a father/parent (2.8 percent), health care provider/observer (1.1 percent), or a relative/friend (1.7 percent).

¹⁷ The Text4baby Tuesday weekly newsletters highlight the activities of outreach partners. For more information on weekly results and activities, see <https://Text4baby.org/index.php/miscellaneous/129>.

Figure II.4. Number of Newly Registered Text4baby Subscribers, by Month and Protocol at Time of Registration, as of September 30, 2013



Source: HMHB, Participants Dataset, as of September 30, 2013, based on analysis conducted by Mathematica Policy Research.
 Note: Protocol at time of registration is defined according to whether the subscriber registered before the due date (“pregnant”) or on or after the birth date (“new mom”).

Retention in the Text4baby program is recognized as an issue by stakeholders, especially during periods with enrollment spikes (such as state enrollment contests). For example, among the women enrolling in July 2013, 22 percent disenrolled within 30 days (based on an analysis of national Text4baby enrollment data conducted as part of the evaluation). The rate was higher among those who enrolled while pregnant (24 percent) rather than as new mothers (13 percent). The rate of rapid disenrollment was also higher among those signing up for the English-language protocol (22 percent) rather than for the Spanish-language protocol (12 percent). Subscribers signing up through the Internet had higher rates of rapid disenrollment than those signing up through text messaging (25 versus 21 percent). The higher disenrollment among web-based subscribers is worth noting given the increasing proportion of registrants via the web. About 13 percent registered through the Internet in September 2013, up from 7 percent a year earlier. As enrollment continues to increase, attention can focus on factors associated with disenrollment to ensure that subscribers receive the full benefit of Text4baby through the baby’s first year.

H. Lessons Learned from the Text4baby Public-Private Partnership

When the Text4baby program was developed in 2009 and launched in 2010, implementation through a public-private partnership was considered an innovative approach for the federal government’s involvement in a new program. Governed by an MOU rather than by a direct contractual relationship and reliant on in-kind support rather than on direct financial contributions to the program, the public-private partnership demonstrated a new strategy for working with nonprofit and commercial entities to support a privately operated, mission-driven program. Lessons learned from the Text4baby public-private partnership are of interest to both public and private partners. The lessons can guide future operations of the Text4baby public-private partnership and, more generally, facilitate new public-private partnership models for implementation of other health text messaging programs and mHealth programs.

Overall, support for the Text4baby public-private partnership is strong. Stakeholders universally agreed that the Text4baby public-private partnership facilitated a faster implementation timeline than would have been possible under public or private sponsorship alone. One private sector stakeholder, for example, noted that, if Text4baby had been implemented as a government program, it would have taken much longer to launch because of the federal clearance and approval process. Federal government partners also reacted positively to the use of a public-private partnership to implement Text4baby; they considered the model “unique,” “a model for how we should increasingly be doing our work,” and “absolutely critical to the success of the program.”¹⁸

This section highlights lessons learned in four key areas: (1) role of the federal government in the Text4baby public-private partnership; (2) governance of the Text4baby public-private partnership; (3) focus of future Text4baby outreach and enrollment efforts; and (4) structure of future partnerships to support health text messaging initiatives.

1. Lessons Learned About the Role of the Federal Government in the Text4baby Public-Private Partnership

There is broad consensus among stakeholders that the public-private partnership was an effective model for implementing the Text4baby program. The public-private partnership is considered a viable and replicable model for addressing public health challenges. Stakeholders agree that what the public-private partnership model achieved with the implementation of Text4baby is something that neither public nor private partners could have achieved independently within the time frame between initial discussions and national launch. However, stakeholders also noted that the federal government’s participation slowed decision making in several important areas because of the requisite clearance and approval process.

- Among program stakeholders, government participation in the development of original message content lent credibility to and built confidence in the program. Government partners convened key stakeholders to shape and ensure the quality of the program’s content, thereby alleviating the initial concerns among professional medical associations and implementation partners with respect to the selection of topics, development of content, and review of messages.
- The federal government’s clearance process added a layer of complexity to managing the program. For example, delays in the approval of publicity materials frustrated nongovernment partners.
- In the future, a single federal government point of contact and decision maker could increase coordination and other efficiencies in the interaction between public and private partners.
- As the program matures and gains its own identity, the role of public partners is undergoing a shift. Public partners suggested that future partnerships may want to consider time-limited roles after a program’s design and early implementation phases.

2. Lessons Learned About the Governance of the Text4baby Public-Private Partnership

Partners highlighted the need for periodically reviewing governance structures and processes, partner roles, and program goals to ensure the effective management, growth, and sustainability of the program and the public-private partnership supporting the program.¹⁹ The Text4baby program has begun to revise

¹⁸ In recognition of the collaboration among government, nonprofit, and private partners, Text4baby received an HHS Innovates award in August 2010.

¹⁹ Self-critique is identified as a “best practice” of global public-private partnerships in health to instill a “learning process” for continuous improvement (Buse and Tanaka 2011).

its governance structure, strengthen its program management, and increase its investment in data analysis. For example:

- Text4baby program governance structures and processes are evolving with the program's growth. The hiring of permanent staff to support the program's day-to-day management, promotion, outreach, and data management activities; and the formation of advisory committees for content, media, technology, and marketing are examples of governance changes that reflect emerging program needs since the launch of Text4baby. In particular, the Content Development Council will now involve a broader representation of stakeholders in the review and approval process, thereby allowing for consensus building and permitting partners to speak as a cohesive entity.
- The fast pace of technology innovation and the evolving nature of the program's strategic growth priorities may require program management changes by, for example, expanding the public-private partnership's steering committee to include more external partners in strategic growth areas such as marketing, public affairs, technology, and media.
- The program is seeking to strengthen its promotion and outreach capabilities by investing in data and analysis. It is aiming to develop more information about users and their experience with the service, such as original source of referral, messages they like, or reasons for disenrollment. Such information would provide real-time feedback on effective promotion and outreach practices and identify areas of needed improvement in content and program features. The addition of program staff to support the analysis of program data is helping advance the program's ability to customize feedback to specific outreach partners on Text4baby enrollment patterns, triggers or mechanisms that may contribute to disenrollment, and user experiences within specific populations.

3. Lessons Learned About Text4baby Outreach and Enrollment Efforts

Text4baby mass media campaigns and direct outreach efforts have raised broad awareness of and interest in Text4baby. However, the program has not yet realized its full potential to enroll the target population and sustain participation in the program. To optimize the effectiveness of Text4baby outreach and enrollment efforts, media-related campaigns could be accompanied by enhanced local grassroots outreach efforts that mobilize and motivate individuals to enroll and sustain their participation. Key strategies for future enrollment growth include the diversification of media channels to reach consumers, ongoing coalition and network building, and expanded efforts to engage with women one-on-one, particularly through their health plans and providers. The Text4baby program can take advantage of opportunities to engage providers in promoting the program and develop tools providers can use to integrate promotion of Text4baby during interactions with patients.

- The Text4baby program is seeking to identify cost-effective and direct-to-consumer marketing and media strategies that not only generate high levels of enrollment but also lead to sustained program participation.
- Text4baby outreach partners report positive user feedback on message content and the perceived benefits of participation, indicating that health text messaging interventions can have a receptive audience. Nevertheless, many women still have not engaged with Text4baby, pointing to the need to assess how Text4baby can improve its reach, especially within the Hispanic population.
- Health care providers recognize that health text messaging programs such as Text4baby can provide an efficient and simple means for sharing important health promotion information with patients as an extension of care beyond the standard clinic visit. Providers are willing to promote Text4baby to support patient-provider communications and reinforce desired health behaviors, but they indicated

that they have neither the tools nor resources to bring the program to the attention of staff and patients on a sustained basis. In addition, providers acknowledged the need for training to support their involvement in outreach. The Text4baby program could provide technical assistance—such as staff training and toolkits—to support providers’ efforts to engage patients. Such technical assistance could become a model for other public-private partnerships in the future.

4. Lessons Learned About the Structure of Future Partnerships to Support Health Text Messaging Initiatives

Partners view mHealth interventions that rely on health text messaging as a promising approach to reach underserved populations with critical health information and resources (although rigorous evidence about effectiveness remains limited). Reflecting their commitment to the mission of the program, private and public partners contributed substantial financial and in-kind resources to the design, promotion, and operation of Text4baby. The success of future public-private partnerships may depend on assembling a similar combination of committed partners. Partners made several observations about future initiatives:

- Partners generally believe that users value and benefit from the personalization, immediacy, timeliness, relevance, and efficiency of communications through text messaging. They also associate considerable value with content delivery features that allow the program to reach vulnerable populations with timely, tailored, and critical communications, such as urgent alerts, appointment and immunization reminders, referrals to Medicaid and WIC, and links to telephone numbers and websites for more information about critical health topics.
- Partners perceive that Text4baby is a cost-effective communication medium for delivering critical health education messages at scale. The medium appeals to women and is nonintrusive. In addition, it contributes to a woman’s frequency of exposure to any health education message, increasing the likelihood of desired behavior change.
- Partners underscored the importance for future health text messaging interventions to undertake upfront market research in order to understand the target audience in terms of need, motivation, and ability to use health text messaging; to assess user needs and preferences; and to develop a marketing plan to help target outreach strategies for other health text messaging interventions.
- All partners—public and private—contributed substantial financial or in-kind resources to the design and ongoing implementation of Text4baby. The contributions reflect the partners’ commitment to the mission of the program and the innovative use of text messaging as a health communication tool for pregnant women and new mothers. In essence, the business model relies on in-kind contributions, voluntarism, and philanthropy to support the program. Partners believe that the “free” cost of the text messages has been essential for incentivizing the target population to sign up for Text4baby (even for those with unlimited text messaging) and that enrollment levels would be lower without efforts promoting the program as “free.” Partners also speculated that the success of future public-private partnerships may depend on garnering support from a similar combination of a generous founding sponsor; a core group of nonprofit, technology, wireless, and media partners; and a well-defined federal collaboration.

I. Concluding Remarks

Implementation of Text4baby through a public-private partnership is considered an innovative approach to federal support of a public health program developed by nonprofit and commercial entities. Stakeholders broadly agreed that the program benefitted from the unique contributions of the private and public partners and that implementation occurred more quickly and flexibly than if the program had been structured around a contractual relationship with the federal government. Moreover, the involvement of more than 1,000 outreach partners built momentum for the program nationally and locally. In summary, experience with the Text4baby public-private partnership offers several lessons for future partnerships:

- Designate a federal decision-making structure and point(s) of contact to facilitate timely decisions and follow-through on tasks.
- Define a time-limited role during a program's development and launch rather than an open-ended commitment; programs may evolve as they mature and require a shift in roles.
- Set realistic expectations about time frames for the federal clearance and approval process to ensure that all partners can account for the process in their planning and scheduling.
- Consider the feasibility of the Text4baby business model, which relies on in-kind contributions, voluntarism, and philanthropy, and which may also be central to the success of future public-private partnerships.

The Text4baby program is continuing to build momentum as new partners sign on to support the program, new strategies emerge to guide outreach and enrollment efforts, and new features enhance the product and make it more useful and attractive to subscribers. The governance structure for the Text4baby public-private partnership is evolving with the creation of a Content Development Council, a structured approach to organizing and overseeing outreach efforts, and, generally, an expanding infrastructure to support Text4baby as a sustainable and branded program. Major issues for the future include: (1) building on the current momentum to expand the reach of Text4baby to achieve its enrollment potential within the target population, and (2) focusing on retention of subscribers throughout pregnancy and the baby's first year of life.

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III. Text4baby Awareness and Participation Among Women Receiving Prenatal Care from Four Community Health Centers

A. Introduction

The Text4baby program was established to provide critical health and safety information to pregnant women and new mothers with an infant up to one year of age to help them have healthy pregnancies and healthy babies. The program was targeted to underserved populations with the ultimate goal of helping to reduce the infant mortality rate in the United States. More than 1,000 public and private organizations at the national, state, and local levels are engaged in raising awareness about Text4baby through a wide range of outreach efforts. Enrollment takes place by sending the text message “BABY” (or “BEBE” in Spanish) to 511411 or by signing up on the Internet (www.text4baby.org).²⁰

“Too many babies in the U.S. are dying or are not given a healthy start. That’s where Text4baby can help. The service was created to help address the overwhelming infant mortality rate in the U.S.”

Source: Text4baby Fact Sheet (www.text4baby.org)

The Text4baby evaluation included an in-depth assessment of the reach of the Text4baby program among pregnant women who received prenatal care from CHCs in four communities (one in each region of the United States). CHCs provide a safety net for populations that typically experience barriers to care (based on race, ethnicity, income, insurance, education, and language, among other factors). Thus, CHCs are an ideal setting for understanding experiences with Text4baby among traditionally underserved populations.²¹ Because this part of the Text4baby evaluation focuses on the level of awareness of and participation in Text4baby among women receiving prenatal care from four CHCs, the results are not generalizable to the full population of pregnant women in the United States or to experiences in the full range of provider settings (including CHCs in other communities).

The next section of this chapter describes the characteristics of women receiving prenatal care from the four selected CHCs, including their cell phone ownership and text messaging experience. The chapter then presents results on Text4baby awareness and participation among prenatal care patients in the four CHCs and in comparison to the level of Text4baby participation nationally. The chapter then examines women’s experiences with Text4baby, including how they heard of Text4baby and their reasons for signing up or not signing up. The chapter concludes with an analysis of the characteristics of Text4baby subscribers and nonsubscribers.

The chapter synthesizes qualitative and quantitative information from four sources: (1) the Healthy Pregnancy and Parenting Survey (HPPS), which included 707 pregnant women receiving prenatal care from four CHCs across the United States; (2) in-depth focus group interviews with 15 Text4baby subscribers in the four communities served by the CHCs; (3) key informant interviews with 30 health care providers and outreach partners in the four communities; and (4) Text4baby enrollment data provided by HMHB under a data-use agreement. Survey data were combined across the four CHCs and weighted to account for non-response. Appendix A describes the data and methods used in the analysis, including the criteria that guided selection of the four CHCs for the evaluation.

²⁰ Text4baby is a health text messaging program and not an online program, although individuals may subscribe online, obtain health tips, and view a list of health hotlines on the Text4baby website.

²¹ The Health Resources and Services Administration provides funding for CHCs, including the CHCs in this study.

B. Characteristics of Women Receiving Prenatal Care from Four CHCs

1. Demographic Characteristics

The community-based component of the Text4baby evaluation took place in four CHCs, reflecting Text4baby's emphasis on reaching traditionally underserved women. To provide context for the analysis of women's experiences with Text4baby in the four CHCs, this chapter first describes the characteristics of women receiving prenatal care from the four CHCs based on data collected in the HPPS. Figure III.1 shows selected characteristics of the pregnant women, including their age, race/ethnicity, country of birth, language spoken at home, marital status, education, employment status, and health insurance status.

Compared to all women giving birth in the United States in 2012 (Hamilton et al. 2013), prenatal care patients in the four CHCs were younger, more likely to be black or Hispanic, and less likely to be married. For example, 19 percent of the CHC prenatal care patients were under age 20, whereas 8 percent of births in the United States in 2012 occurred to women under age 20. In addition, the proportion of women receiving prenatal care at the CHCs who were Hispanic (66 percent) or non-Hispanic black (30 percent) was considerably higher than the proportion of 2012 births to women who were Hispanic (23 percent) or non-Hispanic black (15 percent). Furthermore, 58 percent of the CHC prenatal care patients primarily spoke Spanish at home, and 36 percent were born outside the United States or U.S. territories.²² One-fourth (26 percent) of the CHC prenatal care patients were married versus 59 percent of births in 2012 were to married women. A large proportion of CHC prenatal care patients reported that they were living with a partner at the time of the survey (35 percent).

Levels of education and employment among CHC prenatal care patients were lower than the overall levels for U.S. women of reproductive age. For example, 50 percent of CHC prenatal care patients had completed at least a high school education (or equivalent) compared to 88 percent of women ages 18 to 44 in the general population.²³ In addition, 32 percent of CHC prenatal care patients were employed full- or part-time compared to 61 percent of women ages 16 to 44 in the general population.²⁴

Prenatal care patients at the CHCs were more likely than CHC patients overall to have health insurance coverage. Only 6 percent reported that they were uninsured at the time of the survey, compared to 36 percent of patients served by federally-funded health centers.²⁵ The majority (74 percent) of CHC prenatal care patients reported that they had public coverage, and another 20 percent reported they had other third-party coverage (mostly private insurance coverage). The higher level of coverage among pregnant CHC patients is not surprising given the more generous Medicaid income eligibility threshold for pregnant women than for other populations served by federally-funded health centers.²⁶

²² Because the survey was conducted in English and Spanish only, it may underrepresent women who have another primary language or were born outside the United States.

²³ Information on educational attainment for women ages 18 to 44 was calculated from Current Population Survey data available online at <http://www.census.gov/hhes/socdemo/education/data/cps/2012/tables.html> (Table 1).

²⁴ Information on employment status for women ages 16 to 44 was calculated from data available online in the Bureau of Labor Statistics 2012 data book titled *Women in the Labor Force* (<http://www.bls.gov/cps/wlf-databook-2012.pdf>).

²⁵ Federally-funded health centers include CHCs, migrant health centers, health centers for the homeless, and centers in/near public housing. Data are not available separately for CHCs. Health center data are available at <http://bphc.hrsa.gov/uds/datacenter.aspx?year=2012>.

²⁶ For more information on Medicaid coverage for pregnant women, see <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Population/Pregnant-Women/Pregnant-Women.html>.

Along virtually all dimensions, the data demonstrate that the four selected CHCs are reaching a traditionally underserved population, although the CHC prenatal care patients have a higher level of health insurance coverage than the overall population (Figure III.1).

Figure III.1. Characteristics of Women Receiving Prenatal Care from Four CHCs, 2012–2013

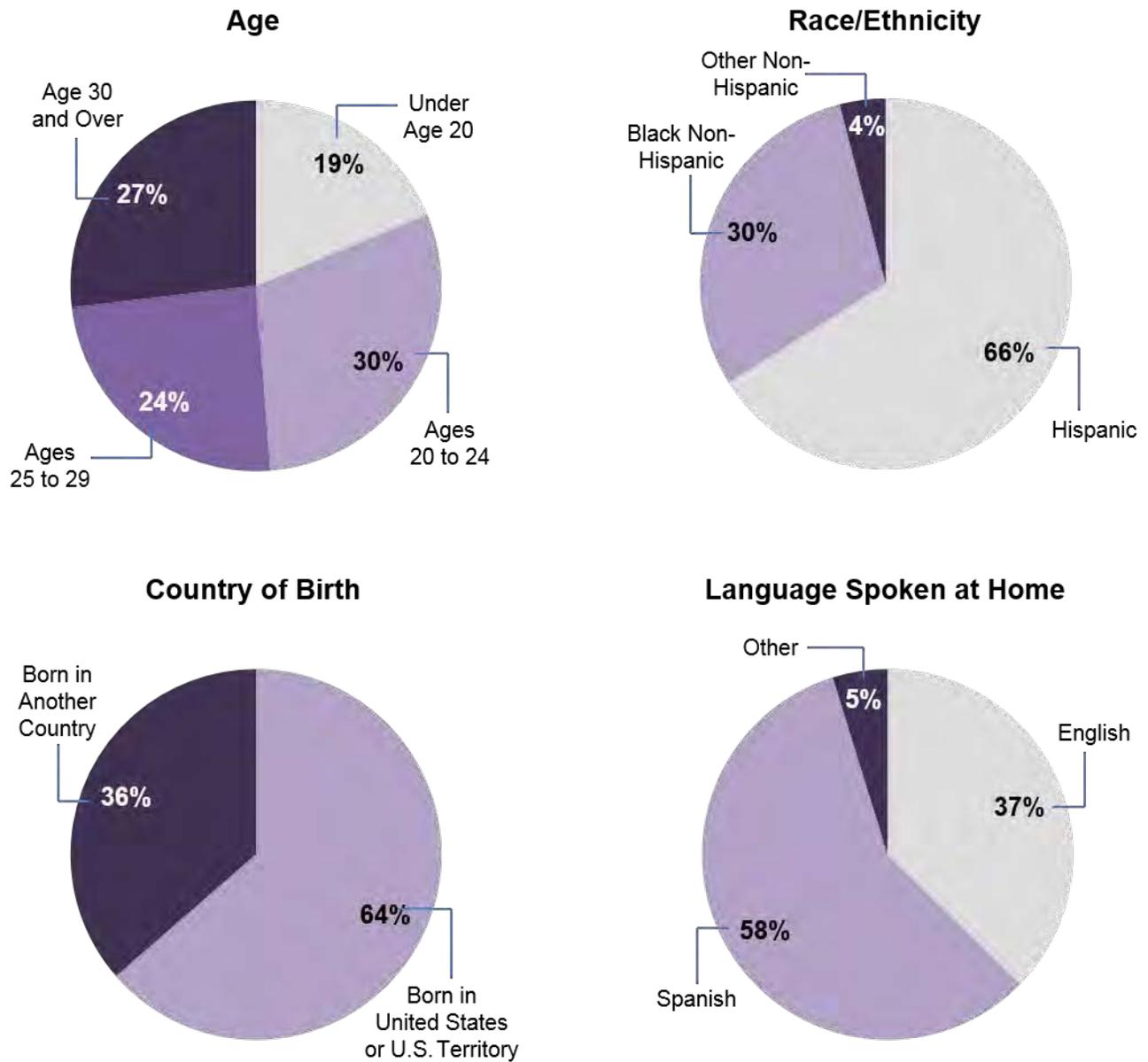
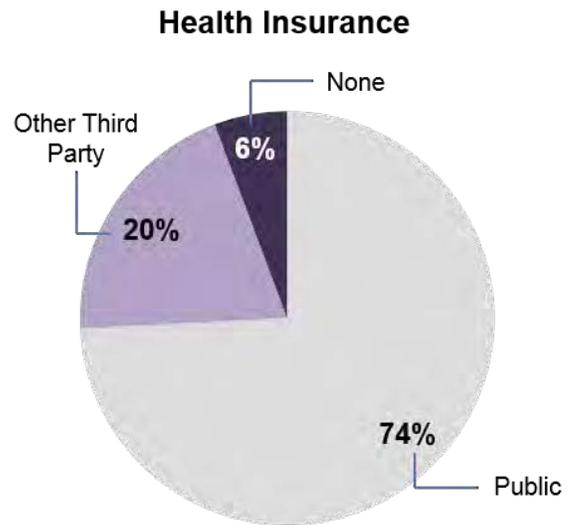
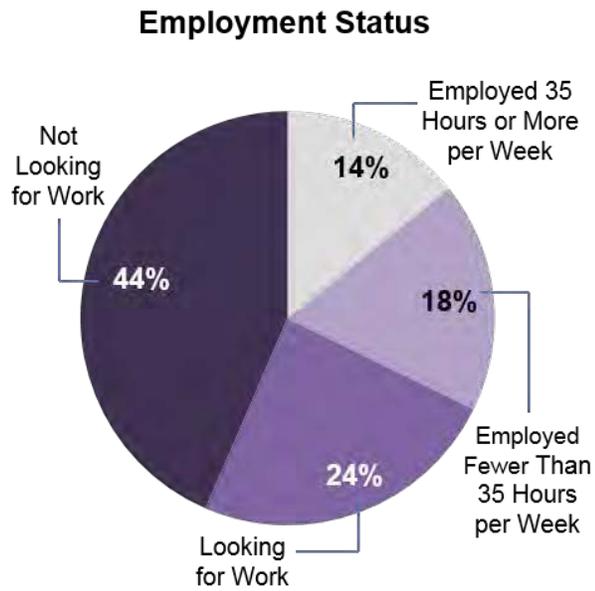
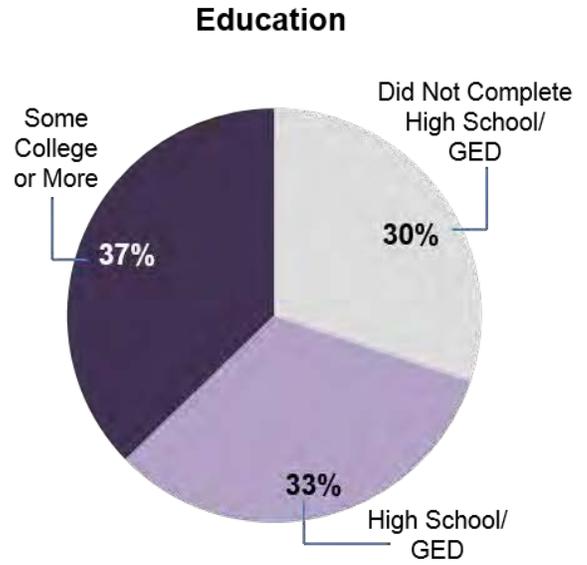
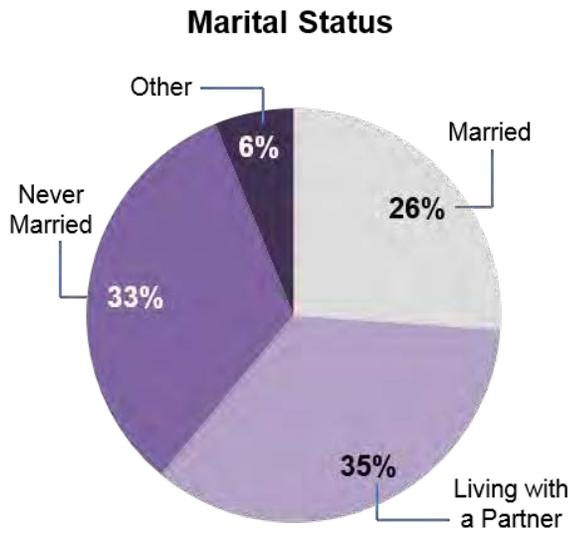


Figure III.1 (Continued)



Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

GED = General Education Development Certificate

2. Cell Phone Ownership and Use

As a health text messaging program, Text4baby is targeted to women who own a cell phone with text messaging capabilities. Among the pregnant women receiving prenatal care from the four CHCs, cell phone ownership and text messaging were extremely common: 87 percent owned their own cell phone and, of these, 97 percent used their cell phone to send or receive text messages. The rate of cell phone ownership was consistently high across the four CHCs (ranging from 85 to 88 percent of CHC prenatal care patients; data not shown).

Cell phone ownership among prenatal care patients in the four CHCs is comparable to the rate among U.S. women in the general population. A national survey conducted at the same time as the HPPS found that 88 percent of women owned a cell phone (Duggan 2013), similar to the rate among CHC prenatal care patients (87 percent). Texting, however, was more common among CHC prenatal care patients than among women in the general population. Nationally, 81 percent of cell phone owners send or receive text messages compared to 97 percent of those receiving prenatal care in the four CHCs. Thus, 84 percent of CHC prenatal care patients owned a cell phone and used it to send or receive text messages compared to 71 percent of women in the general population. The high rate of cell phone ownership and text messaging among CHC prenatal care patients is consistent with the rationale for targeting a health text messaging program to traditionally underserved women (Remick and Kendrick 2013).

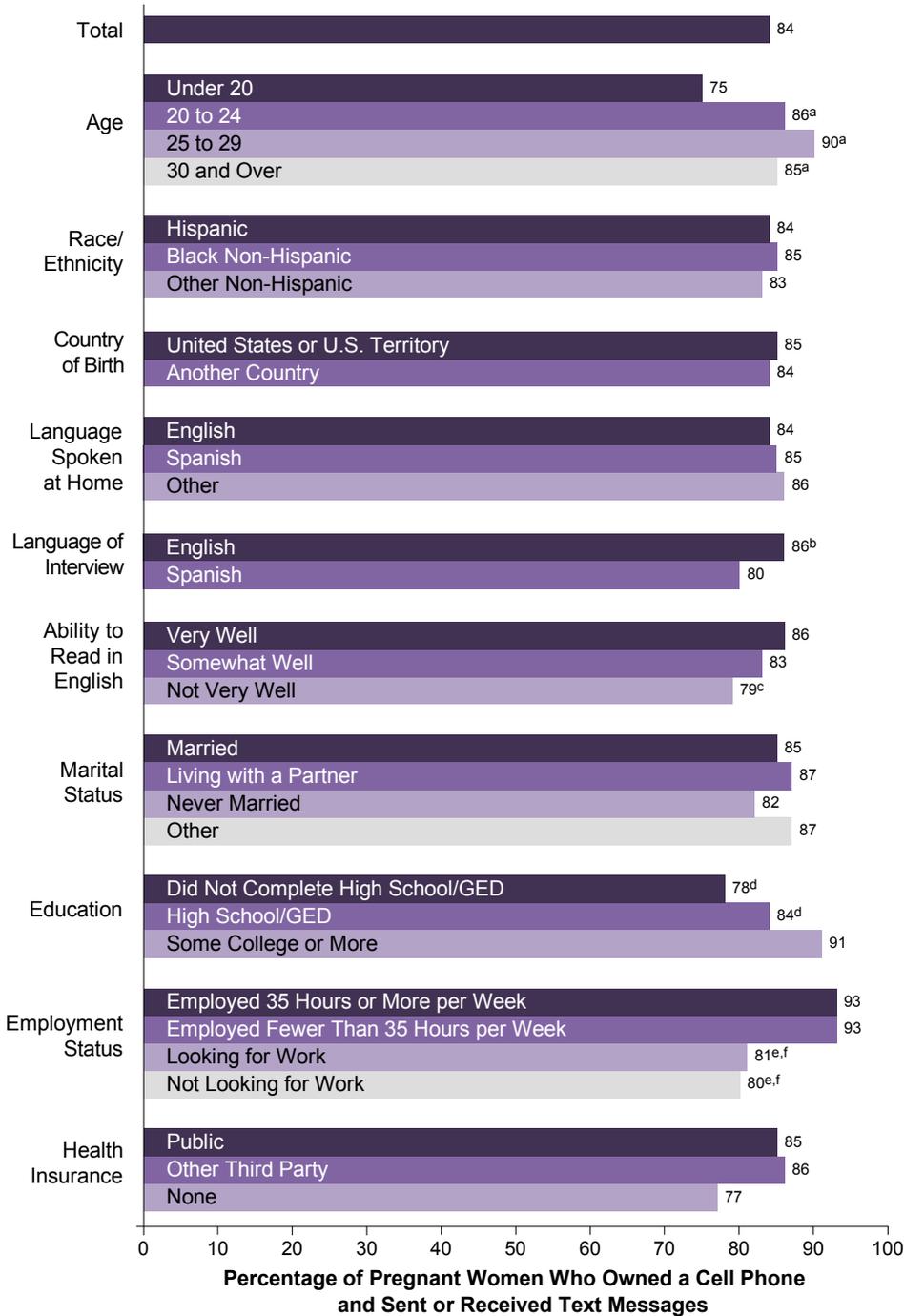
The percentage of CHC prenatal care patients who used text messaging as a communication tool varied by age, language of interview, education, ability to read in English, and employment status (Figure III.2). For example, women under age 20 were significantly less likely than those in other age groups to own a cell phone and use it to send or receive text messages (75 versus 85 to 90 percent).²⁷ There were no differences in use of text messaging by race/ethnicity, country of birth, or primary language spoken at home. However, two measures of English-language proficiency were significant. First, women who chose to conduct the survey interview in Spanish had a lower rate of text message use than those who conducted the interview in English (80 versus 86 percent). Similarly, those who said that they read English “not very well” had a lower rate of text message use than those who said that they read English “very well” (79 versus 86 percent).

Significant differences in text message use were also found by education and employment status. The proportion of CHC prenatal care patients who used text messaging increased as the level of education increased (from 78 percent among women with less than a high school education to 91 percent among women with at least some college). It also was higher among those working full- or part-time (93 percent) than among those not looking for work or not working (80 to 81 percent). Finally, there were no significant differences by marital status or health insurance status. The results point to a slight “digital divide,” even within a traditionally underserved population, with higher rates of cell phone ownership and text messaging among women over age 20, those who are more proficient in English,²⁸ those with a higher level of education, and those working at least part-time.

²⁷ The lower rate of text messaging among the under-20 age group reflects a lower rate of cell phone ownership rather than a lower rate of text messaging.

²⁸ The measurement of English proficiency is based on women’s self-selected language for the survey (English versus Spanish) and self-reported ability to read English (very well or somewhat well versus not very well).

Figure III.2. Text Message Use Among Women Receiving Prenatal Care, by Demographic Characteristics, Four CHCs, 2012–2013



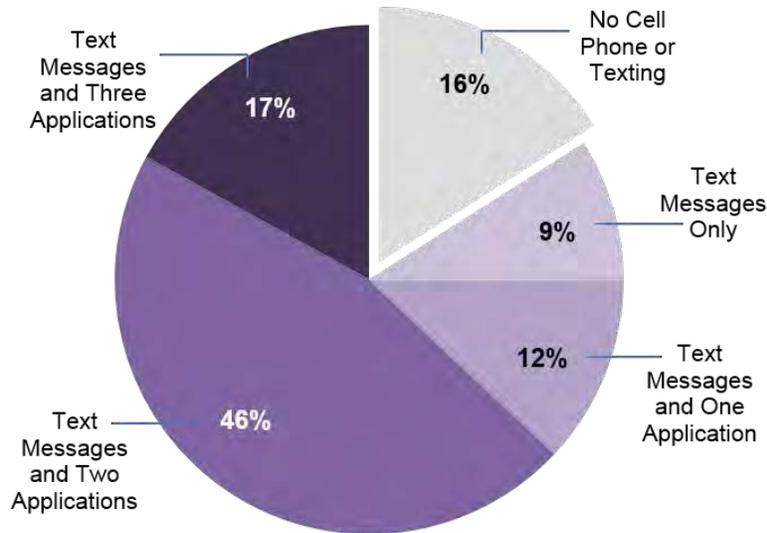
Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

Note: T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:
 a = significantly different from age under 20
 b = significantly different from interview conducted in Spanish
 c = significantly different from reads English very well
 d = significantly different from some college or more
 e = significantly different from employed 35 hours or more per week
 f = significantly different from employed fewer than 35 hours per week

GED = General Education Development Certificate

Most CHC prenatal care patients (75 percent) used a cell phone for one or more purposes besides text messaging (Figure III.3). The most common use was going to the Internet (73 percent), followed by looking at social networking sites (67 percent) and, least often, accessing Twitter (18 percent) (data not shown).

Figure III.3. Cell Phone Ownership and Use Among Prenatal Care Patients, Four CHCs, 2012–2013



Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

Applications = the Internet, social networking sites, and Twitter

C. Text4baby Awareness and Participation Among Prenatal Care Patients in Four CHCs

1. Text4baby Awareness and Participation Rates

When the survey of CHC prenatal care patients was conducted at the end of 2012 and beginning of 2013, the Text4baby program had been enrolling pregnant women and new mothers for about three years. Awareness rates—that is, the percentage of CHC prenatal care patients that indicated they had heard about Text4baby—ranged from 8 to 38 percent across the four CHCs (Table III.1). Participation rates—that is, the percentage of CHC prenatal care patients that reported they signed up for Text4baby—ranged from 2 to 16 percent across the four CHCs.²⁹ The data also show that a sizable proportion of CHC prenatal care patients who heard of Text4baby decided not to sign up.

“I was interested in it because I know at the time I was expecting, I’m still expecting, and I wanted to have as much information about the baby as possible, especially knowing that it was coming from the U.S. Department of Health [and Human Services]. So I knew it would be good information.”

[Focus Group Participant]

²⁹ Data are not available on the national level to estimate Text4baby participation among prenatal care patients in CHCs. Therefore, the generalizability of the Text4baby enrollment experience in the four CHCs is unknown.

Table III.1. Text4baby Awareness and Participation Among Pregnant Women, by Site, Four CHCs, 2012–2013

CHC	Percentage of Pregnant Women Who Heard of Text4baby	Percentage of Pregnant Women Who Signed Up for Text4baby
CHC 1	7.9	2.0
CHC 2	12.0	4.3
CHC 3	37.7	16.0
CHC 4	19.0	5.9

Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to April 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

Interviews with health care providers and outreach partners in the four communities revealed that the CHC with the highest awareness and participation rates was the only one of the four CHCs that proactively informed pregnant women about Text4baby, and was the only one that signed up as a Text4baby outreach partner. Survey results are consistent with this finding. According to the survey, pregnant women were significantly more likely to have heard of Text4baby from a health care provider in the CHC with the highest Text4baby participation rate (66 percent) than in the other three CHCs (26 percent). Nevertheless, even within that CHC, the level of attention to promoting Text4baby has decreased over time as a function of competing priorities.

How does the rate of Text4baby participation in the four CHCs compare to the national participation rate?³⁰ Computation of a national Text4baby participation rate for 2012 was based on the number of subscribers with a due date or baby’s birth date during 2012 as a percentage of the number of live births in the United States in 2012.³¹ The same methodology was used to estimate national participation rates for 2010 and 2011. We estimate that the national Text4baby participation rate in 2012 was 4.8 percent, which is substantially lower than the rate in the CHC with a proactive outreach effort. The national participation rate has been increasing steadily since the program’s launch, from 1.9 percent in 2010 to 3.6 percent in 2011 and 4.8 percent in 2012. The data suggest that the program may be gaining momentum in reaching a higher proportion of total births nationally.

³⁰ As of February 3, 2015, more than 830,000 people had ever enrolled in Text4baby since the program’s launch (Text4baby Tuesday, February 3, 2015). However, it is not possible to determine how many subscribers were either pregnant or new mothers when they enrolled. The Text4baby program began collecting information on “type of user” in March 2013; of the 355,302 people providing information on their status as of September 30, 2013, 94.4 percent indicated that they were pregnant or new mothers; the rest indicated that they were a father/parent (2.8 percent), health care provider/observer (1.1 percent), or a relative/friend (1.7 percent).

³¹ We calculated a national rate of Text4baby participation by using a methodology similar to the one HMHB uses to determine the winners of its annual Text4baby state enrollment contest. The 2012 national participation rate is a ratio of the number of Text4baby subscribers with a due date or birth date in 2012 (numerator) to the total number of live births in the United States in 2012 (denominator). Calculation of the number of Text4baby subscribers with a due date or birth date in 2012 was based on data provided by HMHB. The number of live births in 2012 comes from the CDC (Hamilton et al. 2013). A similar method was used to calculate participation rates for 2010 and 2011. This method may overstate the national Text4baby participation rate among those delivering in a given year because the numerator includes an unknown number of subscribers who were family members, providers, or observers. In addition, as noted in Chapter II, approximately 20 percent of subscribers disenroll within 30 days, suggesting a minimal level of participation in Text4baby.

Safety Net Provider Experiences with Text4baby: A Tale of Four CHCs

Provider experiences with Text4baby in the four CHCs provide context for understanding the varying levels of Text4baby awareness and participation across the CHCs. The CHC with the highest Text4baby participation rate was an official Text4baby partner, reflecting its commitment to promoting Text4baby to providers and patients. The statewide MCH coalition also was heavily engaged in promoting Text4baby in the community; subsequently, the state Medicaid agency joined as a partner. In 2011, MCH coalition staff visited the CHC, presented information about Text4baby, and provided brochures and promotional materials to post in waiting rooms and distribute to patients. Providers, case managers, and health educators were informed of the program and received promotional materials to hand out to women. Promotional materials are also visible in the community (such as on buses and in bus shelters).

The CHC integrated Text4baby promotion into the clinic workflow in several ways: hanging Text4baby posters in all patient rooms where prenatal care is provided; introducing Text4baby to patients during the scheduling of prenatal care; integrating promotion into centering groups for pregnant women and community-based outreach efforts such as health fairs; and inserting a check-box in the EHR system to track individuals who signed up for Text4baby. Initial enthusiasm among CHC staff was high, but that excitement has waned in response to competing priorities during prenatal visits.

“We were all very excited about Text4baby at first and I talked with patients about it frequently and then over time I have not made it a priority in my routine. I have not talked about Text4baby in the last 18 months because there are too many things competing for my attention at the time of a visit. . . . If providers more routinely and early in prenatal care verified that patients were enrolled or knew how to and if that were done routinely across the board, that would be excellent. However, relying on providers to do this will not result in the best outcome due to the competing issues for our attention and effort. Providers focus on what we consider to be the medical issues.”

[Physician at CHC 3]

At two other CHCs, staff recalled receiving information about Text4baby from a professional society or local health department but did not realize that they were to promote the program to patients. At the fourth CHC, staff had not heard of Text4baby in advance of the evaluation. Providers indicated that they would be willing to promote Text4baby in the future if the program is formally introduced through the CHC or a local outreach organization and if they are assured that the program will not be eliminated. In addition, CHC staff in one clinic suggested that case managers and nutritionists could assume the role of promoting Text4baby as part of their normal workflow to connect women with health care and health information.

“I may have received something in the mail at home . . . I did not think it applied to me so thought no more about it. It was more like a notification of a government program that was to be launched but not specifically pertaining to me. It is not like I felt like I was being asked to implement this as a provider. If it had come through my [CHC] email, then that would have made a difference. If it had come through the employer or if it had mentioned that it could or should be considered for community health centers, then that would have been different.”

[Physician at CHC 1]

“Personally I would have promoted Text4baby if I knew it definitely existed and it was something that they could actively pursue . . . if it was something that is here to stay, I would love to promote it.”

[Physician at CHC 2]

2. How Women Heard About Text4baby

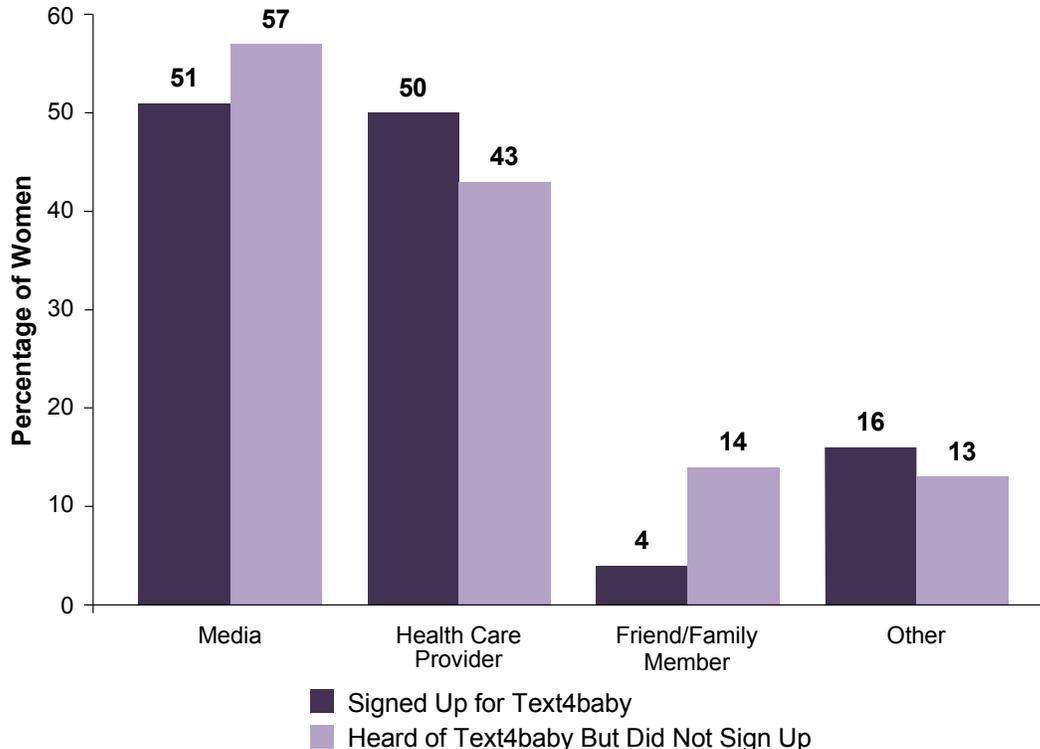
Women receiving prenatal care from the four CHCs heard about Text4baby from various sources. Overall, the most common source of information was media publicity, such as billboards, television, or the Internet (55 percent); followed by health care providers (45 percent), friends or family members (10 percent), or other sources (14 percent). (Women could have heard about Text4baby from more than one source.) As discussed in the previous section, prenatal care patients were significantly more likely to learn about Text4baby from health care providers in the CHC with the highest participation rate than in the other three CHCs.

The sources of information about Text4baby differed slightly between women who signed up and those who did not. Among women who signed up for Text4baby, media publicity and health care providers were equally important sources of information, with each source reported by half the women who signed up (Figure III.4). Among the women who heard of Text4baby but decided not to sign up, media publicity was a more common source of information than a health care provider, suggesting that media publicity alone may not persuade some women to sign up and that outreach by health care providers may be effective in encouraging women to sign up for Text4baby.

“And I found out about the Text4baby program when I was at the bus stop one day. I [saw] an ad, and it said it was free, so I text BABY to it, and then they text me back and told me what to do. And ever since then I’ve been texting it.”
[Focus Group Participant]

“The lady at WIC told me about it. She said that it provides very good information for the baby, especially because I was a first-time mother. And so I signed up for it and it worked.”
[Focus Group Participant]

Figure III.4. How Pregnant Women Heard About Text4baby, by Participation Status, Four CHCs, 2012–2013



Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. This figure includes women who had heard of Text4baby. The results have been weighted to account for the probability of selection and nonresponse.

Note: Survey respondents could indicate they heard about Text4baby from more than source.

Among the women who signed up for Text4baby, virtually all (98 percent) found it “very” easy to sign up while the remainder (2 percent) found it “somewhat easy.” No one responded that signing up was “not easy.” In addition, only one woman in the sample reported that she had tried to sign up and was unable to do so. Thus, the evaluation did not find evidence that the Text4baby enrollment process was a barrier to signing up.

“Text4baby is more reliable than, say, a mom or an aunt because a lot of family members, sometimes their information is outdated.”
[Focus Group Participant]

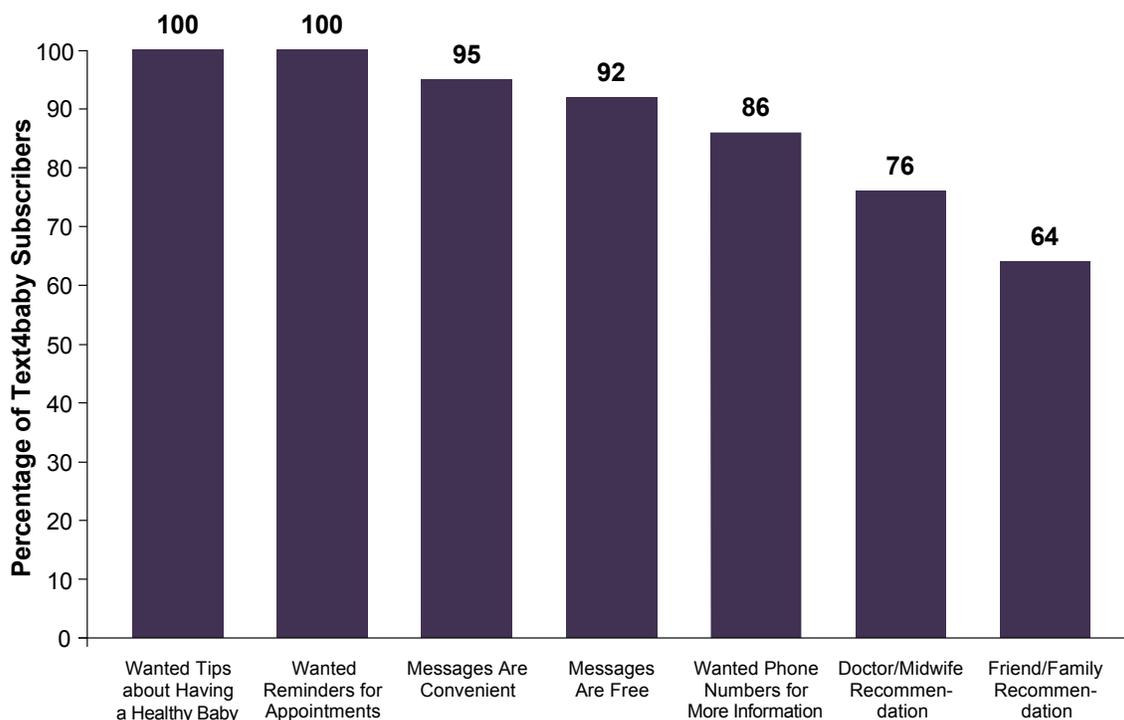
3. Women’s Reasons for Subscribing to Text4baby

Why did prenatal care patients at the four CHCs decide to sign up for Text4baby? The two most common reasons for signing up, reported by all of the pregnant women who enrolled in Text4baby, were that they wanted tips for having a healthy baby and reminders for appointments (Figure III.5). Other reasons for signing up included the convenience of the messages (95 percent), the availability of the messages at no cost (92 percent), and telephone numbers for more information (86 percent). Recommendations from a doctor or midwife (76 percent) or a friend or family member (64 percent) were less frequently mentioned as reasons for signing up.³²

“When I got the information, I know like it’s the resources and the information I’m getting . . . is based off facts.”
[Focus Group Participant]

“I remember it said it was free. So I’m like, if it’s free, it’s not taking any risks.”
[Focus Group Participant]

Figure III.5. Women’s Reasons for Subscribing to Text4baby, Four CHCs, 2012–2013



Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. This figure includes women who had heard of Text4baby. The results have been weighted to account for the probability of selection and nonresponse.

Note: Survey respondents could indicate more than one reason for subscribing to Text4baby.

³² Small sample sizes precluded an analysis of reasons for subscribing to Text4baby by CHC.

4. Women’s Reasons for Not Subscribing to Text4baby

Among CHC prenatal care patients who had heard of Text4baby, why did the majority decide not to sign up? The most common reason was that they felt they had sufficient information from other sources (66 percent) (Figure III.6). In addition, 34 percent cited one or more reasons related to text messaging: they did not like text messaging (20 percent), they did not have text capabilities on their cell phones (13 percent), or they did not know how to use text messaging (12 percent). Nearly 1 in 10 nonsubscribers reported that Text4baby was not available in their preferred language. In most cases, the preferred language was Spanish, signaling that some women did not realize that Text4baby was available in Spanish.

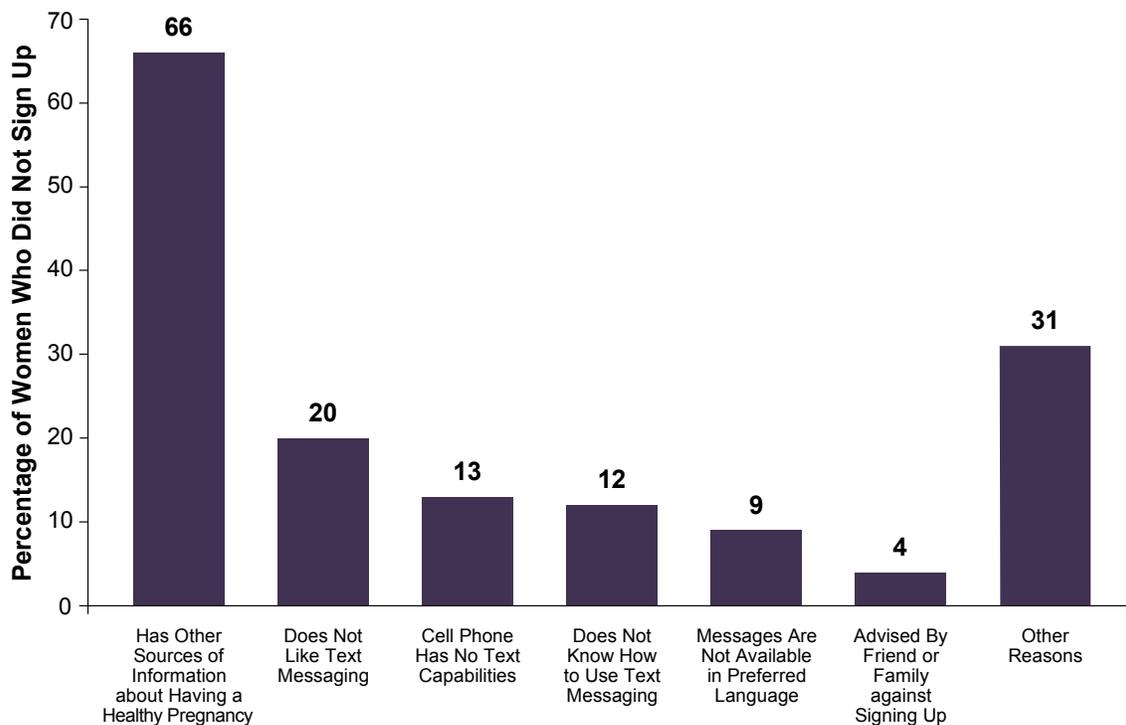
“I didn’t have my phone connected at that time.”
[Survey Respondent]

“I did not know how many messages I will receive because I don’t want to get a lot of messages.”
[Survey Respondent]

“I already had my first experience in being pregnant. This is my second pregnancy.”
[Survey Respondent]

About one-third of women who had heard of Text4baby and decided not to sign up reported “other” reasons for their decision. The other reasons included lack of knowledge about the service, problems with continuity of cell phone service, and perceptions that the service is not needed. The diversity of reasons for not subscribing to Text4baby underscores the challenge of developing an outreach effort to raise awareness of Text4baby and persuade women to sign up. As noted in the previous chapter, mass media efforts can help raise awareness of Text4baby, but they need to be complemented by community-based outreach efforts to address women’s individual situations and concerns.

Figure III.6. Women’s Reasons for Not Subscribing to Text4baby, Four CHCs, 2012–2013



Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. This figure includes women who never heard of Text4baby. The results have been weighted to account for the probability of selection and nonresponse.

Note: Survey respondents could indicate more than one reason for not subscribing to Text4baby.

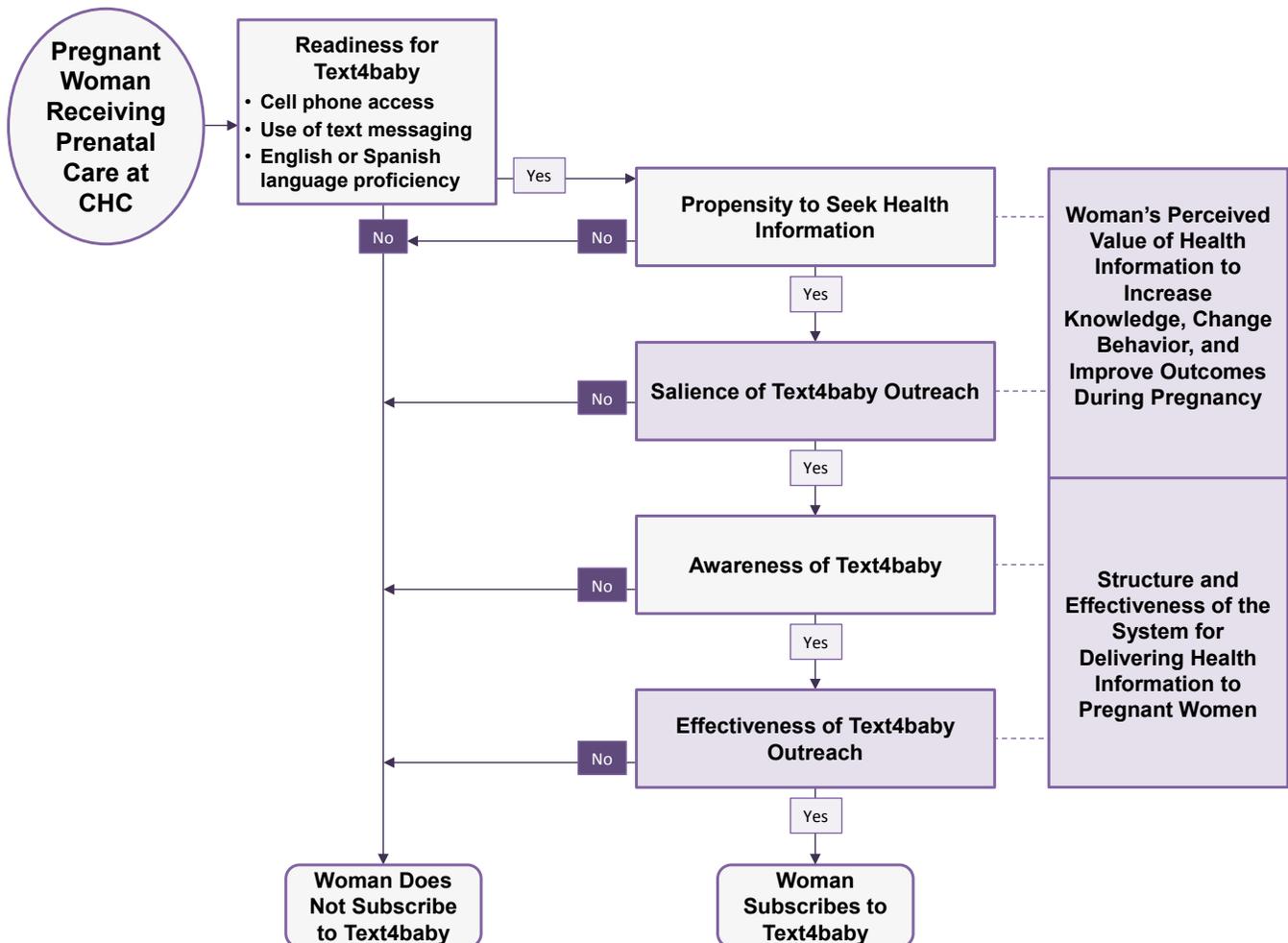
D. Characteristics of Text4baby Subscribers and Nonsubscribers

Understanding the characteristics of women who signed up for Text4baby versus those who did not sign up can provide insights into the reach of Text4baby within the target population of women who received prenatal care in the four selected CHCs. The evaluation compared the characteristics of three groups of women: women who signed up for Text4baby, women who heard about Text4baby and decided not to sign up, and women who never heard about Text4baby. Implications for Text4baby outreach may differ according to the characteristics of women who never heard of Text4baby versus women who heard of Text4baby and decided to sign up or not sign up.

1. Framework for Analyzing Text4baby Awareness and Participation

Figure III.7 provides a framework to guide the analysis of awareness and participation in Text4baby among pregnant women receiving prenatal care from the four CHCs. Three main factors may affect whether a woman signs up for Text4baby: (1) the woman's readiness for a health text messaging program based on cell phone requirements and language proficiency, (2) the woman's propensity to seek health information, and (3) the salience and effectiveness of Text4baby outreach to raise awareness and influence a woman's decision to sign up.

Figure III.7. Framework for Analyzing Text4baby Awareness and Participation



Women’s readiness for a health text messaging program based on technology requirements and language proficiency is outside the control of the Text4baby program. The program targets women who have a cell phone with text messaging capabilities. In addition, the availability of Text4baby in English and Spanish requires proficiency in either of the two languages. The framework suggests that women also need to have a propensity to receive health information during pregnancy. However, the Text4baby program can influence women’s propensity to seek health information during pregnancy and to select Text4baby as a “go to” source.

Text4baby outreach efforts are pivotal to raising awareness of Text4baby (“outreach salience”) and, once women are aware of the program, pivotal to influencing their decision to sign up (“outreach effectiveness”). The framework explicitly considers awareness and participation as two separate components of the outreach process, given the importance of understanding the reasons women decide not to subscribe once they have heard of Text4baby. Individual- and system-level factors may also affect the decision points along the path to subscribing or not subscribing to Text4baby.

- At an individual level, the decision may be affected by women’s perception that their use of health information (whether from Text4baby or other sources) can help increase their knowledge, change their behavior, and improve their outcomes or that of their babies (that is, self-efficacy). Those who do not perceive the value of health promotion information (or who are not ready to change health behavior) may be less likely to seek information, become aware of Text4baby, or decide to enroll if they are aware of the program (National Cancer Institute 2005).
- At a system level, the structure and effectiveness of organizations delivering health information to pregnant women may affect the likelihood that women will enroll in Text4baby. The “system” that provides health information includes mass media, family members and friends, health care providers, and other community-based programs (such as Healthy Start, Medicaid, and WIC). Women who receive pregnancy-related information from other sources may decide not to sign up for Text4baby. On the other hand, effective promotion of Text4baby may raise women’s awareness of the benefits of the program as a complement to information from other sources.

The next section analyzes Text4baby awareness and participation according to elements of the framework, including readiness (technology and language proficiency), propensity to seek health information, and demographic characteristics (including race/ethnicity).

2. The Reach of Text4baby Among CHC Prenatal Care Patients

Cell Phone Use. Text4baby was designed to be a simple-to-use technology, requiring only a cell phone with text messaging capabilities. There were no significant differences in the percentage of pregnant women who had heard of Text4baby or signed up for the service based on their level of cell phone use (text messaging, Internet, social networking, and Twitter). For example, 6 percent of those who used their cell phone for text messaging alone signed up for Text4baby compared to 10 percent of those who used text messaging and all three selected applications (Table III.2). The percentage that had never heard of Text4baby was also similar, ranging from 77 percent for the most sophisticated users (text messaging plus three applications) to 84 percent for the least sophisticated users (text messaging only or with one application). The findings suggest that technology is not a barrier as long as women have a cell phone with text messaging capabilities.

Table III.2. Text4baby Participation Status, by Demographic Characteristics, Four CHCs, 2012–2013

Characteristic		Percentage of Pregnant Women Who Signed Up for Text4baby	Percentage of Pregnant Women Who Heard of Text4baby But Did Not Sign Up	Percentage of Pregnant Women Who Never Heard of Text4baby
Total		7.0	12.2	80.8
Cell Phone Use				
a	Text messages only	5.6	10.8	83.5
b	Text messages and one application	4.5	11.6	83.9
c	Text messages and two applications	7.6	12.8	79.6
d	Text messages and three applications	9.5	13.4	77.1
Language Spoken at Home				
a	English	6.7	9.8	83.5
b	Spanish	7.7	14.5	77.8
c	Other	2.0 ^{a,b}	2.6 ^{a,b}	95.3 ^{a,b}
Ability to Read in English				
a	Very well	8.2	11.2	80.6
b	Somewhat well	6.1	16.9	77.1
c	Not very well	2.3 ^a	12.1	85.6
Race/Ethnicity				
a	Hispanic	8.2	14.5	77.3
b	Black non-Hispanic	3.2 ^a	5.5 ^a	91.4 ^a
c	Other non-Hispanic	18.7	26.5 ^b	54.8 ^{a,b}
Country of Birth				
a	Born in United States or U.S. territory	7.6	12.7	79.7
b	Born in another country	6.0	11.2	82.8
Age				
a	Under 20	12.5	10.8	76.7
b	20 to 24	8.5	11.1	80.4
c	25 to 29	3.4 ^{a,b}	13.6	83.0
d	30 and over	4.9 ^a	13.0	82.0
Number of Previous Pregnancies				
a	Never been pregnant before	9.0	13.1	77.8
b	1 or 2 previous pregnancies	6.8	12.0	81.2
c	More than 2 previous pregnancies	4.2 ^a	11.0	84.8
Marital Status				
a	Married	7.6	15.7	76.7
b	Living with a partner	8.7	13.0	78.3
c	Never married	4.9	8.3 ^a	86.8 ^{a,b}
d	Other	6.9	12.6	80.5
Employment Status				
a	Employed 35 hours or more per week	1.7	11.8	86.5
b	Employed fewer than 35 hours per week	4.4	10.1	85.6
c	Looking for work	8.0 ^a	13.5	78.5
d	Not looking for work	9.4 ^{a,b}	12.5	78.1 ^{a,b}

Table III.2 (Continued)

Characteristic	Percentage of Pregnant Women Who Signed Up for Text4baby	Percentage of Pregnant Women Who Heard of Text4baby But Did Not Sign Up	Percentage of Pregnant Women Who Never Heard of Text4baby	
Education				
a	Did not complete high school/GED	6.5	10.8	82.7
b	High school/GED	5.6	12.6	81.8
c	Some college or more	8.3	13.0	78.6
Health Insurance				
a	Public	7.4	11.8	80.8
b	Other third party	7.8	15.6	76.6
c	None	0.0 ^{a,b}	4.9 ^{a,b}	95.1 ^{a,b}

Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

Note: T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted by a superscript next to the percentage, which indicates a significant difference between that row and the row designated by that letter, among categories within each demographic characteristic.

GED = General Educational Development Certificate

Language Proficiency. Text4baby is offered in two languages, English and Spanish. Women who are not proficient in either language would face a barrier to signing up and using the service. As shown in Table III.2, women who spoke primarily a language other than English or Spanish at home were significantly less likely to have signed up for Text4baby or to have heard of the program. Consistent with these findings, outreach partners expressed concern that women who spoke a language other than English or Spanish would not be able to take advantage of Text4baby.³³

Participation status did not differ significantly by primary language among those speaking English or Spanish. However, participation status differed by English reading ability. Specifically, women who self-reported that they were able to read English “very well” were significantly more likely to sign up than those who reported they read English “not very well” (8 versus 2 percent), suggesting that a low level of English fluency may be a deterrent to signing up.

Propensity to Seek Health Information. Women receive health information during pregnancy from health care providers, family members or friends, and various media (including books, magazines, and the Internet). All Text4baby subscribers indicated they received information from a health care provider, 99 percent from a friend or family member, and 84 percent from a media source (Table III.3). The vast majority of subscribers received information from all three sources (82 percent). These findings suggest that Text4baby subscribers have a propensity to seek health information and that Text4baby complements other sources of information.

“I applied for it, they sent me a message in English. So I was like, oh, good, I don’t have to like change my language or change my preferences or anything, it was convenient. Because a lot of the times people assume that, you know . . . you’re Hispanic so they want to send you like Hispanic paperwork and messages. I was like, finally, English.”
[Focus Group Participant]

“They suggested it, because I guess there’s many things that I don’t know, because everything changes as time goes on. So I wanted to learn something my mom didn’t know, something she couldn’t teach me, and something maybe at the WIC [clinic] they did not have the time to teach me. So I just signed up for it.”
[Focus Group Participant]

³³ The HPPS was conducted in English and Spanish. Women who were unable to respond to the survey in one of these languages were excluded and considered ineligible for the survey. Similarly, women who do not speak English or Spanish would be unable to participate in Text4baby. Thus, estimates related to women who speak a language other than English or Spanish are understated.

Most women who heard of Text4baby but did not sign up also obtained health information from all three sources (75 percent). This finding is consistent with women’s reasons for not subscribing to Text4baby, because they had other sources of information. Women who never heard of Text4baby were less likely than the other two groups to report they received information from all three sources (61 percent), including a health care provider, suggesting a broader challenge to reaching these women with health information, not just through Text4baby.

Table III.3. Sources of Pregnancy-Related Health Information, by Text4baby Participation Status, Four CHCs, 2012–2013.

Information Source	Percentage of All Pregnant Women	Percentage of Pregnant Women Who Signed Up for Text4baby	Percentage of Pregnant Women Who Heard of Text4baby But Did Not Sign Up	Percentage of Pregnant Women Who Never Heard of Text4baby	Significance*
All Three Sources	64.2	82.1	74.8	61.1	b, c
Health Care Provider	89.2	100.0	93.8	87.5	a, b, c
Friend or Family Member	87.2	98.6	85.3	86.5	a, b
Media	75.2	83.5	81.9	73.4	n.s.

Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

* T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:

a = women who signed up for Text4baby versus women who heard of Text4baby but did not sign up

b = women who signed up for Text4baby versus women who never heard of Text4baby

c = women who heard of Text4baby but did not sign up versus women who never heard of Text4baby

n.s. = not significant

Race/Ethnicity. Given the mission of Text4baby to address disparities in infant mortality, the program targets racial/ethnic minorities who are at greater risk of low birth weight, preterm birth, and other risk factors for infant death. Text4baby participation varied substantially by race/ethnicity within the four CHCs in the evaluation (Table III.2). A significantly higher proportion of Hispanic women than non-Hispanic black women were aware of Text4baby and decided to sign up (8 versus 3 percent); a correspondingly smaller proportion of Hispanic women than non-Hispanic black women had never heard of Text4baby (77 versus 91 percent). There were no differences in participation status by country of birth.

The data suggest that Hispanic women may be signing up for the Text4baby English-language protocol and that representation of Hispanic women in Text4baby is understated based on enrollment for the Spanish-language protocol.³⁴ Nevertheless, evidence from the survey suggests that many women are not aware that Text4baby messages are available in Spanish.³⁵

Other Demographic Characteristics. Although women under age 20 were less likely to own a cell phone and use it for text messaging (Figure III.1), they were significantly more likely to sign up for Text4baby. Nearly 13 percent of those under age 20 signed up for Text4baby compared to 3 to 5 percent

³⁴ Of the women who speak primarily Spanish at home, 59 percent indicated that they preferred to receive text messages in English.

³⁵ Among women who signed up for Text4baby in English or who had heard of Text4baby and decided not to sign up, about one-third (36 percent) indicated that they were not aware that Text4baby messages were available in Spanish.

of those age 25 and older (Table III.2). In addition, women who were pregnant for the first time were significantly more likely to sign up than women with more than two previous pregnancies (9 versus 4 percent). The data suggest that Text4baby is reaching a higher proportion of younger women and those who are pregnant for the first time.

Women who were not working (including those looking for work) were significantly more likely than those working full- or part-time to sign up for Text4baby. This may reflect the appeal of the “free” service to those who were not working. Women who were uninsured were significantly less likely to have heard of Text4baby (or to sign up if they had heard) than those who had public or other third-party coverage, although it should be noted that a small proportion of the total sample is uninsured (6 percent; Figure III.1). There were no significant differences in Text4baby participation rates by marital status or education level.

E. Concluding Remarks

The four CHCs that served as the sites for the community-based component of the Text4baby evaluation provide prenatal care to a diverse group of women. Compared to 2012 births nationally, CHC prenatal care patients were younger, more likely to be black or Hispanic, and less likely to be married. They also had lower levels of education and employment than reproductive-age women nationally. However, CHC prenatal care patients had a higher level of cell phone ownership and text messaging use than women nationally, consistent with the rationale for targeting a health text messaging program to traditionally underserved women.

Women who signed up for Text4baby indicated that they were attracted to the pregnancy tips, appointment reminders, and convenience of the text messages (among other features). Moreover, they had a propensity to seek pregnancy information from several sources, including health care providers, friends and family members, and media sources (such as books, magazines, and the Internet). Among women who had heard of Text4baby and decided not to sign up, the majority indicated that they relied on other sources of information, but a sizable proportion (about one-third) indicated that they were not comfortable with text messaging. Nevertheless, cell phone and text messaging use was high among CHC prenatal care patients, suggesting that technology may not be a barrier in the population as a whole.

Certain groups of women in the four CHCs had higher Text4baby participation rates, including those under age 20, pregnant for the first time, and unemployed. Other groups may experience barriers to signing up, including those with a lower level of English-language reading proficiency and those who prefer to receive text messages in Spanish. In general, there were few significant differences across demographic groups, reflecting the difficulty of targeting Text4baby promotion by demographic group via mass media. These findings provide further support for developing direct outreach strategies that inform women about Text4baby during prenatal appointments or during other one-on-one encounters that provide opportunities for addressing women’s individual needs for health information during pregnancy.

The analysis also has implications for refining the way Text4baby is marketed to women who may have other sources of health information during pregnancy. The analysis found that the majority of women who had heard of Text4baby did not enroll. Some women decided not to sign up because they rely on other sources of health information while others seek information from a wide range of sources. The findings suggest that Text4baby could be promoted as a complement to other sources of information, encouraging women to integrate its use with information from health care providers, family members and friends, and other media (such as books and Internet sources).

The experiences in the four CHCs highlight the role that providers and staff can play in promoting Text4baby and integrating the program into the clinic workflow to increase awareness and participation. The Text4baby participation rate among prenatal care patients in the four CHCs ranged from 2 to 16 percent and was substantially higher within the CHC that was involved in actively promoting Text4baby.

In addition, within the four CHCs, awareness and participation by non-Hispanic black women was lower than the rates for Hispanic and other women; anecdotal evidence suggests that the difference may reflect low levels of direct promotion of Text4baby at the CHCs where non-Hispanic black women receive care. Providers in these centers expressed a willingness to promote Text4baby in the future. As discussed earlier, engagement of providers could help target enrollment to populations with low enrollment rates.

In summary, although participation rates among CHC prenatal care patients were low overall, the rate was substantially higher in the CHC with strong provider support, a visible presence of Text4baby posters in clinic waiting rooms, and a statewide MCH coalition directly involved in supporting activities in the community. This model of multilevel promotion and outreach may hold promise for expanding the reach of Text4baby.

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IV. Health Information, Knowledge, and Behavior Among Women Receiving Prenatal Care from Four Community Health Centers

A. Introduction

The goal of the Text4baby program is to help women have healthy pregnancies and healthy babies by sharing high-priority health information, increasing their health knowledge, promoting healthy behaviors, and improving access through referrals to health resources (such as help lines for smoking cessation, Medicaid, and WIC). This chapter examines the type of health information received, level of health knowledge, and selected preventive health behaviors among women receiving prenatal care from four CHCs, according to the women's Text4baby participation status. The analysis compares women who signed up for Text4baby to those who heard of Text4baby but decided not to sign up and those who never heard of Text4baby. The chapter concludes with a discussion of women's satisfaction with the Text4baby program among those who signed up. The analysis is based primarily on data collected from prenatal care patients in four CHCs through the Healthy Pregnancy and Parenting Survey, conducted between December 2012 and May 2013. Quotations from consumer focus groups in the four communities provide additional context on experiences with Text4baby.

B. Receipt of Health Information on High-Priority Topics

The Text4baby program has identified a core set of topics about which all women should receive health and safety information during their pregnancy and their baby's first year (as discussed in Chapter I). Women reported whether they received any information on 14 health topics (Table IV.1). Virtually all CHC prenatal care patients reported receiving information on taking prenatal vitamins (96 percent), eating healthy foods (96 percent), avoiding alcohol or drugs (93 percent), and finding out about WIC eligibility (91 percent). They less frequently reported receiving information on avoiding stress (79 percent), getting a flu shot (78 percent), seeing a dentist (76 percent), using a seatbelt (76 percent), and calling a help line if they were depressed (68 percent).

"I just like the practical tips. Like I remember one was telling me how to wear a seatbelt. Because at first I thought, how do I wear a seatbelt kind of comfortable. It told you that we had to position it."
[Focus Group Participant]

As shown in Figure IV.1, women who heard of Text4baby (regardless of whether they signed up) were significantly more likely to report receiving health information on 14 high-priority topics compared to women who never heard of Text4baby. In particular, women who had heard of Text4baby were significantly more likely to report they received information about exercising (93 versus 84 percent), avoiding stress (90 versus 77 percent), getting a flu shot (88 versus 76 percent), seeing a dentist (83 versus 74 percent), and calling a help line if they were depressed (81 versus 65 percent). There were no significant differences in the receipt of health information between women who signed up for Text4baby and those who heard of Text4baby but decided not to sign up. The results suggest that women who decided not to sign up for Text4baby relied on other sources of health information (consistent with women's reasons for not signing up for Text4baby, as discussed in Chapter III). The results also suggest that women who never heard of Text4baby were significantly less likely than the other two groups of women to report they received high-priority health information on virtually all topics.

Table IV.1. Percentage of Prenatal Care Patients Who Reported Receiving Health Information on Selected Topics, by Text4baby Participation Status, Four CHCs, 2012–2013

Health Information Topic	Percentage of All Pregnant Women	Percentage of Pregnant Women Who Heard of Text4baby	Percentage of Pregnant Women Who Never Heard of Text4baby	Significance*	Percentage of Pregnant Women Who Signed Up for Text4baby	Percentage of Pregnant Women Who Heard of Text4baby But Did Not Sign Up	Percentage of Pregnant Women Who Never Heard of Text4baby	Significance*
Taking Prenatal Vitamins	96.4	97.3	96.2	n.s.	95.1	98.7	96.2	n.s.
Eating Healthy Foods	96.4	99.2	95.8	a	100.0	98.7	95.8	c, d
Avoiding Alcohol or Other Drugs	92.6	95.0	92.1	n.s.	97.7	93.5	92.1	c
Finding Out If You Are Eligible for WIC	90.6	92.5	90.1	n.s.	96.5	90.3	90.1	c
Breastfeeding Your Baby	85.7	90.4	84.7	a	92.5	89.2	84.7	c
Getting Exercise	85.6	93.1	84.1	a	96.0	91.4	84.1	c, d
Finding Out If You Are Eligible for Medicaid	85.1	92.0	83.9	a	91.6	92.3	83.9	d
Quitting Smoking during Pregnancy	84.8	88.6	83.9	n.s.	94.2	85.4	83.9	c
Becoming Aware of Pregnancy Health Risks	83.7	88.4	82.8	n.s.	91.8	86.4	82.8	c
Avoiding Stress	79.2	89.9	76.9	a	92.9	88.2	76.9	c, d
Getting a Flu Shot	78.0	88.2	75.8	a	91.4	86.3	75.8	c, d
Seeing a Dentist	76.1	83.3	74.4	a	79.3	85.6	74.4	d
Using a Seatbelt	75.8	82.4	74.3	a	80.8	83.4	74.3	d
Calling a Help Line If Feeling Depressed	68.2	80.8	65.3	a	81.0	80.6	65.3	c, d

Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

* T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:

a = women who heard of Text4baby versus women who never heard of Text4baby

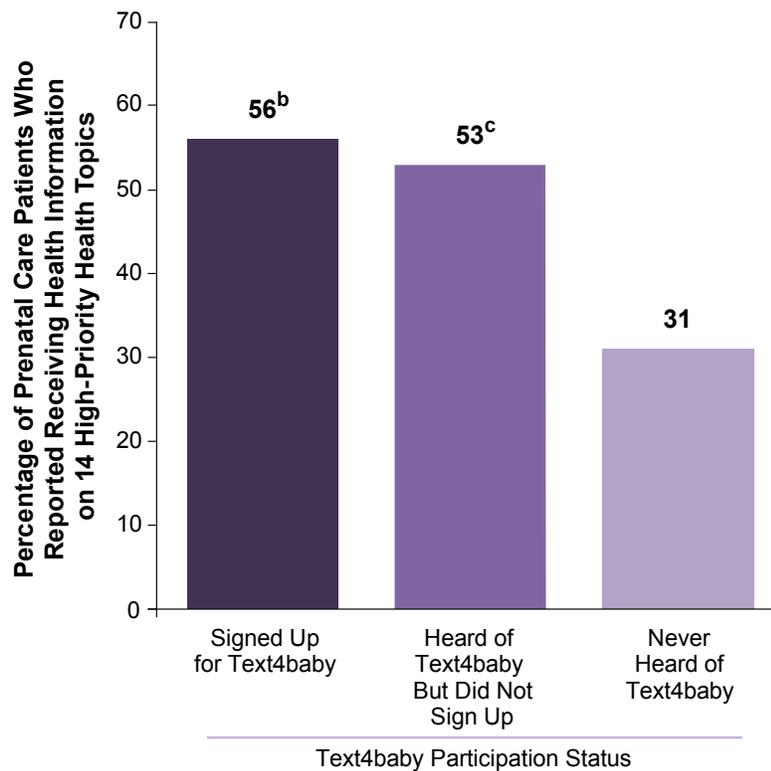
b = women who signed up for Text4baby versus women who heard of Text4baby but did not sign up (no significant differences found)

c = women who signed up for Text4baby versus women who never heard of Text4baby

d = women who heard of Text4baby but did not sign up versus women who never heard of Text4baby

n.s. = not significant

Figure IV.1. Receipt of Health Information on High-Priority Health Topics, by Text4baby Participation Status, Four CHCs, 2012–2013



Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

Note: See Table IV.1 for the list of 14 high-priority health topics. T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:

a = women who signed up for Text4baby versus women who heard of Text4baby but did not sign up (no significant difference found)

b = women who signed up for Text4baby versus women who never heard of Text4baby

c = women who heard of Text4baby but did not sign up versus women who never heard of Text4baby

Overall, 8 percent of CHC prenatal care patients reported that they had any unmet health information needs (data not shown). There were no differences in the rate of unmet health information needs by Text4baby participation status. However, women who never heard of Text4baby—who represent the largest share of the CHC prenatal care patients—accounted for most of the unmet health information needs. Women who never heard of Text4baby most frequently mentioned a need for information about Medicaid, WIC, breastfeeding and nutrition, smoking cessation, and mental health issues (such as depression and stress)—all issues addressed by Text4baby.

The results suggest that women who have heard of Text4baby received health information on more topics than those who have not heard of Text4baby, but there were no significant differences between those who signed up for Text4baby and those who had heard of Text4baby but did not sign up. The results support the finding in Chapter III that women who had heard of Text4baby and decided not to sign up relied on other sources of health information. Furthermore, the women who never heard of Text4baby were not only hard to reach with information about signing up for Text4baby but were also hard to reach with information on high-priority health topics.

C. Level of Health Knowledge

The evaluation assessed women’s health knowledge along four dimensions: how women plan to feed their babies, how they plan to lay their babies down to sleep, what they consider to be the best time to deliver when there are no medical problems in the pregnancy, and when they view a pregnancy to be full-term. All of these health knowledge topics are part of large public health campaigns to promote evidence-based practices related to infant feeding, safe sleeping, and optimal delivery time.³⁶ As shown in Table IV.2, 90 percent reported that they plan to breastfeed their baby, 57 percent indicated that they plan to lay their baby down to sleep on his or her back, 69 percent responded that the best time to deliver when there are no medical problems is 39 to 40 weeks, and 60 percent were aware that pregnancy is considered to be full-term at 39 to 40 weeks. Overall, 62 percent of CHC prenatal care patients responded “correctly” to at least three of the four knowledge questions.

Infant Feeding Plan. Although most women reported that they planned to breastfeed or feed pumped milk to their baby, the rate was significantly higher among those who had heard of Text4baby (including those who signed up and those who decided not to sign up) than those who never heard of Text4baby (97 versus 89 percent). Among those who had heard of Text4baby, there were no significant differences between those who signed up and those who decided not to sign up (97 percent). Black, non-Hispanic women were significantly less likely than other CHC prenatal care patients to report that they planned to breastfeed (79 versus 95 percent; data not shown). The results are consistent with studies showing lower rates of breastfeeding initiation among blacks than among whites and Hispanics (Allen et al. 2013).

Infant Sleep Position. Safe sleep campaigns focus on preventing Sudden Infant Death Syndrome (SIDS). Messages aim to educate pregnant women and new mothers on the importance of laying their baby to sleep on his or her back and avoiding co-sleeping. Women who signed up for Text4baby were significantly more likely than those who had heard of Text4baby but did not sign up or those who had not heard of the program to plan to lay their baby to sleep on his or her back (77 versus 59 and 55 percent, respectively).

Optimal Delivery Time. More than two-thirds of CHC prenatal care patients (69 percent) correctly responded that the “best time” to deliver their baby when there are no medical problems in the pregnancy is 39 to 40 weeks. Text4baby subscribers were more likely than other women to know the best time to deliver; 83 percent responded correctly compared with 69 percent of women who had never heard of Text4baby and 65 percent of those who had heard of Text4baby but decided not to sign up. When asked about how Text4baby improves women’s knowledge, one provider commented, “Everything from the beginning of the pregnancy all the way to the end, they want to know, for example, why the doctor wants them to be induced if they think they are not ready according to their own research.”

“It gave a little information about SIDS and that you should lay the baby on its back, because if you lay it on the front, there’s a possibility that the baby could die in its sleep.”
[Focus Group Participant]

“I was co-sleeping and recently I’ve been trying to get him out of the bed and make sure that he’s sleeping in his bassinet . . . Text4baby is one of many different sources . . . saying, get him out of your bed, get him out of your bed. It’s . . . dangerous and all that kind of stuff which contributes to my changing my behavior. Because, like I said, for me, a lot of times I have to hear it from many different places.”
[Focus Group Participant]

³⁶ For information on the Initiative to Reduce Elective Deliveries before 39 Weeks of Pregnancy, see <http://www.nichd.nih.gov/ncmh/ep/isitworthit/Pages/default.aspx>. For information on the Safe to Sleep campaign, see <http://www.nichd.nih.gov/sts/Pages/default.aspx>. For information on the It’s Only Natural breastfeeding campaign, see <http://www.womenshealth.gov/itsonlynatural/>.

Table IV.2. Health Knowledge Among Prenatal Care Patients, by Text4baby Participation Status, Four CHCs, 2012–2013

Health Knowledge Item	Percentage of All Pregnant Women	Percentage of Pregnant Women Who Heard of Text4baby	Percentage of Pregnant Women Who Never Heard of Text4baby	Significance*	Percentage of Pregnant Women Who Signed Up for Text4baby	Percentage of Pregnant Women Who Heard of Text4baby But Did Not Sign Up	Percentage of Pregnant Women Who Never Heard of Text4baby	Significance*
Plan to Breastfeed Baby								
Yes ✓	90.1	96.8	88.5	a	96.9	96.7	88.5	c, d
No	8.5	3.2	9.8		3.1	3.3	9.8	
Don't Know	1.4	0.0	1.8		0.0	0.0	1.8	
Plan to Lay Baby Down to Sleep								
On Back ✓	57.1	65.4	55.2	a	76.8	58.8	55.2	b, c
On Side	29.6	27.5	30.2		21.0	31.2	30.2	
On Stomach	11.1	5.5	12.4		0.0	8.7	12.4	
Don't Know	2.1	1.6	2.3		2.2	1.3	2.3	
Best Time to Deliver When There Are No Medical Problems in the Pregnancy								
34 to 36 Weeks	6.1	7.2	5.8		3.5	9.2	5.8	
37 to 38 Weeks	22.3	19.9	22.9		13.2	23.9	22.9	
39 to 40 Weeks ✓	69.3	71.6	68.7	n.s.	83.3	64.8	68.7	b, c
Don't Know	2.3	1.3	2.5		0.0	2.1	2.5	
When Pregnancy Is Considered Full-Term								
34 to 36 Weeks	10.4	12.0	10.0		7.6	14.5	10.0	
37 to 38 Weeks	25.4	25.5	25.4		25.0	25.8	25.4	
39 to 40 Weeks ✓	60.1	61.2	59.9	n.s.	67.4	57.6	59.9	n.s.
Don't Know	4.0	1.2	4.7		0.0	2.1	4.7	
Composite Level of Health Knowledge	62.1	69.2	60.4	a	81.4	62.2	60.4	b, c

Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

Note: The composite level of health knowledge is measured based on the percentage of women responding “correctly” to at least three of the four items related to: (1) their infant feeding plan, (2) infant sleeping position, (3) optimal delivery time, and (4) definition of full term.

* T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:

a = women who heard of Text4baby versus women who never heard of Text4baby

b = women who signed up for Text4baby versus women who heard of Text4baby but did not sign up (no significant differences found)

c = women who signed up for Text4baby versus women who never heard of Text4baby

d = women who heard of Text4baby but did not sign up versus women who never heard of Text4baby

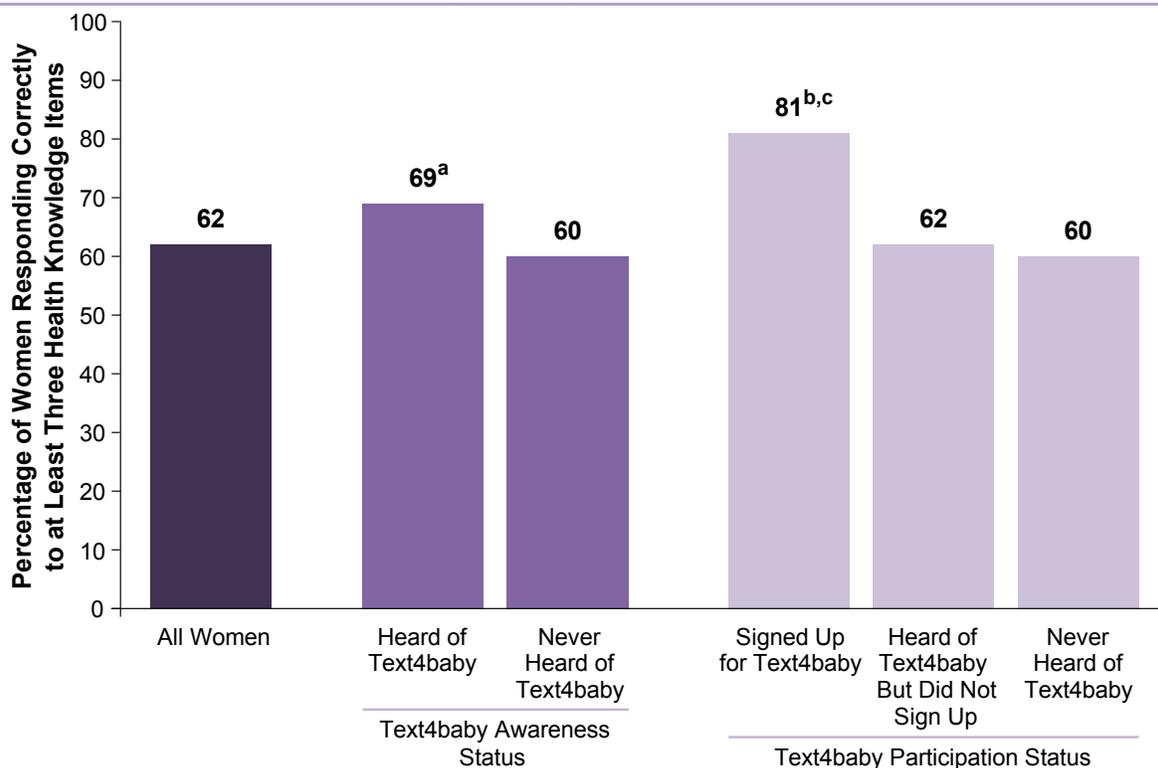
n.s. = not significant

Definition of Full Term. Overall, 60 percent of CHC prenatal care patients responded correctly that their baby would be full-term at 39 to 40 weeks; there were no differences in the rate according to Text4baby participation status. The recent prominence of “39 Weeks” campaigns may account for a higher level of knowledge of the definition of full term among CHC prenatal care patients compared to an earlier study in which 25 percent of women considered full term to occur at 39 to 40 weeks (Goldenberg et al. 2009). Nevertheless, the results suggest that a sizable proportion of CHC prenatal patients are not aware of the correct definition of full term, perhaps because, until recently, preterm was considered to be before 37 weeks (ACOG 2013).

Composite Level of Health Knowledge. A measure of the composite level of health knowledge provides evidence of a higher level of knowledge among women who signed up for Text4baby. The score reflects women’s knowledge about four items related to (1) their infant feeding plan, (2) infant sleeping position, (3) optimal delivery time, and (4) definition of full term. Eighty-one percent of women who signed up for Text4baby responded “correctly” to at least three of the four knowledge items, versus 60 to 62 percent of other CHC prenatal care patients. (See Table IV.2 and Figure IV.2.)

“It would be convenient for me because sometimes I might forget something and a Text4baby might come in right around that time and remind me about something but I just forget. So it helps out a lot on forgetting things or you might get that text that something you might forget. You get a Text4baby, just say or something, so I go back to it and read it and help me out with what I forget.”
[Focus Group Participant]

Figure IV.2. Level of Health Knowledge Among Prenatal Care Patients, Four CHCs, 2012–2013



Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

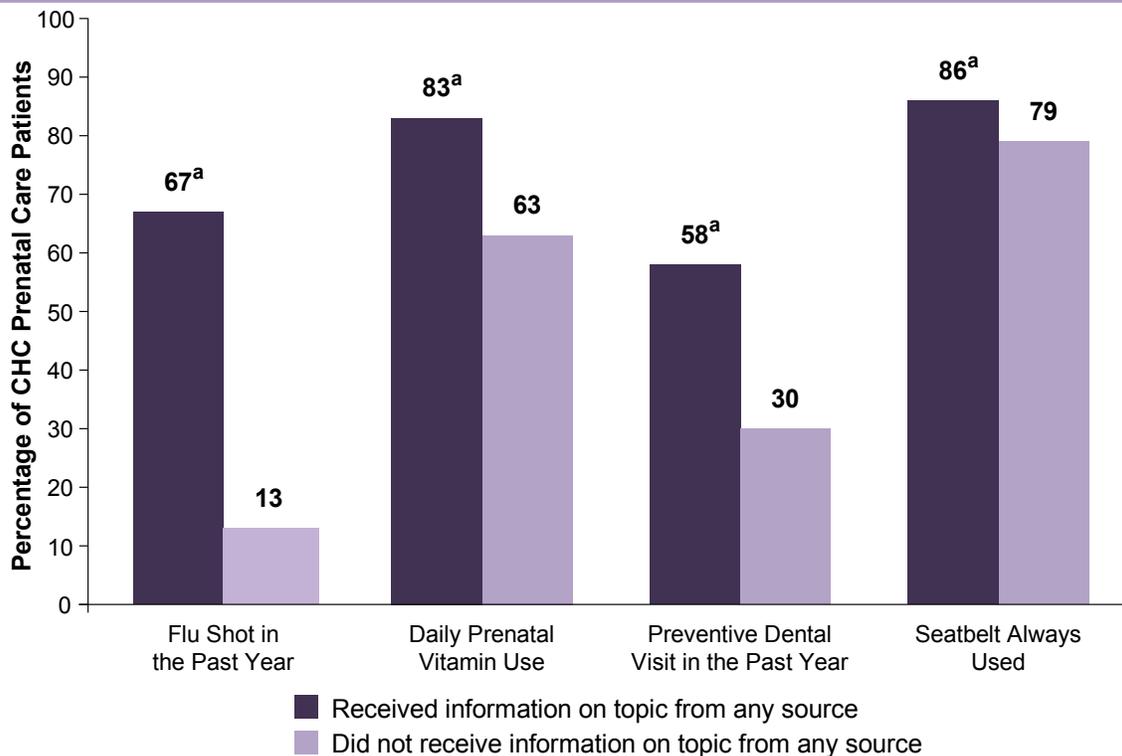
Notes: The composite level of health knowledge is measured based on the percentage of women responding “correctly” to at least three of the four items related to (1) their infant feeding plan, (2) infant sleeping position, (3) optimal delivery time, and (4) definition of full term. T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:

- a = women who heard of Text4baby versus women who never heard of Text4baby
- b = women who signed up for Text4baby versus women who heard of Text4baby but did not sign up
- c = women who signed up for Text4baby versus women who never heard of Text4baby

D. Preventive Health Behaviors

As shown in Table IV.3, more than 80 percent of CHC prenatal care patients reported they always used a seatbelt in the car (86 percent) or took a prenatal vitamin daily (82 percent). Only about half had a flu shot (55 percent) or a preventive dental visit (51 percent) in the past year. The only preventive health behavior that varied significantly by Text4baby participation status was the percentage getting a flu shot in the past year. However, the percentage reporting each preventive health behavior differed significantly according to whether women indicated they had received health information on the topic from any source (Table IV.4; Figure IV.3).

Figure IV.3. Prenatal Care Patients' Preventive Health Behaviors, by Receipt of Health Information, Four CHCs, 2012–2013



Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

Note: T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:

a = women who received information on topic from any source versus women who did not receive information on topic from any source

Getting a Flu Shot. Overall, 55 percent of CHC prenatal care patients reported having a flu shot during the past year. The rate was significantly lower among those who never heard of Text4baby (51 percent) than among those who signed up for Text4baby (72 percent) or those who had heard about Text4baby but decided not to sign up (68 percent) (Table IV.3). Moreover, the percentage of women getting a flu shot was significantly higher among those who received information from any source (67 percent) than among those who received no information (13 percent) (Table IV.4). (Recall Table IV.1, which showed that 78 percent of women received flu shot information from any source.) The results suggest that receiving information from Text4baby or other sources may provide an “extra push” to encourage women to get a flu shot during pregnancy.

“... [T]hey reminded me to get the flu shot when I was pregnant. I mean I was going to . . . but it’s kind of nice to have an extra push, an extra bit of a reminder.”
[Focus Group Participant]

Table IV.3. Health Behavior Among Prenatal Care Patients, Four CHCs, 2012–2013

	Percentage of All Pregnant Women	Percentage of Pregnant Women Who Heard of Text4baby	Percentage of Pregnant Women Who Never Heard of Text4baby	Significance*	Percentage of Pregnant Women Who Signed Up for Text4baby	Percentage of Pregnant Women Who Heard of Text4baby But Did Not Sign Up	Percentage of Pregnant Women Who Never Heard of Text4baby	Significance*
Flu Shot in the Past Year	54.7	69.1	51.3	a	71.6	67.6	51.3	c, d
Daily Prenatal Vitamin Use	82.0	83.6	81.6	n.s.	78.3	86.6	81.6	n.s.
Preventive Dental Visit in the Past Year	51.0	48.3	51.7	n.s.	55.0	44.5	51.7	n.s.
Seatbelt Always Used	86.4	85.5	86.7	n.s.	80.7	88.4	86.7	n.s.

Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

* T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:

a = women who heard of Text4baby versus women who never heard of Text4baby

b = women who signed up for Text4baby versus women who heard of Text4baby but did not sign up (no significant differences found)

c = women who signed up for Text4baby versus women who never heard of Text4baby

d = women who heard of Text4baby but did not sign up versus women who never heard of Text4baby

n.s. = not significant

Table IV.4. Self-Reported Health Behavior and Information Receipt Among Prenatal Care Patients, Four CHCs, 2012–2013

Self-Reported Health Behavior	Percentage Who Received Information on the Topic from Any Source and Reported Health Behavior	Percentage Who Did Not Receive Information on the Topic from Any Source and Reported Health Behavior	Significance*
Flu Shot in the Past Year	66.5	13.2	a
Daily Prenatal Vitamin Use	82.7	63.4	a
Preventive Dental Visit in the Past Year	57.5	30.3	a
Seatbelt Always Used	86.4	78.5	a

Source: Healthy Pregnancy and Parenting Survey, conducted by Mathematica Policy Research, December 2012 to May 2013. The survey included 707 pregnant women receiving prenatal care at four CHCs. The results have been weighted to account for the probability of selection and nonresponse.

* T-tests were conducted to determine statistical significance of differences between groups ($p < 0.10$). Statistically significant differences are denoted as follows:

a = women who received health information on topic from any source versus women who did not receive health information on topic from any source

The results are consistent with national findings on influenza vaccination rates among pregnant women (CDC 2013). About half (51 percent) of pregnant women had a flu shot, and the rate was substantially higher among those who reported that a provider recommended and offered the vaccination (71 percent) versus among those who received no recommendation (16 percent).

A recent study by the Text4baby program examined the effects of an interactive module to promote flu shots among pregnant women (Text4baby 2013). At the time of the study, about one-third (36 percent) of the pregnant women indicated that they had already received a flu shot, another third (32 percent) was planning to get one, and the final third (32 percent) was not planning to get one. The results suggest that the likelihood of having a flu shot increased with text message reminders to those planning to get a flu shot and with messages tailored to those not planning to get a flu shot; in the latter case, the messages addressed women's reasons for not wanting a flu shot (such as safety concerns or a belief that one can get the flu from the vaccination).

Taking Prenatal Vitamins. Prenatal vitamins that contain folic acid are recommended before and during pregnancy to prevent neural tube defects (U.S. Preventive Services Task Force 2009). Virtually all CHC prenatal care patients received information from at least one source on taking prenatal vitamins (Table IV.1). Those who received information were more likely to report taking a prenatal vitamin every day than those who did not receive any information (83 versus 63 percent; Table IV.4). There were no significant differences in prenatal vitamin use by Text4baby participation status (Table IV.3).

Seeing a Dentist. Untreated dental problems during pregnancy are associated with preterm delivery and low birth weight (Kim et al. 2012). A dental visit during pregnancy can detect or treat oral health problems among pregnant women and prevent transmission of bacteria that cause dental caries in infants (Oral Health Care during Pregnancy Expert Workgroup 2012). About half of the CHC prenatal care patients reported that they had a preventive dental visit in the past year. There were no significant differences in the percentage having a dental visit in the past year by Text4baby awareness or participation status (Table IV.3). Three-fourths of CHC prenatal care patients reported that they received information on seeing a dentist (Table IV.1), and those receiving information from any source were significantly more likely to have a preventive dental visit than those not receiving such information (58 versus 30 percent) (Table IV.4).

Wearing a Seatbelt. Proper use of seatbelts during pregnancy can reduce the risk of adverse outcomes after a motor vehicle crash, including low birth weight, preterm delivery, and fetal death (Vladutiu and Weiss 2012). Three-fourths of CHC prenatal care patients reported that they received information on the proper use of seatbelts during pregnancy. Women who received information about seatbelt use were significantly more likely to report they always use a seatbelt (86 percent) than those who did not receive information (78 percent). There were no significant differences by Text4baby awareness or participation status.

“So even though you know something, you probably don’t know the full of it, or you probably don’t know it in a different aspect . . . so even though I know it, like I still try to read it. Like I know I’m supposed to get my flu shot and I know certain things, but I still read it.”

[Focus Group Participant]

“[At the] beginning of my pregnancy, I was not taking prenatal vitamins and then the message came in saying how important the prenatal vitamins were. I think I skipped maybe about three months’ worth of prenatal vitamins that I wasn’t taking. And once I got the message I’m like, oh man, I should because I didn’t know that prenatal vitamins were that important in the baby’s development. So, yeah, that helped out.”

[Focus Group Participant]

“So it made me think like you can go to the dentist when you’re pregnant. And then I called the dentist and I explained to them I’m pregnant, and he said, yes, you can come in, but you just need to get a clearance.”

[Focus Group Participant]

The results show that prenatal care patients at the four CHCs were more likely to engage in preventive health behaviors during pregnancy if they received health information about the recommended behaviors, regardless of the source. However, these results are not directly attributable to the effects of Text4baby, given the multitude of health information sources used by Text4baby subscribers. Nevertheless, focus group participants indicated two ways that Text4baby messages affected their health behaviors. Sometimes a message presented a woman with new information that she then decided to act on, and other times a woman had already received information on a topic, but a Text4baby message provided “an extra push” toward a healthy behavior. The strongest evidence about the role of Text4baby is related to getting a flu shot. Although not providing conclusive evidence of the role of Text4baby in view of the many other information sources promoting vaccination, the results show the importance of health information in promoting preventive health behaviors.

E. Women’s Satisfaction with the Text4baby Program

Most women who signed up for Text4baby were very satisfied with key features of the program: 90 percent said it was very easy to understand the messages; 78 percent were very satisfied with the frequency of the messages; and 64 percent found the messages very useful. A recent enhancement to the Text4baby service is the provision of telephone numbers that subscribers may call for more information about a specific topic. Few Text4baby subscribers (6 percent) indicated that they had called a telephone number included in a message. However, more than half (53 percent) of subscribers indicated that they had saved a telephone number to use in the future if they needed more information.³⁷ One CHC provider commented that referral telephone numbers are a valuable resource for patients, and even more so with Text4baby, because women can save the numbers in their cell phones for future reference.

Virtually all Text4baby subscribers who received prenatal care from the four CHCs (99 percent) indicated they would recommend Text4baby to a friend or family member. Among the reasons given by survey respondents were the following: Text4baby “gives good tips and it’s convenient;” “provides good information, and the phone numbers to contact them;” and “tells important things about baby’s progress, what to eat, and phone numbers for help.” Among the recommendations given by survey respondents for improving Text4baby were “to have the option of sending a question and they will answer back;” “maybe say more things in the texts that they send because sometimes they don’t say much;” and less repetition because “some text messages are the same.” The focus groups provided more in-depth insights about the use of Text4baby. All but one woman said that they always read their Text4baby messages, and several said that they sometimes save informational text messages for future reference. Very few of the focus group participants indicated that they had used the Text4baby website or Facebook page, and many indicated that they did not know these resources existed. Women felt that the Facebook page may be a good avenue for raising awareness about Text4baby.

“So it’s real convenient . . . if you’re going to ever forget about something, it’s always good to go back to that text message that they give you and read it. It’s good help.”

[Focus Group Participant]

“The text message they give you, it’s basically explaining to you about the text but they give you a number just in case. If the text they give you is not enough information”

[Focus Group Participant]

³⁷ The referral telephone numbers direct subscribers to helplines that are tied to the content of Text4baby messages, such as safe sleep, health insurance coverage, smoking cessation, breastfeeding, and substance abuse treatment. The U.S. government sponsors the majority of the helplines. For more information on telephone numbers to connect Text4baby subscribers to health resources, see <https://text4baby.org/index.php/health-info-for-moms>.

F. Concluding Remarks

Women who signed up for Text4baby appear to be engaged with the program: they read the messages and find them easy to understand, most think the messages are very useful, and many like to save the referral telephone numbers for future use. Compared to CHC prenatal care patients who never heard of Text4baby, subscribers reported receiving health information on more high-priority topics during pregnancy. There were no significant differences in the receipt of health information between women who signed up for Text4baby and those who heard of Text4baby but did not sign up.

In addition, the results indicate that women who signed up for Text4baby exhibited a higher level of health knowledge than the other two groups (women who never heard of Text4baby and women who heard of Text4baby but did not sign up), as measured by their composite responses related to four topics of public health significance: how women plan to feed their babies, how they plan to lay their babies down to sleep, what they consider to be the best time to deliver when there are no medical problems in the pregnancy, and when they view a pregnancy as full-term.

The low enrollment in Text4baby made it challenging to assess the effect of the Text4baby program on health behaviors and outcomes. Women who reported that they received health information from any source had higher rates of adherence to four recommended preventive health behaviors—flu vaccination, daily prenatal vitamin use, preventive dental visits, and regular seatbelt use—compared to women who reported that they did not receive any information on these topics. The results suggest that receiving any information on the topics is important, regardless of the source of information. Further research is needed to obtain a more definitive assessment of the effect of Text4baby on health behaviors and outcomes.

The data suggest that women who never heard of Text4baby are not only hard to reach with information about signing up for Text4baby but are also hard to reach with information on high-priority health topics. Taken together, the results indicate that broadening the reach of Text4baby to more women—particularly those who have never heard of Text4baby—could potentially increase women’s health knowledge on topics of public health significance.

The results are subject to many caveats (discussed in detail in Chapter VI). Major limitations include small sample sizes, the evaluation’s limited geographic reach, and the lack of a comparison group to assess what would have happened in the absence of signing up for Text4baby. Given that Text4baby subscribers appear to be “information seekers,” it is possible that they would have sought, received, and acted on information from other sources if they had not subscribed to Text4baby.

Nevertheless, evidence suggests that women who heard of Text4baby but decided not to sign up are also “information seekers,” as exhibited by the extent of health information they received from other sources. Their lower level of health knowledge on topics of public health significance suggests that Text4baby’s approach to providing evidence-based information by using short, easy-to-understand messages may be an effective formula for educating women on critical topics. Such an approach is consistent with the perspective that Text4baby may provide “an extra push” to help women experience a healthy pregnancy and have a healthy baby.

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V. Lessons Learned About the Use of Health Text Messaging to Provide Health Information During Pregnancy

The Text4baby program is the largest health text messaging program in the United States in terms of the number of subscribers and messages sent. It is breaking new ground for other Text4Health initiatives currently under development or in the early stages of implementation. The use of a public-private partnership to develop and implement the Text4baby program is widely credited with enabling a rapid launch from the initial vision in January 2009 to live registration in February 2010. This chapter synthesizes the findings from the Text4baby evaluation according to the five domains introduced in Chapter I: reach, engagement, education, connection, and sustainability.

A. Reach: How well does the Text4baby program reach the target population at both the individual (consumer) and system (partner) levels?

The reach of the Text4baby program is reflected by the involvement of a diverse mix of outreach partners in promoting Text4baby as well the level of awareness about and enrollment in Text4baby among the target population. Since the Text4baby program launched in February 2010, more than 1,000 organizations have joined as outreach partners at the national, state, and local levels. The large and growing number of public and private outreach partners signifies the extent of interest in the program. These partners have engaged in a two-pronged outreach strategy to raise awareness about and enroll women in Text4baby: (1) a mass media strategy to raise awareness in the target population, and (2) a direct outreach strategy in collaboration with an extensive network of public health agencies, health care providers, and health plans. More than 830,000 people have ever signed up for Text4baby since February 2010. The Text4baby participation rate was estimated at 4.8 percent of women giving birth in the United States in 2012.

“What we’ve learned is that it is the person-to-person approach that is going to make a difference on this. You need the mass media to create general awareness, but ultimately it requires the doctor, nurse, midwife, WIC provider, or best friend being engaged too or having it be automatically part of something in that it fits within established practices such as around enrollment.”
[Founding Partner]

The level of awareness of and participation in Text4baby varied widely among women who received prenatal care from the four CHCs included in the evaluation. Text4baby awareness among CHC prenatal care patients ranged from 8 to 38 percent, and participation ranged from 2 to 16 percent. Among women who had heard of Text4baby and decided not to sign up, the majority indicated that they relied on other sources of information, but a sizable proportion (about one-third) indicated that they were not comfortable with text messaging. The findings suggest that Text4baby could be more actively promoted as a complement to (rather than a substitute for) other sources of information, encouraging women to integrate its use with information from health care providers, family members and friends, and other media (such as books and Internet sources).

In general, Text4baby participation rates were low across all demographic groups, reflecting the difficulty of targeting Text4baby outreach. Certain groups of women in the four CHCs had above-average participation rates, including those under age 20, pregnant for the first time, and unemployed. The data suggest that other groups may experience barriers to signing up, including those with a lower level of English-language reading proficiency and those who prefer to receive text messages in Spanish. These findings support the use of direct outreach strategies to reach women one-on-one and help them assess whether Text4baby can meet their needs. In addition, they highlight the need for enhanced Spanish-language outreach and promotion tailored to those with a lower level of English-language reading proficiency.

Over time, the Text4baby program has strengthened its infrastructure with an outreach director and regional coordinators to organize and mobilize the partners to promote enrollment. The program is placing more emphasis on integrating Text4baby sign-up with other workflows, such as scheduling prenatal care appointments, signing up for Medicaid coverage or the WIC program, or enrolling in a health plan. These strategies are consistent with lessons learned in the four communities.

B. Engagement: How well does the Text4baby program engage partners and consumers in the use of Text4baby, with a special focus on how safety net providers are affected?

Engagement of safety net providers in the Text4baby program is reflected by their level of involvement in promoting the program, while engagement of consumers is reflected by their use of the service once enrolled. Experiences across the four CHCs highlight the opportunities and challenges of engaging safety net providers in the promotion of Text4baby. The CHC with the highest participation rate had strong provider support, displayed Text4baby posters in clinic waiting rooms, and directly involved a statewide MCH coalition in supporting activities in the community. However, early enthusiasm among providers waned in response to competing priorities, and providers recommended that future promotion efforts should involve other staff (such as intake staff, health educators, or nutritionists).

Providers in the other CHCs either did not know about Text4baby or did not recognize that they could promote the program to patients. Providers indicated that they would be willing to promote the program in the future, especially if they could receive tools (such as examples of workflows and talking points) to help them integrate the promotion of Text4baby into interactions with patients. Evidence from provider interviews suggests that provider engagement would be more effective through provider workplaces rather than through a mailing from a national professional organization.

Consumer engagement is reflected in women's perceptions of the value and use of Text4baby once enrolled. According to the Healthy Pregnancy and Parenting Survey conducted as part of the evaluation, virtually all Text4baby subscribers who received prenatal care from the four CHCs (99 percent) indicated they would recommend the program to a friend or family member. Almost all found the messages to be very easy to understand (95 percent), and most were very satisfied with the message frequency (78 percent) and found the messages very useful (64 percent). More than half (53 percent) indicated that they had saved a telephone number to use in the future if they needed more information. The ultimate engagement is reflected by a quote from a focus group participant who was a "new mom," expressing a desire for Text4baby to continue beyond her son's first birthday.

"[Text4baby] meets our needs in reinforcing our efforts with women while meeting their preferences for texting."

[Local Health Department Partner]

"[Text4baby] helps me out . . . my son, he's almost one so it still goes on. I hope it continues. I love for it to continue, I really do."

[Focus Group Participant]

Despite the high level of satisfaction among women engaged in Text4baby, one of the emerging issues for the program nationally is the extent of rapid disenrollment, especially during periods with enrollment spikes (such as state enrollment contests). According to an analysis of national Text4baby enrollment data conducted as part of the evaluation, among women enrolling in Text4baby in July 2013, 22 percent disenrolled within 30 days. The rate was higher among those who enrolled while pregnant (24 percent) rather than as new mothers (13 percent); among those signing up for the English-language protocol (22 percent) rather than for the Spanish-language protocol (12 percent); and among those signing up through the Internet rather than through text messaging (25 versus 21 percent). The higher disenrollment among web-based subscribers is noteworthy given the increasing proportion of registrants

via the web. As enrollment continues to increase, attention can focus on factors associated with disenrollment to ensure that subscribers receive the full benefit of Text4baby through the baby's first year.

C. Education: How well does the Text4baby program educate consumers to improve their health knowledge and behaviors?

Compared to women who never heard of Text4baby, women who heard of Text4baby were more likely to report that they received information on high-priority health topics. In particular, women who had heard of Text4baby were more likely to receive information about exercising (93 versus 84 percent), avoiding stress (90 versus 77 percent), getting a flu shot (88 versus 76 percent), seeing a dentist (83 versus 74 percent), and calling a help line if depressed (81 versus 65 percent). There were no significant differences in the receipt of health information between women who signed up for Text4baby and those who heard of Text4baby but decided not to sign up. The results suggest that women who heard of Text4baby but decided not to sign up relied on other sources of health information (consistent with their reasons for not signing up for Text4baby, as discussed earlier).

In addition, the results indicate that women who signed up for Text4baby exhibited a significantly higher level of health knowledge than the other two groups (women who never heard of Text4baby and women who heard of Text4baby but did not sign up), as measured by their composite responses related to four topics of public health significance: how women plan to feed their babies, how they plan to lay their babies down to sleep, what they consider to be the best time to deliver when there are no medical problems in the pregnancy, and when they view a pregnancy as full-term. Text4baby's emphasis on delivering evidence-based health information may have led to success in reaching women on high-priority topics, relative to other sources of health information. Moreover, the messages target low-literacy populations, perhaps also contributing to a higher level of understanding and knowledge of key issues.

The data suggest that women who never heard of Text4baby are not only hard to reach with information about signing up for Text4baby but are also hard to reach with information on high-priority health topics. When asked about their unmet needs for health information, women who never heard of Text4baby most frequently mentioned critical topics included in the Text4baby message protocol, such as information about Medicaid, WIC, breastfeeding and nutrition, smoking cessation, and mental health issues. Taken together, the results suggest that broadening the reach of Text4baby to more women—particularly those who have never heard of Text4baby—offers the potential to increase women's health knowledge on topics of public health significance.

D. Connection: How well does the Text4baby program connect consumers and providers to improve the use of services?

The Text4baby program aims to connect consumers with providers through text messages that include evidence-based health tips, appointment reminders, and referral telephone numbers. All women who signed up for Text4baby cited the availability of health tips and appointment reminders as motivating factors, and 86 percent signed up because they wanted telephone numbers for referrals. Few Text4baby subscribers (6 percent) indicated they had ever called a telephone number included in a message. However, more than half (53 percent) of subscribers indicated they had saved a telephone number to use in the future if they needed more information. One CHC provider commented that referral telephone numbers are a valuable resource for patients, and even more so with Text4baby, because women can save the numbers in their cell phones for future reference.

Women’s receipt of a flu shot in the past year illustrates Text4baby’s indirect effect on connecting subscribers to recommended care. Overall, 55 percent of CHC prenatal care patients reported having a flu shot during the past year. The rate was significantly lower among those who never heard of Text4baby (51 percent) than among those who signed up for Text4baby (72 percent) or those who had heard about Text4baby but decided not to sign up (68 percent). Moreover, the percentage of women getting a flu shot was significantly higher among those who received flu shot information from any source (67 percent) than among those who received no information (13 percent). (A total of 78 percent of CHC prenatal care patients received flu shot information from any source.) The results suggest that receiving information from Text4baby or other sources may provide an “extra push” to encourage women to get a flu shot during pregnancy.

In addition, a recent study by the Text4baby program suggests that the likelihood of having a flu shot increased with text message reminders to those planning to get a flu shot as well as with messages tailored to those not planning to get a flu shot; the latter messages addressed recipients’ reasons for not wanting a flu shot (such as safety concerns or a belief that one can get the flu from the vaccination) (Text4baby 2013). The results are also consistent with national findings on influenza vaccination rates among pregnant women (Centers for Disease Control and Prevention 2013). About half (51 percent) of pregnant women had a flu shot, and the rate was substantially higher among those who reported that a provider recommended and offered the vaccination (71 percent) versus among those who received no recommendation (16 percent).

E. Sustainability: What are the implications for text messaging programs to serve the target population across a range of public health issues?

The sustainability of Text4baby has two components: (1) ongoing operations of (and improvements to) the Text4baby program, and (2) application of lessons learned from the implementation of Text4baby to other health text messaging programs. The evaluation adds to the evidence base on the sustainability of Text4baby and the implications for other health text messaging programs.

The Text4baby program infrastructure is strong and getting stronger, as reflected by lessons learned in the evaluation. When the Text4baby program was developed in 2009 and launched in 2010, implementation through a public-private partnership was considered an innovative approach for the federal government’s involvement in a new program. Overall, there is strong support for the Text4baby public-private partnership. Stakeholders universally agreed that the Text4baby public-private partnership facilitated a faster implementation timeline than would have been possible under sole public or private sponsorship.

“The only reason we have [wireless] carrier support is because of the low-income family target. They would not be interested if it was not that. I am very surprised by how important that was to them. It is a concern of theirs that low-to moderate-income mothers receive this information. . . . There would not be a Text4baby if we said we were doing this for a general population.”
[Founding Partner]

A key defining feature of Text4baby is its engagement of partners who support the mission of the program. Partner engagement is built on in-kind contributions, voluntarism, and philanthropy. The founding partners, founding sponsor, government partners, and more than 1,000 outreach partners are committed to the program’s sustainability. The program has continued to build infrastructure to support content development, outreach, and research; in addition to hiring new staff, the program has formalized its procedures for developing content, overseeing outreach efforts, and, more generally, ensuring smooth operation of the program. In addition, the wireless carriers have committed to another year of free messages.

The Text4baby public-private partnership offers several lessons for future public-private partnerships supporting health text messaging programs specifically and public health initiatives generally. First, partners suggested the designation of a more clearly defined federal point of contact and decision-making structure to facilitate timely decisions and follow-through on tasks. Second, they recommended that MOUs governing future public-private partnerships should define a time-limited role during a program's development and launch rather than an open-ended commitment; programs may evolve as they mature and require a shift in roles. Third, the experience with Text4baby suggests the importance of setting realistic expectations about time frames for the federal clearance and approval process in order to ensure that all partners can account for the process in their planning and scheduling. Finally, the Text4baby business model relies on in-kind contributions, voluntarism, and philanthropy, which may also be central to the success of future public-private partnerships in mHealth and public health. The viability of the Text4baby business model for future health text messaging programs should be considered further.

The Text4baby program is continuing to build momentum as new partners sign on to support the program, new strategies emerge to guide outreach and enrollment efforts, and new features enhance the product and make it more useful and attractive to subscribers. As the program concludes its fifth year, the governance structure for the Text4baby public-private partnership is evolving with the creation of a Content Development Council that will oversee the development of new message content and features; a structured approach to organizing and overseeing outreach efforts; and, generally, an expanding infrastructure to support Text4baby as a sustainable and branded program. These efforts position the program well to focus attention on broadening the reach of Text4baby within the safety net and promoting retention among those who sign up for the program.

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VI. Limitations of the Text4baby Evaluation

This evaluation involved a mixed-method study of the implementation of Text4baby and a more in-depth analysis of experiences of safety net providers and prenatal care patients in four CHCs. The community components—safety net consumer survey, key informant interviews, and consumer focus groups—provided an understanding of Text4baby participation, satisfaction, use, and effects at the local level. The use of a mixed-method design with qualitative and quantitative components at the national and local levels provided a comprehensive picture of the implementation and effects of Text4baby. However, several limitations should be acknowledged because they may affect the interpretation of results.

Generalizability of Results. Even though a data-driven approach guided the selection of the four CHCs, the findings are not generalizable to all CHCs, to all communities with CHCs, or to all populations served by CHCs. Instead, they are illustrative of provider and consumer experiences within the four CHCs, specifically as they pertain to awareness of and participation in Text4baby, receipt of health information, level of health knowledge, and adherence to recommended preventive health behaviors.

Small Sample Sizes. For two reasons, the survey involved smaller sample sizes than planned. First, the number of women who signed up for Text4baby or even heard of Text4baby was smaller than expected; second, it was more challenging to recruit women for the survey than expected. Similar studies have experienced slower-than-expected recruitment (Evans et al. 2012). In addition, slower-than-expected Text4baby enrollment nationally was a factor in small Text4baby sample sizes at the local level. As a result, statistical power was weaker than expected, particularly for detecting differences between Text4baby subscribers and nonsubscribers. Moreover, the evaluation was not able to examine the impact of the length of Text4baby participation among those who signed up (that is, the dose-response relationship).

Cross-Sectional Design. The survey used a cross-sectional design with a “natural” assignment to three analytic groups based on self-reported Text4baby awareness and participation status. Women were asked if they had ever heard of Text4baby and, if so, whether they had signed up. Based on their responses the women were classified into three groups: (1) signed up for Text4baby; (2) heard of Text4baby but did not sign up; and (3) never heard of Text4baby. By differentiating those who heard of Text4baby and decided not to sign up from those who decided to sign up, the evaluation shows that the majority of women who decided not to sign up had other sources of health information (although their level of health knowledge was below that of Text4baby subscribers). This evaluation also compared women who had heard of Text4baby to those who had not heard of Text4baby. Those who had not heard of Text4baby received less health information and demonstrated lower levels of health knowledge. The results can help shape future efforts to improve the effectiveness of Text4baby outreach and enrollment.

Lack of a Control/Comparison Group. In the absence of a control group or external comparison group and given the potential for self-selection among women who decided to sign up for Text4baby, differences between and among groups cannot be attributed to the effects of Text4baby. However, significant differences may suggest associations with Text4baby participation status. In addition, because the survey took place at one time point, it is not possible to examine changes in knowledge or behavior over time (for example, before and after enrollment in Text4baby).

Focus on the Prenatal Period. The cornerstone of the analysis of Text4baby's effects on women's health information, knowledge, and behavior is the Healthy Pregnancy and Parenting Survey. The survey focused on the effects of Text4baby during pregnancy. However, this focus is consistent with Text4baby's goal to engage women early in pregnancy before their baby is born. Text4baby enrollment data show that 79 percent of subscribers registered before their due date and received the pregnancy protocol.

Unknown Effect of Program Changes. Text4baby is a dynamic program. The qualitative components reflect stakeholder perspectives on the evolution of the program, including the underlying rationale, challenges, and lessons learned. The survey took place between December 2012 and May 2013; subscribers may have experienced variations in features depending on when they enrolled, but the sample sizes are too small to isolate any effects of changes in the Text4baby product over time. It is unknown whether changes in message content or features affected any of the outcomes measured in the survey.

Despite these caveats, much has been learned about Text4baby from a variety of stakeholder perspectives (Text4baby partners, providers, and consumers). The evaluation highlights experiences nationally and across four diverse communities as well as at the individual and system levels. It recognizes that Text4baby affects not only women and their infants but also the MCH system designed to serve them. Moreover, the evaluation provides a unique opportunity to understand the experiences of women who signed up for Text4baby as well as those who did not and, in particular, variations in their health information, health knowledge, and preventive health behaviors.

VII. Concluding Remarks

Stakeholders widely agree that the public-private partnership was a driving force in the successful launch of Text4baby in February 2010. Although the participation rate was lower than expected, women who signed up for Text4baby valued the program: 99 percent of the Text4baby subscribers who received prenatal care from the four CHCs indicated they would recommend Text4baby to a friend or family member. The lessons learned are being applied to improve program operations, enhance the Text4baby product, and refine the outreach strategy in order to expand the program's coverage. In particular, the focus on integrating Text4baby promotion within existing health programs may hold promise for increasing the program's reach to a broader population.

The evaluation also sheds light on the health information and health knowledge of women who received prenatal care from CHCs. Compared to CHC prenatal care patients who never heard of Text4baby, subscribers were significantly more likely to receive health information on high-priority topics during pregnancy. The data suggest that women who never heard of Text4baby are hard to reach with health information in general.

In addition, as measured by their composite responses to four questions regarding knowledge of recommended health practices, women who signed up for Text4baby exhibited a significantly higher level of health knowledge than the other two groups of prenatal care users (women who had never heard of Text4baby and women who had heard of Text4baby but did not sign up). Text4baby's emphasis on delivering evidence-based health information via short, easy-to-understand messages may have contributed to the higher level of health knowledge among subscribers.

The findings suggest that integration of Text4baby with the delivery of prenatal services in existing health programs offers the potential to expand access to health information during pregnancy and improve knowledge about significant public health topics. The low enrollment in Text4baby made it challenging to assess the effectiveness of the Text4baby program, and in particular, its effect on health behaviors and outcomes. Further research is needed to obtain a more definitive assessment of the effect of Text4baby on health behaviors and outcomes. In addition, the viability of the Text4baby business model for future health text messaging programs (that is, reliance on in-kind contributions, voluntarism, and philanthropy) should be considered further.

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Appendix A

Methods Used in the Text4baby Evaluation

A. Overview of the Text4baby Evaluation Approach

The Text4baby evaluation was designed to assess the implementation and effects of Text4baby across three dimensions. First, we collected data at both the national and community levels to assess performance nationally and to gain a local view. Second, we sought responses from a variety of stakeholders—Text4baby partners, providers, and consumers—to ensure that all stakeholders had a voice in the evaluation. Third, we considered effects at both the individual and system levels, recognizing that the Text4baby service affects not only women and their infants but also the maternal and child health (MCH) system designed to serve them.

The Text4baby evaluation included five main components: (1) national stakeholder interviews, (2) key informant interviews, (3) consumer focus groups, (4) a safety net consumer survey, and (5) secondary data analysis.³⁸ The multifaceted approach recognizes that no one component can address all the issues of interest. As shown in Table A.1, the five components gathered information across several stakeholder perspectives at both the national and community levels. For example, stakeholder interviews with partners at the national level complemented key informant interviews with partners and providers at the community level. The safety net consumer survey collected quantitative data on consumer experiences while focus groups delved qualitatively into consumers’ impressions. The community-level components were conducted in four selected communities, as discussed below. This appendix describes each evaluation component in turn. Approval from the U.S. Office of Management and Budget and the New England Institutional Review Board was obtained before data collection.

Table A.1. Features of the Text4baby Evaluation Approach

Evaluation Component	Stakeholder Perspectives			Level of Effects	
	Partners	Providers	Consumers	Individual	System
National Level					
Stakeholder interviews	√				√
Secondary data analysis	√		√	√	√
Community Level					
Key informant interviews	√	√		√ (P, NP)	√
Consumer focus groups			√ (P)	√ (P)	√
Safety net consumer survey			√ (P, NP)	√ (P, NP)	√

Note: The evaluation also included abstraction of electronic health record (EHR) data for women participating in the safety net consumer survey who consented to the release of their records. Analysis of EHR data is excluded from this report because of the lack of comparability of data across the four community health centers (CHCs).

P = Text4baby participants; NP = Text4baby nonparticipants

³⁸ The evaluation also included abstraction of EHR data for women participating in the safety net consumer survey who consented to the release of their records. Analysis of EHR data is excluded from this report because of the lack of comparability of data across the four CHCs.

B. National Stakeholder Interviews

The goal of the national stakeholder interview component was to conduct semi-structured interviews with national stakeholders to assess: (1) the approach to and effectiveness of Text4baby implementation; (2) experiences with technical, organizational, and operational elements of program implementation; and (3) lessons learned for Text4baby and other health text messaging interventions.

The stakeholder selection criteria prioritized organizations that have either played a significant role in Text4baby implementation at the national level or have demonstrated leadership and innovation at the state or local level. To be considered, stakeholders were required to have been engaged as a partner for at least six months. Selection was purposive, with some organizations selected with certainty (such as the founding partners) and the remainder distributed across the various types of partner organizations that have been involved in program implementation. The interviews took place between October 2012 and January 2013.

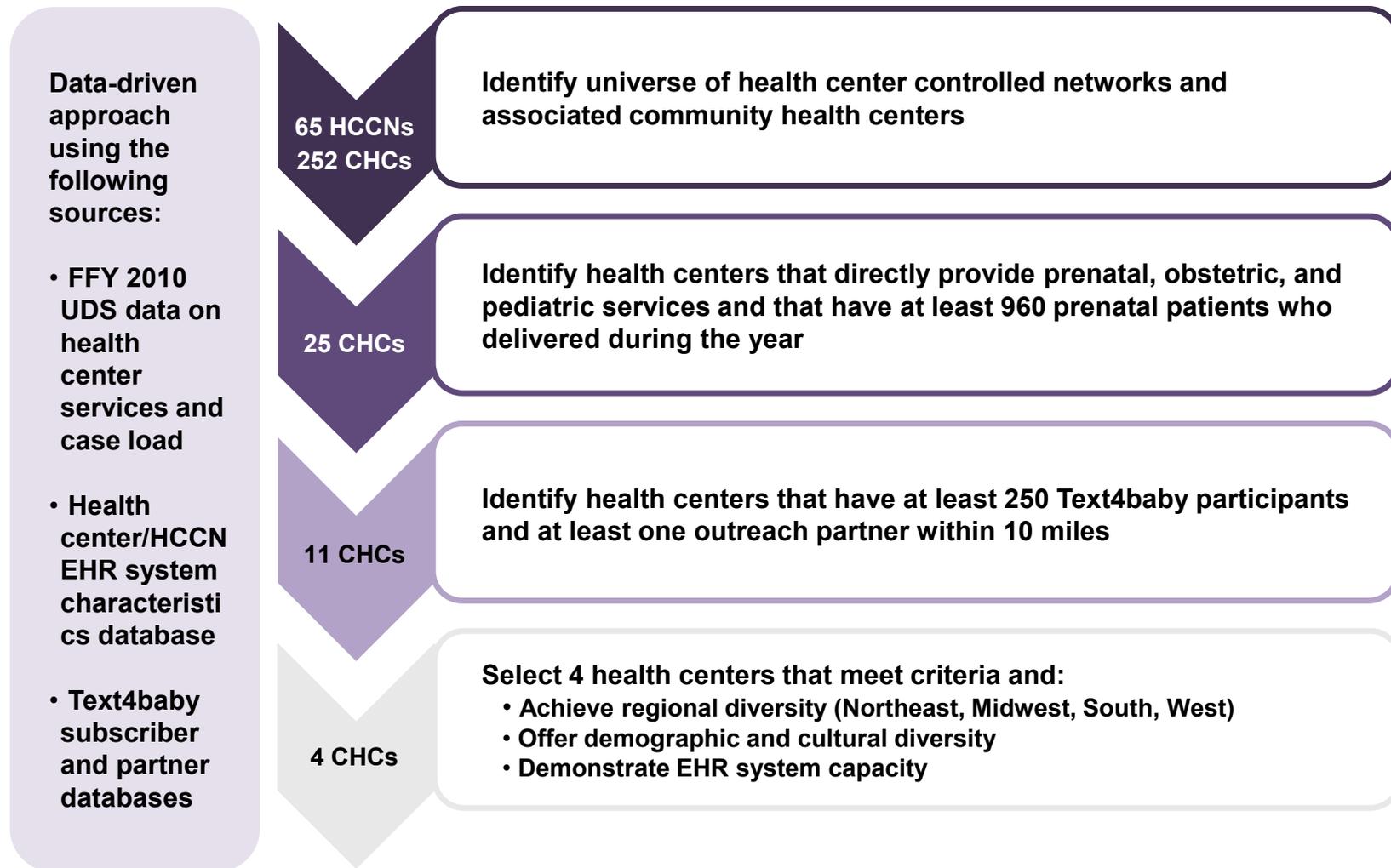
The interviews with national stakeholders followed a two-step process. The first step targeted eight organizations that have been involved with the design and implementation of Text4baby since program inception. Among the eight partners were three U.S. government partners, four founding partners, and the founding sponsor. The second step targeted outreach partners; two interviews were completed with health plans, one with a mobile operator, four with state and local public health agencies or coalitions, four with national nonprofit organizations, and one with a media organization. The interviews were conducted by telephone and lasted about one hour on average. They were recorded, with consent, and transcribed to facilitate analysis.

C. Safety Net Consumer Survey

1. Site Selection

From the universe of health center controlled networks (HCCNs) and associated community health centers (CHCs) in 2010, we selected four CHCs based on the following criteria: the provision of prenatal, obstetrical, and well-baby care; the number of prenatal patients who delivered during 2009 (the most recent year for which data were available when the sites were selected); the number of Text4baby users and outreach partners within a 10-mile radius to ensure Text4baby's presence in the community; and an operational electronic health records system (Figure A.1). Once we narrowed down the HCCNs and CHCs based on these criteria, we selected the final four to achieve regional, demographic, and cultural diversity. In all four sites, at least 90 percent of patients were racial/ethnic minorities, and more than 90 percent were at or below 200 percent of poverty. At least 80 percent of patients were covered by Medicaid or CHIP or were uninsured (unpublished data from the HRSA Uniform Data System Summary Reports 2011).

Figure A.1. Site Selection Process for the Text4baby Evaluation



CHC = community health center; EHR = electronic health record; FFY= federal fiscal year; HCCN = health center controlled network; UDS = Uniform Data System

2. Survey Administration

The Healthy Pregnancy and Parenting Survey (HPPS) was administered in the four selected safety net communities. Given concerns about the release of women’s contact information without the women’s permission or consent, the four selected health centers assisted with the recruitment of survey respondents. To be eligible, women had to be pregnant at the time of recruitment. Text4baby enrollment was not a criterion for selection into the sample; in addition, Text4baby was not mentioned during the recruitment of women for the survey. Each HCCN/CHC had varying requirements and preferences regarding recruitment. As a result, the recruitment strategy varied slightly among health centers, as shown in Table A.2.

The goal was to recruit 300 eligible women at each CHC, with 240 completing the survey. Once the sample of 300 eligible women was obtained, recruitment concluded at the CHC. However, for two CHCs, the recruitment period ended before the CHCs reached the target recruitment number because of the evaluation timeline. The CHCs securely faxed the consent/contact release forms to Mathematica on a weekly basis. Women were not contacted for the interview until they were at least four months pregnant. Women were considered ineligible if they were recruited past their due date or had delivered at the time of contact for the interview. The survey field period ran from December 21, 2012, to May 16, 2013. Overall, 1,135 women were recruited, 1,018 of whom were more than four months pregnant during the field period; of those, 707 completed the survey and were included in the analysis. The survey was conducted in English and Spanish. Of the 707 women completing the survey, 35 percent completed the interview in Spanish.

Table A.2. Survey Recruitment Strategy by Safety Net Community

Recruitment Strategy	Total	CHC 1	CHC 2	CHC 3	CHC 4
Number of participating health center sites	9	1	1	4	3
Approach to consent	n.a.	Full consent to participate in the survey	Permission to release contact information	Permission to release contact information	Full consent to participate in the survey
Recruitment personnel	n.a.	One coordinator in the waiting room	9 medical assistants at intake	7 women’s health educators at intake	10 women’s health coordinators at select times during pregnancy
Recruitment period	n.a.	December 17, 2012, to April 10, 2013	December 13, 2012, to January 31, 2013	December 14, 2012, to April 22, 2013	December 20, 2012, to April 30, 2013

n.a. = not applicable

3. Sample Design and Survey Response

The CHCs were not selected probabilistically. Therefore, the findings should not be generalized beyond the four CHCs. The CHCs should not be treated as clusters (primary sampling units) but rather as sampling strata. Weights have not been constructed to permit the CHCs to represent the other CHCs in the nation that were not part of the evaluation. Within each site, a recruitment period began in late 2012 or early 2013 and concluded when the site approached its targeted number of women to be recruited for the evaluation (two CHCs) or at the end of the recruitment period on April 30, 2013 (two CHCs). The length of the recruitment period differed across the four CHCs.

The women selected to participate in the HPPS were not a probability sample of pregnant women in the CHCs. They were women who came in for prenatal care at one of the four CHCs during that site’s enrollment period and represented essentially a census during the designated time period. Women already recruited for the survey were not approached when they came in for a subsequent prenatal visit during the enrollment period.

The following women were considered ineligible: (1) women not pregnant at time of visit, (2) women pregnant but past their due date, and (3) women who spoke neither English nor Spanish. (The survey was conducted in English and Spanish, the same languages used by Text4baby.) Women who were not yet four months into their pregnancy were recruited for the survey but were not contacted until they reached four months’ gestation. If they had not reached four months’ gestation by the end of the data collection period, they were counted as ineligible for the survey.

To perform weighting and nonresponse adjustment and to calculate response rates, each site was asked to maintain a log of women who had a prenatal visit during recruitment for the survey (in essence, a “retrospective sample frame”). Sites varied in how they produced the information (manually at time of recruitment versus electronically at the end of the recruitment period). Table A.3 shows the number of cases by survey recruitment and interview status for the HPPS across the four CHCs. Table A.4 presents the response rates.

The low rate of survey agreement across the four CHCs is a function of how each CHC developed the retrospective sample frame of prenatal care patients seen during the field period who were potentially eligible as part of survey recruitment. The reasons for the large gap between the number agreeing to be contacted and the number who were potentially eligible included lack of staff to recruit patients during all prenatal care clinic hours and at all sites in which prenatal care was provided as well as substantial variation across sites in the definition of potential eligibility based on type of appointment.

Table A.3. Survey Recruitment and Interview Status

Survey Recruitment and Interview Status	All CHCs Combined
Agreed to be contacted	1,135
Eligible	994
Completed interview	707
Estimate of the number who were potentially eligible for the survey ^a	4,798

^a Each CHC developed a list of all prenatal care patients seen during the field period who were potentially eligible as part of survey recruitment. The estimate was based on manual record keeping by the CHC or an electronic file of prenatal care patients created by the CHC at the end of the field period. The reasons for the large gap between the number agreeing to be contacted and the number who were potentially eligible included lack of staff to recruit patients during all prenatal care clinic hours and at all sites in which prenatal care was provided as well as substantial variation across sites in the definition of potential eligibility based on type of appointment.

Table A.4. Survey Response Rates

Response Rates	All CHCs Combined
Interview response rate among eligible women	71.1
Survey agreement rate ^a	22.3
Survey agreement rate ^a x interview response rate	15.9

^a The survey agreement rate is a function of the methodology used by each state to count the number of women who were potentially eligible for the survey (that is, the “retrospective sample frame”). Each CHC developed a list of all prenatal care patients seen during the field period who were potentially eligible as part of survey recruitment. The estimate was based on manual record keeping by the CHC or an electronic file of prenatal care patients created by the CHC at the end of the field period. The reasons for the large gap between the number agreeing to be contacted and the number who were potentially eligible included lack of staff to recruit patients during all prenatal care clinic hours and at all sites in which prenatal care was provided as well as substantial variation across sites in the definition of potential eligibility based on type of appointment.

4. Weighting Methodology

The survey weighting process involved two sets of nonresponse adjustments:

1. **Consent Adjustment.** Adjusting for whether the woman agreed to allow Mathematica to contact her for the survey
2. **Survey Response Weight.** Among women who agreed and were not excluded as ineligible, adjusting for whether the woman completed the interview

The two adjustments were applied cumulatively. Depending on the auxiliary variables that were available for both respondents and nonrespondents in a given site at each weighting adjustment stage, we used either a weighting class approach or a response propensity model approach. Whether applying a weighting class or propensity score approach, we tried to find characteristics of women that might be significantly associated with both the likelihood of responding and key outcomes. We also looked for two-order interaction effects when appropriate. The smallest amount of information was available for the consent adjustment, and we applied a ratio adjustment at this stage for two of the four sites because of data limitations.

Given that data were pooled across all four sites, we constructed a normalized weight that reduces or expands the weights of each woman by a constant within each site so that each site contributes to one-fourth of the combined weighted totals. The relative sizes of the weights within each site remain unchanged. Because we selected the four CHCs for the Text4baby evaluation purposively rather than probabilistically, we did not construct the weights to have the sites represent the other CHCs in the nation that were not part of the evaluation.

5. Variance Estimation

To account for the sample design and weighting complexities when producing estimates from the survey data, we used the analysis weights to minimize nonresponse bias and then estimated the variances by using statistical software and procedures designed for survey data (SAS or Stata). When producing weighted estimates across the four sites, we also specified the stratum (site).

D. Key Informant Interviews and Consumer Focus Groups

To place the survey results in a local context, the evaluation team visited each community in May or June 2013 to conduct key informant interviews and consumer focus groups. Each visit lasted two days and included two members of the evaluation team. A total of 30 key informants were interviewed across the four communities (Table A.5). Interviews were conducted with 16 health care providers associated with the participating CHCs, including physicians, nurse-midwives, health educators, and other staff. The 14 outreach partners included health departments, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) programs, and MCH coalitions. The interviews lasted 30 to 45 minutes, were recorded upon consent, and transcribed for analysis.

Table A.5. Key Informant Interviews Conducted in the Four Communities

Type of Key Informant	Total Number of Interviews	Total Number of Respondents
Total key informants	17	30
Health care providers	8	16
Outreach partners	9	14

Focus groups were planned and conducted in the same communities as the four selected CHCs. Eligible participants included current Text4baby users (pregnant and postpartum). Text messages with information about how to sign up for the focus groups were sent via Text4baby to users in the ZIP codes served by the health centers. In two communities, the focus groups were held at health centers while in the other communities they were held at a public library or in a hotel conference space.

The focus group discussions covered the mode through which subscribers learned about Text4baby, their motivation for signing up and their length of enrollment, their perceptions about the usefulness of the information and effect on their behaviors, and suggestions for improving Text4baby. Two focus groups were scheduled in each community. The focus groups were conducted in English. Fifteen women participated, and their qualitative information complemented and enriched the data collected through the survey (Table A.6). Focus group attendance was lower than expected, partly as a result of heavy storms that resulted in 13 “no-shows” in one location.

Table A.6. Focus Group Recruitment and Attendance in the Four Communities

Focus Group Logistics	Total
Number recruited	57
Number attended	15
Location	Health center (2), Public library (1), Hotel (1)

Text4baby National Evaluation Technical Advisory Group (TAG)

In September 2010, following consultation with the Text4baby National Evaluation Technical Advisory Group (TAG), the Health Resources and Services Administration awarded a contract to conduct an evaluation of the Text4baby program. The ongoing commitment, engagement, and contribution of the TAG have been critical to the success of this effort. The TAG is composed of representatives from several U.S. Department of Health and Human Services agencies, the U.S. Department of Agriculture, and the White House Office of Science and Technology Policy. Throughout the course of the evaluation, the TAG has provided invaluable guidance on the development of the key evaluation questions, methodology, implementation, analysis, and summary report of findings.

Participating Organizations

U.S. Department of Agriculture

U.S. Department of Health and Human Services Agencies

Administration for Children and Families

Agency for Healthcare Research and Quality

Centers for Disease Control and Prevention (TAG co-chair)

Centers for Medicare & Medicaid Services

Health Resources and Services Administration (TAG co-chair)

Indian Health Service

National Institutes of Health

Office of Adolescent Health (HHS)

Office of the Assistant Secretary for Planning and Evaluation (HHS)

Office on Women's Health (HHS)

Substance Abuse and Mental Health Services Administration

White House Office of Science and Technology Policy
