

Parents Raising Children: Premature Babies

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Testimony

Good morning Mr. Chairman and Members of the Subcommittee. I am Dr. Eve Lackritz, Chief of the Maternal and Infant Health Branch in the National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. I am also a Commissioned Officer in the U.S. Public Health Service and a pediatrician. I am pleased to be here today to participate in discussions of the problem of preterm birth, which is one of the most devastating health issues facing women, children, and families in America today. I would like to take this opportunity to briefly outline the burden of disease in the nation due to preterm birth and summarize current prevention and research activities and challenges. I will close by defining priority areas where CDC, in partnership with other governmental and nongovernmental agencies, need an expanded, comprehensive prevention research agenda, and an action plan for the prevention of preterm birth.

Background

In terms of the health of women and infants, preterm birth is a public health priority. Preterm labor is the leading cause of hospitalization among pregnant women. Preterm delivery is the second leading cause of death among infants, second only to deaths from severe birth defects. The crisis is particularly acute among African Americans. Complications from preterm births are the leading cause of death for African American infants today. This national epidemic of prematurity affects 12 percent of all births in the United States and 17 percent of births among African Americans.

We have very few health threats of this magnitude, and this health threat goes well beyond the burden of infant mortality. Preterm delivery is the leading cause of developmental disability in children, including cerebral palsy and mental retardation, and is an important cause of blindness and chronic lung problems. Infants who are born premature are more than two times more likely to have a birth defect than infants who are born at term. Premature infant births extract a huge financial toll on our healthcare resources. Hospital care of preterm infants costs over \$13 billion each year. This is just for hospital care at their birth. Additional costs include hospitalization of mothers and continued care of children, including costs for repeat hospitalizations, medical visits, rehabilitation, and special services for children with special needs. But the toll of preterm delivery is not just financial. It tears at the fabric of our families and our communities, and takes an enormous emotional toll on mothers and fathers. Taken together, it is clear that preterm delivery is a public health priority.

As a pediatrician, like tens of thousands of my colleagues across the country, I spent years working in the hospital wards struggling to combat the problem of prematurity, fighting to keep babies alive who were unable to survive on their own. All too often, I had to inform parents that their premature son had brain damage, or that their tiny daughter had debilitating handicaps, or that their newborn child would not be able to survive – all because they were born too early. Medical care has become more sophisticated over the years resulting in improved survival of preterm infants. But we are still left with unacceptably high rates of death and disability. It is clear that the solution to the problem of preterm delivery must come through better prevention. And better prevention can occur only through research to understand the reasons why too many women deliver too many infants too early.

Current Research and Challenges

CDC, as the nation's prevention agency, addresses the problem of preterm delivery through research and programs, focusing on both the social and biomedical factors that affect preterm risk. CDC formulates a prevention response by identifying populations at risk, assisting in implementation of prevention programs, and monitoring progress of prevention efforts. CDC's work is achieved through three basic mechanisms: public health surveillance, support for state and community based programs, and epidemiologic and laboratory research.

Surveillance:

Surveillance is the core of CDC's work, the way in which we monitor how many infants are born premature, determine if trends are getting better or worse, define risk factors, and target prevention programs. Surveillance is our early warning system. It tells us if there is a new emerging health threat and if our programs are effective. There are two key surveillance systems that are used for preterm birth.

The first major surveillance system focuses on the collection of vital records such as birth and death certificates. For preterm birth, this is the backbone of health surveillance, where risk factors are evaluated such as the mother's education, tobacco use, race, and the infant's birthweight. Vital records allow epidemiologists to follow trends, risk factors, and identify areas with high rates of preterm births. Although this system provides useful information, it is also a system facing some critical technology challenges. In this computer age, our data systems are antiquated. More flexible, timely, and responsive surveillance systems are needed to get vital information more quickly and effectively to decision-makers. It is an important time to move to a new, electronic vital records system, whereby risk factors for preterm birth and low birthweight can be measured and reported with greater speed and precision. CDC is working with partners in states and other federal agencies to develop the nationwide standards and practices needed to implement this system, and the President has requested funding to support this effort in his FY 2005 budget request.

CDC's second key surveillance system on maternal and infant health is called PRAMS –

the Pregnancy Risk Assessment Monitoring System. PRAMS is an ongoing, state-specific, population-based surveillance system designed to identify and monitor selected maternal behaviors and experiences before, during, and after pregnancy. Through this system, we have been able to better understand issues such as prenatal care, folic acid to prevent birth defects, obesity, stressful life events, and physical abuse. PRAMS provides vital information to program managers and decision-makers in 31 states and New York City, supporting the development of important policies and programs in maternal and infant health. Examples of policies and programs informed by PRAMS data include:

- PRAMS data on statewide breast-feeding initiation and duration prompted staff at the Maine Medical Center to examine breast-feeding practices at their hospital. The study results, along with state-level data from PRAMS, were used to improve breast-feeding education and support in the Neonatal Intensive Care Unit.
- In New Mexico and North Carolina, PRAMS data were used to demonstrate the benefit of Medicaid coverage on early initiation of prenatal care.
- In Florida, North Carolina, Colorado, and Maine, PRAMS data are used to monitor knowledge about the benefits of folic acid and provide information to healthcare providers and community leaders for improving knowledge and use of folic acid.

While PRAMS only covers 31 states, other states recognize the utility of PRAMS and are requesting assistance and participation. CDC is working to include as many states in this surveillance system as possible. States are asking CDC to help them analyze and use data for health policy and programs related to preterm delivery and infant mortality.

In addition to these two key surveillance systems, CDC also uses more focused surveillance efforts to address specific health issues. As required under Public Law 102-493, CDC collects and analyzes data from all clinics that use infertility treatment termed Assisted Reproductive Technology (ART). CDC and other partners have used this system to evaluate the impact of ART on preterm birth and low birthweight, but there is still much to be learned in this area. Linking the ART surveillance data with state birth and death files provides a population-based database to examine maternal and infant health outcomes associated with this rapidly advancing technology. This activity was first initiated in 2001 when CDC developed a collaborative project with the Massachusetts Department of Public Health. Although recent research has indicated that ART is not driving the epidemic of preterm delivery in the U.S., it is important to continue to monitor its impact on preterm delivery.

Public Health Capacity:

CDC provides assistance to states and communities to collect and analyze data for development of maternal-infant policy and programs responsive to local, tribal, and state-specific needs. Fifteen CDC scientists are assigned to state health departments and one to an Indian Health Service epidemiology center. These assignees have assisted state public

health agencies with the spectrum of maternal and infant health issues including prematurity. For example, in Michigan, the assignee helped to identify the largest racial infant health disparity in the nation. This finding led to the formation of eight community initiatives targeting high risk communities, legislative mandating of a state infant mortality summit, developing a state policy white paper on prevention, and implementing new initiatives at a time of budget crisis. In Mississippi, the assignee evaluated the health outcomes of the state's system of perinatal care. With a national goal of 90 percent, only 40 percent of very premature babies are born in Mississippi's perinatal centers. (The mortality rate of babies born outside the centers is 50 percent higher than those born in perinatal centers.) These findings have led to much discussion statewide and the development of a legislative plan to address these shortcomings in the state.

In partnership with the Health Resources and Services Administration (HRSA), the March of Dimes, local coalitions, and health departments, CDC epidemiologists worked with CityMatCH (a national organization of city and county health departments and maternal-child health program leaders) to develop Perinatal Periods of Risk (PPOR), a new approach to investigate a community's infant mortality problem. This simple method enables communities to quickly identify the problems so that they can move to action with prevention strategies. The uses of PPOR have been advanced through collaborative work in 12 cities across the country. PPOR examines a community's fetal and infant mortality problems by mobilizing communities to address four primary prevention areas: maternal health and prematurity, maternal care, newborn care, and infant health. Prematurity was identified as the leading issue driving their infant mortality problem.

CDC works with a number of community-based organizations such as Healthy African American Families in Los Angeles and through CDC's Racial and Ethnic Approaches to Community Health (REACH) programs in Michigan and California. CDC provides technical assistance and helps build networks of local organizations, public health workers, and health care providers in communities with high preterm delivery rates and ethnic minority populations. These networks begin to help increase awareness about preterm delivery in the community and promote healthy pregnancies.

Despite the complexities of preventing preterm delivery, there are ways to build public health capacity. Tobacco use, for example, remains a major preventable cause of low birth weight. CDC has responded by working with state health departments to assist with smoking cessation programs during pregnancy.

Epidemiologic Research:

For more than 20 years, CDC has conducted research to understand the racial disparities in preterm delivery. Research has identified that stressful social factors, such as poverty, poor housing, and crime, exacerbate a woman's risk of preterm delivery. Bacterial vaginosis is also higher among African American women. CDC has conducted research evaluating interactions between adverse pregnancy outcomes and social factors, race, infectious processes and behaviors. For example, vaginal douching has been shown to be associated with low infant birthweight and bacterial vaginosis. More work is needed to

elucidate the effects of these factors on preterm birth.

In addition, we must remain vigilant to new and emerging threats to preterm delivery. The CDC and Indian Health Service recently learned about the use of a chewing tobacco product called Iq'mik, which is used widely among Alaska natives in the Yukon Delta region. Iq'mik is prepared by mixing chewing tobacco with the ash of a punk fungus, resulting in free-basing of nicotine and high blood nicotine levels. Analysis of PRAMS surveillance data found that well over 60 percent of women in the Yukon region were using this product during pregnancy. CDC responded by initiating a field investigation to assess pregnancy risk and assist with a prevention response.

An Agenda for Prevention Research and Program

There have been promising new discoveries in the field of preterm delivery, but many unanswered issues remain. CDC recognizes that a comprehensive prevention research agenda is needed to better understand the multiple and complex causes of prematurity, address racial and ethnic disparities, and develop and implement effective strategies. Preterm delivery is one of the many challenging epidemics that CDC must address. We need to attack the problem of prematurity in the way that we face all other epidemics.

Action steps to address preterm birth include:

- researching the causes and risk factors for preterm delivery;
- identifying women at risk early in their pregnancy;
- moving new research discoveries to public health prevention;
- expanding community-based programs on prematurity

1. Identifying Causes and Risk Factors for Preterm Delivery.

A complex array of factors interferes with healthy pregnancy outcomes and racial disparities. We know now that low grade infections, sometimes silent infections such as vaginal infections or periodontal gum disease, are associated with risk of preterm birth; however, a decade of research by NIH and their partners suggests that treatment of infections may not be effective in preventing preterm delivery. Perhaps the inflammatory response to infection, and not the infection itself, is responsible for preterm labor and delivery. We know that tobacco and psychological stress from living in poor neighborhoods create the same damaging chemicals in the body as infection. These same damaging inflammatory factors have been identified as mediators of cardiovascular disease, and are increased by the same factors such as periodontal gum disease, smoking, and stress. Damaging by-products of inflammation that spread throughout the body may result in increased risk of premature birth, as they have with cardiovascular disease. Our research agenda includes examining the role of inflammation on preterm delivery and

opportunities for intervention.

2. Early Detection and Screening.

Biological markers associated with preterm delivery, such as markers for inflammation, are often present very early in pregnancy, weeks to months before a preterm birth; however, these laboratory markers have not been thoroughly researched or applied to clinical practice. Our research agenda includes determining if there are ways to identify women at risk early in their pregnancy, so that they may be referred to tertiary care medical systems or provided with interventions to reduce their risk. A prospective study evaluating the causes of preterm delivery and early detection of women at risk would inform the research greatly.

3. Moving Research to Prevention.

NIH recently completed an exciting new study that found that weekly injections of 17-alpha hydroxyprogesterone reduced the risk of preterm delivery among women who had had a prior preterm infant. But many questions remain regarding how best to move this new research discovery to widespread public health practice. This progesterone product is not commercially manufactured and it is unknown if women in high risk populations will accept painful weekly injections or what other risk groups might benefit from this intervention.

In collaboration with NIH and other partners, a comprehensive research agenda is needed to evaluate drug availability, patient acceptability and adherence, and evaluate alternative routes of delivery such as a patch or suppository. Additional research is also needed to identify if other risk groups would benefit from progesterone therapy and evaluate how clinical practice has changed following these recent scientific findings. CDC can help address some of the operational challenges in moving research results to widespread public health practice.

4. Expansion of Community-Based Programs.

CDC has made strides in working with communities to reduce racial and ethnic disparities in preterm delivery and infant mortality. Community-based programs serve to increase awareness about preterm birth, promote early initiation and continuity of prenatal care, and promote pregnancy health at the community level.

Conclusion

Prevention of preterm birth is an important public health priority. Reducing preterm delivery poses many challenges, and the solutions will not come easily. A comprehensive research agenda would begin to identify the multiple and complex causes of preterm delivery and develop effective interventions. Together we can make a difference for the infants and families of this nation.

Thank you for the opportunity to speak to you about preterm birth. I would be happy to answer your questions.