

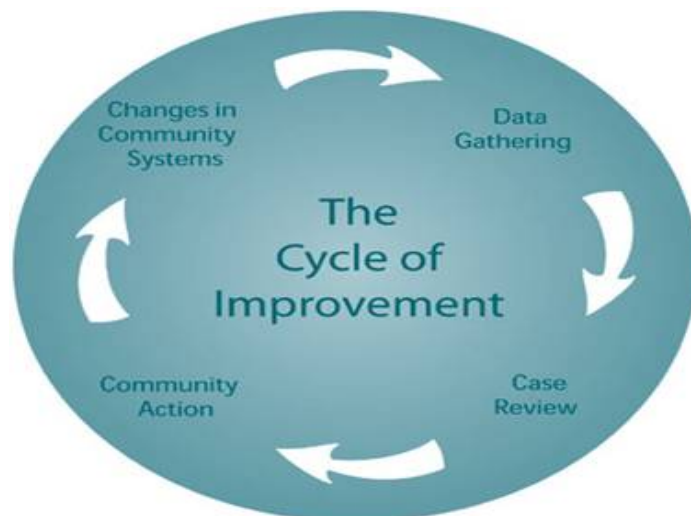


Revitalizing Fetal Infant Mortality Review: Ventura County Perinatal Periods of Risk Analysis 2007 - 2011

Fetal Infant Mortality Review

The Fetal Infant Mortality Review (FIMR) Program is a community-action driven process to understand the health care system and social problems contributing to fetal and infant deaths and find strategies to prevent them. FIMR recommendations may mobilize communities affecting women, infants, and their families through systems and community changes in order to reduce fetal and infant deaths. Ventura County is one of the 16 jurisdictions with a FIMR Program in California. FIMR members are medical doctors and nurses from different hospitals and clinics, public health nurses, epidemiologist, health educators and other staff from Ventura County Public Health, and other members from public and community organizations.

There was a need to review the trends of fetal and infants deaths to revitalize and improve the recommendations for a better Ventura County. This report includes an introduction to the Life Course Theory (LCT), the beginning of Perinatal Periods of Risk (PPOR), a collective report of main maternal issues encountered in the Ventura County cases reviewed by the FIMR team.



Life Course Perspective and Infant Mortality

Infant mortality is an indicator of population health. By decreasing infant mortality, there will be improvement in the health of mothers and babies within the entire community. The Healthy People 2020 goal is to reduce infant deaths to no more than 6 deaths per 1,000 live births. Although this goal is being met in Ventura County, rates are still slightly higher than the state of California (see Figure 1 below).



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According to Halfon (2009), from a Life Course Perspective, health is a developmental process occurring throughout the lifespan. The life course approach conceptualizing health care needs and services evolved from research. It finds the important role played by early life events in shaping an individual's health trajectory. The life course perspective is actually a community-focused theory since social, economic, and environmental patterns that affect one's health are closely linked to community and neighborhood settings.

Infant mortality is influenced by a woman's health, healthcare before and during pregnancy, labor and delivery, and by the baby's healthcare after delivery. Through the Life Course Perspective, it is known that a woman's health (and even the father's health) prior to conception can affect the health of their baby.

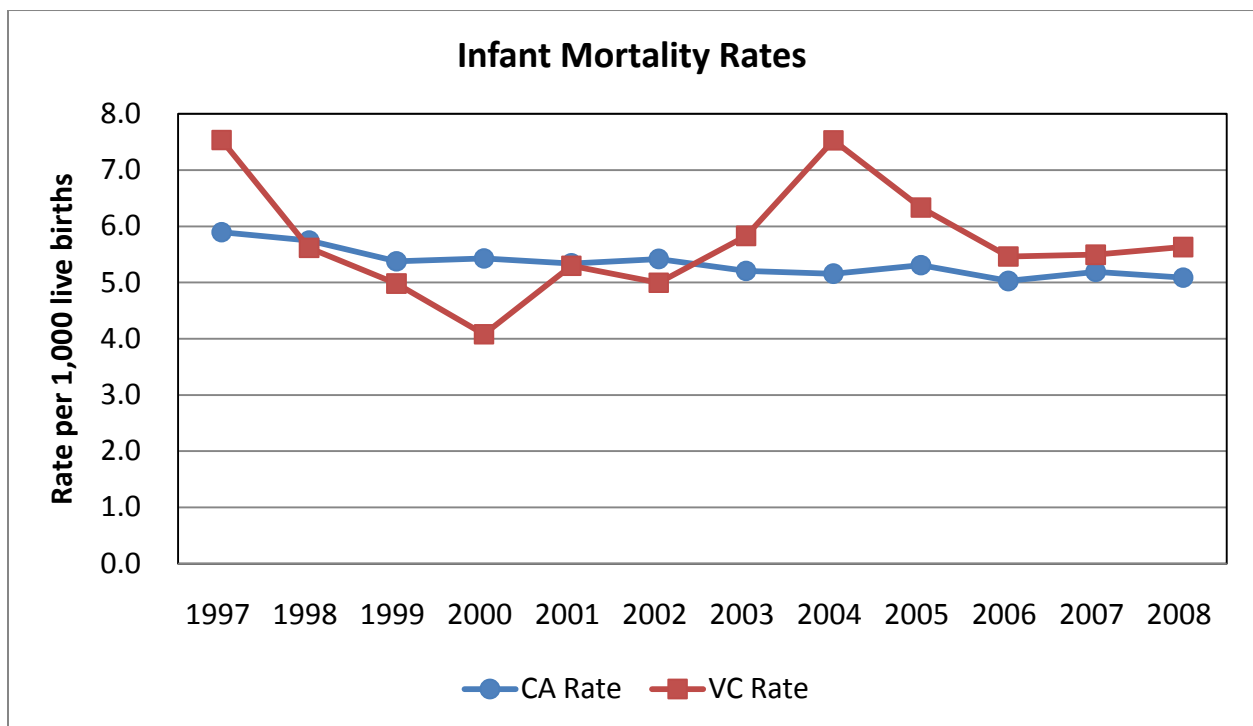


Figure 1 – Source: Family Health Outcomes Project (FHOP), University of California San Francisco.

Unfortunately, there is a disparity that exists between infant mortality rates for Whites versus Hispanics in Ventura County. From 1997-2008, infant mortality rates for Hispanics were higher than infant mortality rates for Whites (6.0 versus 4.5 per 1,000 live births, see Figure 2 below).



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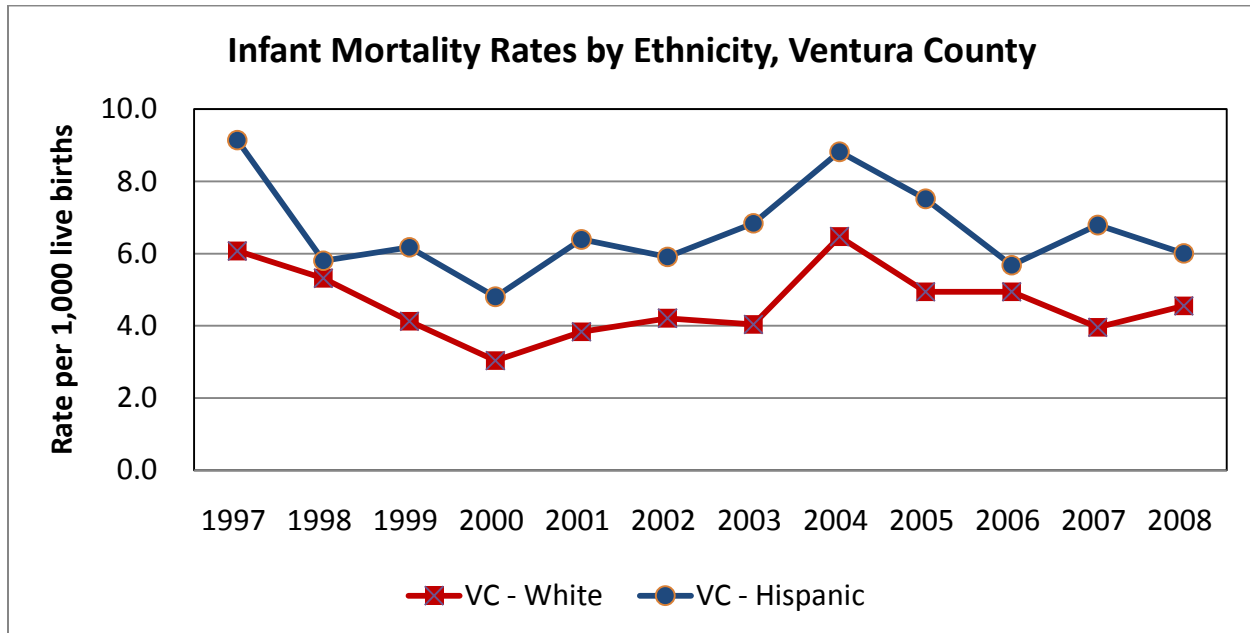


Figure 2 – Source: Family Health Outcomes Project (FHOP), University of California San Francisco.

Perinatal Periods of Risk Analysis

To begin looking at why this disparity exists within Ventura County, the Fetal Infant Mortality Review (FIMR) collaborative decided to conduct a Perinatal Periods of Risk (PPOR) analysis of fetal and infant deaths. The six stages of the PPOR approach were developed by Dr. Brian McCarthy and colleagues at the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). They realized that causes of perinatal death are closely related to both age at death and birth weight. Therefore, the PPOR approach uses both of these pieces of information to learn more about why babies are dying. The stages of the PPOR approach include assuring community and analytic readiness, conducting the analytic phases of PPOR, developing strategic actions for targeted prevention, strengthening and launching new prevention initiatives, monitoring and evaluating the approach, and sustaining stakeholder investment and political will. The remainder of this data brief will focus on the results of conducting the phase 1 PPOR analysis.

Standard Infant Mortality Rates do not include fetal deaths, but the PPOR approach is about using every bit of information that is available. Fetal deaths, like infant deaths, are important to their families. From 2007-2011, there were 209 infant deaths and 265 fetal deaths within Ventura County. Fetal deaths are an important picture of maternal and child health and provide information about mothers, their communities and health systems.



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The difference between PPOR and traditional infant mortality analysis is that PPOR examines fetal and infant mortality in two dimensions. The first dimension is birth weight, which is reported in grams. For this analysis, fetal and infant deaths with a birth weight of less than 500 grams were excluded. There is inconsistent reporting for the very smallest fetal and infant deaths not only across the United States, but even at the local level between two different physicians in the same hospital. The second dimension for PPOR analysis is the age at death. Deaths that occur after one year of age are excluded from the analysis similar to traditional infant mortality analysis. In California, a death certificate is produced at 20+ weeks gestation, therefore, all fetal deaths of 20+ weeks gestation were included if they met the weight criteria (traditionally 24+ weeks gestation is utilized in the analysis).

As stated above, PPOR examines death in two dimensions, which form a grid of boxes that indicate periods of risk. In looking at the two dimensions, statistical methods were utilized, by the researchers at the CDC and WHO, to combine the periods of risk that had similar causes of death and similar maternal risk factors. This resulted in the development of four periods of risk (see Figure 3 below); the four periods of risk were given labels that suggest the primary preventive direction for the deaths in that group. The dividing lines had been chosen so deaths in the same box had similar causes of death and maternal risk factors which meant that they also have similar solutions.

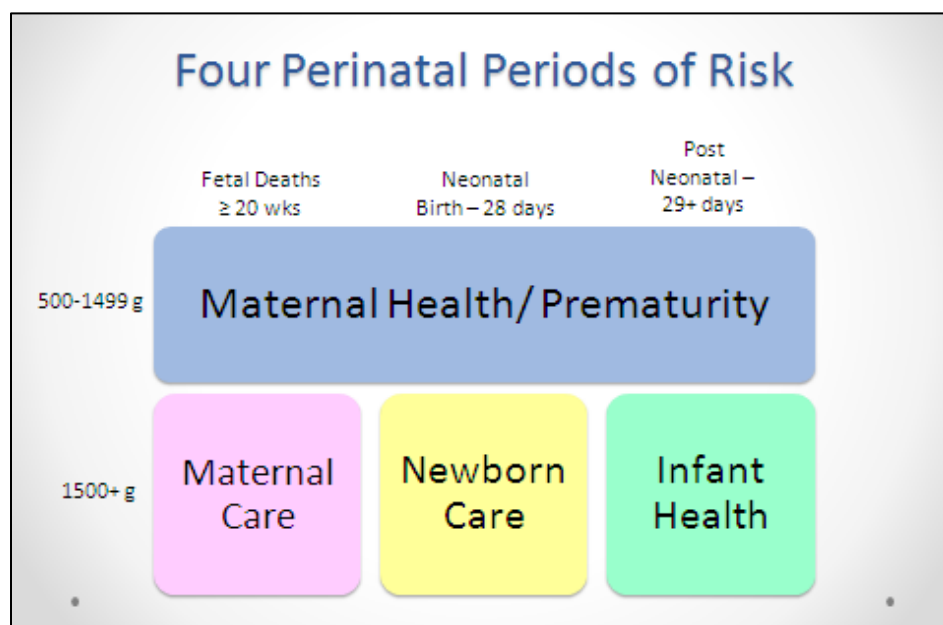


Figure 3 – Source: City Match.



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The Phase 1 PPOR analysis helps to determine which periods of risk account for the greatest excess mortality within Ventura County. Then this information can be utilized to prioritize limited resources by only focusing on those periods of risk identified to maximize the impact of interventions taken on by FIMR.

For phase 1 PPOR analysis, deaths were counted if the mother resided in Ventura County when the baby was born or the fetus delivered. The birth must have occurred from 2007-2011, and the baby must have died before its first birthday. Changes over time in healthcare practices prevent PPOR analysis from including more than five years worth of data.

Of the 474 fetal and infant deaths that occurred from 2007-2011 in Ventura County, only 59.7% (283) were included in the phase 1 PPOR analysis because the other deaths did not meet the criteria for inclusion or had missing information. The 283 deaths were categorized into periods of risk, and mortality rates (deaths per 1,000 live births) were calculated by period of risk (see Figure 4 below).

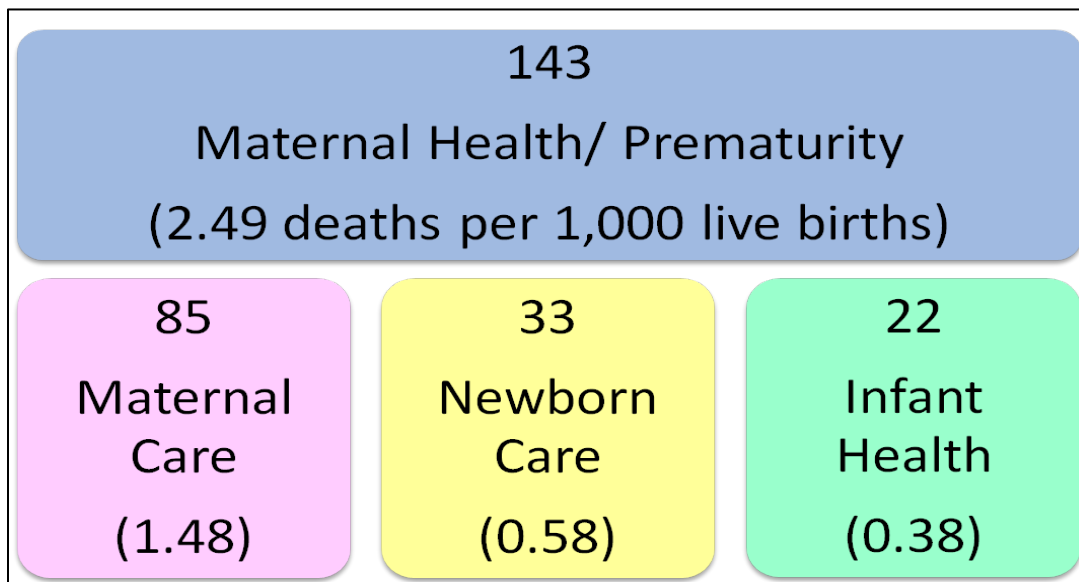


Figure 4 – Source: Ventura County Public Health Maternal, Child, and Adolescent Health.

In order to determine what rates should be expected in each period of risk, a reference group is utilized that experiences low fetal and infant mortality rates. The underlying assumption is, “if one population can experience better fetal-infant mortality rates, then other populations should be able to attain the same rates.” Reference populations can be internal, a subpopulation within the community, or external, some appropriate population from outside the community.



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For the purpose of this analysis, an internal reference population was chosen. An internal reference population should represent at least 15% of the overall study population to ensure realistic community representation and to have sufficient numbers for calculation of rates. As stated previously, Whites experience better perinatal outcomes than Hispanics in Ventura County. Therefore, the internal reference group chosen was Non-Hispanic, White women with an 11th grade education or higher who were residents of Ventura County at the time of the baby’s birth. The birth and the death must have occurred between 2007 and 2011. There were 60 deaths that met the criteria with this reference population which is the minimum requirement for calculation of rates; the internal reference population represents about 30% of the overall study population.

In order to compare the study and the internal reference populations, mortality rates by period of risk were calculated in the same fashion for the reference population. Then the mortality rates in the reference group were subtracted from the rates in the entire study population in order to determine the excess mortality. As an example, for the Maternal Health and Prematurity period of risk, there were 0.86 excess deaths for every 1,000 live births and fetal deaths (see Figure 5 below).

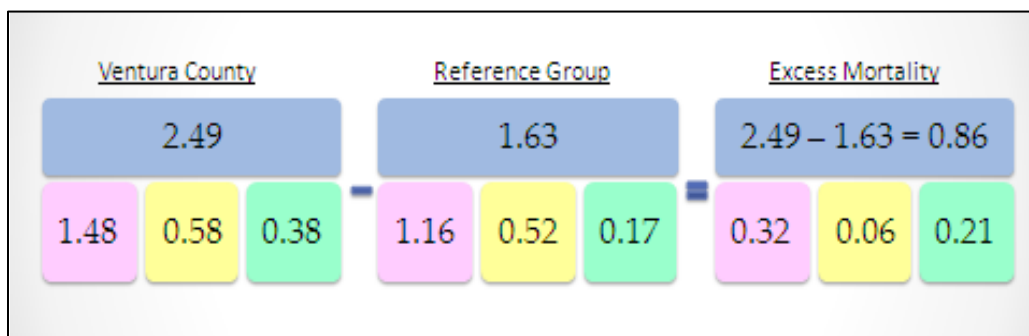


Figure 5 – Source: Ventura County Public Health Maternal, Child, and Adolescent Health.

The number of preventable deaths from 2007-2011 was estimated by multiplying the excess mortality rate by the total number of pregnancies and dividing by 1,000. Therefore, for the five year time period, there were an estimated 82 preventable deaths. The overall excess mortality rate was 1.45 deaths per 1,000 live births and fetal deaths. Two periods of risk accounted for 81.9% of the excess mortality, the Maternal Health and Prematurity and Maternal Care periods of risk. Although there are preventable deaths in the other two periods of risk, Ventura County will utilize this information to focus prevention efforts where the greatest impact can be made.

Next Steps for FIMR and Future Analysis



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Until the next PPOR analysis is completed, Ventura County FIMR will focus their case review efforts on those fetal and infant deaths that fall within the Maternal Health and Prematurity and Maternal Care periods of risk. Ventura County FIMR will also continue to explore risk factors associated with poor perinatal outcomes and report on this information during each meeting.

Through the PPOR analysis, Ventura County identified that the Maternal Health and Prematurity period of risk accounted for 59.8% of all preventable deaths. Risk factors associated with poor outcomes attributed to this period of risk mainly focus of the health of the mother prior to conception as well as perinatal care. Mothers in Ventura County who experienced a fetal or infant death in 2012 were more likely to be overweight or obese (56.3% versus 49.1% of all mothers). And, mothers in Ventura County who experienced a fetal or infant death in 2012 were more likely to have late entry into prenatal care (27.7% versus 17.4% of all mothers).

The top two cities within Ventura County that experienced the greatest percentage of fetal and infant deaths in 2012 were Oxnard (40.0% of all deaths) and Simi Valley (11.1%). The cities of Camarillo, Port Hueneme, Santa Paula, and Ventura each experienced 8.9% of the fetal and infant deaths in 2012. During that same time period, 37.0% of all mothers giving birth resided in Oxnard, 4.7% of mothers resided in Santa Paula, and 3.7% of mothers resided in Port Hueneme. Therefore, mothers from Oxnard, Santa Paula, and Port Hueneme experienced a disproportionate percentage of fetal and infant deaths as compared to births, which supports the notion that Hispanic women have poorer perinatal outcomes within Ventura County because these cities have higher populations of Hispanic women.

After reviewing PPOR and analyzing some of the Ventura County cases, the integration of the Life Course Perspective in different programs was discussed and some of the ideas for future consideration were as follows:

- Incorporate wellness and self-esteem with domestic violence clients
- Look into Promotoras Model from Orange County
- More education regarding pre-conception health for clients
- Active involvement of fathers during home visits
- Ensure fathers are educated in the care of the child and have the resources available to be a good parent
- Encourage preconception care among family/friends and parents.
- Provide more education to the high risk population to inform and refer to the county programs



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- Promote New Parent Kits to more women who are not pregnant but want children in the future
- Discuss prenatal efforts, education/outreach with First5 and the different programs
- Deliver message to behavioral health clinicians to screen and be aware of depression risk in pregnant women, track referrals and follow up those women receiving primary care services
- Refer post partum mothers to as many resources/agencies as needed to maintain their well-being and their child's wellbeing
- Initiate safe sleeping curriculum in parent education



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