

Improving Maternal and Infant Child Health Outcomes with Community-Based Pregnancy Support Groups: Outcomes from Moms2B Ohio

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Abstract *Objectives* To describe temporal changes in maternal and child health outcomes in an impoverished urban community after the implementation of an innovative community-based pregnancy support program, named Moms2B. *Methods* Beginning in 2011, pregnant women in an urban impoverished community were recruited for participation in a community-based pregnancy support program focused on improving nutrition coupled with increasing social and medical support. The comprehensive program targeting pregnancy through the infants' first year of life was developed and staffed by a multidisciplinary team from an academic health system. As a preliminary effort to assess the effectiveness of Moms2B, we examined maternal and infant health characteristics in the community before and after implementation of the program. *Results* From 2011 to 2014, 195 pregnant women attended one or more Moms2B sessions at the Weinland Park (WP) location. Most (75%) were African American (AA) with incomes below \$800 per month and significant medical and social stressors. Outcomes from the two WP census tracts before and after implementation of the Moms2B program were studied. From 2007 to 2010, there were 442 births in WP and 6 infant deaths for an infant mortality rate of 14.2/1000. In 2011–2014, the first four years of the Moms2B program there were 339 births and one infant death giving an IMR of 2.9/1000, nearly a

five-fold reduction in the rate of an infant death. Among pregnant women in WP who were covered by Medicaid, the breastfeeding initiation rate improved from 37.9 to 75.5% ($p < .01$) after the introduction of Moms2B. There were no infant deaths among Moms2B participants at the WP location in the first four years of the program. *Conclusions* Implementation of an innovative community-based pregnancy support program was associated with important improvements in maternal and infant health in an impoverished neighborhood.

Keywords Infant mortality · Disparities · Academic-community · Pregnancy group support · Social determinants

Significance

There are few reports evaluating the effectiveness of community-based programs aimed at improving maternal and infant health outcomes in impoverished settings. We describe an innovative program for pregnant women focused on improving nutrition along with increasing social and medical support that resulted in immediate measurable improvements in maternal and infant health outcomes in an impoverished urban neighborhood in the Midwest.

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Introduction

Infant mortality rates (IMRs) are defined as the number of live born infants dying in the first year of life per 1000 live births. Rates directly reflect both maternal and infant health and can be used to gauge the overall health of a nation or community (Wegman 2001). In the U.S., IMRs have

consistently declined over the years, reaching an all-time low of 5.87 per 1000 in 2015 (Matthews et al. 2015). However, for African Americans (AA) in some U.S. states and communities, the IMR rates remain higher than rates in less well developed countries and twice as high as those among white infants (March of Dimes 2016). In 2011, in Ohio, the location of this study, infant mortality among AAs ranked 50th in the nation, at 16/1000 (Ohio Department of Health 2015). Although now improved at a national level, the IMR among AA infants in Ohio remains more than twice that of white infants, 14.3 versus 5.3 per 1000. In 2014, 955 infants died in Ohio, with 37% being AA (Ohio Department of Health 2015).

Medical and social conditions underlying maternal and infant health are complex and interwoven. Social factors known to increase the risk of infant deaths include living in poverty with related food insecurity, poor housing, neighborhood and domestic violence, adverse childhood experiences, short interpregnancy intervals, absence of fathers, and stress related to transportation, financial problems, racism, smoking, drugs, alcohol, and mental illness (Love et al. 2010; Spong et al. 2011; Cook et al. 2013; Englund-Ogge et al. 2014; Christiaens et al. 2015; Rawlings et al. 1995; Stein et al. 2000). After birth, AA infants are at additional risk because of infections (Person et al. 2014), sleep-related deaths (Carlberg et al. 2012), and lower rates of breastfeeding (Forste et al. 2001; Chen and Rogan 2004) compared to white infants. Medical interventions known to reduce preterm births and to improve infant health include early access to prenatal care, evaluation for and, when appropriate, treatment with progesterone (Meis and Connors 2004), and enhanced prenatal clinical care delivered in a group setting (Ickovics et al. 2011). Intensive nurse home visiting for individual women in their first pregnancy has also been shown to improve social factors and maternal and infant health (Olds 2006).

In Columbus, Ohio and the surrounding Franklin County, maternal and infant health indicators have not improved despite the presence of several large health systems and nurse home visiting programs. Almost 1 in 12 (8.1%) women enter prenatal care late or deliver without prenatal care (March of Dimes 2016). In 2014, Franklin County had a total of 18,822 births. Among these infants, 145 died, resulting in an IMR of 7.7/1000. While 26% of the births were to AA mothers, almost half of these infant deaths (46%) were to AA mothers, indicating a high disparity ratio, almost twice the expected number. Among the deaths that occurred after the neonatal period, 22 (15%) were sleep-related with more than half of those being AA infants.

In response to these unsettling trends, a statewide collaborative (the Ohio Collaborative to Prevent Infant Mortality, OCPIM) was formed to take collective action to improve

birth outcomes and to reduce infant deaths in the state (Ohio Department of Health 2015). Building on the OCPIM strategic focus areas, this report describes a unique academic health system initiated and community-based intervention called Moms2B. The intervention is aimed at reducing disparities in infant mortality by engaging low income, predominantly AA, pregnant women in their neighborhoods to improve nutrition, social support and connection to medical care. Drawing on the life course model (Lu et al. 2010) and building relationships around food and nutrition (Lu and Lu 2007), the intervention was designed to empower targeted women by enhancing the biopsychosocial protective factors during pregnancy and the interconception period (Kramer and Hogue 2009). Herein, we describe temporal changes in maternal and child health outcomes in an impoverished urban community after the implementation of this innovative community-based program.

Methods

Program Inception

To reduce infant deaths in high risk neighborhoods, a group of academic health care providers and local civic and public health leaders met to consider options. A weekly program was proposed, focused on nutrition coupled with social and medical support. Weinland Park was chosen as the initial Moms2B site based on need and proximity. The initial objective was to assess the feasibility of enrolling and retaining 24 AA pregnant women in a program to improve birth outcomes. All pregnant women living in WP were encouraged to participate, but others were welcomed as well (i.e., living outside the WP area was not an exclusion criterion). Pregnant women were recruited from the zip codes encompassing the WP neighborhood. In 2010, WP had a loosely organized civic group. Its president was active in helping to plan our initiative and recommended an AA church, located in the neighborhood, to host the weekly program.

Setting

WP, with a population of 4386 (2010), is a thirty square block urban area undergoing economic revitalization near the Ohio State University (OSU). In the mid-1990s, WP had one of the highest rates of violent crime in the Columbus, Ohio. In 1995, the Ohio State University, in partnership with the City of Columbus, created Campus Partners, a non-profit redevelopment organization focusing on the areas around campus, including Weinland Park. Since 2010, local and federal law enforcement have worked to identify and arrest several dozen of the major players in the

WP community's gang and drug culture (Sullivan 2014). In 2014, Campus Partners purchased and closed two car-youts, which were hotbeds for gang-related activity in the area. Since 2010, over \$50 million has been invested in community revitalization. As noted in the 2006 Weinland Park Neighborhood Plan, the goal was revitalization rather than gentrification with the creation of "...an attractive, diverse, mixed-income area" (p. 2) (City of Columbus Department of Development 2008).

While updated intercensal data for WP are not yet available, data from the 2010 census indicate that WP remains an at-risk neighborhood (Collaborative 2013). In 2000, 50.4% of WP residents were black and 4.5% were Hispanic. As of 2010, 35.8% of residents were African American (AA) and 11.8% were Hispanic. The vast majority of housing units in WP remain renter-occupied and the median rental cost in the area has remained relatively stable since 2000, approximately \$570/month. The unemployment rate in WP and poverty have increased since 2000, with an unemployment rate of 18.3% and a median family income of only \$12,000 in 2010.

OSU, a land grant university with extension agents in all counties, placed an urban extension agent in the WP neighborhood to help with community development. The urban extension agent was familiar and trusted in the neighborhood. With the agent's guidance, several sites within WP were considered: the local police department's neighborhood Pride Center, a neighborhood guild association, and an historically AA church. Outreach and community health fit the mission of the church. The pastor welcomed Moms2B and provided a basement meeting room to conduct the sessions and kitchen facilities to prepare the weekly meals.

In 2009, the year before Moms2B began, the birth rate in WP was 31/1000, which was three times the rate for Ohio. The infant mortality rate in WP was more than twice that of Ohio, with 16.4 deaths per 1000 live births. Nearly all of these deaths occurred on the East side of WP, where most of the AA residents lived. Other area demographics in 2009 included: 93% unmarried, 34% high school graduates, and 14% with some college credits (Columbus Public Health 2016).

Recruitment

A recruitment flyer was developed showing a smiling pregnant AA woman holding a green apple, the program's iconic logo. The flyer read:

Are you pregnant? Come to Moms2B. You will have the chance to learn how to have a healthy baby and pregnancy, talk with healthcare professionals, share a meal and make new friends!

Some women attending the initial program were offered positions as community coaches to recruit other pregnant women in the neighborhood. Pregnant women at any gestational age were invited to attend along with one support person and their other children, if applicable.

Curriculum

Each week, the two-hour group intervention focused on nutrition, teaching pregnancy and parenting topics, a one-on-one review of social factors influencing health, connecting women to needed services, and serving a healthy meal. Follow up text messages and telephone calls during the week were carried out to build positive relationships between participants and Moms2B staff. The rotating six-month curriculum, which is available by request from the authors, covered: nutrition, mental health, pregnancy, reproductive health, parenting, and infant safety topics.

Teaching the pregnant and parenting woman was based on "small, interactive messages" while fostering a "two-way learning" environment. We found that short 10–15 min discussions with good visual learning tools was the most effective way to engage and relate to our mothers. Colorful easy to read handouts were used with each lesson. All team members were trained in both "Bridges out of Poverty" (DeVol et al. 2006) and motivational interviewing (Lundahl et al. 2013).

Intervention Structure

Sessions were held every week at the same time except for snow days or national holidays. Activities in the two-hour session began with a group circle of pregnant and parenting women, their support person (if present), staff members, and health professions students, who often attend Moms2B as part of their training. Group size ranged from 10 to 25 individuals. After introducing themselves, each woman was asked to answer a simple question related to the teaching topic, for example, "...name one healthy thing about breastfeeding?" This was followed by a 15–20 min nutrition topic, taught by a medical dietician, and a mental health lesson taught by a social worker. Additional teaching encouraged infant bonding, positive brain development, speech, language, and fine and gross motor skills. Ongoing demonstrations reinforced safe sleep environments. Through a partnership with the Supplemental Nutrition Program for Women Infants and Children (WIC) and our lactation counselor, every session included teaching and support for breastfeeding. After a short break, with water and healthy snacks, pregnant and parenting women separated and discussed relevant subjects, or continued in the large group for common topics, such as making a

reproductive health plan, with a demonstration and interactive sessions on all forms of birth control.

As the women were interacting, supervision was provided for the children who were present. Volunteer physical therapists conducted sessions with the infants, and child development students planned activities for toddlers and older children who were in attendance with their mothers. Before the session ended, a healthy hot buffet meal was offered to all.

Helping to Address Needs

Every need that was identified by the weekly checklist created a pathway that described and documented the steps necessary to address that social determinant of health. The Moms2B pathways were adapted from a tool, which was developed to improve tracking and accountability of factors connected to healthy pregnancy outcomes (Redding et al. 2015). One example of a pathway that all pregnant women complete is the safe sleep pathway. Women are guided through a series of questions designed to: assess their knowledge about safe sleep practices, provide them with safe sleep education, determine whether they have a safe place for their baby to sleep, and if necessary link them to community programs that can provide a crib or playard.

Women indicating they had limited food were given an emergency food bag and a meal to take home. All women were connected to local food pantries, assisted with enrolling in the Supplemental Nutrition Agriculture Program (SNAP), and WIC. A food bank truck brought fresh produce and other staples monthly during the session.

In an effort to promote breastfeeding, women were visited in the hospital by Moms2B staff and were encouraged to seek support from a lactation consultant. After hospital discharge, nurse home visits to assess maternal and infant health, safe sleep conditions, and to support breastfeeding were arranged through a partnering institution.

Program Staff

A multidisciplinary team from The OSU College of Medicine's Departments of Pediatrics and Obstetrics and Gynecology led and staffed the program. A pediatrician and an infant mental health specialist, the co-founders of Moms2B, directed the team that included: a medical dietitian, two social workers, a community educator, and a family advocate. Two obstetricians served as consultants. While the majority of current Moms2B staff are white, there is strong AA leadership and a major emphasis on meeting families where they are to ensure that all aspects of the program are culturally relevant.

Program Locations

While this paper describes outcomes at our initial WP site, Moms2B now has four active locations. A second location opened near an OSU satellite hospital, and another was launched with the help of a local community health system. The fourth site recently opened in a Federally Qualified Health Center.

Program Retention

We have been successful in retaining mothers over time by practicing consistency, predictability, and responsibility (CPR). Women develop trust and relationships with the Moms2B staff and other women in the group. These relationships create strong bonds within the program; most women return with their infants, some only a few days after giving birth. Parenting participants receive continued individual and group support. As the infants grows, they are included in a "baby play time" and the practice allows the moms their own time for the group and individual interactions. During this play time, an infant mental health specialist and physical therapists interact one-on-one with infants and engage in developmental play. All pregnant and parenting women also give back to the program with their insight and suggestions. Some bring back donations to give to other women. It's this "give and take" that creates strong social bonds.

Program Costs

All sessions were offered without charge to the moms. As an incentive to attend, participants received a five dollar gift card to a local grocery store at each session. Costs of the program included salaries for eight full-time staff to serve all four of our current locations. Supplies, food, and transportation to sessions are covered by grants from charities and government agencies. Over the past five years, the program has cost approximately \$2200 per pregnant or parenting women per year. While this cost might seem high, it should be viewed in the context of the societal cost of preterm birth. A premature infant incurs much higher medical expenses than a full term infant in the initial period of hospitalization and the pattern of increased medical utilization extends into childhood as well (Petrou et al. 2011). Medical care costs alone from birth through age five for preterm children are estimated to be \$31,290 per case (2005 dollars) (Behrman and Butler 2007). Furthermore, preterm birth has other direct and indirect costs associated with it such as lost parental wages, increased use of social services, and a greater

need for educational interventions among school age children born premature (Petrout et al. 2001).

Data Collection

Data collected by Moms2B included: demographics, involvement with the father of the baby, past and current pregnancy history and outcomes, use of progesterone in prior pregnancies, current medical concerns, smoking and drug use, prenatal provider status, and delivery plans. A weekly needs checklist was used to assess immediate needs including: housing, utility bills, food security, infant car seat availability, a safe place for the infant to sleep, and future plans for education, employment, and reproductive health. Standard questionnaires assessed breastfeeding plans, food security, prenatal stressors, depression, social support, adverse childhood experiences, and birth outcomes. Specific instruments include: the Edinburgh Postnatal Depression Scale (EPDS), the Medical Outcomes Study (MOS) Social Support Survey, the Perceived Stress Scale (PSS), the Adverse Childhood Experiences (ACE), the Food Security Scale-Short Form, the Women, Infants, and Children Infant Feeding Practices Study (WIC-IFPS) Breastfeeding Scale, the Prenatal Psychosocial Profile Hassles Scale, and other instruments designed or adapted by the research team to measure housing instability, intimate partner violence, and nutrition self-efficacy. Data were entered into REDCap, a secure, web-based application that serves as a clinical research database (Harris et al. 2009). During the sessions, women were weighed and counseled regarding optimal weight gain during pregnancy. A medical dietitian collected one 24-hour diet history. The types and amounts of food and fluids consumed were documented.

Analysis

In this analysis, we present data regarding program participation and demographics of participants for the first four years of Moms2B at WP. As an initial attempt to assess the effectiveness of the program, we compared the maternal and infant health outcomes of WP women who participated in Moms2B and lived in WP to those WP women whose index birth(s) were covered by Medicaid during the same time period regardless of Moms2B participation status (2011–2014). For comparison purposes, we present the maternal and infant health outcomes of WP women whose index birth(s) were covered by Medicaid in the years before Moms2B began (2007–2010). Overall WP data came from birth certificates while outcomes among Moms2B participants came from program records. Outcomes were compared using chi-squared tests. Data were analyzed in Stata 13.0. The project was reviewed and approved by the institutional review boards at The Ohio State University

and Nationwide Children's Hospital, the local children's hospital.

Results

From 2011 to 2014, a total of 194 weekly Moms2B sessions were held at the WP site, an average of 49 per year. A total of 206 pregnant women were served by at least one visit to Moms2B during this time, with seven women participating in the program for two or more pregnancies. Participant attendance ranged from 1 to 26 sessions; 61.7% participated in 3 or more Moms2B sessions. We currently believe three visits to be the minimum necessary “dose” to have a positive impact on the pregnancy, as it takes time to gain a woman's trust so that she is able to take full advantage of the information and resources offered. Most women who came to Moms2B presented in the second trimester of pregnancy (range=4–35 weeks). For the first four years of the project, each Moms2B session at WP included an average of 13–15 pregnant or postpartum women (range=2–26 women).

Moms2B participants at WP were at high risk for adverse maternal and infant health outcomes. The majority of participating women were AA (72%), and lived well below the federal poverty level. Over half (66%) received assistance from the Women, Infants, and Children food and nutrition service, 40% had two or more children, and 51% had not completed high school. Many participants (48%) scored at-risk of depression based on the Center for Epidemiologic Studies Depression Scale (CES-D) and had ongoing medical conditions, reporting for example anemia (24%) asthma (23%) hypertension (10%) and diabetes (1.7%).

Among women with a prior pregnancy ($n=107$) for whom pregnancy outcomes were known, 36.8% reported having a prior miscarriage, 8.2% a prior stillbirth; and 29% a prior preterm birth. Among the participants who completed a validated questionnaire on life stressors ($n=94$) almost half described stressors related to feeling overloaded (45%), money (42%), the pregnancy itself (40%), and transportation (40%). Stressors related to work (35%), moving (34%), crime (23%), shelter (18%), and food (15%) were also reported. We introduced the measures of Adverse Childhood Experiences (ACE) scale in 2014 (Felitti et al. 1998). Among the women who have completed the scale to date, 51% have had scores indicating that they experienced significant social and emotional trauma during their childhood.

Table 1 presents maternal and infant health outcomes of Moms2B participants in WP compared to all births in WP both before and after the program began. In the four years before Moms2B started (2007–2010) there were 442 births

Table 1 Moms2B outcomes compared to overall births in two census tracts before and after the program was active in the Weinland Park Neighborhood (WP)

	2007–2010 all births before Moms2B in WP	2011–2014 all births after Moms2B in WP	2011–2014 births to women in Moms2B in WP
Total births	442	339	67
Average per year	106	85	17
Medicaid coverage	285 (67.5%)	211 (63.0%)	67 (100%)
Non-Hispanic black ^a	224 (78.6%)	157 (63.0%)	57 (86.0%)
Pregnancy spacing 18–24 months ^{a,b}	23/170 (13.5%)	20/139 (14.4%)	7/7 (100%)
Twins and triplets ^a	3 (1.1%)	15 (7.1%)	9(13.4%)
Low birth weight (<2500 g) ^a	41 (14.4%)	44 (21.0%)	19 (28.0%)
Low birth weight singletons (<2500 g) ^a	38 (13.5%)	33 (16.9%)	10/56 (17.9%)
Preterm (<37 weeks) ^a	45 (15.9%)	44 (27.0%)	17/67 (25.0%)
Preterm singletons (<37 weeks) ^a	42 (15.0%)	31 (15.8%)	8/56 (14.3%)
Breastfeeding at hospital discharge ^{a,*}	103 (37.9%)	147 (71.4%)	37/45 (75.5%)
Infant mortality rate	14.2/1000 ^c	2.9/1000 ^c	0

^aMedicaid data^bAmong women with repeat pregnancies^c6 deaths from 2006 to 2010; 1 death from 2011 to 2014* $p < 0.001$

in WP and six infant deaths giving an IMR of 14.2 per 1000 births. In the four years (2011–2014) since Moms2B has been active, there have been 328 births and only one infant death, (2.9 per 1000 births). That child's mother did not attend Moms2B.

Among women who attended three or more sessions, there were 67 women served by the WP Moms2B site who actually lived in WP and reported birth outcomes to the Moms2B program following their baby's birth. All of these pregnancies were covered by Medicaid. With the help of Medicaid data, we were able to compare the maternal and infant health outcomes of these pregnancies to all pregnancies covered by Medicaid in the WP area both before and after the introduction of Moms2B. There were 7 repeat pregnancies among Moms2B women residing in WP, they all involved healthy spacing, with at least 18 months between deliveries. There were no statistically significant differences in low birth weight status in Moms2B singletons versus other singletons born in WP, most likely due to the overrepresentation of AA moms in the program. Breastfeeding at hospital discharge nearly doubled among Moms2B moms residing in WP as well as all WP moms, going from 37.9 to 75.5% and 71.4%, respectively. While not a statistically significant decrease, WP saw a decrease in its infant mortality rate from 14.2 to 2.9 per 1000 with no deaths reported among the children of Moms2B participants.

Moms2B participants were interviewed about the program. Representative comments from two women include:

I was stressed, discouraged and depleted by the people and situations in my life that were negative. The relationships and bonds that I built with the Moms2B staff and other mothers have been important in my life. They have worked with me during and after my pregnancy, to help me accomplish my goals and get basic necessities that I need for my son.

The Moms2B program has consistently given me a chance to bond and interact with mothers within my community. Even after a year, I still look forward to Moms2B every week. I know that each session will provide me with new information and resources to grow as a mother. My time in the Moms2B program has shown me that I am dedicated, resourceful, and hard working. I plan to use these qualities to complete the workforce development program that I am in.

Most of the women surveyed agreed or strongly agreed that the program gave them a better understanding about their health, available health care services, and their medical care. Most of the women said they learned to eat healthier, to be more physically active, and to follow their health care provider's recommendations.

Discussion

In response to high infant mortality rates, especially for AA infants, a holistic program aimed at improving

maternal nutrition, building womens' relationships with perinatal health providers, and providing social support was introduced in an impoverished urban community in the Midwest. The program was well-received by targeted pregnant women, and most mothers continued to participate through their infant's first year of life. From 2011 to 2014, infant mortality in the neighborhood declined from 14.2/1000 to 2.9/1000. Breastfeeding initiation increased from 37.9 to 71.4%. Rates for both low birth weight and prematurity did not change, in part due to the large number of multiple births, 7.1% as compared to the expected rate of 3.8% (March of Dimes 2016). The number of multiple births did not affect the IMR, even though reported IMRs for AA twins and triplets are extremely high, 42/1000 and 122/1000 respectively (Luke and Brown 2006).

We are unaware of any other reports of community-based intervention that have had a positive impact on maternal and infant health outcomes in a defined high-risk geographic area. Deters and colleagues noted the value of using geographic mapping of infant deaths and preterm births to engage the community and address maternal and infant health using the Healthy Start home visiting model (Detres et al. 2014). In the first two years of our program, we partnered with the Franklin County Healthy Start Program. This collaboration provided an ideal model combining Moms2B, which emphasizes socialization, nutrition, and education with the one-on-one in-home nurse and social worker assessment and support.

Can pregnancy outcomes be improved by providing enhanced social support during the pregnancy? Or can they be improved only with excellent preconception and interconception health care? Pregnant women reporting high levels of stress in their lives, assigned to receive care in a group clinical care model, were found to have significantly improved psychosocial outcomes and overall there were fewer preterm births (Ickovics et al. 2011). Ideally conception should occur during a time of optimal maternal emotional and physical health. Unfortunately, in our participants, most of the major stresses of food insecurity and homelessness existed around the time of conception. Food security, as measured in the prior year and defined as "access by all people at all times to enough food for an active, healthy life," was lacking in most (84%) of our population as measured by the United States Department of Agriculture Food Security Survey Module—Short Form. This indicates the women and their children were at high-risk for adverse health outcomes; (Cook et al. 2013) however only 15% noted a lack of food as a current stressor during their pregnancy. This improvement could be related to enrollment in WIC and access to more food and nutrition counselling through Moms2B.

Recent commentaries have called for more efforts to engage communities of color (Bassett 2015) and

to address racism within our medical delivery system (Ansell and McDonald 2015). To gain insight about and empathy for pregnant women living in poverty, we introduced nurses, medical students, and physicians to pregnant women in a predominantly AA community setting. A major strength of the Moms2B program includes the success of recruiting and retaining pregnant women living in poverty in a multidisciplinary model to address the social determinants of health extending through the infants' first year of life. Including health science undergraduate and graduate students in the model to both learn from and mentor the pregnant and parenting women demonstrates how the goals to improve empathy and reduce racism among future health care providers can be achieved by such community-based programs.

The limitations of the data presented in this report should be noted. First, this is a description of a program that has been successful in a relatively small impoverished urban neighborhood in the Midwest. As such, our results might not be broadly applicable to all high risk settings. Further, to date, we have only been able to evaluate our outcomes in the context of other available neighborhood data. We cannot rule out that the maternal and infant health improvements that we saw are due to other factors that occurred during that time period. We are currently working with the State of Ohio to obtain the vital records of all births/deaths in the WP area so that we can get a more complete picture of the impact of the Moms2B program. Given the high rate of infant mortality in this state and others, we felt that it was important to share information about the program itself as well as preliminary data that we have on program effectiveness as soon as possible so that other communities can be made aware of this model, which indeed seems to be associated with improvements in maternal and child health outcomes.

In summary, we have found that the introduction of a community-based interdisciplinary model aimed at addressing the social determinants of health was associated with important improvements in maternal and infant health outcomes, most notably a decline in infant mortality from 14.2 to 2.9 per 1000. While these findings await confirmation, the preliminary success of this program suggests that this model could offer promise to other similar communities at high risk of adverse maternal and infant health outcomes.

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