

Committee on Assessing Health Outcomes by Birth Settings

February 6, 2020

Study Sponsor

- ***Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)**

Committee Members

SUSAN C. SCRIMSHAW (*Chair*)
Former President, The Sage Colleges

JILL ALLIMAN
Frontier Nursing University

MELISSA CHEYNEY
Oregon State University

MICHELLE R. COLLINS
Rush University College of Nursing

BROWNSYNE TUCKER EDMONDS
Indiana University School of Medicine

WENDY GORDON
Bastyr University

MARIAN FRANCES MACDORMAN
Maryland Population Research Center

M. KATHRYN MENARD
University of North Carolina

KAREN MILGATE
Karen Milgate Health Policy Consulting

JOCHEN PROFIT
Stanford University

CAROL SAKALA
National Partnership for Women & Families

NEEL SHAH
Harvard Medical School and Ariadne Labs

KATHLEEN SIMPSON
Mercy Hospital Saint Louis

RUTH E. ZAMBRANA
University of Maryland

Study Staff

EMILY P. BACKES

Study Director

ELIZABETH S. HOWE-HUIST

Associate Program Officer

DARA SHEFSKA

Associate Program Officer

MARY GHITELMAN

Senior Program Assistant

LESLEY WEBB

Senior Program Assistant (through October 2019)

LORI TREGO

NAM Distinguished Nurse Scholar-in-Residence (through August 2019)

Statement of Task

An ad hoc committee will provide an **evidence-based analysis of the complex findings in the research on birth settings**, focusing particularly on **health outcomes experienced by subpopulations of women**. It will bring together key stakeholders in a public workshop to further inform this analysis, including representatives from government, academia, healthcare provider organizations, third party payers, and women's health organizations.

The ad hoc committee will explore and analyze the current state of science on the following topics, identifying those questions that cannot be answered given available findings.

- I. Risk factors that affect maternal mortality and morbidity
- II. Access to and choice in birth settings
- III. Social determinants that influence risk and outcomes in varying birth settings
- IV. Financing models for childbirth across settings
- V. Licensing, training, and accreditation issues pertaining to professionals providing maternity care across all settings
- VI. Learning from international experiences

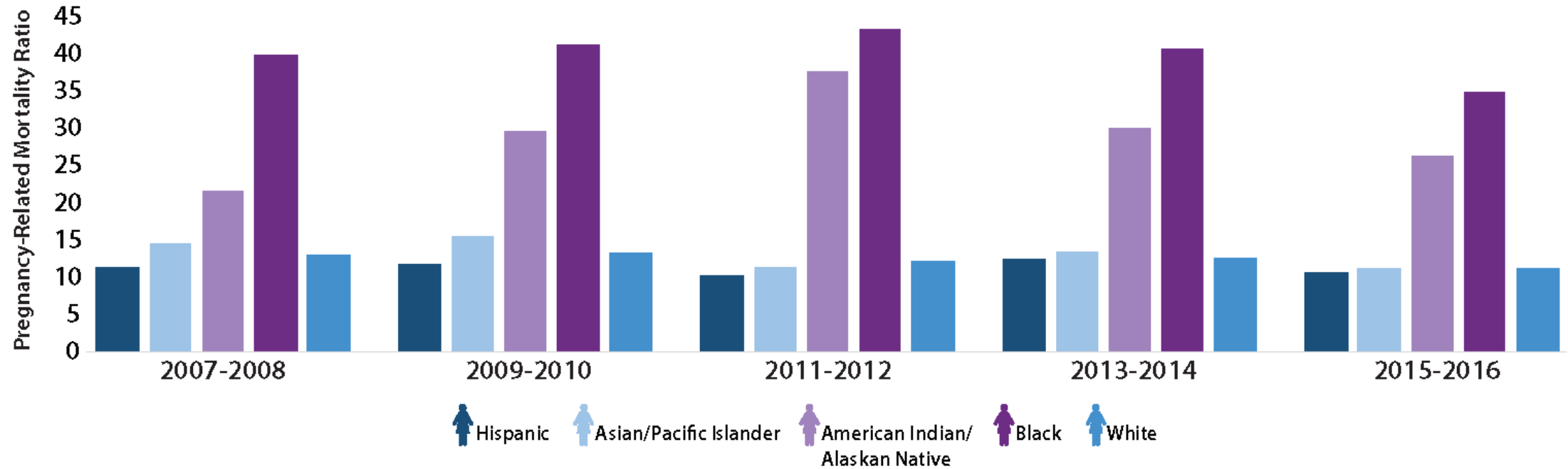
Main Messages

- The U.S. maternity system is fraught with uneven access and quality, stark inequities, and exorbitant costs, particularly in comparison with other peer countries. At the same time, the United States has among the highest rates of maternal and neonatal mortality and morbidity of any high-resource country, particularly among Black and Native American individuals. There is also growing recognition of a mismatch between the collective expectations of the care and support pregnant people deserve and what they actually receive.
- These challenges, while urgent, are not insurmountable, and opportunities for improving the systems that support childbirth exist.
- To improve maternal and infant outcomes in the United States, it is necessary to provide economic and geographic access to maternity care in all settings; to provide high-quality and respectful treatment; to ensure informed choices about medical interventions when appropriate for risk status in all birth settings; and to facilitate integrated and coordinated care across all maternity care providers and all birth settings.
- Achieving these objectives will require coordination and collaboration among multiple actors—professional organizations, third-party payers, governments at all levels, educators, and accreditation bodies, among others—to ensure system-wide improvements for the betterment of all women, newborns, and families.

Why Study Birth Settings?

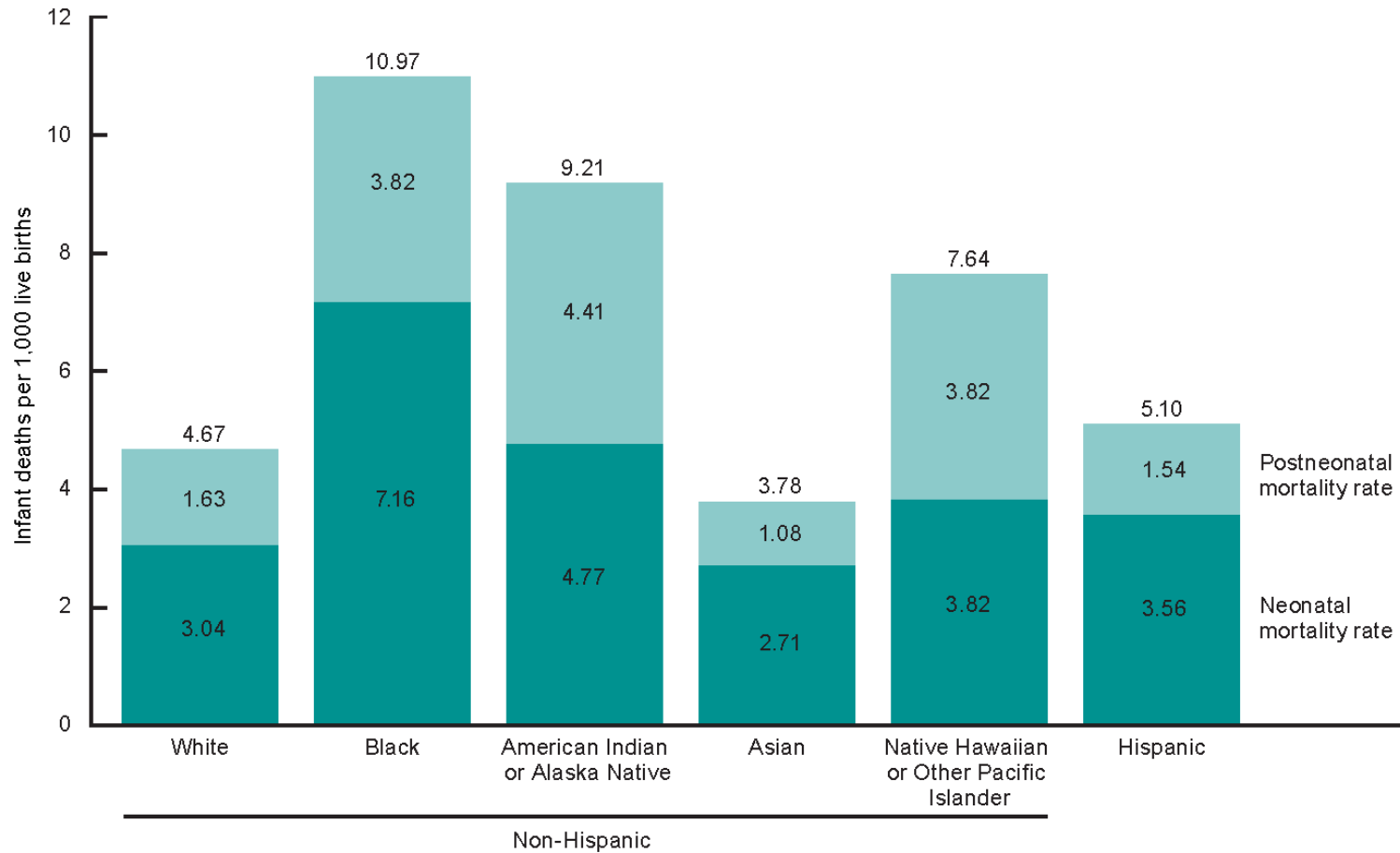
- The United States has among the highest rates of maternal and neonatal mortality and morbidity of any high-resource country, particularly among Black and Native American women
- Structural racism, implicit and explicit bias, and discrimination underlie large and persistent racial and ethnic disparities in the quality of care received by childbearing women and infants

Why Study Birth Settings?



Trends in pregnancy-related mortality ratio: United States, 2005-2016

Why Study Birth Settings?



Infant, neonatal, and postneonatal mortality rates, by race and Hispanic origin: United States, 2017

Why Study Birth Settings?

- Disparities also exist in maternal and infant mortality rates by geographic location. In 2016, more than 5 million women lived in counties (rural or urban) with neither an OB/GYN, CNM, nor a hospital with a maternity unit
- The maternal mortality rate in large metropolitan areas was 18.2 per 100,000 live births, but in the most rural areas it was 29.4 per 100,000 (in 2015).
- Infant mortality in rural counties was 6.55 deaths per 1,000 births, 20 percent higher than in large urban counties (in 2014).
- Mortality for infants of non-Hispanic White mothers in rural counties (5.95 per 1,000) was 41 percent higher than in large urban counties and 13 percent higher than in small and medium urban counties. For infants of non-Hispanic Black mothers, mortality was 16 percent higher in rural counties (12.08) and 15 percent higher in small and medium urban counties than in large urban counties.

Why Study Birth Settings?

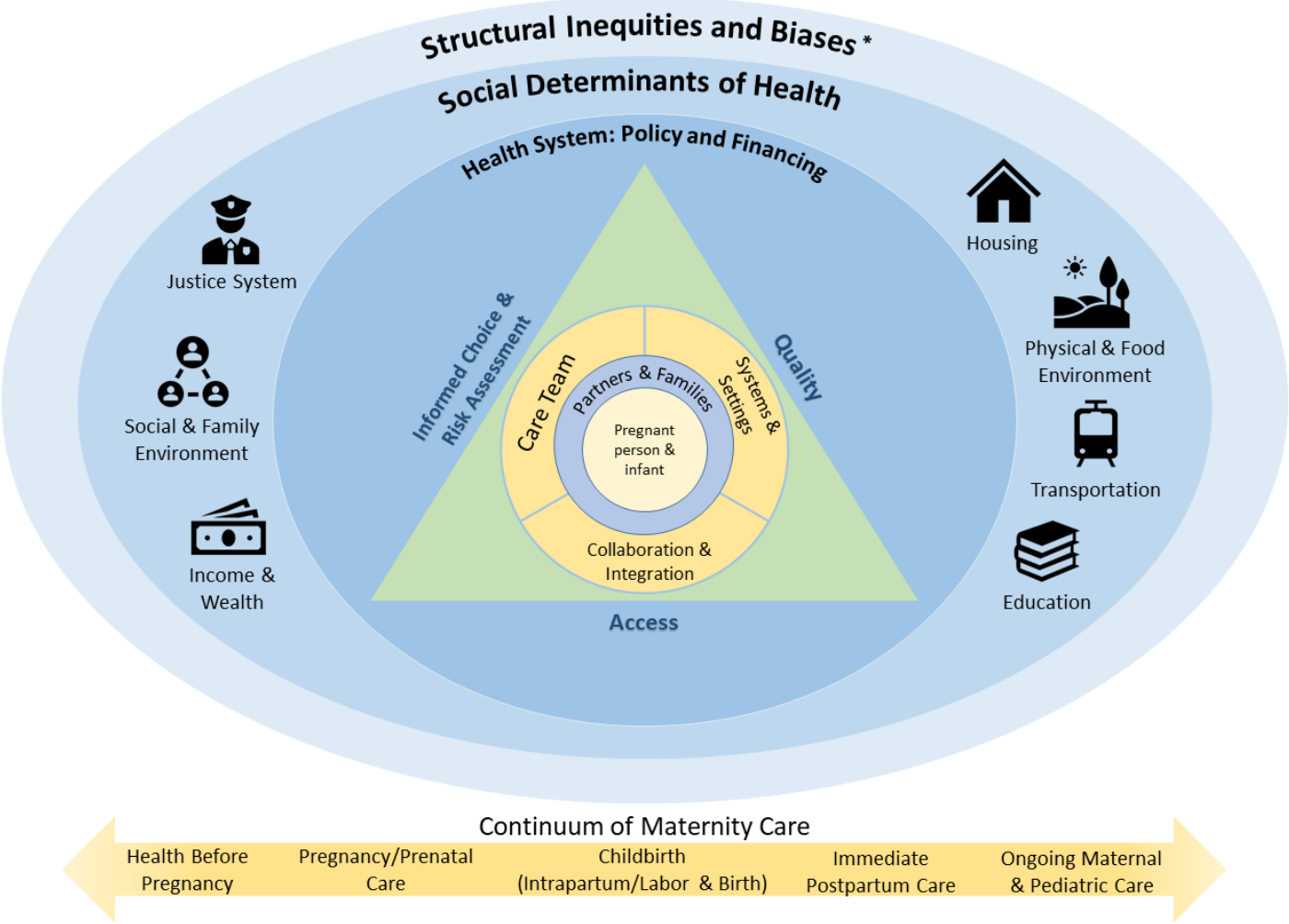
- Some childbearing women and newborns do not reliably receive quality care that is safe, evidence-based, and appropriate for their health needs and preferences.
- Maternal and newborn care in the United States is characterized by broad variations in practice, with considerable overuse of non-medically indicated care, underuse of beneficial care, and gaps between practice and evidence
- For example, the United States has one of the highest rates of caesarean birth among high-resource countries—31.9 percent of all births.
- The United States continues to outpace its peer countries in the costs of maternity care.

Why Study Birth Settings?

Two urgent questions for women, families, policy makers, and researchers arise:

- 1) How can an evidence-informed maternity care system be designed that allows multiple safe and supportive options for childbearing families?
- 2) How can birth outcomes be improved across and within all birth settings?

Interactive Continuum of Maternity Care: A Conceptual Framework



Understanding Birth Settings

Definitions

Birth Center Birth: occur in a freestanding health facility not attached to or inside a hospital

Home Birth: occur at a person's residence and can be either planned or unplanned

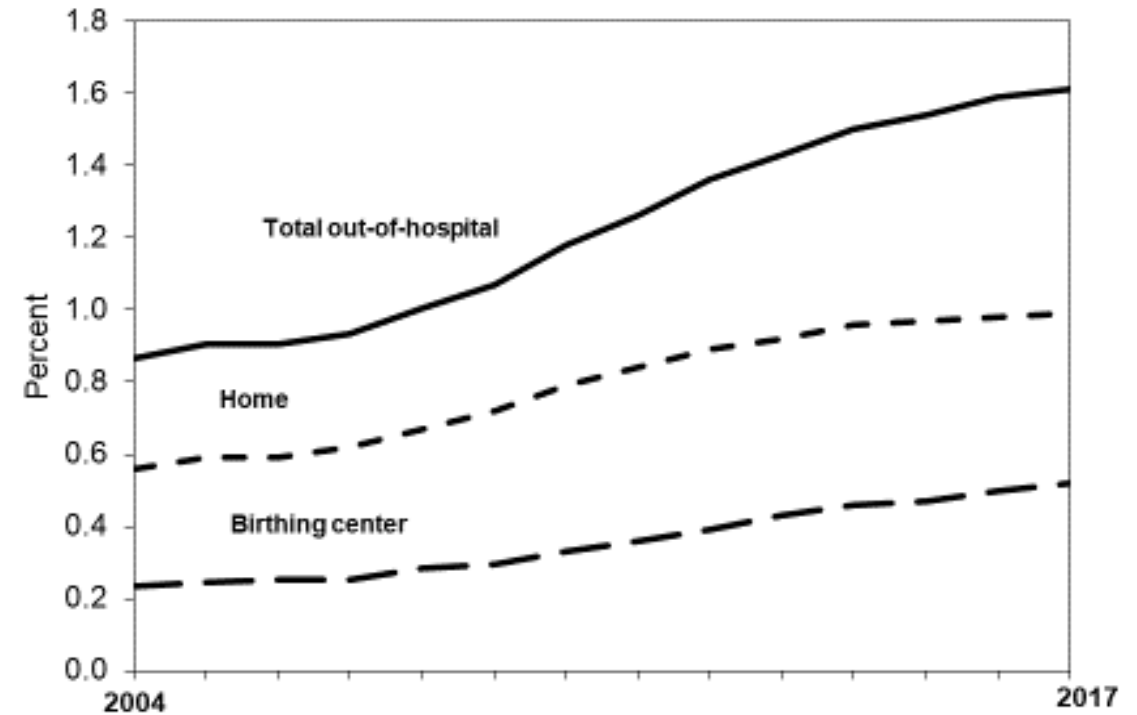
Hospital Birth: those births occurring in a hospital, whether a Level 1 community hospital or a Level 4 maternity unit.

Understanding Birth Settings

Settings and Providers

- In the United States, the vast majority (98.4 percent) of women give birth in hospitals, with 0.99 percent giving birth at home and 0.52 percent giving birth in freestanding birth centers
- Nurses, physicians, and midwives provide the majority of maternal and newborn care across birth settings.
- The United States is unique among nations in that it has three types of midwives with nationally recognized credentials: certified nurse midwives (CNMs), certified midwives (CMs), and certified professional midwives (CPMs)

Trends in home and birth center births in the United States, 2004–2017



Understanding Birth Settings

Policy and Financing

- Federal and state laws and regulations help determine which settings and providers are legally able to provide maternity care, and set rules about Medicaid eligibility
- Insurance coverage for home and birth center births varies by state and coverage type.
- States are responsible for licensing health care professionals and for dictating where they can practice, what services they can provide, and whether they are required to be supervised.
 - Currently, CNMs are licensed in all 50 states, CPMs are licensed in 33 states, and CMs are licensed in only 6 states

Risk in Pregnancy and Childbirth

- Risk is defined by the committee as the **increased likelihood of an adverse maternal, fetal, or neonatal outcome.**
- Risk is conferred by four main sources:
 - 1) individual medical and obstetrical factors;
 - 2) health system related factors, such as policy and financing decisions;
 - 3) the social determinants of health;
 - 4) and structural inequities and biases in the health system and in society at large.
- The term “high-risk pregnancy” typically describes a situation in which the pregnant woman, fetus, or both have an increased likelihood or odds of a pregnancy complication, adverse event, or poor outcomes occurring during or after the pregnancy or birth as compared to an uncomplicated or “low-risk” pregnancy.
- The majority of U.S. pregnancies are not high-risk, but rates of conditions that warrant additional monitoring are on the rise.

Epidemiology of Clinical Risks

- At the individual level, a variety of medical and obstetric factors can contribute to elevated risk during pregnancy and birth. Many of these risk factors are increasing in prevalence in the U.S.
 - Hypertensive disorders were the cause of 6.8% of maternal deaths from 2011 – 2015
 - Between 6 – 9% of women develop gestational diabetes during pregnancy
 - Rates of first births to women ages 35 and above increased by 23% between 2000 – 2013
- These individual risk factors can influence women's choices in maternity care. Appropriate risk assessment by qualified providers is needed to match pregnant people with the most appropriate setting and provider for their care during pregnancy and birth.

Choice, Risk, and Decision Making

- Given the prevalence of medical risk factors in the U.S. population, risk assessment and selection in birth settings is critical to decision making and choice.
- Ongoing **risk assessment** is needed to determine if maternal or fetal risk factors are present that would place a woman at increased risk of requiring care accessible to her or her newborn only in the inpatient setting.
- Women with decisional capacity have the right to refuse medically recommended care, and may do so for any number of reasons. Maternity care providers have a responsibility to ensure that these are **informed refusals**, offering resources and information to support informed choice and mitigate bias and misinformation where possible.
- Providers have a responsibility to accurately and transparently inform women about the risks and benefits of their options, and do so in a way that is culturally concordant, easily understandable, and respectful—a process known as **risk communication**.

Systems-Level Risk Factors

- Systems-level factors can contribute to existing risk factors or create new ones, shaping quality, access, choice, and outcomes in birth settings. Systems-level factors include:
 - **Structural inequalities and biases** that are historically rooted and deeply embedded in policies, laws, governance, and culture. They include inequitable treatment in the health care system, the health effects of racism, and inequitable distribution of resources in society.
 - The **social determinants of health**, which are mutable upstream factors that influence health, such as housing instability, transportation, and employment.
 - **Policy and financing aspects of the health system**, including the distribution of maternity care services across the country, financing for maternity care, and access to prenatal and birth care.
- These systems-level factors and social determinants are correlated with higher risk for poor pregnancy outcomes and inequity in care and outcomes.
- Understanding the role that non-clinical factors play in determining clinical risk is essential for developing risk-appropriate models of care.

Challenges Studying Outcomes by Birth Settings

- Data and methodological limitations
 - *Finding 5-1:* Vital statistics and birth registry data each have limitations for evaluating birth outcomes by setting, provider types, and intentionality
- Differing definitions, terminology, and reports of outcomes
- Small number of women giving birth in home and birth center settings
 - A lack of data and the relatively small number of home and birth center births prevent an exploration of the relationship of maternal mortality and severe maternal morbidity to birth settings. (Conclusion 6-2).
- Lack of data on differences by race/ethnicity or other subpopulations in comparisons across birth settings
- Modifications to the birth certificate that allow inquiry into birth settings based on models indicating intended setting of birth, including planned attended and planned unassisted home births in the United States and intended birth attendants, and development of best practices for use of these expanded data in birth settings research are needed to better understand and assess outcomes by birth settings. (Conclusion 5-1).

Maternal and Newborn Outcomes by Birth Setting

- **In the United States, home, birth center, and hospital birth settings each offer risks and benefits to the childbearing individual and the newborn. These risks may be modifiable within each setting and across settings. (Conclusion 6-1)**
- *Finding 6-1:* Statistically significant increases in the relative risk of neonatal death in the home compared with the hospital setting have been reported in most U.S. studies of low-risk births using vital statistics data. However, the precise magnitude of the difference is difficult to assess given flaws in the underlying data. Regarding serious neonatal morbidity, studies report a wide range of risk in low-risk home versus hospital birth and by provider type. Given the importance of understanding these severe morbidities, the differing results among studies are of concern and require further study.
- *Finding 6-2:* Vital statistics studies of low-risk births in freestanding birth centers show an increased risk of poor neonatal outcomes, while studies conducted in the United States using models indicating intended place of birth have demonstrated that low-risk births in birth centers and hospitals have similar to slightly elevated rates of neonatal and perinatal mortality. Studies of the comparative risk of neonatal morbidity between low-risk birth center and hospital births were mixed with variation across studies by outcome and provider type.

Maternal and Newborn Outcomes by Birth Setting (cont.)

- *Finding 6-3:* In the United States, low-risk women choosing home or birth center birth have lower rates of intervention, including cesarean birth, operative vaginal delivery, induction of labor, augmentation of labor, and episiotomy, and lower rates of intervention-related maternal morbidity, such as infection, postpartum hemorrhage, and genital tract tearing among low-risk women compared with women choosing hospital birth. These findings are consistent across studies. The fact that women choosing home and birth center births tend to select these settings because of their desire for fewer interventions contributes to these lower rates.
- *Finding 6-4:* Some women experience a gap between the care they expect and want and the care they receive. Women want safety, freedom of choice in birth setting and provider, choice among care practices, and respectful treatment. Individual expectations, the amount of support received from caregivers, the quality of the caregiver–patient relationship, and involvement in decision making appear to be the greatest influences on women’s satisfaction with the experience of childbirth.

International Perspective

- *Finding 6-5*: International studies suggest that home and birth center births may be as safe as hospital births for low-risk women and infants when:
 - (1) they are part of an integrated, regulated system;
 - (2) multiple provider options across the continuum of care are covered;
 - (3) providers are well-qualified and have the knowledge and training to manage first-line complications;
 - (4) transfer is seamless across settings;
 - (5) appropriate risk assessment and risk selection occur across settings and throughout pregnancy
- Such systems are currently not widespread in the United States.
 - *Finding 6-6*: Lack of integration and coordination and unreliable collaboration across birth settings and maternity care providers is associated with poor birth outcomes for women and infants in the United States.

Framework for Maternal and Newborn Care in the United States

- **Culture of Health Equity:**
 - System-level factors and social determinants of health such as structural racism, lack of financial resources, availability of transportation, housing instability, lack of social support, stress, limited availability of healthy and nutritious foods, lower level of education, and lack of access to health care, including mental health care, are correlated with higher risk for poor pregnancy outcomes and inequity in care and outcomes.
 - These system-level factors are modifiable and improving maternal and newborn care in the United States will require interventions outside of the health care system.
- **“Right Amount of Care at the Right Time”:**
 - “Too little, too late” and “too much, too soon” patterns in the provision of maternity care contribute to excesses of morbidity and mortality.
 - Available care is matched to the preferences, needs, and life circumstances of the woman and her fetus/infant. The woman and infant are matched to a risk appropriate level of care. Rigorous attention to the best available evidence limits overuse of unneeded care and underuse of beneficial care.
- **Respectful Treatment:**
 - Need for respectful care for all women by listening to them and responding appropriately, providing risk information in understandable terminology, providing culturally and linguistically appropriate care, providing informed choices around care and interventions, and providing clear and supportive communication for women.

Improving Hospital Settings

- **Conclusion 7-1:** Quality improvement initiatives...and adoption of national standards and guidelines for care in hospital settings have been shown to improve outcomes for pregnant people and newborns in hospital settings.
- **Conclusion 7-2:** Providing currently underutilized nonsurgical maternity care services that some women have difficulty obtaining...according to the best evidence available, can help hospitals and hospital systems ensure that every pregnant person receives care that is respectful, appropriate for their condition, timely, and responsive to individual choices. Developing in-hospital low-risk midwifery-led units or adopting these practices within existing maternity units, enabling greater collaboration among maternity care providers (including midwives, physicians, and nurses), and ensuring cultivation of skills in obstetrical residency and Maternal Fetal Medicine fellowship programs can help support such care.
- **Conclusion 7-3:** Efforts are needed to pilot and evaluate high value payment models in maternity care and identify and develop effective strategies for value-based care.

Improving Home and Birth Center Settings

- **Conclusion 7-4:** Integrating home and birth center settings into a regulated maternity and newborn care system that provides shared care, and access to safe and timely consultation; written plans for discussion, consultation, and referral that ensure seamless transfer across settings; appropriate risk assessment and risk selection across settings and throughout the episode of care; and well-qualified maternity care providers with the knowledge and training to manage first-line complications may improve maternal and neonatal outcomes in these settings.
- **Conclusion 7-5:** The availability of mechanisms for all freestanding birth centers to access licensure at the state level and requirements for obtaining and maintaining accreditation could improve access to and quality of care in these settings. Additional research is needed to understand variation in outcomes for birth centers that follow accreditation standards and those that do not.
- **Conclusion 7-6:** The inability of all certified nurse midwives, certified midwives, and certified professional midwives whose education meets ICM Global Standards, who have completed an accredited midwifery education program, and who are nationally certified to access licensure and practice to the full extent of their scope and areas of competence in all jurisdictions in the United States is an impediment to access across all birth settings.

Improving Informed Choice and Risk Selection

- **Conclusion 7-7:** Ongoing risk assessment to ensure that a pregnant person is an appropriate candidate for home or birth center birth is integral to safety and optimal outcomes. Mechanisms for monitoring adherence to best-practice guidelines for risk assessment and associated birth outcomes by provider type and settings is needed to improve birth outcomes and inform policy.
- **Conclusion 7-8:** To foster informed decision making in choice of birth settings, high-quality, evidence-based online decision aids and risk-assessment tools that incorporate medical, obstetrical, and social factors that influence birth outcomes are needed. Effective aids and tools incorporate clinical risk assessment as well as a culturally appropriate assessment of risk preferences and tolerance and enable pregnant people, in concert with their providers, to make decisions related to risk, settings, providers, and specific care practices.

Improving Access to Care and Birth Settings

- **Conclusion 7-9:** Access to choice in birth settings is curtailed by a pregnant person's ability to pay. Models for increasing access to birth settings for low-risk women that have been implemented at the state level... Additional research, demonstration, and evaluation to determine the potential impact of state-level models is needed to inform consideration of nation-wide expansion, particularly with regard to effects on reduction of racial/ethnic disparities in access, quality, and outcomes of care.
- **Conclusion 7-10:** Ensuring that levels of payment for maternity and newborn care across birth settings are adequate to support maternity care options across the nation is critical to improving access.
- **Conclusion 7-11:** Research is needed to study and develop sustainable models for safe, effective, and adequately resourced maternity care in underserved rural and urban areas, including establishment of sustainably financed demonstration model birth centers and hospital services. Such research could explore options for using a variety of maternity care professionals...in underserved communities to increase access to maternal and newborn care, including prenatal and postpartum care. These programs would need to be adequately funded for evaluation, particularly with regard to effects on reduction of racial/ethnic and geographic disparities in access, quality, and outcomes of care.
- **Conclusion 7-12:** To improve access and reduce racial/ethnic disparities in quality of care and treatment, investments are needed to increase the pipeline for the maternity and newborn care workforce...with the goal of increasing its diversity, distribution, and size. Greater opportunities for interprofessional education, collaboration, and research across all birth settings are also critical to improving quality of care.

Future research

Future research is needed:

- 1) To understand safety, quality, and outcomes of each birth setting by type of provider and the profiles of pregnant people such as race/ethnicity, socioeconomic status, gender identity and sexual orientation, and immigrant status as well as risk factors.
- 2) On how to improve the quality of care and outcomes in each setting.
- 3) To understand the impacts of policy and practice changes on racial/ethnic inequities in outcomes.

Final Thoughts

- System-wide improvements for the betterment of all pregnant people, newborns, and families are possible with coordination and collaboration from multiple actors: professional organizations, third-party payers, governments at all levels, educators, and accreditation bodies, among others.
- Key areas for improving the knowledge base around birth settings and levers for improving policy and practice across settings include:
 - providing economic and geographic access to maternity care options in all settings;
 - providing high-quality and respectful treatment;
 - ensuring informed choices about medical interventions when appropriate for risk status in all birth settings; and
 - facilitating integrated and coordinated care across all maternity care providers and all birth settings.
- While change will take time, there is an urgent need for all to come together to improve maternity care and build a high-functioning, integrated, regulated, and collaborative maternity care system, a system that fosters respect for all pregnant people, newborns, and families, regardless of their circumstances or birth or health choices.

Thank you!

To read or download a copy of the report,
please visit:

www.nationalacademies.org/birthsettings

For more information about the study or dissemination activities, please contact:

Emily P. Backes, JD, MA

Study Director

ebackes@nas.edu

