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Community Outreach and Engagement Strategies from the Wisconsin Study Center of the National Children's Study

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Abstract

The purpose of this methods paper is to describe and evaluate outreach and engagement strategies designed to initially build county-wide awareness and support for the National Children's Study (NCS or the study) and subsequently to target the segment communities where recruitment for the study occurred. Selected principles from community outreach, social marketing, and healthcare system and personal referral formed the foundation for the strategies. The strategies included a celebration event, community advisory board, community needs assessment, building relationships with healthcare providers and systems, eliciting a network of study supporters, newsletters, appearances at local young family-oriented events (health fairs, parades), presentations to local community leaders, community forums, "branding" with assistance from a women-owned local marketing firm, and mailings including an oversized, second-touch postcard. Six months after study launch, approximately 4600 study-eligible women were asked in a door-to-door survey if and how they became aware of the study. On average, 40% of eligible women reported being aware of the study. The most frequently cited strategy to cultivate their awareness

was study-specific mailings. Awareness of the NCS increased by 7.5% among those receiving a second-touch postcard relative to controls 95% CIs [4.9, 10.7] $z = 5.347$, $p < 0.0000$, $d = 0.16$. Community outreach and engagement strategies, in particular the oversized postcard as a second-touch effort, may be used effectively by researchers for participant recruitment and by public health nurses for delivery of important population-focused messages.

Keywords

Child health; community health nursing; population-based nursing

Anticipated to be the largest, comprehensive national study of child health and development ever conducted in the United States, the National Children's Study (NCS or the study) was designed to generate a longitudinal database that researchers can use to investigate the influence of environmental factors on human health and development, from the prenatal period to adulthood. Long-term goals of the NCS are to generate knowledge about the root causes of many child and adult health outcomes, such as, allergies, asthma, autism, obesity, and diabetes, and ultimately to improve future pregnancy outcomes and children's health and development (Trasande et al., 2009). By enrolling 100,000 children across the United States prenatally and following them until age 21 years, the NCS is intended to generate a wealth of data that can be used to test hypotheses and improve the health and well-being of future generations of children. These data will be invaluable to inform the public health nursing research agenda (Batista, 2009) and to underpin public health nursing practice.

The U.S. Congress authorized planning and implementation of the NCS with the Children's Health Act of 2000 and appropriated funds for "Vanguard" or pilot Centers in seven locations throughout the US. In 2005, contracts for the Vanguard Centers were awarded with the explicit purpose of creating and implementing strategic plans for community needs assessments and engagement in the study. Additional Study Centers were funded for a total of 41 active Centers awarded to date (National Children's Study, 2012).

As one of the original Vanguard Centers, the Wisconsin Study Center's (WSC) charge was to recruit and enroll participants using door-to-door strategies (or a household survey approach) similar to the National Health and Nutrition Examination Survey (Centers for Disease Control, 2012). The community would need to be informed, receptive, and engaged as a study partner for recruitment to succeed. The study team -- comprised of epidemiologists, pediatricians, environmental health scientists, academic public health nurses, social workers, sampling statisticians, and outreach specialists from the academic institutions funded to conduct the study-- considered various approaches to community outreach and engagement before selecting several strategies.

Community outreach was defined as the practice of conducting local public awareness activities through broad (county-wide) and targeted (community-specific) interaction. Community engagement was conceptualized as a long-term, in-depth relationship-building process between the study and the community with the goals of fostering partnerships beneficial to all parties involved and cultivating a sense of pride in the important

contributions that participants, study team members, and the community would make to children's health.

The purpose of this methods paper is to describe and evaluate strategies to engage the community during the initial 3-year recruitment phases of the NCS. We anticipate that the lessons learned from our experience will benefit public health colleagues who undertake community outreach and engagement strategies to recruit participants in large scale studies. Potentially, these strategies could inform public health nurses (PHNs) involved in developing and delivering population-focused health messages.

Background

With longitudinal epidemiologic studies, Sapienza, Corbie-Smith, Keim, and Fleischman (2007) suggested that community engagement is necessary to achieve successful recruitment and retention of participants. Similarly, Kulbok, Thatcher, Park, and Meszaros (2012) reported that PHNs carrying out health promotion and prevention messages and interventions foster community engagement for successful implementation. Vulnerable populations (e.g. children, pregnant women, and racial/ethnic minorities) present special challenges to community engagement and recruitment. In the case of birth cohort studies, pregnant women and parents may be reticent to consent to the recruitment of their offspring. In the case of racial and ethnic minorities, language and cultural differences between the researchers and the community, and often a general distrust of research by community members may interfere with successful community engagement and recruitment (Alvarez, Vasquez, Mayorga, Feaster, & Mitrani, 2006).

Strategies designed to overcome these challenges and improve study recruitment or message relevance include community outreach, social marketing campaigns, and health system and provider recruitment and referrals. UyBic and colleagues (2007) conducted a systematic review of the literature on community outreach and engagement strategies. They concluded that there is no clear dominant strategy across populations and studies overall, but taking into account heterogeneity of populations, some strategies may work better than others. Below we provide a brief review of these strategies for utility in the NCS.

Community outreach is an effort by individuals within an organization to connect their ideas or practices to the general public (Ford, Miller, Smurzynski, & Leone, 2007). Outreach is education about issues related to ideas, a study, or intervention that is integrated into a campaign. Non-profit organizations and civic groups frequently use outreach to disseminate their messages or provide education. Examples of outreach activities include direct mailings, newspaper, television, presentations, posters, booths at public events, and newsletters. Several projects documented effectiveness of outreach in raising awareness, but found it ineffective for research study recruitment (Bretthauer-Muller et al., 2008; Ford, et al., 2007).

Social marketing involves the systematic application of marketing strategies to achieve specific behavioral goals for the greater social good. The "Red Dress Campaign", to increase awareness among women about the risk of heart disease by combining traditional social marketing with the power of branding (Long, Taubenheim, Wayman, Temple, & Ruoff, 2008), is one example of a successful social marketing strategy. Techniques included a

survey of heart disease awareness among the target populations (African American and Hispanic women), followed by focus groups and a call to action. Support by key corporate and media partners, non-profit organizations, celebrities, and online resources gave momentum to their campaign. Other social marketing strategies included television advertising, direct mailings, formative research, and investing significant cash into new, creative strategies considered “going out on a limb” or “risk taking.” Compared to community outreach and referral from healthcare providers, social marketing yielded the highest participant recruitment outcome and message connection among the target population, but it required significant investment of time and money over other strategies (Gren et al., 2009; Hodgson, Lindsay, & Rubini, 2007).

Several studies have used a combination of both social marketing and community outreach to raise awareness. An example is VERB™, a national, multicultural, message campaign coordinated by the Centers for Disease Control and Prevention (CDC) to increase physical activity in nine to 13 year olds that ran from 2001 to 2006. The national social marketing strategy used by Bretthauer-Mueller and colleagues (2008) in the VERB campaign incorporated adaptations to achieve local implementation. VERB used social marketing strategies such as logos, posters, and national advertising in combination with grass roots activities that involved collaboration with existing community networks to sustain the positive effects of initial outreach. Similarly, the HEALTHY study used social marketing-based communications in combination with multi-faceted local strategies to improve the message of nutrition and physical education of middle school students at risk for Type 2 diabetes and obesity. Besides the public messaging, HEALTHY subsequently formed partnerships with middle schools to conduct a randomized controlled trial to measure the effectiveness of an educational intervention (Hirst et al., 2009).

Recruitment of study participants through healthcare system and/or personal referrals is an often used strategy (Ahrens et al., 2006; Nacapoy et al., 2008) Using the healthcare provider to make contact with potential subjects in clinical settings, or identifying eligible participants through medical records or registries would appear to be a seamless approach. These options were not considered during the initial phase of the study due to concerns about patient confidentiality, involvement of healthcare providers who were not members of the research team, and intrusion upon the work-flow of clinical practice. Moreover, research shows that recruitment for a community sample from healthcare systems and personal referrals is less effective than social marketing (Sapienza, et al., 2007).

Research Questions

This literature, in addition to regular communication among the seven Vanguard Centers, provided a broad framework of strategies and content to guide our community outreach and engagement activities. Selected principles from community outreach, social marketing, and healthcare systems and personal referral were integrated. This comprehensive approach provided the foundation for our efforts to create study awareness. To evaluate the strategies, we asked the following questions:

- a. What proportion of study-eligible women were aware of and how did they become aware of the study?

- b. Of respondents who were aware of the study, which of the community outreach and engagement strategies did they identify as contributing to their awareness?
- c. Was awareness of the study increased for women in segments mailed a second-touch postcard compared to those in segments not mailed a second-touch postcard?

Methods

The outreach and engagement strategies occurred under a human subject's protocol that was approved administratively for activities preparatory to research by the Institutional Review Board at the University of Wisconsin-Madison. The full NCS protocol for recruitment and data collection with pregnant or potentially pregnant women was reviewed and approved by each university involved in the study.

Target Population and Cluster Sampling

Sapienza et al. (2007) writing specifically about the NCS, outlined three phases of community outreach and engagement at both the national and local levels: planning, pre-recruitment, and recruitment/retention/data acquisition. In this paper, we address the planning and pre-recruitment strategies at the Waukesha, Wisconsin NCS Vanguard Site. Because the exact geographical areas and communities within the county chosen for recruitment were not known when the contract was awarded and because the segments when selected would be representative of the county, the entire county was targeted in the pre-enrollment period. We reviewed demographic characteristics of Waukesha County as background data before conducting outreach and engagement strategies.

Waukesha County, located in southeastern Wisconsin (Figure 1), is a 576 square mile predominantly rural area that has 37 municipalities including one mid-sized city. In 2009, Waukesha County had an estimated population of 383,154 residents that reflects a 6.2% growth rate since the United States 2000 Census (Census Bureau, n. d.). Also in 2009, the median age in the county was 42 years with nearly one-fourth of the population under age 18. The county population was estimated to be 49.1% male and 99% white with 3.7% Hispanic/Latino (any race). Based on the 2005–2009 American Community Survey (Census Bureau, n. d.), the estimated per capita income of \$36,553 (2009 inflation-adjusted) makes Waukesha County one of the most affluent counties selected for inclusion in the NCS, well above the national per capita income of \$27,041. The county is ranked seventh healthiest among the 72 counties in Wisconsin (Population Health Institute, 2012). Yet, residents face many health hazards from its physical environment including poor air quality primarily due to traffic and industrial sources and contaminants in community water supplies (McElroy, Anderson, Durkin, & Cronk, 2006).

As an original NCS Vanguard Center, the charge for the Waukesha site was to conduct household enumeration and pregnancy screening to yield a sample of 1,250 births over a five-year recruitment period. Enumeration involved field staff knocking on doors to identify women living in each household who were or may become pregnant and who were then potentially eligible for study. These women were then asked to complete a 'pregnancy screener' – a series of confidential questions about pregnancy status and plans. Women

eligible for enrollment were those between the ages of 18–49 years, residing in a selected geographic area or segment, and in pre-specified pregnancy risk categories.

Segment Identification and Characteristics

An analysis of the census and birth certificate data was used to stratify the population into 17 geographic segments. The segments were delineated such that each generated approximately 250 births per year and was relatively homogeneous on one or more census indicators. Once selected, the 17 segments served as our targeted recruitment areas for the NCS within the county. The cluster probability sampling plan for the NCS was designed so that the findings could be generalized to all births occurring in the United States during the recruitment period (Michael & O’Muirheartaigh, 2010).

Descriptive data for the 17 segments were compiled from 2008 census block descriptions in the American Community Survey (Cronk, 2009). As displayed in Table 1, the data show there was limited variability across segments in age, race, and ethnicity. In contrast, socioeconomic indicators, such as income and home values, varied considerably.

Outreach and Engagement Strategies

Phase I – Planning—We reasoned that if a “positive buzz” or word-of-mouth marketing could be created across the county, residents would be likely to participate in the enumeration and pregnancy screening interviews and, if eligible, enroll and participate over the long term. All sectors of the county - healthcare, public health and in particular public health nurses, law enforcement, social services, faith-based organizations, business and industry, child care, government bodies and agencies, schools and other entities that serve young children and families, and residents with demographic characteristics that would make them potential study participants – contributed to strategies to blanket the entire county with study information.

To build trust across the county, particularly among healthcare providers and a network of study supporters, we conducted three specific activities. We held a celebration event that was covered by local media and attended by healthcare providers, political representatives, and other community members; established a Community Advisory Board; and conducted a community needs assessment.

The Community Advisory Board (CAB) is comprised of public health representatives from the City and County of Waukesha and the Wisconsin Department of Health, parents, day care providers, faith-based organizations, advocacy groups, healthcare providers, and leaders in the public education system. The primary aim of the CAB initially was to understand the study intent and serve as a conduit for community input into the NCS. As the study proceeded, the CAB became increasingly integrated into the community outreach activities, providing critical input into plans for communications and marketing, and participating in outreach efforts.

We conducted the Community Needs Assessment (CNA) in two steps. First, we held conversations with key community informants who were identified by the CAB and the study team. The conversations focused on: (a) what informants thought were the most

pressing issues affecting children's health in the physical and social environments; (b) informants' reactions to the study's purpose and methods such as, recruitment, family participation, collection of biological and environmental samples, frequency of visits, long-term commitment, and study burdens and how to address them; and (c) what informants thought the community needed to know about the study and how best to inform them. We relied on conversations instead of surveys and focus groups because we did not have official regulatory approval from the federal Office of Management and Budget to ask more than nine individuals similar questions.

The second component of the CNA involved use of data from publicly available datasets to describe the social and physical environmental health characteristics of Waukesha County and to verify and/or expand upon the issues identified in the key informant conversations. An intent of the CNA was to include and establish the relevance of the community's views and concerns about children's health to the study's goals and hypotheses.

Phase II - Pre-recruitment: Messages and Material—To make the study as community-focused as possible and consistent with work by Bretthauer-Miller et al. (2008) and Hirst et al. (2009), each study center developed outreach messages and materials for use in its community. Our first five strategies were broad, targeting the entire county. The last four strategies were segment specific. See Table 2 for an overview of the strategies.

Analytic Strategy

To answer the evaluation questions, frequency distributions were calculated. The data provided to the WSC were aggregated; therefore, tests of statistical significance among population characteristics and study awareness or types and numbers of outreach and engagement strategies could not be conducted. To determine whether the second-touch postcards promoted women's awareness of the study, a Binomial Difference of Proportion Test (Agresti, 1990) with nonlinear transformation of the difference (Cohen, 1988) was conducted.

Results

Six months after study launch in May of 2009, approximately 9,000 dwelling units had been enumerated. Approximately 52% of households (4,300) had age-eligible women, with some households having more than one. Almost all age-eligible women (4,600 or 99.6%) completed the pregnancy screener.

Study Awareness

On average, 40% of eligible women reported being aware of the study. In Table 3, we present how eligible women reported they became aware of the study. The top identified sources were mailings (63.7%) which could include the advance letter and/or second-touch postcard; "other" (19.8%) which included brochures, posters, and information sent from a child's school; and the newspaper/radio/TV (10.6%). Interestingly, nearly 2% reported messages on billboards, although we did not use this strategy.

Community Outreach and Engagement Strategies

Awareness of the study among study-eligible women ranged from 54.4% to 26.5%. Data from Table 1 suggest that study awareness was greatest in segments with the highest median per capita income, the highest proportion of married males, the highest proportion of African Americans, and the highest median home values.

In contrast, study awareness was the least in segments in which residents were among the youngest, economically less advantaged as indicated by median income, and mobile as indicated by fewer owner-occupied and limited time in residence. These segments' residents were among the lowest in proportion of married males and females and highest in Hispanic ethnicity.

No discernible pattern was observed for outreach activities and women's reports of study awareness. The number or type of outreach and engagement events held in a segment did not appear to influence study-eligible women's awareness of the study (Table 4).

Second-Touch Postcard

As displayed in Table 4, in segments mailed the second-touch postcard, 43.4% of eligible women ($n =$ approximately 800) reported they knew of the study compared with 35.6% of eligible women ($n =$ approximately 1,000) residing in segments that were not mailed the second-touch postcard. The proportional difference between study-eligible women's awareness of the study if they resided in a segment that was mailed the second-touch postcard ($\pi_1=0.434$) was statistically significant when compared with those residing in a segment not mailed the second-touch postcard ($\pi_2=0.356$). The effect size ($d = 0.16$) was based on a nonlinear transformation of the difference between π_1 and π_2 ($\pi_1 - \pi_2 = 0.078$; 95% CIs [4.9, 10.7], $z = 5.374$, $p = 0.0000$ (Cohen, 1988).

Discussion

This evaluation of strategies to engage the community for purposes of recruiting participants into the National Children's Study revealed that 40% of the eligible women were aware of the study. Awareness was highest in segments with higher median per capita income, higher proportions of married males and African Americans, and higher median home values. It was lowest in the segments with the youngest median age, lower percentages of married men and women, fewer owner-occupied units, and higher proportions of Hispanics. Written communications using first class US mail was the most frequently identified strategy to inform potential study participants.

Several limitations constrain our results. First, data about study awareness were gathered through the Pregnancy Screening interview, meaning that only women who agreed to answer questions about their eligibility for the study were asked if and how they had heard about the study. To more fully understand individuals' motivation and barriers to participating, it would have been helpful to sample both those who agreed to the screening and those who did not to identify how the message was heard in the community. Second, the data provided from the NCS office to the WSC are not raw but aggregated. Therefore, data analyses strategies were limited to those that can be conducted with aggregated datasets.

Our findings are consistent with other outreach and community engagement studies. For example, our 40% awareness rate about the NCS among eligible women is within the range of 12–71% reported by Flores and colleagues (Flores, Prue, & Daniel, 2007). In an evaluation of a campaign to increase folic acid awareness among Hispanic women of childbearing age, Flores et al. found that unpaid Public Service Announcements (PSA) resulted in a 12% awareness rate while paid media yielded a rate of 71%. Television was the most frequently mentioned source of the information, followed by physician, clinic, magazine/newspaper, hospital, brochure, radio, books, and friends/coworkers/family members. The Flores et al. campaign did not use direct US mail strategies such as that used by the WSC.

According to the Direct Marketing Association (DMA) (DMA, 2010), direct postal mail typically yields an awareness response rate of 3.43% for a household list and 1.38% for a prospect list using a letter-sized envelope. The “open rate” for emails (proportion of people who open an email to see the message) according to the 2009 DMA data base was 14.9% for a household list and 8.56% for a prospect list (MailChimp, 2010). Although we do not know the “open rate” for the WSC email, we postulate that because the emails came from trusted sources such as alumni institutions and employers, the ‘open rate’ might have exceeded the DMA level. Our results are also consistent with marketing benchmarks that show a good campaign is likely to yield 30 to 50 percent awareness rate.

Postcards are frequently used to respond to invitations to be in survey studies (Riesch et al., 2012), remind participants to return study materials (Drane, Rainey, Valois, & Guevara, 1998), serve as a booster to a clinical intervention (Carlson et al., 2000), or to report clinical or study events such as adverse drug reactions (Avery et al., 2011). Also, we found that marketing firms use these postcards to increase awareness of products (Yankee, 2006). To our knowledge, the present study is the first to evaluate the use of oversized postcards as a second-touch effort to promote study awareness or opportunities for study participation.

Lessons Learned

Our initial outreach and engagement strategies were broad with the intent to reach a large proportion of the community. This county-wide approach was a larger undertaking than we had anticipated. As documented by Flores et al. (2007), paid TV might have increased the number of study-eligible women who were aware of the study and may have been less labor intensive.

A second lesson learned was the wide variability in the percentage of eligible women who reported they had heard of the study, from a minimum of 26.5% to a maximum of 54.4%. The data indicate that eligible women who were affluent and settled were more likely to be aware of the study in contrast to those with greater mobility and financial constraints. The success of the study depends upon having a high participation rate for all eligible women and families regardless of their socio-demographic characteristics or the challenges to engage them. The community outreach and engagement strategies might have been more successful had they been targeted to characteristics of the population in each segment, particularly the Hispanic aggregate in the segment that ranked 16th of 17.

Future Directions

Three important questions remain. First, what proportion of the entire population of the County was aware of the study? Because many of our strategies were conducted county-wide and were intended to build general community awareness of the study, it would be important to understand the overall county's knowledge about it. Documenting county-wide awareness would enable analysis of the return on investment of time and effort.

Second, which strategies were most effective for which particular sub-groups? The answer to this question might sort out when to use targeted community outreach, social marketing, healthcare system and personal referral, or a combination of all three to inform and recruit women for study. Planning, budgeting, and data gathering early in the process is required to answer these questions.

Third, to what extent do the community outreach and engagement strategies used to create study awareness apply to the dissemination of public health messages? PHNs are involved with varying levels of leadership in campaigns to promote immunization (Johansen, Stenvig, & Wey, 2012), private well water testing (Severtson & Henriques, 2009), and community health promotion (Kulbok, et al., 2012). Future research, particularly using an oversized postcard as a second-touch effort is recommended to answer this question.

As public health nurses strive to inform and engage communities, the strategies used by the study might be useful. Linking the messages to particular community perceptions, needs, and interests through conversations with key informants such as that accomplished in the community needs assessment is recommended. Knowledge of community demographics and seeking the advice of an established Community Advisory Board, experts, and key stakeholders is also recommended. Though a 40% awareness rate of the study is acceptable, specifically tailoring the strategies to important characteristics of each segment might improve the rate. Tailoring messages to the specific characteristics of the sub-group such as age, home ownership status, and ethnicity, is highly recommended for future study recruitment activities or public health messages. An appealing, over-sized postcard as a second-touch effort to announce public health initiatives or messages is recommended as a potential strategy but should be tested for relevance and impact for this use by public health nurses and local public health departments.

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Figure 1.
Location of Waukesha County in the State of Wisconsin

I'm in.

There's nothing I wouldn't do for my baby. Eat my veggies, exercise, take vitamins.

But I'm doing something that will benefit future generations, too.

I support the National Children's Study.

THE NATIONAL CHILDREN'S STUDY

HEALTH GROWTH ENVIRONMENT

WAUKESHA COUNTY

www.nationalchildrensstudy.gov

National Children's Study Waukesha Vanguard Office
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Figure 2.
Example of Wisconsin Study Center local brand poster

Table 1

Wisconsin Study Center Segment Characteristics Ranked by % Study-Eligible Women Having Heard of the Study 6 Months after Launch

Segment Rank of Study	% Aware of Study	Median Age	% White	% AA ^a	% AI ^b	% Asian	% Hisp ^c	% Married Males	% Married Females	% Owner Occupied	% at Residence in 1995	Median Per Capita Income (USD) ^d	Median Home Value (USD) ^d
1	54.4	36.7	93.8	2.9	0.3	2.1	0.6	79.0	74.0	95.7	49.7	34,600	241,000
2	50.4	38.4	94.5	0.7	0.2	3.4	1.8	70.4	66.6	79.4	60.0	39,300	240,750
3	46.2	40.0	98.7	0.3	0.1	0.3	1.1	75.4	68.9	98.5	68.6	23,350	167,100
4	44.8	39.0	96.6	0.8	0.1	1.4	1.0	68.7	70.1	93.4	67.6	23,100	151,950
5	42.0	44.4	94.7	0.7	0.1	3.7	0.9	73.3	66.8	94.0	69.8	33,500	181,900
6	42.5	39.8	97.5	0.6	0.2	0.5	1.2	65.5	69.0	85.7	62.1	30,250	185,050
7	39.0	40.5	97.7	0.1	0.5	0.6	1.5	68.1	69.8	95.0	70.4	26,400	157,450
8	36.2	35.6	97.4	0.1	0.2	0.5	2.1	62.3	54.8	62.4	50.2	25,550	185,300
9	36.1	40.0	97.8	0.2	0.4	0.9	1.2	68.4	70.7	96.2	72.1	26,000	156,850
10	35.6	39.5	97.4	0.3	0.1	1.0	1.0	62.7	65.3	72.7	53.8	30,500	205,850
11	35.1	35.4	95.4	0.6	0.3	1.6	4.2	59.8	58.6	64.3	55.6	20,500	109,250
12	35.7	35.8	95.3	0.6	0.4	1.0	5.1	65.1	62.0	73.5	53.8	20,400	101,400
13	34.7	37.8	94.3	1.1	0.2	2.3	3.2	63.4	64.1	60.9	41.2	25,150	140,200
14	34.5	35.8	95.9	0.5	0.2	1.7	2.6	71.5	70.3	83.9	58.2	25,800	199,100
15	33.8	39.0	98.2	0.4	0.3	0.2	1.2	68.5	70.2	93.7	70.3	24,100	157,300
16	33.6	31.5	90.3	1.4	0.3	1.5	9.8	56.9	49.3	62.6	46.8	24,300	125,500
17	26.5	33.6	98.0	0.1	0.4	0.5	1.4	56.6	53.0	48.5	45.4	24,700	137,900

^a AA=African Americans^b AI=American Indians^c Hisp= Hispanics^d United States Dollar

Table 2**Summary of Six County-Wide and Three Segment-Specific Community Outreach and Engagement Activities**

Community Outreach and Engagement Strategy	Focus	Activities
Develop appealing messages and materials (Alvarez, et al., 2006)	County-wide	Hire a local, women-owned marketing firm. Develop a style, logo, and brand. Design promotional materials (See Figure 2)
Engage healthcare provider community (Ahrens, et al., 2006; Nacapoy, et al., 2008)	County-wide	Attend relevant departmental meetings of academic and healthcare institutions. Provide seminars to public health nurses and provide them with study announcement materials Conduct grand rounds. Identify practice partners. Place signage in offices. Achieve partnerships with local hospital birthing units.
Enlist organizations and individuals as study supporters	County-wide	Signed letters from health-related, service, advocacy, government, education, business, and faith-based sectors. Poster placement. Links to WSC from their websites. Inclusion of study supporter names on outreach materials.
Use print and electronic media (Gren, et al., 2009; UyBic, et al., 2007)	County-wide	Stories in local newspapers and television stations. Broadcast email to 34,000 county residents who were alumni of the collaborating universities or employees of the collaborating institutions. Participation in health fairs, parades, expositions devoted to children and families. Distribution of informational WSC branded materials (bookmarks, posters, brochures) at healthcare agencies, health care provider offices, and gyms and health clubs. Announcements on the big screen at movie theatres.
Develop and distribute newsletters	County-wide	Updates on study activities. Information closely related to study aims on topics such as asthma, autism, and gestational diabetes. Presentations to schools, colleges, day care centers, and mothers' groups.
Distribute NCS Program Office advance letter	Segment- Specific	Sent by US mail. Provided a general description of the study. Announcing study staff would visit homes in coming weeks.
Create over-sized postcard as a second-touch effort	Segment- Specific	8 segments randomly selected from 17 total segments. Included the logo and key concepts from the advance letter.
Write informational letters	Segment- Specific	Directed to clergy at churches, administrators at schools, businesses, and libraries in the segments.
Hold community forums	Segment- Specific	1 hour, standard 15–20 minute presentation and Q & A session. Invitations to families through school folders, libraries, with the second-touch postcards, and in Chamber of Commerce announcements. Varied by day of the week and time of day. Few families attended the forums, strategy discontinued.

Table 3**How Eligible Women Became Aware of the Study**

Heard of the Study Through:	%
Letter (including second-touch postcard)	63.7
Newspaper, TV, Radio	10.6
Friends	7.0
Doctor or healthcare provider	4.6
Someone else in the community	4.5
Family members	3.2
Internet	2.3
Community leader	1.8
Billboard	1.7
Church	1.3
Other ^a :	<i>n</i> 19.8
•Brochures, information left at home	30
•Child's school	25
•Signs or Posters	6
•Community events	5
•Business	4
•Work	3

Note. Women could choose as many responses as applicable to the item, "How did you hear of the study?" Therefore, the sum of the frequencies by categories exceeds 100%.

^a NCS rounding rules require approximate numbers.

Number of Community Events and Proportion of Study-Eligible Women Aware of the Study by Segment and Receipt of Second-Touch Postcard

Table 4

Segment Number	Second-Touch Postcard		Segment Number	No Second-Touch Postcard	
	# of Events	% Knew Of Study		# of Events	% Knew Of Study
2	12	50.4%	1	13	42.0%
3	12	36.1%	5	10	26.5%
4	11	39.0%	6	10	36.2%
7	11	46.2%	8	12	35.6%
11	12	54.4%	9	13	33.6%
12	14	44.8%	10	12	42.5%
16	12	35.1%	13	3	34.5%
17	14	35.7%	14	11	34.7%
			15	11	33.8%
Totals		43.4%			35.6%

Note. Proportion who knew of the study in segments who did and did not receive the postcards, $\pi_1 - \pi_2 = 0.078$; 95% CIs [4.9, 10.7]; $z = 5.374$, $p < 0.0000$, Effect Size $d = 0.16$.