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**Implementing Community Baby Showers to Address Infant Mortality in Oklahoma**

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**ABSTRACT**

**Importance.** Oklahoma has one of the highest rates of infant mortality and poor birth outcomes in the U.S., particularly among minority populations.

**Objectives.** To describe the formation and implementation of a state-led infant mortality prevention program which sought to: educate minorities about their disproportionate risk for infant mortality; improve pregnancy, infancy, and early childhood outcomes; and prevent infant mortality.

**Design, Setting, and Participants.** Participants completed one of many community baby shower events and were evaluated pre- and post-shower on infant mortality and well-baby knowledge.

**Intervention.** The “A Healthy Baby Begins with You” program. Main Outcomes and Measures. Pre- and post-intervention questionnaires assessing participant knowledge about infant mortality and willingness to share learned knowledge with others in the community.

**Results.** Preliminary results suggest that community baby showers were well-received. Respondents tended to be American Indians, non-Hispanic Whites, or Blacks/African Americans, young adults (aged 20 to 29 years), pregnant women, and mothers and grandparents of young children. Showers were successful in increasing participant knowledge of infant mortality, although these results varied by respondent race and age. Most respondents reported intent to share knowledge acquired during community baby showers with others.

**Conclusions and Relevance.** Preliminary findings suggest community baby showers may increase participant knowledge, although future studies are needed to ensure effectiveness across all participant subgroups. This study documents the feasibility and acceptability of a community-based educational program targeting dissemination of infant mortality and well-child information. Barriers and future directions for research and prevention are discussed.

**Keywords:** Infant mortality; minority health; community-based prevention

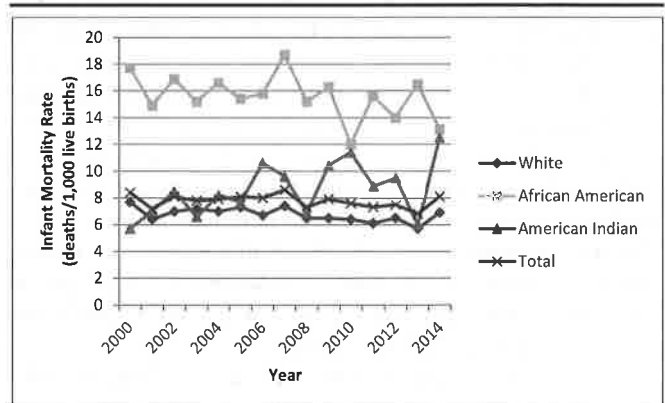
**INTRODUCTION**

Infant mortality, or death of an infant within the first year of life, is an important indicator of a state’s health. Although the

Southern and Midwestern regions have seen recent declines,<sup>1</sup> Oklahoma has some of the highest rates of infant mortality and poor birth outcomes in the U.S., with an overall rate of 8.1 infant deaths per 1,000 live births in 2014.<sup>2</sup> Similar to national trends,<sup>3</sup> minority populations within Oklahoma are at particular risk for infant mortality. In 2014, African Americans had the highest infant mortality rate (IMR) in Oklahoma with 13.1 infant deaths per 1,000 live births, almost double the rate of Whites (6.9 infant deaths/1,000 live births) and Hispanic Americans (7.4 deaths/1,000 live births) and more than double the rates for Asian Americans/Pacific Islanders (5.7 deaths/1,000 live births). The rates for American Indians/Alaska Natives briefly dropped to 6.0 deaths/1,000 live births in 2013 but increased to 12.5 in 2014.<sup>2</sup> Although the total IMR for Oklahoma appears to have been stable over the past decade, rates in African Americans and American Indians remain disproportionately high (see Figure 1).

The disparities in infant mortality faced by minority populations may be influenced by multiple factors, including perceived racial discrimination, maternal age and education, poverty, inadequate housing and social support, being unmarried, unintended childbearing, and adverse health behaviors.<sup>3</sup> Late, absent, or inadequate prenatal health care and inability to access health information may also contribute to high IMRs in minorities.<sup>3-5</sup> Thus, there are a variety of potential targets for prevention.

**Figure 1. Oklahoma infant mortality rates by race, 2000-2014\*.**



\*Data obtained from Oklahoma State Department of Health, Center for Health Statistics, Health Care Information, Vital Statistics 2000-2014. Accessed at <http://www.health.ok.gov/ok2share>

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Previous projects like the NIH-DC Initiative to Reduce Infant Mortality suggest that high IMRs in minority populations can be addressed.<sup>3,6-8</sup> Education programs that disseminate high quality health information may provide a low-cost means of addressing infant mortality in minority populations. Such programs will only be effective if they circumvent barriers to accessing health information, such as cost, transportation, literacy, and language. One potential method for addressing these barriers is the use of health information mavens.<sup>5</sup> These community members may facilitate the word-of-mouth distribution of important health information to high-need and difficult-to-access persons from within that very same community and thereby shape health-related beliefs and behaviors. Mavens can disseminate this information in a manner that is accessible and meaningful to community members, thereby transcending barriers related to transportation, language, and literacy. Further, trained paraprofessionals may be able to deliver effective intervention or prevention programs at reduced cost compared to professionals and repeat the message to improve uptake in the community.<sup>8</sup>

This article describes the conceptualization, development, and implementation of a community baby shower program, "A Healthy Baby Begins with You," intended to educate Oklahoma minorities of their disproportionate risk of infant mortality and provide health information to decrease infant mortality rates. Shower participant demographics are presented as are survey results assessing participant knowledge about infant mortality pre- and post-shower. Qualitative feedback about the showers was collected and intent to disseminate shower information was also assessed. Barriers to implementation, suggestions for addressing these barriers, and future directions in intervention and research are described.

## **METHODS**

### **Program Development**

The "A Healthy Baby Begins with You" program was conceptualized in 2008 by a committee of African-American health professionals as a means of providing health information in a non-intrusive way to women who wanted to become pregnant, were pregnant, or were parents, grandparents, or foster parents of young children ( $\leq 2$  years). The purpose of this community program was to increase awareness of infant mortality, particularly among minority populations, increase knowledge of prenatal and infant health, development, and safety, and to challenge popular myths about pregnancy and childrearing in order to prevent infant mortality. Showers incorporated local medical providers as well as health information mavens ("Big Mamas") to disseminate health-related information to community members throughout the state of Oklahoma in an acceptable, low-cost format. Most medical providers were obstetricians/gynecologists or general practitioners.

The first community baby shower was held in 2009. Presentation topics were chosen by Oklahoma State Department of Health Office of Minority Health's community partners based on perceived community needs to address infant mortality. Topics included prenatal care, well child care, preconception health, safe infant sleep, infant CPR, breastfeeding, and parent self-care.

Local health information mavens also presented information to shower participants using a provided list of talking points given to presenters prior to showers. These presentations focused on cultural pregnancy traditions and myths and their impact on maternal and child health. Big Mamas attended a brief training session prior to the shower where they were informed about their role in the shower and were educated on the topics to be addressed during showers.

Along with presentations of medical and cultural information, showers also engaged families with educational games and donated gifts. Donations were secured from local vendors (e.g., banks, community organizations, local businesses, schools, libraries, child care centers, grocery stores) by community partners. These vendors were permitted to staff booths at the showers and provide two-minute overviews of their program or business to shower participants. Child care was provided when possible to minimize distractions during shower presentations. Shower programs were typically an hour and a half in duration and were held at various times of the day and days of the week.

### **Participants**

This article presents data from eight community baby showers held across Oklahoma in 2013. Shower participants were recruited using a variety of methods, including flyers, emails, community presentations, press releases, radio and TV advertising, word-of-mouth, and media blitzes.

### **Procedure**

At the beginning of community baby showers, participants were asked to complete questionnaires assessing basic demographic information as well as knowledge about infant mortality, pregnancy, and well-baby information. Confidential questionnaires were administered before and after the educational portion of the shower and were later matched using participant identification numbers. The pre-intervention questionnaire consisted of demographic questions and 11 multiple-choice questions related to infant mortality and well-baby issues. The post-intervention questionnaire asked the same 11 multiple-choice questions, assessed whether shower participants intended to share shower information with others, and requested permission for follow-up.

### **Statistical Analyses**

Descriptive statistics were analyzed to obtain information about participant age, race, ethnicity, gender, and reason for attending. Paired t-tests were used to compare mean scores on pre- and post-shower questions related to infant mortality and well-baby knowledge. Pre- and post-shower mean comparisons were conducted for the entire participant pool as well as for racial and age groups.

## **RESULTS**

### **Demographics**

For the eight events reported, there were a total of 256 participants who completed pre- and post-intervention surveys. Thirty-three percent of respondents who completed pre- and post-shower

surveys identified as American Indian, followed by 29% who reported being White, 28% who identified as Black/African American, and 7% multiracial. Twenty-six shower participants did not identify their race. Regarding ethnicity, all but 15% of respondents reported being Non-Hispanic, but more than a third of participants did not identify their ethnicity. The great majority of respondents were female (93%), although 28 participants did not identify their gender. Approximately half (52%) of respondents were young adults (i.e., ages 20-29 years). Approximately 15% of respondents were teenagers (<20 years old) and 18% were 30 to 39 years old. Six of the 38 teenage participants (15%) reported currently being pregnant while 52% of those aged 20-29 years, 18% of those aged 30-39 years, and no one  $\geq 40$  years of age reported being pregnant. One shower participant who reported being pregnant did not specify her age.

### Reason for Attending

Approximately 85% of respondents provided at least one reason why they attended the community baby shower. The most frequently cited reason was a current pregnancy (46%), followed by being a parent, grandparent, or foster parent of a child under the age of two years (40%, 8%, and 2%, respectively). Twenty-five percent of respondents reported they attended the shower in order to learn more about infant mortality and well-baby information. Less than 4% of respondents reported wanting to become pregnant as their reason for attending.

### Knowledge of Infant Mortality and Well-Baby Issues

On average, respondents correctly answered 7.2 of the 11 knowledge items on the pre-shower questionnaire. After the education portion of the event, the average correct score was 7.8, a statistically significant increase ( $p < 0.0001$ ). Examining pre- and post-shower survey means by racial group revealed that changes in scores differed by race (see Table 1). White respondents had the largest change in mean scores on pre- and post-shower knowledge surveys ( $p < 0.0001$ ), followed by American Indians ( $p = 0.0043$ ). While the mean scores of African Americans and multiracial individuals increased slightly from pre- to post-shower, this difference was not statistically significant.

Changes in questionnaire scores also varied with participant age. The only statistically significant change in mean knowledge

score was for the 20-29 year old age group (7.3 to 8.1 correct,  $p < 0.05$ ). Twenty-eight respondents did not indicate their age, but their average knowledge score increased significantly from 7.1 to 8.3 correct items ( $p < 0.05$ ).

### Sharing of Shower Information

Ninety-two percent of respondents indicated they would tell a family member or friend at least one fact they learned from the community baby shower, 7% were unsure, and only one respondent indicated that he/she would not share information following the event.

### Qualitative Feedback

One hundred seventeen shower participants provided qualitative feedback about the showers. Although there were several positive comments about the content and perceived value of information provided at the showers, there were also many constructive comments about potential improvements to showers. Some respondents indicated that they would like more frequent showers, especially for younger or first-time parents. Many respondents provided suggestions for additional topics they would like covered during showers, including care of premature and extremely premature infants; the benefits of breastfeeding and physical activity; the effects of smoking, alcohol use, and prescription drug use during pregnancy; Sudden Infant Death Syndrome (SIDS); and more general information about healthcare. Other participants suggested that showers be limited to only pregnant women, while others suggested more information be aimed towards fathers in order to increase fathers' attendance of events. Finally, there were several comments about the shower venues themselves, with respondents indicating that more space and louder audio would have been helpful. Alternatively, respondents suggested that having a separate child play area may remedy these concerns.

### DISCUSSION

The "A Healthy Baby Begins with You" project sought to address infant mortality in Oklahoma minority populations using a cost-effective, short-term, education-based strategy. This goal was accomplished by utilizing local resources, including volunteered time and donations from medical providers, community members, and vendors. This intervention sought to gain access to minority communities and provide information in an acceptable, comprehensible manner. To accomplish this, the project enlisted the help of medical providers as well as mavens or community "Big Mamas" to increase the cultural relevance of information. Many providers eagerly donated their time to community baby showers and perceived them as valuable opportunities to serve their communities. Although many showers occurred in urban settings, rural medical providers requested future showers be held in their communities to increase their own patients' access to health information. The largest barrier to recruiting providers was scheduling conflicts whereas the largest barrier for recruiting Big Mamas was discomfort related to public speaking.

This project successfully engaged minorities, who constituted the majority of study respondents. Although more

**Table 1. Mean Score (Standard Deviation) of Knowledge Pre and Post Surveys by Race/Ethnicity.**

Self-identified Race/Ethnicity	n	Pre Score Mean (SD)	Post Score Mean (SD)	p-value
White†	66	7.4 (2.1)	8.5 (1.8)	< 0.0001
American Indian†	77	7.2 (1.8)	8.0 (2.2)	0.0043
Black/African American	64	6.9 (2.2)	7.2 (2.2)	0.2517
Multiracial	15	6.2 (2.7)	7.0 (3.2)	0.3411
Other	7	7.1 (2.7)	7.0 (2.9)	0.7358
Hispanic‡	27	7.2 (2.2)	7.7 (2.1)	0.2887

†Race/ethnicity has  $p < 0.05$ , which indicates a statistically significant difference via paired t-test.

‡Hispanic ethnicity includes respondents of any race.

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work is needed to increase minority community involvement in infant mortality prevention programs, this study suggests White communities may also benefit from and show interest in such programs as 29% of respondents identified as White. This project did not attract many prospective fathers, fathers, or grandfathers. This is unfortunate given that previous studies of at-risk pregnancies (e.g., low income, inadequate prenatal care) report a majority of fathers are involved with the family during the mother's pregnancy.<sup>8</sup> This suggests a possible missed opportunity to effectively inform entire families of important steps they can take to reduce infant mortality. Fathers can be an important support for families during pregnancy and infancy, and their knowledge of health-related information can help guide perinatal care. Prenatal education for fathers may have positive effects on health knowledge and behaviors, postpartum family planning/contraception use, infant health and feeding, and spousal communication and support.<sup>9</sup> Qualitative feedback from respondents in this study suggests tailoring program content to fathers may increase their involvement. Future studies should query fathers, especially minority fathers, to assess what infant health topics may be important or acceptable for them to discuss in a group setting and then incorporate this feedback into future educational programming.

A variety of age groups were represented by these results, the majority of respondents being young adults aged 20 to 29 years. This suggests that the community baby shower format may be most popular among young adults, especially those who are pregnant (approximately half of respondents). In addition, this was the only age group with a significant increase in knowledge following the educational intervention. Thus, the current project was successful in attracting and educating the target demographic of minority, young adult parents and soon-to-be parents, but may need additional tailoring to expand effects to other populations. Although the showers were open to all interested community members, future programs could focus exclusively on young adults, pregnant women, or other target groups. Narrowing program focus in this manner may have differential effects on participant learning and engagement and may decrease logistical barriers related to venue size, child care arrangements, etc. Further, it may allow researchers and public health workers to focus program content solely on those topics deemed most important for the target demographic (e.g., expectant families). Alternatively, a community baby shower program could mimic previous research<sup>8</sup> and strive for a long-term relationship between community members, providers, and mavens with developmentally-driven information provided at key times during the baby's development. However, such an approach is likely to be more costly. As such, this project represents a relatively low-cost, short-term, broader-scoped program intended for multiple populations that could be modified for specific populations.

Given that teen parenting is associated with a variety of negative outcomes for mother and child, including infant mortality,<sup>10-13</sup> it is especially exciting that this subgroup was receptive to this educational program. Previous studies have focused on this demographic to prevent negative outcomes associated with adolescent parenting and rapid, subsequent

pregnancies.<sup>14-17</sup> Although there was good representation of teen parents in this study, no significant difference was found in teens' overall mean knowledge score pre- and post-intervention. Apart from limited statistical power, this finding suggests that more work is needed to tailor the presented educational program to expectant teens in order to boost knowledge gained. Conducting follow-up focus groups with teen mothers who participated in the community baby shower may reveal how information could have been presented more effectively to this specific demographic.

Evidence of this intervention's ability to increase participant knowledge of infant mortality and well-baby issues is mixed. Although the mean score for all respondents on an 11-item survey improved after the program, these results varied by age and racial group. Scores significantly increased for Whites and American Indians but were not statistically different for African Americans, multiracial respondents, or for respondents who chose not to specify their race. Null results were also found when comparing pre- and post-shower knowledge scores for those who reported a Hispanic ethnicity. Although these null findings may be attributable to small sample size, it is discouraging that these results do not reflect an increase in knowledge in African American participants given that these community members tend to have the highest rates of infant mortality in Oklahoma. It is possible that shower information was not presented in a manner acceptable to this demographic despite the use of multiple sources of information including handouts, word-of-mouth by providers and mavens, and interactive games and materials. Future research is needed to test additional dissemination methods to find those most effective for minority populations in Oklahoma.

Another potential reason no knowledge difference was found is that the knowledge survey may not have adequately measured change in knowledge. Due to the limited sample and lack of a control group, more-sophisticated psychometric support for the survey could not be obtained. Thus, it is not known if the knowledge measure used in this study was sufficiently sensitive to measure changes in respondents' knowledge for each given subgroup surveyed. The fact that a significant change was found for Whites and American Indians (our largest subgroups) suggests that limited power may have been a factor. Future studies with additional participants and a control group may determine which items are most useful in assessing participant knowledge, provide more detail about which topics participants gained knowledge following the educational intervention, and guide changes in shower programming that will improve its effectiveness in educating participants.

This study has several strengths that deserve mentioning. First, this project demonstrates the feasibility of a cost-effective educational program to increase participant knowledge about risk factors for infant mortality and strategies for improving pregnancy outcomes in high-risk populations. Donations from local community groups and businesses provided incentives for attendance of the educational showers in exchange for advertising to an often difficult-to-reach population. Ongoing support by local businesses and community organizations is crucial for the sustainability of such educational programs. Additional studies examining the long-term sustainability of this or similar programs

are needed to ensure educational interventions create lasting, meaningful change in high-risk communities.

Second, this program effectively engaged local medical providers and community members. Indeed, this program is not possible without the generous donation of time by these important figures, and such involvement is crucial for effective information dissemination by trusted sources. Recruiting local providers and community members for this project was expedited by their inclusion in the development of the program. Ensuring that educational programs' content and format are acceptable to local providers and community members is important for uptake of the program by the community and sustainability.<sup>18</sup> It is recommended that communities seeking to implement similar educational programs first organize focus groups to ensure acceptability by local providers and community members prior to implementation. Such feedback may increase involvement of stakeholders and improve program information quality. Furthermore, focus groups may allow educational interventions to be tailored to specific community needs and maximize impact on infant mortality.

Third, this program uses mavens to assist in the dissemination of health-related information. Not only does this reduce the cost of educational interventions by relying on community members and paraprofessionals rather than professionals, but it also ensures information is provided in a manner that is accessible, credible, and acceptable to community members. In addition, recruiting community members to voluntarily donate their time and effort to implement such educational programs promotes long-term sustainability. The use of mavens may also circumvent literacy barriers, although this study did not measure literacy of respondents. Future studies should consider using orally-administered demographics and knowledge questionnaires to increase the participation of subjects who may have reading limitations due to educational or language barriers. It is vital that at-risk populations with literacy or language barriers receive comprehensible information that changes health-related knowledge and behaviors to prevent infant mortality.

In addition to its strengths, this study has limitations to consider when interpreting these results. First, many shower participants did not complete both pre- and post-shower surveys, limiting the number of matched cases that could be presented. Second, some of those who completed both surveys did not answer all questions. The causes of missing data are difficult to assess and may be attributable to literacy limitations or discomfort with revealing certain information despite anonymous sampling. Third, small samples made it difficult to interpret subgroup differences on knowledge questionnaires or other surveyed items such as reason for participating in the shower. Future studies with larger samples may allow for additional analyses to assess particular subgroups' knowledge limitations related to infant mortality and well-child care as well as aspects of an educational intervention that are most appealing to or effective for these subgroups. Such information would allow for better community participation and dissemination of educational content. Finally, this study did not include a no-treatment control group. Such a comparison group in future studies would allow one to assess

the stability of infant mortality knowledge over time and better assess the effects of the prevention program.

## CONCLUSIONS

This project represents an important step in addressing the consistently high rate of infant deaths in Oklahoma. By adopting and tailoring existing prevention programs to the particular needs of a local community, public health workers and community members can decrease infant mortality in those populations with the greatest health disparities. "A Healthy Baby Begins with You" addresses infant mortality in Oklahoma, particularly in minority communities. However, this community baby shower program can likely benefit additional communities facing high rates of infant mortality. In 2010, a shower toolkit was created and disseminated to encourage the organization of showers in various communities; a revised toolkit was created in 2013. The revised toolkit was created in response to lessons learned from the implementation of community showers held from 2010 to 2012. Revisions included logistical timelines, comprehensive evaluation surveys, additional games and a revised committee structure. To date, over 1,000 kits have been distributed throughout the U.S. and Virgin Islands.

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