Recommendations from

Advisory Committee on Infant and Maternal Mortality (ACIMM)

to the Secretary of Health and Human Services

January 2025

The US infant mortality rate in 2022 was 5.6 deaths per 1000 live births with leading causes being birth defects, preterm birth and low birth weight, and sudden infant death syndrome. The Non-Hispanic White rate was 4.5 deaths per 1000 live births with the **Non-Hispanic Black rate being more than twice that rate at 10.9 deaths per 1000 live births.** The 2021 US maternal mortality rate continues to rise. **The maternal mortality rate for Non-Hispanic Black women was 69.9 deaths per 100,000 live births, 2.6 times the rate for** non-Hispanic White of 26.6. To realize improvements in maternal and infant health outcomes, ACIMM has developed specific recommendations designed to improve Non-Hispanic Black maternal and infant outcomes related to **Preconception/Interconception Care and Rural Health Systems of Care.**

In developing these recommendations, considerations were given to the importance of **social drivers of health**. ACIMM acknowledges and believes in the importance of these non-medical drivers and plans to **release a second set of recommendations** specific to social drivers of health by summer 2025. This will be inclusive of, though not limited to, safe housing, transportation, racism, discrimination, and access to nutritious foods.

Focus – Preconception/Interconception Care (PCC/ICC)

Preconception/Interconception Care are critical components in addressing infant and maternal mortality. Preconception/Interconception care involves medical care, education, and counseling in order to increase the likelihood of improved pregnancy outcomes, inclusive of maternal morbidity and mortality. This also includes the importance of reproductive health care which allows individuals to have children, if and when they would like to, be born in a safe and nurturing environment.

Recommendation 1 – Surveillance, Research, and Data

1. Develop **standardized tools that measure, track, and identify** best practices for optimal reproductive health before conception, during pregnancy, and between pregnancies:

    1A. Provision of high-quality evidence informed PCC/ICC in primary care, prenatal/postpartum and community-based health care settings including but not limited to local health departments, FQHC's, and community-based non-profit health care entities.

    - Funding to development of a system that captures the availability, accessibility, utilization, and quality of reproductive health including PCC/ICC.

- Funding to develop HEDIS measures for evidenced informed PCC/ICC indicators such as those recommended by the United States Preventive Services Task Force (USPSTF) and/or Women's Preventive Services Initiative (WPSI).

1B. Monitor outcomes of current best practices for reproductive health care including those recommended by the USPSTF and WPSI.

- Funding and support to monitor the current 10 indicators for PCC (Kroelinger, 2018; Robbins, et al, 2018). Expand existing indicators to include mental health (anxiety, depression), safe relationships (IPV), SDOH and environmental indicators such as those included in the Perinatal Assessment of Environmental Risk (PAER) developed by the Agency of Toxic Substance and Disease Registry (ATSDR).

1. Current Smoking
2. Depression
3. Diabetes
4. Folic Acid Uptake
5. Heavy Alcohol Consumption
6. Hypertension
7. Normal Weight
8. Physical Activity
9. Postpartum Contraception
10. Unwanted Pregnancy

- Track specific indicators of health and conditions relevant for PCC/ICC Health at the county level (Maternal Vulnerability Index)

1. Pre-Existing Hypertension
2. Body Mass Index
3. Smoking
4. Mental Health
5. Diabetes
6. Substance use

- Fund and support collaboration for federal, state and local Maternal, Infant, and Fetal Mortality Review Committees and the incorporation of data to inform indicators aimed at prevention of adverse outcomes.

1C. Fund collection of data related to overall population health and with special attention to all African American and Black reproductive age individuals, regardless of their gender or sexual identity, through the creation of a standardized national surveillance system, including tracking of morbidity and mortality related to intimate partner violence data during the reproductive years.

- Funding for CDC to expand the Behavioral Risk Factor Surveillance System (BRFSS) to include reproductive health questions specific to PCC/ICC.

Rationale: Providing evidence-based/informed, high-quality PCC/ICC depends on having accessible and reliable national data, by race and ethnicity. This requires data that document the provision of PCC/ICC, populations served and outcomes. Creation of a national surveillance system to track and monitor the provision and outcomes of

reproductive health care, including PCC/ICC to nonpregnant individuals. PCC/ICC quality indicators must be added to existing national surveillance systems such as Pregnancy Risk Assessment Monitoring System (PRAMS) or the Behavioral Risk Factor Surveillance System (BRFSS).

Recommendation 2 – Workforce and Training

2. Prioritize funding that increases and expands the diversity of the reproductive healthcare workforce.

    2A. Provide funding opportunities for health care professional educational programs, loan forgiveness, and training programs aimed at increasing the number of health care providers from traditionally underrepresented Black, Indigenous People of Color (BIPOC) and gender non-conforming populations that provide PCC/ICC based on a life course reproductive health framework.

    - Develop new funding mechanisms to support increasing the number of PCC/ICC professionals overall, with specific efforts to increase the number of BIPOC professionals, thereby increasing access to PCC/ICC.

    2B. Provide funding opportunities for health care professional educational programs, loan forgiveness, and training programs aimed at increasing the variety of providers involved in the care of African American and Black individuals (including, but not limited to, physicians, advanced practice nurses, certified nurse-midwives, certified professional midwives, doulas, lactation consultants, community health workers, and promotoras) prepared to deliver evidenced based/informed PCC/ICC, and who are competent in providing culturally congruent care based on a life course reproductive health framework.

    2C. Provide funding opportunities that support continuing education and quality improvement efforts for health care providers, social service providers, and educators to provide high quality evidence informed reproductive health and wellbeing information across the lifespan.

    - Develop new modules and training materials that can be incorporated into professional education programs and continuing professional educational units.
    - Provide technical assistance and capacity building support to primary care settings, health departments, FQHCs, and other community based organizations for development and dissemination of educational materials aimed at quality improvement for the delivery of primary care related to preconception and interconception.
    - Update existing online training modules available for practicing professionals, such as https://beforeandbeyond.org/modules/-

2D. Provide funding opportunities for the creation of standards in training for doulas, community health workers (CHW) and/or local health department providers on best practices that are culturally congruent. (Altschul, Deborah & Samuels, Judith & Zeitlin, Wendy. (2008).

2E. Provide funding opportunities directly to community-based organizations (CBOs) that provide training for community-based health providers to enhance their ability to provide evidenced based/informed and culturally appropriate PCC/ICC, by incorporating current and expanded indicators of PCC/ICC.

- Funding for the development and dissemination of PCC/ICC toolkits such as the Preconception Health Toolkit developed by the Reproductive Health National Training Center and funded by DHHS.

  (https://rhntc.org/resources/preconception-health-toolkit)

Rationale: There is a need to expand the number and variety of health care providers that can implement appropriate high-quality, respectful, and culturally sensitive PCC/ICC counseling and care. Maternal and infant outcomes are not dependent on the type of obstetric provider, but rather on the quality of care. Recognizing this, the emphasis must be on ensuring that preconception, prenatal and postnatal care is provided by an interdisciplinary team which should include obstetricians or family physicians with obstetric training, and could also include, if risk-appropriate, midwives (nurse-midwife, certified professional midwife or a midwife with appropriate training and experience**)**. Published data indicates that access to high quality care prior to conception and between pregnancies improves outcomes for pregnant people and their infants (Atrash, Johnson, Adams, Cordero, Howse, 2006). Studies indicate that in those states that expanded ACA associated Medicaid coverage, individuals experienced increased health insurance coverage, increased access to care, including PCC/ICC counseling and contraceptive services. The most significant impacts were for low-income women, Black women and women without dependent children (Johnston, Strahan, Joski, Dunlop, &Adams, 2018; Margerison, MacCallum, Chen, Samani-Hank, & Kaestner, 2020; Myerson, Crawford, Wherry, 2021). In addition, encourage funded partnerships between other entities such as health departments, hospitals and universities that also receive funding for health care professional education programs and training to partner with CBOs to provide training. There is also a need to ensure that all individuals despite where they live geographically (urban, suburban, rural) have access to evidence based/informed, high-quality PCC/ICC counseling and care. The PCC/ICC workforce should be expanded so that PCC/ICC care is accessible across all settings, including primary care clinics, community health centers, well women centers, adolescent health care centers, gender diverse communities, with a specific emphasis to improve and ensure access to comprehensive PCC/ICC for potential Black birthing populations. Increasing the number of providers who are from underrepresented populations is desired by many potential Black birthing people. Funding that supports education and training to expand the number of BIPOC professionals across the spectrum of PCC/ICC is a direct desired response, noted within listening sessions and among community voices. There is evidence that shows patients who receive healthcare

from a provider with whom they share culture have improved outcomes. Increasing the number of BIPOC professionals will be an important strategy for addressing the disparate outcomes for Black and African American maternal and infant outcomes. Health care organization supported published study findings are recognizing the importance of diversity, equity, inclusiveness, and belonging (DEIB) are core principles for improved health outcomes and lower health care costs (Byas, 2024; Moore, Coates, Watson, de Heer, McLeod, & Prudhomme, 2023). Studies also provide findings that racial concordance between providers and patients result in increased patient satisfaction, improved communication and greater trust in the healthcare system (Byas, 2024; Moore, Coates, Watson, de Heer, McLeod, & Prudhomme, 2023). Provider-patient interactions including these factors are associated with improved adherence to treatment plans, decreased anxiety associated with accessing care and improved health outcomes. Cultural concordance in provider-patient interactions include understanding of cultural practices that may impact health behaviors and practices (Ayala-Luna, 2023).

Recommendation 3 - Increase public awareness and knowledge of PCC/ICC

3. Conduct a comprehensive, intentional, widespread and accessible reproductive health and well-being education campaign aimed at increasing public knowledge.

    3A. Provide reproductive health and well-being information across the USA using a multimodal approach including video ad campaigns, social media, and public service announcements that reach all populations, regardless of age, sexual orientation, or gender orientation.

    3B. Provide funding opportunities, including technical assistance to small and local community-based organizations, school-based health centers, and local health departments for the creation and dissemination of education materials that are culturally sensitive, multi-lingual and built on existing best practices.

    3C. Provide funding opportunities that support the national scale up of existing best practice educational materials for reproductive health including before, during and after pregnancies.

        - Example – Show Your Love website - https://showyourlovetoday.com/ or funding to support the development of and widespread national awareness campaign and modules that address women, men, and special populations.

    Rationale: All individuals need reproductive health knowledge that includes their reproductive health care rights and knowledge that dispels misinformation and myths. Inadequate and false information is a barrier to seeking appropriate and timely care. A comprehensive educational campaign should be inclusive and specific for all genders and identities, culturally appropriate, and based on a life course approach. The comprehensive public education campaign should include human biology, healthy and safe intimate partner relationships, prevention of pregnancy and sexually transmitted infections,

management of chronic illnesses, appropriate use of alcohol, tobacco and other drugs, and medical insurance options.

The comprehensive education program should be based on literacy needs and should address limited broadband access and be available in multiple settings such as primary care medical homes, FQHC's, community health centers, libraries, schools, universities, workplaces, and religious/faith-based settings.

Focus – Rural Health Systems of Care

Rural America is populated by an increasingly diverse demographic. Consideration of the needs of people living in rural and geographically isolated communities is essential to addressing health disparities in maternal and infant outcomes. Census data from 2020 indicated that nearly a quarter of rural residing Americans are from racial or ethnic minority groups, and in 10% of rural counties, people of color are the majority. (1) People living in rural communities face barriers to accessing comprehensive, high quality and affordable healthcare often described as a triple challenge of availability, accessibility, and acceptability of care. As highlighted in the March of Dimes 2024 Report, hospital and birthing unit closures, scarcity of obstetric clinicians, and lack of adequate health insurance coverage are prominent stressors in accessing care, particularly in rural areas. (2)

Rural areas have been particularly hard hit by recent trends in hospital closures, with more than 200 rural hospitals closing in the past twenty years and one-third of rural hospitals remaining at high risk for closure. (3) Even more relevant to maternal and infant health outcomes is the closure of labor and delivery units in rural hospitals, in fact, from 2022 to 2024, 50 rural hospitals closed these critical units, often in response to the high financial cost associated with staffing and operations within a low-volume context. This labor and delivery unit closure trend has reached crisis levels - as of 2024, more than 57% of rural hospitals do not offer labor and delivery services. (4)

The impact of availability, accessibility, and acceptability of care in rural communities can have significant effects on outcomes for racial and ethnic minority groups. The concentration of Black, Latino, and Indigenous Americans is highly regionalized across the nation, including in rural areas. In the rural lowland South, Black people are the largest population of color. (1) With reference specifically to the birthing population, nationwide data from CDC WONDER indicate that 7.9% of Non-Hispanic Black births are to those who reside in rural geography and 78% of those births are funded by Medicaid. Nine states in the Southeastern belt from Virginia to Louisiana were home to 80% of rural Non-Hispanic Black births in 2020. In these nine states, an average of 79% of Non-Hispanic Black births are funded by Medicaid. (5) These factors highlight the pressing need to create systemic change in rural maternal and infant care access and services in order to address the nation's staggering inequities in maternal and infant health outcomes. To illustrate, in Mississippi the majority (55%) of births in rural communities are Non-Hispanic Black. The legacy of slavery and Jim Crow segregation has a lasting effect on life and economic opportunity, particularly in the South. In addition to addressing core access to care and sustainability of labor and delivery systems, public health policies and investments aimed at achieving health equity for Black birthing people and their infants must address the social drivers of health, particularly the intersection of systemic racism, economic opportunity, and geography.

To address disparities in healthcare and health outcomes for Non-Hispanic Black people living in rural areas, systems need to be in place to enable access to comprehensive, risk appropriate, high quality, affordable and culturally appropriate healthcare. The Systems for Rural Perinatal Care Workgroup proposes recommendations to: 1) Create a sustainable financial model for high-quality, holistic maternal and infant care in rural communities that meets the needs of all residents, 2) Advance maternal and infant health equity in rural communities by ensuring access to high-quality, team-based, risk-appropriate care, and 3) Achieve cultural safety in the rural health care system by developing and supporting a diverse workforce, creating integrative and collaborative community support systems, and advancing cultural humility.

1. "Mapping Rural America's Demographic Change," Brookings Institute, 2021
2. "Nowhere to Go: Maternity Deserts Across the US." March of Dimes, 2025
3. "Rural Hospitals at Risk of Closing," Center for Healthcare Quality and Payment Reform, 2024.
4. "Addressing the Crisis in Rural Maternity Care," Center for Healthcare Quality and Payment Reform, 2024
5. CDC WONDER Natality, 2020. Report contributed by Ashley Hirai, HRSA.

Recommendation 1 - Create a sustainable financial model for high-quality, holistic maternal and infant care in rural communities that meets the needs of all residents

1A. Provide enhanced reimbursement for facilities and providers serving in maternity care shortage areas, including adequate support for low volume rural facilities

- Establish a Critical Access Labor and Delivery Unit designation that provides low volume payment adjustments/standby payments for rural hospitals that serve communities in need of local access to comprehensive maternity care*
- Provide enhanced reimbursement to maternity care providers** who practice in rural maternity care shortage areas

1B. Implement payment structures that incentivize the development and maintenance of regionalized care systems that emphasize quality care as close to home as possible

- Designate funds and payment/reimbursement policies to establish and maintain formal regionalization structures that ensure access to the full continuum of perinatal care for rural families including transfer and back-transfer of to appropriate levels of care
- Revise the global fee model for perinatal services to provide appropriate compensation to all individuals who are part of the continuum and cycle of care
- Develop telehealth-specific payment structures, including payment parity, for remote specialty support for rural maternity teams, including provider-to-patient as well as provider-to-provider telehealth communications.

- Collaborate with Housing and Urban Development, US Department of Agriculture, and the Federal Communications Commission to enhance access to affordable and reliable high-speed internet and related community-accessible telehealth equipment in rural areas.

Rationale: As described in the introduction to this section, rural hospitals are facing extreme financial pressures that are increasingly resulting in either closure of the hospital or closure of labor and delivery units in an effort to preserve the broader hospital. Addressing the financial challenges faced by rural, low-volume maternity units and care providers is essential to sustain access to equitable access to high-quality perinatal care. This need is particularly acute as low-volume rural hospitals are often unable to sustain the high fixed costs of staffing a labor and delivery unit. Absent systemic change and intentional stabilization efforts focused directly on preserving access to labor and delivery services, current trends are likely to continue, resulting in increased places without maternity care, which have also been referred to as "maternity deserts."

Recommendation 2 – Advance maternal and infant health equity in rural communities by ensuring access to high-quality, team-based, risk-appropriate care.

2A. Provide states with financial resources and technical support to adopt standard definitions, implementation guidelines and verification of maternal and neonatal levels of care. Create a public portal for hospitals' resources for care and the meaning of those levels.

2B. Incentivize regionalized systems to provide support to rural hospitals and clinicians

- Financially support collaboration among hospitals and EMS services that ensure timely maternal and neonatal transport to a higher level of care when indicated
- Financially support establishment of multi-state Medicaid coverage agreements for perinatal services and state licensure reciprocity
- Financially support regional centers to collaborate with referring hospitals in their region by providing support for higher-risk pregnancy, labor and delivery, management of conditions, and newborn care (including through telehealth).
- Financially support regional centers in providing outreach education, skills training, and leadership for data driven quality monitoring and improvement.
- Require and provide financial support for obstetric readiness training in non-birthing facilities including Rural Emergency Hospitals, and for EMS services
- Support mental/behavioral and other specialty/subspecialty providers to become part of regionalized systems

2C. Provide financial support for rural hospitals and clinics to engage in evidence-based/evidence informed quality improvement efforts and continuing education

- Provide ongoing financial support to rural hospitals and clinics to actively participate in quality improvement initiatives and continuing education/skills maintenance
- Provide direct financial support to providers, organizations, and systems that implement hospital-based and community care bundles

2D. Increase financial support to statewide perinatal quality collaboratives to support rural hospitals in implementing quality improvement initiatives and supporting systems of risk-appropriate care

2E. Enact policy that requires and provides financial support to hospitals that close labor and delivery units to create a new continuum-of-care plan for residents in the hospital's catchment area

Rationale: Even with efforts to stabilize access to perinatal services in rural communities, it is not feasible to maintain direct access to all levels of care in every location. As such, it is critical to support the establishment and sustainability of regional systems of care with intentional and continuous collaboration between local and distant providers. Such access to risk-appropriate care is a key element to improving the outcomes for pregnant patients and their infants. Collaboration rather than duplication can advance quality and cost efficiency. In creating these systems, it is critical that they be designed in a way that supports rural hospitals and providers who are living and working in rural communities to better meet the needs of their patients, while also supporting high-volume perinatal centers in having the resources necessary to support local rural providers.

Recommendation 3 - Achieve cultural safety in the rural health care system by developing and supporting a diverse workforce, creating integrative and collaborative community support systems, and advancing cultural humility

3A. Seek input from rural community members regarding barriers and facilitators to accessing what they perceive as high quality, respectful care.

3B. Create systems that support financial viability and universal accessibility of doula, community health workers, promotoras, peer-support specialists, and lactation consultants.

- Create a system that supports the establishment of integrated comprehensive teams, including doulas and CHWs in rural areas
- Incentivize states to allow doulas and community health workers to bill for perinatal-related services under Medicaid
- Ensure doulas, lactation consultants, peer-support specialists, and community health workers are fully covered by public and private insurance to remove financial barriers in accessing such services

3C. Increase the availability of healthcare workforce training opportunities within rural communities

- Provide sustainable, continuous financial support for precepting and training health professions students in rural communities
- Increase support for family medicine residency rural training tracks that incorporate OB skills and explore opportunities to implement a similar model in other health professions
- Provide financial support for establishing and/or maintaining health professions programs located in rural areas, including at HBCUs and other minority-serving institutions

3D. Increase the availability of continuing education opportunities for maternity care providers in cultural humility and in patient-centered, respectful, and trauma-informed care. Incentivize their participation in these trainings.

Rationale: As described in the introduction, rural areas contain highly diverse populations that in many cases have racial and ethnic groups as the majority population. It is well-established that Black, Hispanic, Native American, and multiracial pregnant individuals are more likely to report mistreatment and disrespect during pregnancy and postpartum. This can lead to avoidance of and disengagement during receipt of care, exacerbating the risk of negative outcomes. It is therefore critical to support systems that focus on ensuring that care is not only available and accessible, but also acceptable and supportive for all pregnant people.

Appendix A:

Expanded Rationale for Recommendation 1 – Rural Health Systems of Care

Addressing the financial challenges faced by rural, low volume maternity units and care providers is foundational to ensuring equitable access to high quality perinatal care. Low birth volume hospitals are often unable to cover the fixed costs of staffing a labor and delivery unit. Obstetric units are one of the first service lines to be closed when hospitals decide to reduce services. Such closures have increased over the past 20 years. (1-3) Worse obstetric and neonatal outcomes were observed in subsequent years following obstetric unit closures, with higher number of out of hospital births, births in hospitals without obstetric units, higher preterm birth rates, and increased neonatal mortality, perinatal mortality, and Cesarean delivery rates in some areas. (4-6) Rural residents and those of minority race/ethnicity have increased likelihood of experiencing a facility closure, and the impact of such closures may exacerbate existing disparities in outcomes. Studies suggest that the burden of closures is felt most significantly in rural areas [7-8] and may exacerbate disparities in severe maternal morbidity for Hispanic women. [9]

Numerous studies have found that financial considerations are a key driver to the decision of rural [9,10] and urban [12] hospitals to continue to deliver obstetric services, especially those hospitals that care for publicly insured or patients of minority race or ethnicity. In a recent survey of rural hospital administrators, 41.7% reported having fewer actual births than necessary for the obstetric service line to remain financially viable [13]. Obstetric services are particularly sensitive to the financial health of a hospital because of differences in payor mix between obstetric and non-obstetric hospitalizations. In 2021, 41% of all deliveries were covered by Medicaid insurance [14] compared to 10% of non-obstetric adult hospitalizations [15]. As a result, obstetric units are the first service line to be eliminated when hospitals undergo a financial crisis [16], and hospital provision of obstetric services have continued to decline in the United States [17].

A second challenge for rural hospitals providing obstetric services is the lack of formal integration of such services into the larger perinatal regional systems in many geographic areas. To safely meet the needs of maternal and neonatal patients, obstetric and neonatal services are part of a much larger, centralized and collaborative system of care, where obstetric and neonatal patients have seamless access to transfer and subspecialty services when needed. (18-20). This process requires timely and acceptable capacity for transferring patients to hospitals that provide higher level of services when needed, and also the ability for referring hospitals to receive recovering infants back to the lower level of hospital for ongoing care until ready for discharge to home. This latter process, also known as the back-transport of care, is rarely performed especially for rural patients and highly variable between different geographic areas [21]. One barrier to the integration of rural hospitals with the larger perinatal system is financial, as the global fee model of perinatal care disincentivizes hospitals from transferring pregnant patients prior to delivery, and the coverage of non-urgent transport costs, such as those incurred during a back-transport of care, are more variable than coverage for higher level of services [22].

Another more recent barrier is the variable coverage for telehealth services that many rural hospitals rely upon to integrate their care with the larger perinatal health care services [23].

Thus, these financial barriers interfere with the optimal provision of obstetric and newborn services to rural and patients of minority race or ethnicities and may contribute to the elevated rates of infant mortality and maternal morbidity and mortality in these communities (24-27).

Recruiting, training, supporting and retaining a rural maternity care workforce requires financial resources. It is not enough to simply train physicians, midwives, and nurses in maternity care and hope that they will choose to work in rural areas. Medical and nursing students need to be specifically recruited and trained to deliver care in rural areas. Focused scholarship programs and ongoing financial support catered specifically to provision of maternity care in rural areas are essential. Since the traditional model of long hours of on-call coverage is becoming less viable, new models of staffing and compensation must be developed so that hospitals can successfully recruit and retain providers who provide maternity care across the spectrum of maternity care, including physicians who can perform cesarean sections. An adequate payment structure is also needed for remote specialty support. Physicians, midwives, and nurses will also be empowered to deliver obstetric care in rural areas if they have access to remote support from maternal-fetal medicine specialists and from staff who have experience addressing infrequently occurring complications.

To cover the fixed costs of staffing a labor and delivery unit, low volume hospitals must receive adequate payment from private and public payers across the continuum and cycle of maternity care. Standby capacity payments are a viable option. Telehealth has tremendous potential to bring subspecialty support to the providers and patients in rural communities. Rapid adoption during the COVID19 pandemic demonstrated telehealth feasibility, but adequate broadband and payment policies are needed to achieve its potential for rural community service.

References:

1. Atrash, H; Johnson, K., Adams, M., Cordero, J., & Howse, (2006). Preconception care for improving perinatal outcomes: The time to act. *Maternal Child Health Journal, 10: S3-S11*. https://link.springer.com/article/10.1007/s10995-006-0100-4
2. Ayala-Luna, M. (2023). Healers and patients in North Carolina. *Journal of Public Health, 93, 1713-1719,* https://doi.org/10.2015?AJPH.93.10.1713.
3. Byas, K. (2024). Racial concordance in healthcare can improve health outcomes and lower costs. *The Center for Health Affairs*. https://www.neohospitals.org/healthcare-blog.aspx?count=140&tag=equity
4. Center for Disease Control and Prevention (2024). The Behavioral Risk Factor Surveillance System (BRFSS) www.cdc.gov/brfss/index.html
5. Hernandez-Green N, Haiman M, McDonald A, Rollins L, Franklin CG, Farinu OTO, Clarke L, Huebshmann A, Fort M, Chandler R, Brocke P, McLaurin-Glass D, Harris E, Berry K, Suarez A, Williams T. A. (2024). Development and Implementation of a Preconception Counseling Program for Black Women and Men in the Southeastern United States: A Pilot Protocol. medRxiv [Preprint]. doi: 10.1101/2024.04.22.24306171. Update in: *Front Public Health*. 2024 Sep

25;12:1416586. doi: 10.3389/fpubh.2024.1416586. PMID: 38712274; PMCID: PMC11071590.

6. Howell, E. (2018). Reducing disparities in severe maternal morbidity and mortality. Clin Obstetrics and Gynecology; 61(2): 387-399. doi:10.1097/GRF.0000000000000349.
7. Huang, S., Zhou, T., Xu, C., & Zheng, J. (2022). Does public health influence economic performance? Investigating the role of governance and greener energies for the case of China. Frontiers in Public Health, 10, 864-736. Doi:10.3389/pubh.2022.864736 https://pmc.ncbi.nlm.nih.gov/articles/PMC9001902
8. Johnston, E., Strahan, A., Joski, P., Dunlop, A., & Adams, K. (2018). Impacts of the Affordable Care Act's Medicaid Expansion on women of reproductive age: Differences by parental status and state policies. J of *Women's Health Issues,* 28(2): 122-129. https://doi.org/10.1016/j.whi.2017.11.005
9. Kroelinger, C.D., Okoroh, EM., Boulet, S.L., Olson, C.K. & Robbins, C. (2018). Making the case: The importance of using the 10 key preconception indicators in understanding the health of women of reproductive age. *J Women's Health, 27(6): 739-743. Doi:10.1089/jwh.2018.7034.*
10. Margerison, C., MacCallum, C., Chen, J., Samani-Hank, Y., & Kaestner, R. (2020). Impacts of Medicaid on health among women of reproductive age. *Am J of Preventive Medicine, 58(1): 1-11. doi:10.1016/jamepre.2019.08.019.*
11. Moore, C., Coates, E., Watson, A., de Heer, R., McLeod, A., & Prudhomme, A. (2023). "It's important to work with people that look like me": Black patients' preferences for patient-provider race concordance. *J of Racial and Ethnic Health Disparities*, 10:2552-2564. https://doi.org/10.1007/s40615-022-01435-y
12. Myerson, R., Crawford, S., Wherry, L. (2020). ACA Medicaid expansions increased preconception health counseling, folic acid intake and effective postpartum contraception. *Health Affairs, 39(11), 1883-1890. doi:10.1377hlthaff.2020.00106.*
13. Robbins, C.L., D'Angelo, D.D., Zapata, L., Boulet, SL., Sharma, A.J., Adamski, A., Farfalla,J., Stampfel, C., Verbiest, S., and Kroelinger, C. (2018). Preconception health indicators for public health. *J women's Health, 27(4): 430-443. doi:10.1089/jwh.2017.6531*
14. Scrimshaw, S.C. & Backes, E.P. (2020). (Eds). Birth Settings in America: Outcomes, Quality, Access, and Choice. National Academies of Sciences, Washington, DC: The National Academies Press. https://doi.org/10.17226/25636.
15. Solomon, J. (2021). Closing the coverage gap would improve Black maternal health. Center on Budget and Policy Priorities. Washington, D.C. Retrieved from https://www.cbpp.org/sites/default/files/7-26-21health.pdf
16. Zeitlin, W., Altschul, D., & Samuels, J. (2016). Assessing the Utility of a *Toolkit for Modifying Evidence-Based Practice to Increase Cultural Competence*: A Comparative Case Study. *Human Service Organizations: Management, Leadership & Governance*, *40*(4), 369–381. https://doi.org/10.1080/23303131.2016.1153551
17. "Maternal health in rural America" a National Rural Health Association White Paper, Hailey Waldman, Alexandra Zimmerman, February 2024

18. "Information for Rural Stakeholders About Access to Maternity and Obstetric Care: A Community-Relevant Synthesis of Research" University of Minnesota Rural Health Research Center, September 2024
19. "Addressing the Crisis in Rural Maternity Care", Center for Healthcare Quality and Payment Reform (CHQPR), November 2024
20. Lorch SA, Martin AE, Ranade R, Srinivas SK, Grande D. Lessons for providers and hospitals from Philadelphia's obstetric services closures and consolidations, 1997-2012. Health Aff (Millwood). 2014 Dec;33(12):2162-9.
21. Lorch SA, Srinivas SK, Ahlberg C, Small DS. The impact of obstetric unit closures on maternal and infant pregnancy outcomes. Health Serv Res. 2013 Apr;48(2 Pt 1):455-75
22. Kozhimannil KB, Hung P, Henning-Smith C, Casey MM, Prasad S. Association Between Loss of Hospital-Based Obstetric Services and Birth Outcomes in Rural Counties in the United States. JAMA. 2018 Mar 27;319(12):1239-1247.
23. Hung P, Henning-Smith CE, Casey MM, Kozhimannil KB. Access To Obstetric Services In Rural Counties Still Declining, With 9 Percent Losing Services, 2004-14. Health Aff (Millwood). 2017 Sep 1;36(9):1663-1671.
24. Carrel M, Keino BC, Ryckman KK, Radke S. Labor & delivery unit closures most impact travel times to birth locations for micropolitan residents in Iowa. J Rural Health. 2023 Jan;39(1):113-120.
25. McGregor AJ, Hung P, Garman D, Amutah-Onukagha N, Cooper JA. Obstetrical unit closures and racial and ethnic differences in severe maternal morbidity in the state of New Jersey. Am J Obstet Gynecol MFM. 2021 Nov;3(6):100480.
26. "Information for Rural Stakeholders About Access to Maternity and Obstetric Care: A Community-Relevant Synthesis of Research" University of Minnesota Rural Health Research Center, September 2024
27. "Addressing the Crisis in Rural Maternity Care", Center for Healthcare Quality and Payment Reform (CHQPR), November 2024
28. Lorch SA, Martin AE, Ranade R, Srinivas SK, Grande D. Lessons for providers and hospitals from Philadelphia's obstetric services closures and consolidations, 1997-2012. Health Aff (Millwood). 2014 Dec;33(12):2162-9.
29. Kozhimannil KB, Interrante JD, Admon LK, Basile Ibrahim BL. Rural hospital administrators' beliefs about safety, financial viability, and community need for offering obstetric care. JAMA Health Forum 2022; 3: e220204.
30. Valenzuela CP, Osterman MJK. Characteristics of mothers by source of payment for the delivery: United States, 2021. NCHS Data Brief, no 468. Hyattsville, MD: National Center for Health Statistics, 2023.
31. Sun R, Karaca Z, Wong HS. Trends in hospital inpatient stays by age and payer, 2000-2015. HCUP Statistical Brief #235, January 2018. Agency for Healthcare Research and Quality, Rockville, MD. www.hcupus.ahrq.gov/reports/statbriefs/sb235-Inpatient-Stays-Age-Payer-Trends.pdf.
32. Kirby PB, Spetz J, Maiuro L, Scheffler RM. Changes in service availability in California hospitals, 1995 to 2002. J Healthc Manag 2006; 51: 26-38.
33. Kozhimannil KB, Interrante JD, Carroll C, Sheffield EC, Fritz AH, McGregor AJ, Handley SC. Obstetric care access at rural and urban hospitals in the United States. JAMA 2024, doi:10.1001/jama.2024.23010.
34. Lorch SA, Myers S, Carr B. The regionalization of pediatric health care. Pediatrics 2010; 126: 1182-90.

35. Lasswell SM, Barfield WD, Rochat RW, Blackmon L. Perinatal regionalization for very low-birth-weight and very preterm infants: a meta-analysis. JAMA. 2010;304:992–1000.
36. DeSisto CL, Alexander C Ewing, AC, Diop H, Easter SR, Harvey E, Kane DJ, Naiman-Sessions M, Osei-Poku G, Riley M, Shanholtzer B, Stach AM, Dronamraju R, Catalano A, Clark EA, Madni SA, Womack LS, Kuklina EV, Goodman DA, Kilpatrick SJ, Menard MK. Maternal Risk Conditions and Outcomes by Levels of Maternal Care. J Womens Health (Larchmt) DOI: 10.1089/jwh.2024.0547. Epub 2024 Oct 23. PMID: 39450864
37. Nelson LF, Harland KK, Shane DM, Ahmed A, Mohr NM. Against the current: back-transfer as a mechanism for rural regionalization. Am J Manag Care 2017; 23: e287-294.
38. Bourque SL, Levek C, Melara D, Grover TR, Hwang SS. Prevalence and predictors of back-transport closer to maternal residence after acute neonatal care in a regional NICU. MCHJ 2019; 23: 212-219.
39. Weigel G, Frederiksen B, Ranji U. Telemedicine and pregnancy care. Kaiser Family Foundation 2020, https://www.kff.org/womens-health-policy/issue-brief/telemedicine-and-pregnancy-care.
40. Ely DM, Driscoll AK. Infant mortality in the United States, 2022: Data from the period linked birth/infant death file. National Vital Statistics Reports; vol 73 no 5. Hyattsville, MD: National Center for Health Statistics. 2024.
41. Ely DM, Driscoll AK, Mathews TJ. Infant mortality rates in rural and urban areas in the United States, 2014. NCHS data brief, no 285. Hyattsville, MD: National Center for Health Statistics. 2017.
42. Kozhimannil KB, Interrante JD, Henning-Smith C, Admon LK. **Rural**-Urban Differences In Severe **Maternal** Morbidity And **Mortality** In The US, 2007-15. Health Aff (Millwood). 2019 Dec;38(12):2077-2085.
43. Harrington KA, Cameron NA, Culler K, Grobman WA, Khan SS. **Rural**-Urban Disparities in Adverse **Maternal** Outcomes in the United States, 2016-2019. Am J Public Health. 2023 Feb;113(2):224-227.