The Perinatal Periods of Risk Approach to Improving Infant Mortality Through a Community Hospital in South Los Angeles

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Abstract

South Los Angeles suffers from many poor social conditions and health outcomes. Among the numerous health disparities, the high infant mortality rate in South LA, especially in its African American population, demonstrates an appalling disparity requiring intervention. This study uses the Perinatal Periods of Risk (PPOR) approach to investigate the areas of excess infant mortality and risk factors in South LA leading to its high infant mortality rate. In combining public health data with information from a focus group of OB/GYN, CNM, neonatology, and preventative care specialists, we develop recommendations for the Martin Luther King, Jr. Hospital to address its community's high infant mortality rate. We recommend strategies that improve preconception care, interconception care, and prenatal care as the data highlights Maternal Health and Prematurity to be the most significant risk factors in the community.

Background and Purpose

South Los Angeles Infant Mortality Rate

South Los Angeles is home to over a million residents who live in neighborhoods like Crenshaw, Compton, and Lynwood.[i] Unfortunately, high rates of poverty, low levels of education, poor access to medical care, and poor access to nutritious foods characterize these areas.[ii] Along with these poor social conditions, South LA suffers from a myriad of poor health outcomes, such as diabetes, obesity, hypertension, breast cancer, and colorectal cancer, to name a few. Furthermore, each of these diseases represents a health disparity; in each of the

aforementioned diseases, South Los Angeles has the highest rates when compared to those in other LA County districts, and in the United States overall.

This study investigates another significant health disparity found in South LA, that of the infant mortality rate (IMR). The IMR is a valuable tool in understanding the public health conditions and needs of a community. A former Chief Medical Officer of the United Kingdom once explained, "Infant mortality is the most sensitive index we possess of social welfare and of sanitary administration, especially under urban conditions."[iii] He later compared infant mortality to the clinical thermometer of a physician by stating that it "bears the additional characteristic that - like the thread of mercury in the thermometer - it goes up and down with deleterious or salutary changes in the social, sanitary, and economic conditions of the people."[iv]

In 2009, South Los Angeles, also known as Service Planning Area 6 (SPA 6) had an infant mortality rate of 5.4%.[v] This compares with a 4.9% IMR for LA County as a whole. More drastically, South LA houses a large African American population, and the IMR for African American infants in SPA 6 was a shocking 21% at that time.[vi] Figure 1 illustrates the disparities between LA County, SPA 6, and SPA 6 African Americans.[vii] (Note that the graph shows both infant and fetal deaths, which accounts for more deaths than the IMR.) Furthermore, these rates show quantitatively the impact of the infant mortality rate on the community; however, it would be impossible to show the value and significance of the loss and devastation that these numbers represent.

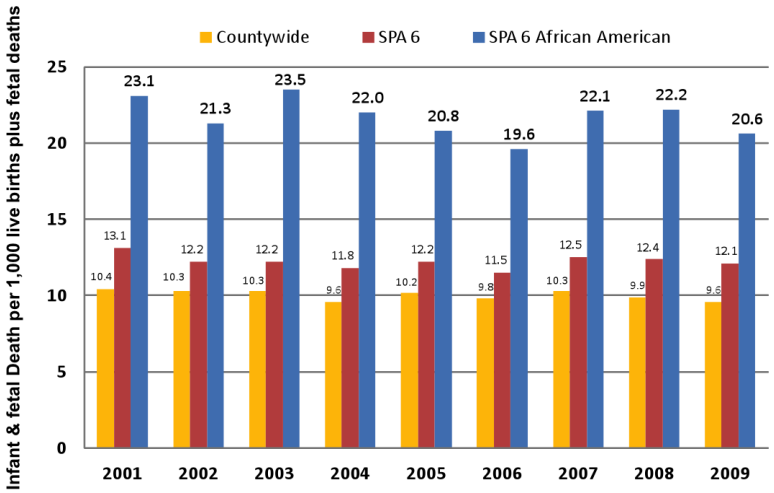


Figure 1.

Martin Luther King, Jr. Hospital

In an effort to address the infant mortality rate, this paper identifies the underlying causes and risk factors of the high IMR in SPA 6, and then proceeds to determine the potential targeted interventions that would best combat this issue. At this time, there is a unique opportunity to design and implement interventions through the re-opening of the Martin Luther King, Jr. Hospital (MLK), and so interventions are specifically designed around how this community hospital could affect the IMR. MLK Hospital was a 600-bed hospital in Compton that closed in 2007 due to conditions that did not meet national standards. However, it will re-open in 2014 as a 100-bed community hospital.[viii] This research looks specifically into what MLK Hospital can do to address the IMR of the surrounding community.

PPOR Analysis

This IRB-approved study followed the guidelines of the Perinatal Periods of Risk (PPOR) strategy to address the IMR in communities. The PPOR analysis is a "new analytic framework that enables urban communities to better understand and address fetal and infant mortality"[ix] by offering a "comprehensive community-based approach for translating data into strategic actions to improve women and infants' health."[x] There are 6 stages. In step 1,the community comes together and mobilizes community stakeholders to align their vision, prioritize goals, and assess readiness in addressing the IMR in their community. In step 2, the team researches the infant mortality rate and identifies areas of excess mortality. From the results in step 2, step 3 identifies the most strategic interventions that address the causes of the infant mortality rate, and formulates an implementation plan. Step 4 implements the strategy while step 5 monitors and evaluates the strategy. Step 6 focuses on sustaining the intervention.[xi]

PPOR benefits include ensuring that the infant mortality intervention is data-driven and focused by identifying areas of excess mortality and targeting those into community-based interventions.[xii] The PPOR emphasizes first understanding the areas of excess mortality, and then targeting those disparities. It "transforms the complexity of feto-infant mortality into clearer, more specific problems amenable to interventions."[xiii] Figure 2 shows how infant mortality is broken down into four different risk areas: Maternal Health/Prematurity, Maternal Care, Newborn Care, and Infant Health, and Figure 3 illustrates how to target those areas with community solutions.[xiv]

Figure 1.

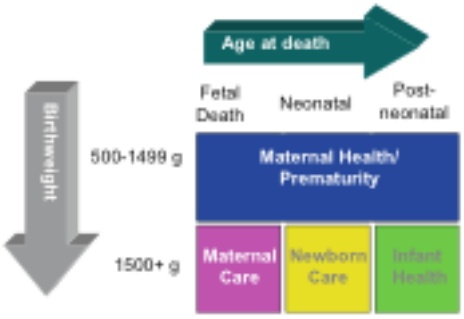
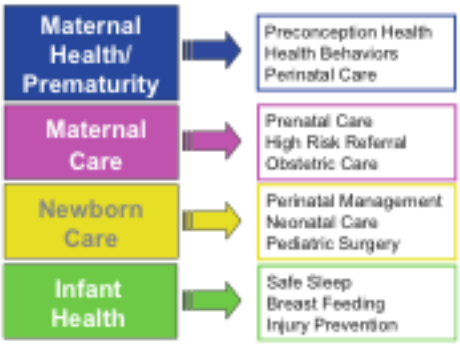


Figure 2.



In 2002, the Maternal, Child, and Adolescent Health Programs of LA County Public Health partnered with a community task force to perform the first three stages of the PPOR analysis in Antelope Valley (SPA 1).[xv] They identified Maternal Health/Prematurity and Infant Health as the most important periods of risk for research and intervention, with specific risk factors including inadequate prenatal care, pre-existing medical conditions, young maternal age, and pre-term and/or low birth weight births, among others. Strategies implemented included: expanding case management of high-risk women, increased family planning services and local

resources, better training for nurses, and public health initiatives to increase awareness of infant safety. Since implementation of PPOR strategies, the infant mortality rate in SPA 1 has decreased. In particular, this decrease had a significant effect within the African-American community, which contained the most disparity.[xvi]

The success of the PPOR analysis in Antelope Valley (SPA 1), and in other areas nationwide, provided strong evidence and encouragement to perform a PPOR analysis in South Los Angeles (SPA 6). Furthermore, during the PPOR analysis of SPA 1, LA County Public Health collected new data and surveys from all of LA Counties regarding maternal and infant health, such as the LAMB survey (Los Angeles Mommy and Baby Project). This information is now accessible for other SPAs, thus providing a stronger foundation for future PPOR analyses in other districts. In addition, the LA County staff received training on conducting the PPOR analysis during the SPA 1 PPOR research. Overall, conducting a secondary PPOR analysis in LA County would provide a good use of the resources that the county has already invested in.

It is important to note that this research does not perform a complete PPOR analysis from stage 1 to stage 6. We used Step 1, 2, and 3 to gather stakeholders, investigate the IMR, identify underlying risk factors, and develop an intervention plan. However, we formulated the plan into policy recommendations for MLK hospital, and they have yet to be implemented, monitored, evaluated, or sustained (steps 4-6). Instead of a broad, general PPOR analysis that is detailed in the literature, this research selects certain PPOR strategies to develop targeted interventions only within a community hospital setting. Therefore, this work not only serves to address infant mortality in our community, but it also sets a new precedent in using part of the PPOR analysis to address infant mortality through a more narrowed lens, such as through a community hospital in our case. This has direct applications for other hospitals, clinics, non-profits, or governmental

organizations that may not have the funds, resources, or time to commit to a full PPOR analysis. Our work shows that the PPOR is a useful tool in a more narrow, isolated situation, in addition to its use in a broader, more general community effort.

Definitions

For the purposes of this paper, South Los Angeles is defined using the Service Planning Area (SPA) distinction. LA County Public Health divides the county into different SPAs based on geographic location. SPA 6 and South LA will be used interchangeably throughout this paper, and represent data from the following zip codes: 90001-90003, 90007-90008, 90011, 90016, 90018, 90037, 90043-44, 90047, 90059, 90061-62, 90220-90222, 90262, 90732.

Materials and Methods

Data Collection

In following the PPOR analysis, we researched the infant mortality rate in South Los Angeles through first identifying areas of excess mortality, and secondly through identifying which specific risk factors led to these disparities. We analyzed public data sets provided by Los Angeles County Department of Public Health, such as the Los Angeles Mommy and Baby Project (LAMB) and the LA County Perinatal Indicators, as well as data provided by the California Department of Public Health, such as Improved Perinatal Outcome Data Reports (IPODR). Due to the previous initiatives of LA County Public Health Maternal, Child, and Adolescent Health (MCAH) Programs, there was a wealth of information available, such as the LAMB project. The Los Angeles Mommy and Baby surveyed over 6,264 mothers representing over 151,813 live births in Los Angeles County during 2007 on topics such as preconception health, prenatal care and maternal medical conditions during pregnancy, psychosocial conditions

during pregnancy, behavioral risk factors, and postpartum care and infant health. The County organized the data by race/ethnicity, and also by Service Planning Area. This provided direct access to risk factors affecting mothers in SPA 6. In addition, data queries on the LA County Public Health website provided information to other characteristics describing women of childbearing age (ages 15-44).

Focus Group

To gain a more qualitative understanding of the infant mortality and risk factor data and to brainstorm potential interventions, we organized a focus group of OB/GYN, neonatology, certified nurse midwives (CNMs), and prenatal case managers. We identified perspective participants using the following qualifications: patient population consisted of SPA 6 residents and included some high-risk patients, previous experience in the field of public health related to maternal and infant mortality, and are leaders in their field or at their clinic. We invited over 20 doctors, and 5 attended the focus group. Participants included one OB/GYN, one case manager for prenatal and interconception patients, two CNMs, and one neonatologist. Together, they represented an average of 27.8 years in practice, and together the work experience includes time over a variety of Los Angeles hospitals and clinics: St Francis Medical Center, Eisner Pediatric and Family Medical Center, the T.H.E. Clinic, Harbor-UCLA Hospital, Centinela Hospital, Daniel Friedman Hospital, MLK Hospital, and South Bay. All serve uninsured and Medi-cal patients with large minority populations. We tape-recorded, transcribed, and analyzed the focus group discussion to elicit possible solutions.

Results

PPOR Step 1: Gathering the Community

As previously mentioned, the first step of the PPOR analysis includes gathering the community, aligning the vision, and making the commitment to work together to lower the infant mortality rate. This PPOR analysis was performed to research and develop strategies for a specific niche—that of the community hospital—and as previously mentioned, a full PPOR analysis was not performed. However, we did identify members of the medical community, non-profit, and governmental organizations within the community who provided individual guidance and various prospectives for our research. Furthermore, this paper advocates for a full PPOR analysis to be conducted in SPA 6, and the previous identification of these community stakeholders will serve as a starting point for implementing PPOR Step 1 in the future.

PPOR Step 2a: Identification of Excess Mortality

Figure 4 demonstrates that the area of Maternal Health and Prematurity holds the greatest disparity in terms of infant mortality. LA County Department of Public Health provided these values for both SPA 6 and the reference group from 2006-2007 data.[xvii] The reference group is a Non-Hispanic White resident of Los Angeles County with more than 20 years of age and with 13 or more years of education. We determined the quantity of excess mortality from subtracting the reference group from SPA 6.

Figure 4.

	SPA 6	Reference Group	Excess Mortality
Maternal Health/Prematurity	**8.00**	**3.9**	**4.1**
Maternal Care	2.0	1.2	0.8
Newborn Care	0.9	0.9	0
Infant Health	1.7	0.7	1
Total Infant Mortality Rate	13.4	6.6	6.8

PPOR Step 2b: Identification of Risk Factors

To further identify what risk factors lead to the disparity in maternal health and prematurity, we examined more data. These include: Preterm birth, Low birth weight, Pre-natal care, Teen Pregnancy, Substance abuse, and Racial Demographics. Out of all of the Los Angeles SPAs, SPA 6 has the highest rates of preterm births, the highest rates of low birth weight babies, and the 2nd highest rate of very low birth weight babies.[xviii] Preterm births and low birth weight are two of the major risk factors leading to infant mortality in the neonatal period. Another risk factor for poor birth outcomes is late entry into prenatal care; however, our results, from two different sources, show that late entry into prenatal care does not correlate directly with poor birth outcomes.[xix] It is important to note that the quality of prenatal care was consistent across the different LA SPAs, as reported by mothers in the LAMB survey.[xx] Consequently, the limited impact of prenatal care could be due to the lack of preconception care. Recently the literature has increasingly highlighted the importance of going beyond prenatal care to focus on preconception care to improve infant mortality,[xxi] as suggested by the New York Times article, "That Prenatal Visit May Be Months Too late."[xxii]

Our research also showed that SPA 6 has the highest rate of teenagers who give birth,[xxiii] as well as a high prevalence of smoking mothers, especially in its African American mothers.[xxiv] Finally, SPA 6 has the highest population of African American mothers in Los Angeles County, as well as a high Latino population.[xxv] This is significant because Hispanics are more likely to be uninsured, not taking a multivitamin, and not breastfeeding, while African Americans are more likely to have hypertension, diabetes, STDs, asthma, anemia, and drug use. Both, as compared to Whites and Asians, are more likely to be obese, live in unsafe neighborhoods, and have less support systems and resources.[xxvi]

The focus group also elicited various risk factors, and gave weight to risk factors previously identified in the data. The physicians, nurses, and case manager specifically mentioned their patients having poor birth outcomes due to drug use (tobacco, marijuana, and alcohol), poor nutrition, lack of folic acid taken before pregnancy, stress, unplanned pregnancies, obesity, teenage pregnancy, and co-morbidity (i.e. hypertension). These risk factors reflected the ones highlighted in the data, and the ones identified in the medical literature that lead to infant mortality.

PPOR Step 3: Potential Interventions

Figure 5 highlights the main themes and associated quotes mentioned by the focus group participants during the brainstorming session of potential interventions to lower the infant mortality rate. The focus group participants mainly highlighted that because most of the excess death is related to maternal health and prematurity, interventions need to focus on strengthening preconception care and interconception care. They relied on their experience with various community strategies that have worked well in the past to highlight what strategies can be applied to or strengthened in SPA 6 to have an impact in lowering the infant mortality rate.

Figure 5.

Potential Intervention	Details and Quotes from the Focus Group
Preconception Care	• "When you're trying to improve maternal health—you start with preconception health." • "All the emphasis must go to the mothers even *before* they get pregnant." • "You need preconception care, and once they get pregnant, you need quality prenatal care."
Centering Pregnancy (a model of group prenatal care)	• "It's group prenatal care and it decreases the rate of prematurity by about 33% in a number of studies, and even more so with African Americans. … This is a very effective way of decreasing prematurity and empowering the women to take charge of their own health." • "I'm very excited about Centering Pregnancy because that encompasses the social support, education, sending those women to help each other – I believe that has a key part in decreasing LWB and infant mortality." • "In Centering Pregnancy you meet with your group. You're in a cohort of women who have similar gestational ages, so you go through prenatal care as a group, and it replaces the exam. And you get a 2 hour visit at each of the 10 visits that you have—instead of having 10 minute if you're lucky with your provider and half of the time measuring you belly and listening to your baby, and maybe answering one question that you might be bold enough to ask-- you've got the group asking the questions and talking about topics and in that group, you're likely to have some first time moms, and then some teen moms and then experienced moms who can talk from their experience."
Interconception Care	• Through the Interconception Case Management Program that LA Best Babies Network started "we were able to eliminate the health disparity in African Americans in terms of infant mortality. … We can demonstrate that with intensive case management that they provide between pregnancies and trying to focus on optimizing women's health between pregnancies and subsequent pregnancies—we can decrease, eliminate that huge disparity [and] prematurity."
Interventions during Prenatal Care	• Trans-vaginal cervical lengths • Progesterone Treatments
Other Interventions	• Home visitation program, Nurse-family partnerships, Healthy Families America, Early Head Start
Interventions addressing infant mortality	• Back-to-sleep program for SIDs • Promoting breastfeeding
Interventions specific to MLK Hospital	• NICU not recommended by majority of the focus group • Community activities and educational campaigns • System in place for transportation and primary prevention of preterm birth (i.e. Mag-sulfate, steroid shots, etc) • Education system explaining to community to NOT go to MLK in preterm labor • "I think we really need to have health education as a major part of a wellness center at King, and have lots of different types of activities and groups or things like that that people can participate in or learn from." • Mid-wifery practice for triage and support • Ongoing developmental pediatric services for surviving preterm babies

Assessment

The focus group highlighted that Martin Luther King, Jr. has a unique opportunity to serve SPA 6 as a "wellness-focused, prevention-focused" community hospital. This coincides with the needs of the community because preconception care was the most supported potential strategy identified by the focus group and the PPOR data analysis. This paper makes the following recommendations to MLK Hospital, which can also be applied to other community hospitals looking to address their community's infant mortality rate.

1. **Preconception Care**: Encourage each OB/GYN whose patients deliver at MLK to follow the CDC Preconception Care Guidelines at each outpatient visit, including Pap Smears, annual visits, etc
2. **Interconception Care**: After each women delivers at MLK, make sure she immediately has an interconception care visit to develop a reproductive life plan and receive contraception
3. **Prenatal Care/Support System**:
    a. Start an elective program, such as Centering Pregnancy, for the women who plan to deliver at MLK Hospital
    b. Offer progesterone treatments and trans-vaginal cervical lengths at the hospital
4. **Transportation Planning in the absence of a NICU:**
    a. Educational campaign to educate the community that preterm labors should NOT go to MLK Hospital, but to St Francis, Centinela, Harbor-ULCLA, etc.
    b. Developing a plan for women in preterm labor who arrive at MLK Hospital who need to be transported
5. **Mid-wifery practice** to handle the caseload of high-risk mothers in SPA 6

Conclusion

In conclusion, both focus group and data collection highlighted the need for better preconception and prevention care. As a community wellness hospital, MLK Hospital can do this in the following ways: through educational campaigns and activities, and through partnerships with local clinics that will reinforce preconception care, interconception care, and better support for women during prenatal care. Another important recommendation for MLK is that since the hospital will not have a NICU, it needs to create a plan to educate the community members about what patients needs MLK can and cannot address, and which hospitals can help them in emergency high-risk delivery situations. Finally, MLK needs to be prepared to handle patients who do not follow the transportation guidelines, for example the high-risk pregnant woman arriving in the MLK ED in preterm labor, but needing transportation to a hospital that does have a NICU.

This paper uses the PPOR analysis in a specific, focused way to shed light on what interventions a community hospital could perform to address the infant mortality rate. We set a trend in demonstrating that the large investments needed for broad PPOR analysis is not always required to lower the infant mortality rate. Instead, a nonprofit, clinic, or hospital could perform a smaller-scale PPOR analysis to increase the efficacy of its own maternal and infant health programs. Nonetheless, it is also our recommendation that the community and health care leaders of SPA 6 and LA County perform a full PPOR analysis. Although our work demonstrates that it is possible to use the PPOR to develop strategies in a very specific situation we believe there will be more benefit for a complete PPOR to be done since the more resources could lead to more interventions.

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