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Bridging the Divide: Connecting Urban and Rural Care Through the Right! From the Start Initiative

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ABSTRACT
Disparities in health and barriers to healthcare are prominent in rural areas, particularly in the Delta region of Mississippi where high rates of premature births, infant mortality, low weight births, and maternal mortality exacerbate the dearth of access to care. Extending the reach of healthcare providers and services between urban and rural areas is of utmost importance in improving the landscape of maternal and child health. Community health workers (CHWs), trusted individuals in the community, play a valuable role in this through social support. This research note delineates the importance of community health workers as connectors in establishing a trusted continuum between the urban Neonatal Intensive Care Unit (NICU) setting and rural community health centers through the Right! From the Start NICU Breastfeeding Initiative in Mississippi.

KEYWORDS
Breastfeeding, community health workers, health disparity

INTRODUCTION

Social determinants of health, the conditions in which people are born, grow, live, work, and age (World Health Organization 2008), are largely responsible for health inequities among rural populations (Braveman and Gottlieb 2014). Nationally, rural areas are characterized by a lower life expectancy and higher mortality rates from leading causes of death (Vierboom, Preston, and Hendi 2019; James 2014; Cosby et al. 2019), higher rates of chronic disease (Matthews et al. 2017), self-reported general poor health status (Chanlongbutra, Singh, and Mueller 2018), and significant mental health disparities (Morales, Barksdale, and Beckel-Mitchener 2020). Further, rural residents often exhibit a higher prevalence of health-related risk behaviors, such as smoking (Doogan et al. 2017), poor diets (Kris-Etherton et al. 2020), and physical inactivity (Whitfield et al. 2019).

The state of Mississippi, predominately rural (Green 2021) and with the nation's highest rate of poverty (Shrider et al. 2021), is no exception to these classifications. Further, Mississippi has high rates of inequality in health outcomes between racial groups, especially in areas of maternal and child health (Funchess et al. 2021). Birth outcomes continually rank poorest in the nation with high rates of premature birth, low weight births, infant mortality, and maternal mortality (MSDH 2020). The Delta region of the state is particularly vulnerable and has had some of the highest rates of premature births and low/very low weight births, due in part to the unique magnitude of the social and economic conditions present in the region (Gennuso et al. 2016). Compounding this issue is the fact that all 82 of the state's counties are designated as either whole- or partial-county Medically Underserved Areas (MUA), with 80 federally designated as either whole- or partial-county Health Professional Shortage Areas (HPSAs) (HRSA 2022). Additionally, a high concentration of Delta counties are classified as maternity care deserts where access to maternity health care services is limited or absent (Wallace et al. 2021). Transportation and travel, a particularly heavy burden, thus, becomes of critical nature to bridge the rural and urban divide.

While poverty and health care provider shortages are contributors to access and utilization, structural barriers that have emerged from social and historical events contribute to low engagement of African Americans with health care systems (Connell et al. 2019). Many studies have found that African Americans experience poor communication with their health care providers, medical distrust, and perceived discrimination when accessing health care (Cuevas, O'Brien, and Saha 2016). Another

overlooked but very important underlying risk factor is the social support system, which is a predisposing factor to experiencing poor maternal health outcomes (Israel 2020). Providing social support, adequate health information, resources, self-help skills, and an advocate within the clinical setting has been shown to improve birth outcomes (Kozhimannil et al. 2016).

In order to address these challenges, and to build on the resources that do exist in communities, alternative pathways and roles are needed. Community health workers (CHWs) are embedded in the community allowing them to promote health in ways that reflect the political, environmental, social, and cultural realities of the community (LeBan, Kok, and Perry 2021). When integrated as members of care delivery teams, CHWs are particularly adept at building peer-to-peer relationships of trust, rather than provider-client relationships (Rosenthal et al. 2010), enabling them to serve an intermediary position between the community and health system to improve access, quality, and cultural competence of service delivery (Kok et al. 2017). Most often community health workers are utilized to deliver culturally-appropriate health and prevention education, make referrals to health and social services, assist in navigating the health system and coordinating care, advocate for individuals and communities within the health and social service system, track and support progress in managing chronic conditions, and administer basic health screening tests (Rural Health Information Hub 2021). In rural communities these duties may be of particular importance as CHWs can extend the reach of healthcare providers and services in urban areas (Callaghan et al. 2019). As such, community health workers have been utilized in rural Appalachia as behavioral interventionists in chronic care management of Diabetes (Crespo et al. 2020), in rural North Carolina to lead lifestyle interventions targeted at preventing cardiovascular disease (Samuel-Hodge et al. 2020), and along the U.S.-Mexico border in Texas through motivational interviewing and home visits to target psychosocial and environmental factors that influence fruit and vegetable consumption (Yeh et al. 2022).

Community health workers play a particularly valuable role in the domain of maternal and child health and have been key figures in reducing maternal and child mortality through improved access to health care (Perry, Zulliger, and Rogers 2014). Effectiveness of prevention interventions with CHW involvement have shown distinct promise, especially in promotion of mother-performed strategies such as breastfeeding (Gilmore and McAuliffe 2013). Evidence suggests that breastfeeding education during pregnancy has a positive effect on

breastfeeding initiation and duration (Lumbiganon et al. 2016). Further, there is evidence that breastfeeding initiation rates are improved for women who receive interventions from non-healthcare professional counselors and support groups compared to women who receive standard care (Balogun et al. 2016). Most importantly, the delivery of breastfeeding information and education has the highest impact when it is provided concurrently in health systems and the community (Sinha et al. 2015).

This research note delineates the importance of community health workers as connectors in establishing a trusted continuum between urban Neonatal Intensive Care Unit (NICU) settings and rural community health centers (CHCs), with focus on lessons learned from the case of the Right! From the Start NICU Breastfeeding Initiative in Mississippi.

CASE DESCRIPTION AND METHODS

Modeled on community engagement and community based multi-method research, rationale for the initiative followed compilation and analysis of: (1) public data to explore patterns in preterm birth and low weight birth rates at the local to state levels as well as rates of breastfeeding initiation and continuation to 6 months, (2) key-informant interviews with mothers at high risk newborn follow-up visits (Canarios et al. 2017) and interviews conducted with mothers seeking care at CHCs who had given birth within the past three years concerning experiences navigating healthcare and decisions on how to feed their babies, (3) facilitation and documentation of community stakeholders and NICU initiative staff/leadership in analyzing and interpreting those data, and (4) a broader survey of physicians and nurse practitioners working with NICUs across the state to inform future Right! From the Start and policy initiatives. This research, some conducted prior to the start of the initiative with some elements ongoing in a parallel study during the course of the initiative, was useful for program planning and improvement.

The specific focus for this research note is the Right! From the Start NICU Breastfeeding Initiative that served vulnerable babies and families through outreach and education at CHCs and the NICU. The present article draws on secondary data on birth outcomes and primary data derived as a normal course of program administration, including baseline characteristics obtained during the intake process, follow-up information collected during systematic check-ins, and interviews conducted at the end of the program. Staff, including the CHCs and other team members, were trained on data collection and entry (using the RedCap system). Research methods and participant protections were reviewed by the

University of Mississippi Medical Center and University of Mississippi Institutional Review Boards. Additional anecdotal insights were obtained during program staff meetings and evaluation discussions.

FINDINGS

The Right! From the Start NICU Breastfeeding Initiative encouraged and supported breastfeeding among mothers of low (typically <2,500 grams but expanded to <2700 grams for the program intervention during year two) and very low weight (<1,500 grams) babies from eight non-metropolitan counties (as classified through the U.S. Department of Agriculture's Economic Research Service for the Rural-Urban Continuum Codes using 2010 Census data and building on nonmetropolitan and metropolitan definitions) located in the Core and Border counties of the Delta region of northwest Mississippi with recently high levels of low weight births (Table 1 and Map 1). These counties – Bolivar, Coahoma, Leflore, Panola, Quitman, Sunflower, Tallahatchie, and Washington – were selected on the basis of their Delta regional location, nonmetropolitan status, high levels of poor birth outcomes, and service by partners with community health centers. To establish the basis for potential future comparison over time (not addressed in this article because of data limitations on county-level breastfeeding rates in general and by birth outcome), the control counties of Holmes, Humphreys, Sharkey, and Tunica were identified at the start of the study.

Mothers interested in breastfeeding with babies fitting the low weight birth criteria and who were in the NICU were recruited for the study. Consenting participants were provided with breastfeeding education and support while in the hospital and with hospital-grade breast pumps at discharge. Follow-up visits after each mother and baby's discharge were led by community health workers cross-trained in lactation and social work interviewing skills to socioemotionally support mothers postpartum and connect them with needed resources in the community (e.g. Diaper Bank of the Delta, Supplemental Nutrition Assistance Program for Women, Infants, and Children, Head Start, and the Mississippi State Department of Health). Since mothers were traveling from the Delta to the NICU in Jackson (drives that would typically take more than two hours, one way to the metropolitan area), transportation assistance was provided for mothers for visits, breastmilk delivery, and appointments while their babies were in the NICU. Mothers and babies were scheduled to receive visits from their CHW, social work, and lactation support providers on a weekly basis. Two CHWs, each with an average caseload of approximately 25 families,

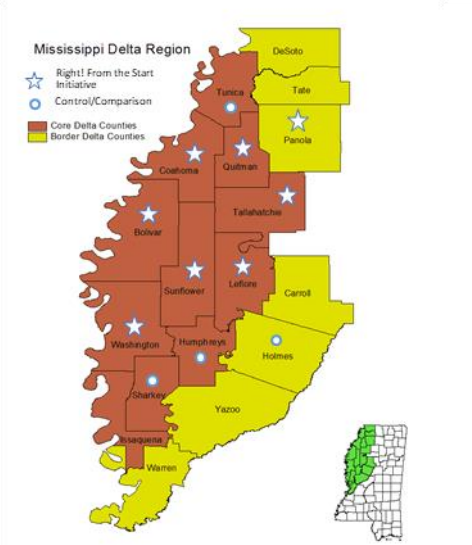
provided support and performed assessments with the goal of staying engaged with the mother through the end of the program or 24 months, which ever occurred first.

Table 1: Low Weight Birth Rates in Mississippi Counties Leading Up to the Right! From the Start Initiative (Per 100 Live Births, Aggregated for Time Periods)

Geography	**Low Weight Birth Rates** (<2,500 grams)	
	2008-12	**2013-17**
All MS Counties (N=82)	11.9	11.5
Non-Delta Counties (N=64)	11.8	11.3
Border & Core Delta Counties (N=18)	12.6	12.1
Right! From the Start Counties (N=8)	14.7	14.2
Control/Comparison Counties (N=4)	15.1	13.0

R!FTS Counties: Bolivar, Coahoma, Leflore, Panola, Quitman, Sunflower, Tallahatchie, and Washington. Control/Comparison Counties: Holmes, Humphreys, Sharkey, and Tunica.
Data Source: Mississippi State Department of Health – Mississippi Statistically Automated Health Resource System.
Map: State Data Center of Mississippi, Center for Population Studies.

Figure 1. Location of the Mississippi Delta Region and Right! From the Start Counties



Patient recruitment and enrollment for the initiative began in October 2017 and served 38 mothers and 43 babies (including 5 sets of twins). Approximately 62 percent of mothers completed their involvement in the program or were still enrolled at its end. Table 2 provides descriptive statistics for the participating mothers. The majority of the mothers (94 percent) were African American with an average age of 28 years and tended to be single (84 percent). They were primarily unemployed (52 percent not looking for work and 16 percent actively looking for work) with low household incomes (84 percent less than $20,000 in the past year). The babies averaged nearly 31 weeks of gestation, ranging from 23 to 37 weeks, and an average birthweight of 1,476 grams (ranging from 510 grams to 2,520 grams).

By definition, given the focus of the program, all of the NICU intervention participating mothers attempted to breastfeed their babies, but with varying levels of success. The average days babies were provided breastmilk from their mothers was nearly 69 days (median=53, interquartile range=51), with a low of 0 days (a mother who tried but could not successfully provide milk) and a high of 271 days. Among mothers, nearly 15 percent were still breastfeeding at six months into their study participation. Babies whose mothers completed the program or stayed until it ended averaged longer periods of being provided with their mother's breastmilk (difference in means=59 days, difference in medians=32).

Following the end of the Right! From the Start NICU Breastfeeding Initiative, interviews were conducted with 19 mothers who completed the program. On a scale ranging from 1=never to 10=always, the mothers tended to rate positive feelings towards breastfeeding higher (identifying with words such as rewarding, beautiful, joy; average scores of 9, 8, and 8, respectively) and negative feelings lower (nuisance, lonely, isolating, and anxiety stress; average scores 2, 3, 4, and 4). While only 42 percent of mothers reported being able to visit the NICU daily due to challenges in transportation, not being able to take time off work, and lack of childcare, the mothers still expressed positive experiences with the intervention staff in experiencing both social and technical/resource support. Concerning the former, one participating mother stated, "I felt like I had some support outside of my circle concerned about my baby and me." Another mother emphasized the technical help and resources in stating, "[The program] was very supportive. The staff made sure that everything I needed was given, down to nursing bras and equipment."

Table 2: Right! From The Start – Maternal Characteristics

(Total maternal participants = 38[a], Fall 2017- Spring 2019 Participants)

Characteristics	Total sample = 38 N (%)	Completed study (N, %) Yes = 21[b]	No = 13[b]
Race			
African American	29 (93.5%)	20 (95.2%)	8 (88.9%)
Caucasian	1 (3.2%)	0	1 (11.1%)
Other	1 (3.2%)	1 (4.8%)	0
Hispanic/Latina			
Yes	1 (3.2%)	1 (4.8%)	0
No	30 (96.8%)	20 (95.2%)	9 (100%)
Highest Education			
< High School	1 (3.2%)	1 (4.8%)	0
GED	2 (6.5%)	1 (4.8%)	1 (11.1%)
High School Degree	9 (29.0%)	5 (23.8%)	4 (44.4%)
College, No Degree	11 (35.5%)	9 (42.9%)	2 (22.2%)
Associate's Degree	6 (19.4%)	3 (14.3%)	2 (22.2%)
Bachelor's Degree	1 (3.2%)	1 (4.8%)	0
≥ Master's Degree	1 (3.2%)	1 (4.8%)	0
Marital Status (N = 31)			
Single	26 (83.9%)	18 (85.7%)	8 (88.9%)
In a committed relationship	1 (3.2%)	1 (4.8%)	0
Married	4 (12.9%)	2 (9.5%)	1 (11.1%)
Employment status (N = 31)			
Disabled	2 (6.5%)	2 (9.5%)	0
Unemployed – not looking for work	16 (51.6%)	10 (47.6%)	6 (66.7%)
Unemployed – actively seeking work	5 (16.1%)	2 (9.5%)	2 (22.2%)
Employed in full-time job	7 (22.6%)	6 (28.6%)	1 (11.1%)
Self-employed	1 (3.2%)	1 (4.8%)	0
Yearly household income (N = 31)			
Less than $20,000	26 (83.9%)	18 (85.7%)	7 (77.8%)
$20,000 to $29,999	3 (9.7%)	2 (9.5%)	1 (11.1%)
$30,000 to $39,999	1 (3.2%)	0	1 (11.1%)
$40,000 or higher	1 (3.2%)	1 (4.8%)	0
Type of birth			
Vaginal	16 (42.1%)	8 (38.1%)	6 (46.2%)
C-section	22 (57.9%)	13 (61.9%)	7 (53.8%)

Note: min = minimum, max = maximum. Frequencies and percentages of mothers within each category are presented. Perc. Might not add up to sample sizes due to missing values on variables. [a]5 of 38 mothers had twin births, resulting in 43 infant participants. Descriptive statistics are reported only for individual mothers to avoid double-counting. [b]4 of 38 mothers had missing values for study completion data and therefore, are not reported here. [c]Mothers had the option to select more than one appropriate choice for these questions.

INSIGHTS AND FUTURE DIRECTIONS

The Right! From the Start NICU Breastfeeding Initiative was a test case in connecting and coordinating services for vulnerable families between rural and urban places and across the health center-hospital divide. Connecting and coordinating mothers and babies to services in the rural/nonmetropolitan region of the Mississippi Delta with the specialized services at the state's highest-level hospital NICU has long been challenging because of communication and transportation challenges, as well as institutional boundaries. For instance, the combination of unfamiliarity between providers in both types of organizations and being divided by space has made it difficult for pediatricians to feel comfortable releasing babies needing the greatest care. By coordinating between the community health centers in the region and the NICU in metropolitan Jackson, communication and support were provided in new ways that allowed for some transcending of time and space. Nonetheless, it was still difficult for the range of providers between the locations to engage with each other in a regular manner, given travel distance and time as impediments for very busy healthcare workers. Program leaders and the CHWs served to connect the two with mothers, but even travel in the Delta proved challenging, given the wide expanse of the region. As R!FTS was piloted before the COVID-19 pandemic, telehealth models of delivery were not included. Future initiatives could benefit from the use of such technology.

The use of community health workers in different settings continues to grow as the occupation itself continues to evolve. This initiative focused attention on further development and application of community health workers in the rural Mississippi Delta. Future initiatives will benefit from the rapidly expanding role of community health workers. The following lessons learned and recommendations may prove informative to such efforts.

When in need of the services for their babies, mothers must consider several factors, including proximity and level of care. Oftentimes, acute care and community health function in silos that may impede solutions to complex community issues. Therefore, efforts like hospital-CHC networks should coordinate across organizations and urban and rural locations. Uniting providers, patients, and engaging community residents through collective efficacy and place-based interventions will rely heavily on community health workers (Dankwa-Mullan and Perez-Stable 2016).

While Right! From the Start utilized community health workers to support and advocate for patients through their NICU stay and back into

the community, key stakeholders were less familiar with the roles of others. Thus, conditions attributed to collective success (e.g., a common agenda, shared measurement systems, mutually reinforcing activities, continuous communication, and backbone support organizations) must be examined further, as noted in collective impact literature (Kania and Kramer 2011). Efforts must include increased outreach to urban providers in order to enhance their familiarity with resources and services available in rural communities.

Further, these initiatives should focus on connecting services prior to birth. Few women (five out of 19 mothers who completed the program) reported receiving breastfeeding information prior to delivery. Intervention staff noted that some mothers felt their breastmilk was less important once their babies were released from the NICU as they interpreted release as indicating they were “healthy.” Thus, promotion, protection, and support of breastfeeding must be approached at a multidimensional level with attention paid to preconception and beyond. Increasing community awareness of breastfeeding, ensuring proper education prior to birth, and having peer support systems distributed across settings will be most beneficial.

Healthy People 2020, the federal government’s health prevention agenda, and the American College of Obstetricians and Gynecologists recommend women begin prenatal care in the first trimester and attend at least 10 visits (Riley and Stark 2012) with adequate prenatal care being instrumental in improving birth outcomes and even more so for African Americans (Mazul, Ward, and Ngui 2017). However, there is disparate use of prenatal care by African Americans stemming from structural barriers, psychosocial stress, and attitudes and perceptions (Alexander, Kogan, and Nabukera 2002). Given the positive effect of prenatal care on both birth outcomes and breastfeeding, ensuring prenatal care is delivered in a culturally competent and relevant setting, such as a community health center, should be a primary focus. Community health workers, who are grounded in the community they serve and trusted by residents, not only can improve access to prenatal care but also serve as a connection between settings in the community and urban hospitals where delivery can occur. Cross-training of community health workers should also be a priority when serving pregnant women so that they have an understanding of the breastfeeding basics, importance, and relevant resources.

The intermediary position of community health workers is pivotal in optimizing health within rural communities. Efforts to increase support,

understanding of their role, and communication between sectors will aid in building trusting relationships that can benefit future interventions. Right! From the Start created a launching point for further work and collaborations between the rural-urban continuum and the health center-hospital divide.

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