Advancing Maternal Health Equity through Telehealth: The MCEI Framework for Sustainable Integration

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Abstract
Persistent maternal health disparities across racial, socioeconomic, and geographic lines remain a critical equity challenge in the United States, particularly for Black women who experience maternal mortality at rates nearly three times higher than white women. Technology-enabled care delivery through telehealth presents a transformative opportunity to address these systemic inequities by expanding access to quality maternal healthcare services across traditional barriers.
This paper reviews the Maternal Care and Equity Intervention (MCEI) framework, an innovative, scalable, equity-centered model for sustainable telehealth integration in maternal care systems. Drawing on a comprehensive review of telehealth applications across prenatal, emergency, and postpartum care, we examine how remote care technologies, when implemented with deliberate, equity-focused strategies, can improve access, reduce mortality, and support culturally competent maternal care.
Sustainable integration of technology-enabled maternal care requires supportive policy frameworks, provider training, and community partnerships to ensure virtual care benefits all women, regardless of geography, race, or income, rather than reinforcing existing disparities.

Keywords*: Telehealth, maternal mortality, MCEI framework, health disparities, health equity, prenatal care, postpartum care,*

1.0 Introduction

Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from unintentional or incidental causes. A maternal death can either be direct or indirect. Direct obstetric deaths (or direct maternal deaths) are those "resulting from obstetric complications of the pregnant state (pregnancy, labor and puerperium), and from interventions, omissions, incorrect treatment, or a chain of events resulting from any of the above". Deaths due to obstetric hemorrhage or hypertensive disorders in pregnancy, for example, or those due to complications of anesthesia or caesarean section are classified as direct maternal deaths. Indirect obstetric deaths (or indirect maternal deaths) are those maternal deaths "resulting from a previous existing disease or a disease that developed during pregnancy and not due to direct obstetric causes but were aggravated by the physiologic effects of pregnancy". For example, deaths due to aggravation (by pregnancy) of an existing cardiac or renal disease are considered indirect maternal deaths. (WHO, 2023).

Despite its advanced healthcare system, maternal mortality in the United States remains a persistent public health crisis, with a maternal mortality ratio (MMR) of 32.9 deaths per 100,000 live births in 2021, as shown in Figure 1 (Hoyert, 2025). The public health crisis is even more severe for marginalized populations as the United States continues to grapple with racial disparities in maternal mortality (Egbedion et al., 2025). For a variety of reasons, low-income individuals, people of color (POC), and residents of rural areas in the United States experience a significantly greater burden of disease and lower life expectancy relative to their higher income, White, and urban counterparts, and this gap has been growing over time (Escarce, 2019). Figure 2 shows how black women are about three times more likely to die from pregnancy-related causes than white women (Hoyert, 2025).

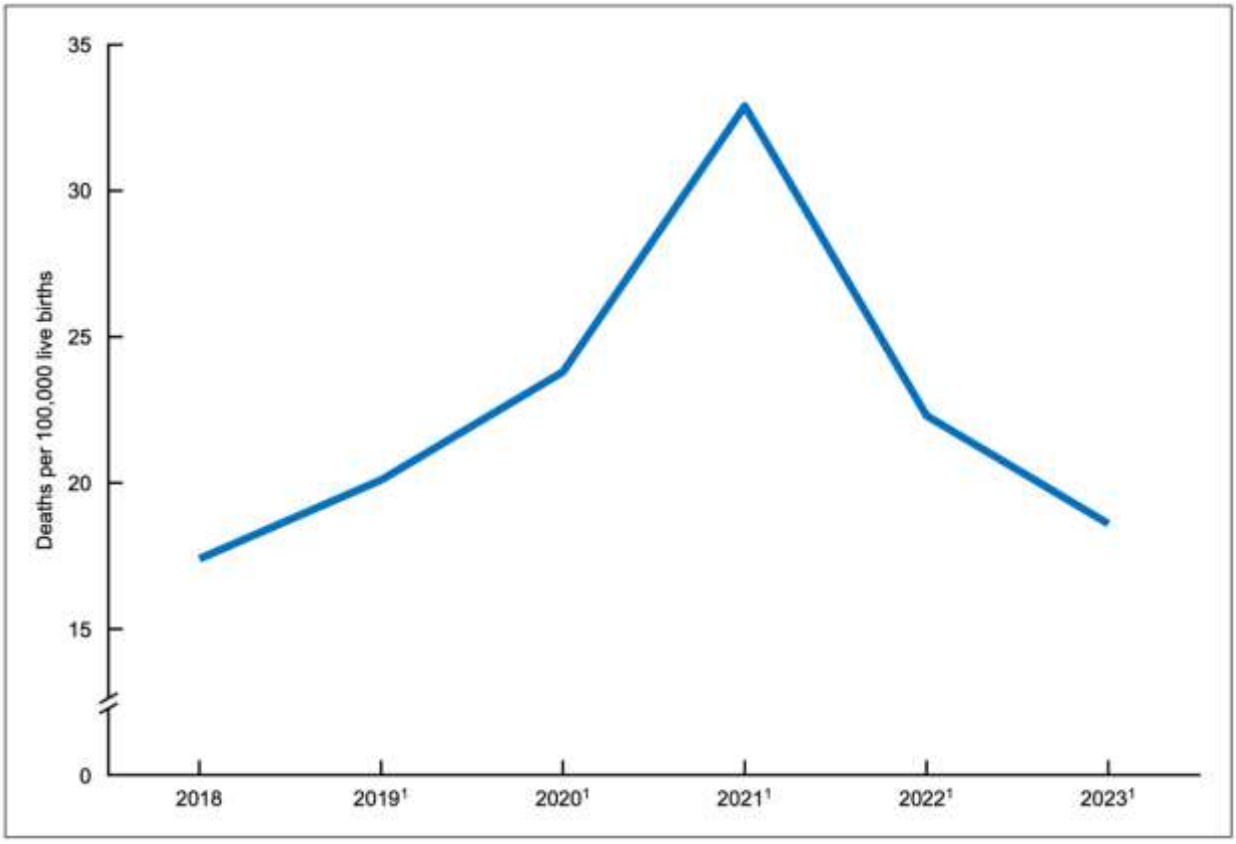

Figure 1: Maternal Mortality Rate (MMR): United States, 2018 – 2023 (Hoyert, 2025)

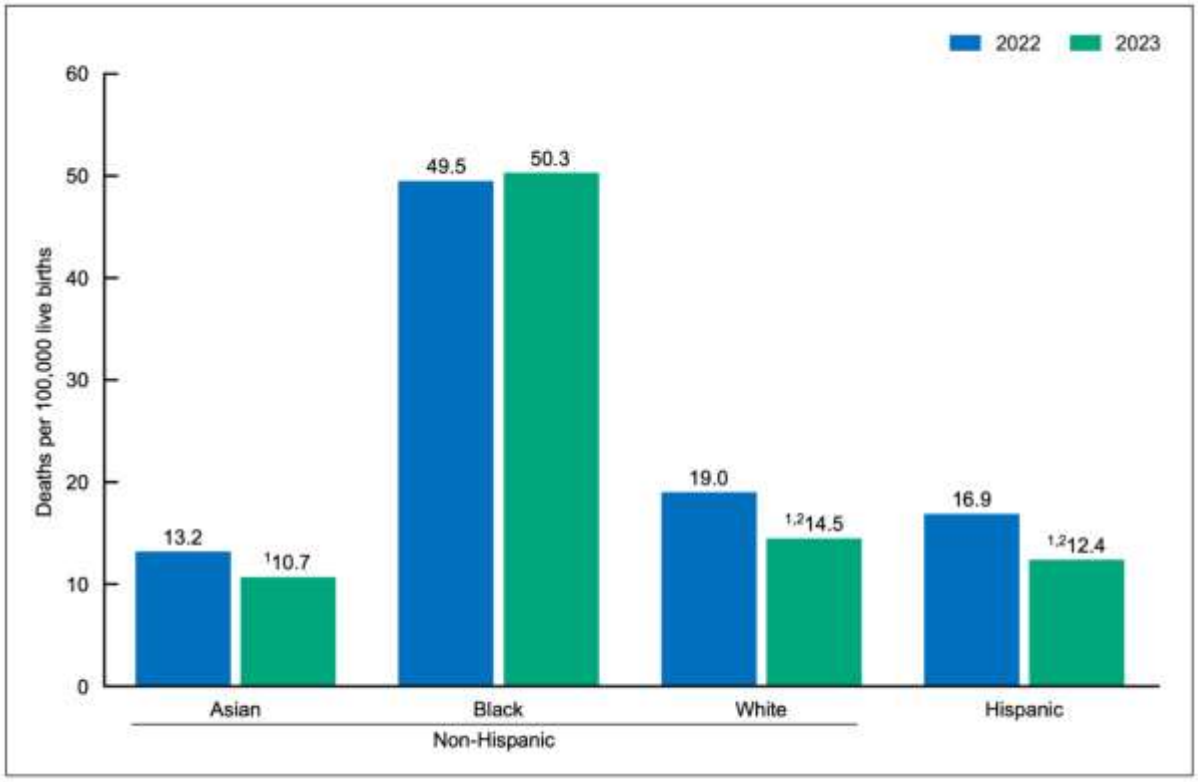

Figure 2: Maternal Mortality Rate, by race and Hispanic origin: United States, 2022 and 2023 (Hoyert, 2025)

There are various causes of maternal mortality; deaths during delivery are significant but only a part of the problem. Slightly more than half (52%) of all deaths occur after the day of delivery, while almost a third occur during pregnancy. There have been considerable efforts to improve clinical care, but efforts that focus on the birth hospitalization will only solve a portion of the problem. To improve outcomes, it will also be critical to address causes of maternal mortality that arise during pregnancy (such as hypertension, or high blood pressure) and in the postpartum period (such as cardiomyopathy, or weakened heart muscle), through upgrades to women's health care before, during, and after pregnancy. (Declercq & Zephyrin, 2020).

From the Declercq & Zephyrin, 2020 study on a report by Listening to Mothers, a series of national surveys in 2011-2012 were fielded by the nonprofit National Partnership for Women and Families. and a California survey conducted in 2016, about the experiences of mothers who had hospital births in the United States. Compared with white women, non-Hispanic Black women were more likely to report:

- Being treated unfairly and with disrespect by providers because of their race
- Not having decision autonomy during labor and delivery
- Feeling pressured to have a cesarean section
- Not exclusively breastfeeding at one week and six months.

The study also discovered that compared with women with private health insurance, women with Medicaid coverage were more likely to report:

- No postpartum visit
- Returning to work within two months of birth
- Less postpartum emotional and practical support at home
- Not having decision autonomy during labor and delivery

- Being treated unfairly and with disrespect by providers because of their insurance status
- Not exclusively breastfeeding at one week and six months.

As these findings from this study illustrate, different women have different experiences with maternity care, childbirth, and parenting. For example, both Black women and those with Medicaid coverage were less likely than white women and those with private health coverage to say they had autonomy about childbirth decisions and were treated with respect by their providers. (Declercq & Zephyrin, 2020)

Telehealth emerged to increase access to care. However, inequities in maternity care exist across the United States related to geography, health insurance status, socioeconomic circumstances, and race and ethnicity, among others (Hawkins, 2023).

Although in-person health services and hospitals are important for the delivery of health care, telecommunications devices are now well-accepted by patients and clinicians and used in many different treatment plans. Telehealth and face-to-face health services are complementary, and allocating appropriate medical resources to telehealth could stimulate economic growth and raise social welfare, and this can be achieved with the optimal share of telehealth expenditure to GDP. (Wang & Wang, 2017)

This study examines the evidence for telehealth's potential to reduce maternal mortality caused by health system disparities by exploring applications of telehealth to maternal care, implementation strategies, and identifying policy requirements for the sustainable integration of virtual care into maternal health systems. We focus particularly on the Maternal Care and Equity Intervention (MCEI) framework as a comprehensive approach to addressing maternal health disparities through technology-enabled care delivery (Egbedion et al., 2025).

2.0 Telehealth for Maternal Health

Telehealth, as defined by the Office for the Advancement of Telehealth, comprises the use of telecommunications and information technologies to share information and to provide clinical care, education, public health, and administrative services at a distance. Telehealth is a broad term that encompasses many digital health technologies, including telemedicine, eHealth, connected health, and mHealth. Telehealth is a new method of enabling care delivery that has the potential to help transform the healthcare system, to reduce costs, and increase quality, patient-centeredness, and patient satisfaction (Schwamm et.al., 2017).

Telehealth is an innovative solution that provides a safe and effective way to connect individuals and their healthcare providers when in-person care is not necessary or not possible. Using telehealth services, patients can receive care, consult with a provider, get information about a condition or treatment, arrange for prescriptions, and receive a diagnosis. In the 30-plus years that telehealth has been in use, it has been consistently shown to be a safe and quality care modality, a convenient option for both patients and the clinicians who care for them, and a secure environment for the collection and transmission of personal health information (American Telemedicine Association, n.d.).

Telehealth is a very interesting approach and can be effective and affordable for health systems aiming to facilitate access to care, maintain the quality and safety of care, and engage patients, health professionals, and users of health services. Despite the many challenges it faces, telehealth presents enormous potential for strengthening and improving health services (Bouabida, et al 2022)

Effective telehealth interventions already exist across many diseases, such as diabetes mellitus, in pain management and medication adherence, and cardiovascular disease and stroke in particular. Telehealth monitoring (telemonitoring) in ambulatory patients with heart failure and in those with implanted cardiac devices with remote monitoring has been most extensively studied and has demonstrated benefits. Telehealth in acute stroke (telestroke) is an evidence-based and well-accepted method of delivering expert stroke care with rapid adoption. Many publications have shown reproducible results across different platforms, countries, and health systems. Across all these diseases, many telehealth studies have shown high rates of patient satisfaction (Schwamm et.al., 2017).

The prenatal and postpartum periods present unique opportunities and challenges to incorporate telehealth: increasing appointment adherence balanced against essential screening, monitoring, and treatment that is well-suited to in-person visits (Hawkins, 2023)

Telehealth and telemedicine programs can be a successful strategy in perinatal care to improve patient outcomes, address the workforce shortages, and reduce health disparities (Stanley & Wallace, 2022). Using telehealth for prenatal care is still an evolving field, in which the COVID-19 pandemic has accelerated its use. Virtual visits can be a valuable tool to improve access to prenatal care, especially in cases where clinics may limit in-person visits because of safety concerns or in more remote rural settings where access to maternity providers may be limited. Developing a hybrid model of care, which includes a mix of in-person and virtual visits to include group visits, can be an effective way to provide prenatal care and education. In low-risk pregnancies, as few as four in-person visits can be accomplished, with the rest of the visits conducted virtually with remote BP and fetal heart tone monitoring (Shmerling et.al, 2022).

Telehealth implementation in postpartum care was associated with the amelioration of disparities in PPV attendance between Black and non-Black patients. (Kumar et.al, 2023). This study demonstrates that telehealth with remote blood pressure monitoring may be a cost-effective solution for the management of postpartum hypertension. Niu et. al, 2021).

Opportunities and Benefits of Telehealth

- Expanded Access to Care: Since its inception, telehealth has been used to bring healthcare services to consumers in distant locations. Telehealth not only improves consumer access, it extends the geographic reach and expertise of physicians and health facilities. Given provider shortages around the world, telehealth has a unique and appealing value proposition. It can provide millions of people in both rural and urban areas access to safe, effective, and appropriate care when and where they need it (American Telemedicine Association, n.d.).
- Cost Efficiencies: Reducing or containing the cost of healthcare is one of the strongest motivators to fund and adopt virtual care technologies. Telehealth reduces the cost of healthcare and increases efficiency with better management of chronic diseases, shared health professional staffing, reduced travel times, and fewer or shorter hospital stays (American Telemedicine Association, n.d.).
- Improved Quality: Studies have consistently shown that the quality of healthcare services delivered via telehealth is as good as those given in traditional in-person consultations. In some specialties, particularly in mental health and ICU care, telehealth delivers a superior product, with greater outcomes and consumer satisfaction (American Telemedicine Association, n.d.). If telehealth services are used to complement face-to-face healthcare provision, then they have the potential not only to

improve access to healthcare but also to improve the care provided to the population. (Wang & Wang, 2017)

- Consumer Demand: The greatest impact of telehealth is on the consumer, their family, and their community. Using telehealth technologies reduces travel time and related stresses for the consumer. Studies consistently show high consumer satisfaction with telehealth over the past 15 years and support for telehealth services. Such services offer consumers access to providers that might not be available otherwise, as well as medical services without the need to travel long distances (American Telemedicine Association, n.d.).

3.0 The Maternal Care and Equity Intervention (MCEI) Framework

The Maternal Care and Equity Intervention (MCEI) represents a comprehensive, theory-driven approach to addressing maternal health disparities through technology-enabled care delivery (Egbedion et al., 2025). Grounded in the Theory of Fundamental Causes, the MCEI framework (Figure 3) recognizes that effective interventions must address underlying social inequities that consistently produce health disparities.

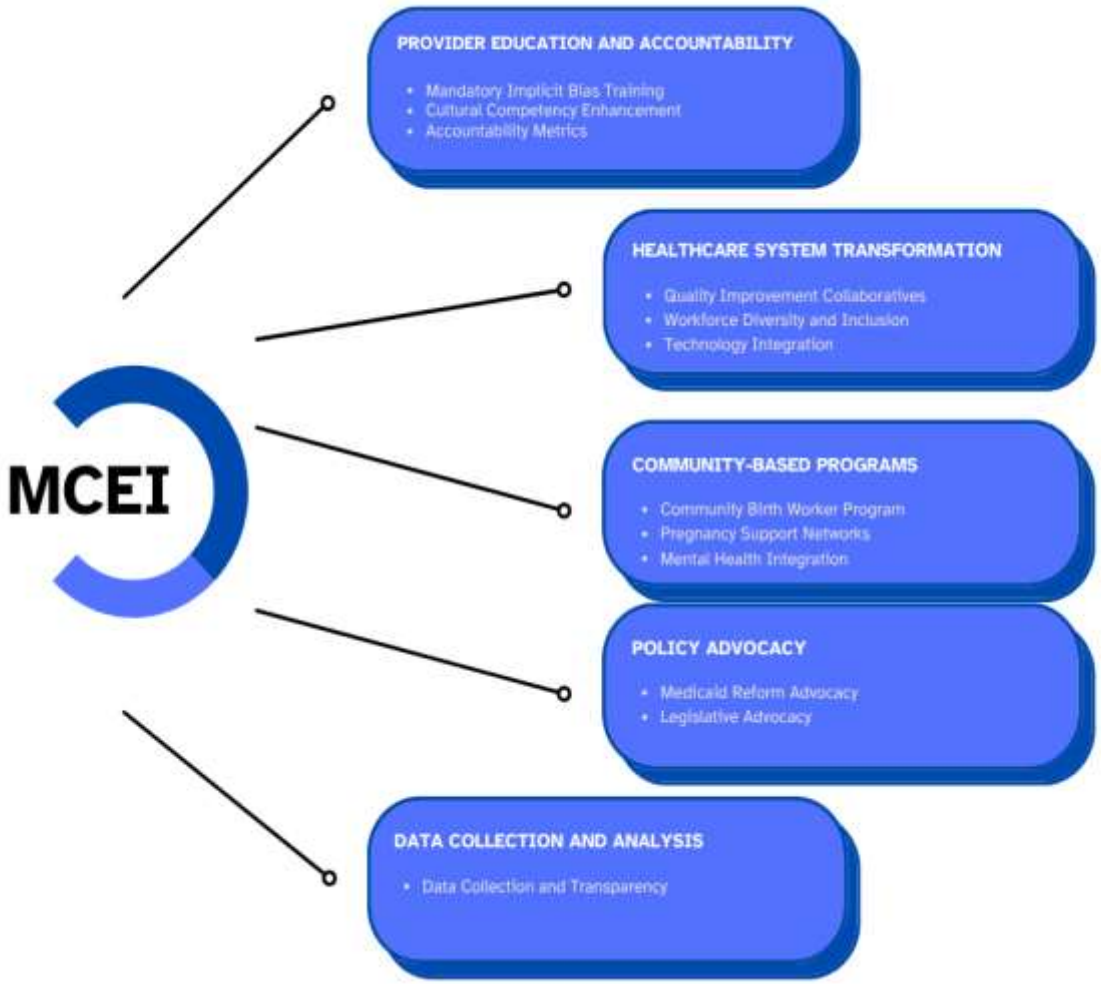

Figure 3: The Maternal Care and Equity Intervention (MCEI) Framework (Egbedion et al.,2025)

Framework Components

The MCEI framework integrates multiple technology-enabled interventions across the maternal care continuum:

- Telehealth Platforms: Comprehensive virtual care platforms providing specialty consultation for high-risk pregnancies, routine prenatal care, and postpartum follow-up. These platforms integrate with electronic health records and support care coordination across multiple providers.
- Remote Monitoring Devices: Home-based monitoring systems for blood pressure, weight, glucose levels, and fetal heart rate. These devices provide continuous health data and enable early identification of developing complications.
- Mobile Health Applications: Smartphone-based applications providing culturally tailored health education, symptom tracking, appointment reminders, and communication with care teams. Applications are designed with user-centered principles to ensure accessibility across different literacy levels and cultural backgrounds.
- Virtual Support Networks: Online support groups, peer counseling programs, and virtual doula services addressing social isolation and mental health needs during pregnancy and postpartum periods.

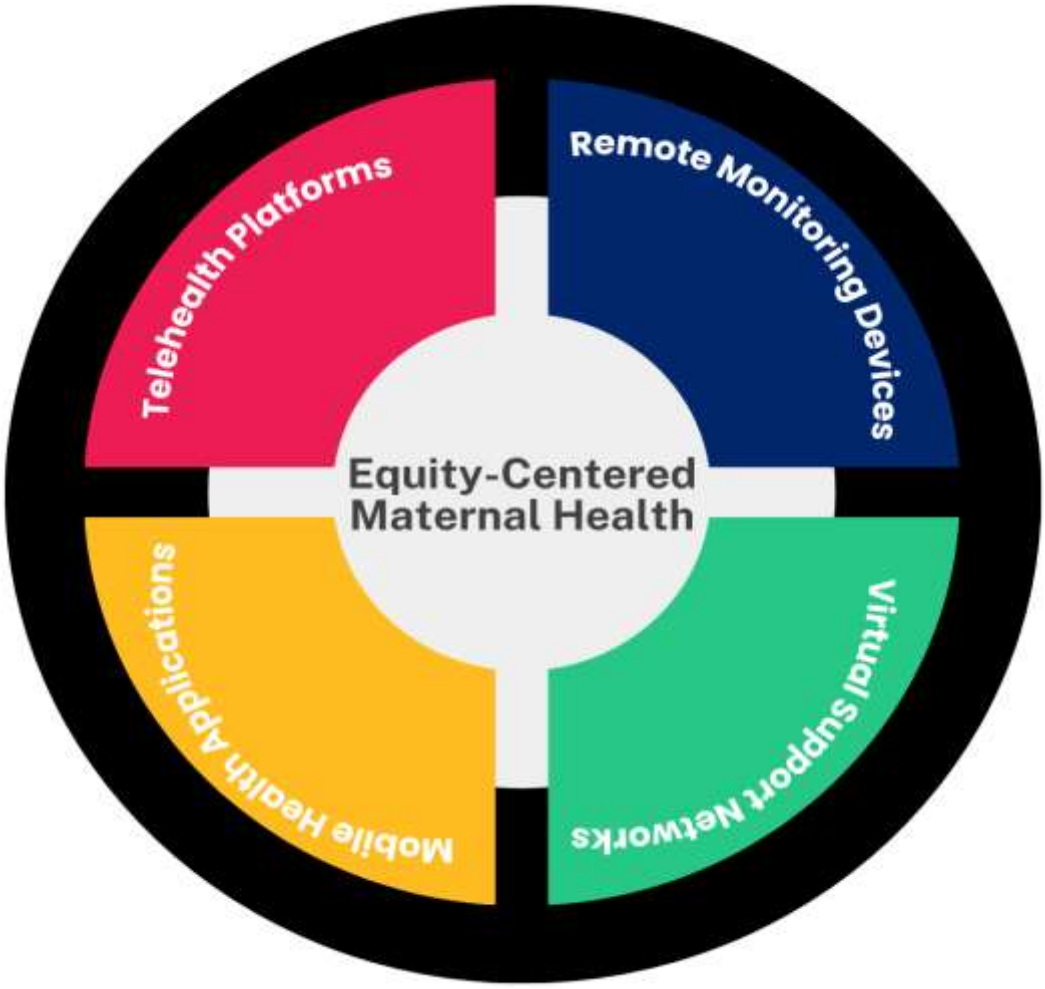

Figure 4: MCEI Framework for Equity-Centered Telehealth Integration in Maternal Care (Egbedion et al.,2025)

Equity-Centered Implementation

The MCEI framework emphasizes equity-centered implementation strategies that address the digital divide and ensure benefits reach the most vulnerable populations. Key components include:

- Community Partnership: Collaboration with community-based organizations, faith-based institutions, and community health workers to increase outreach, build trust, and ensure cultural appropriateness of interventions.
- Digital Navigation Support: Staff who provide digital access support and technical support, including technical assistance, device training, and ongoing troubleshooting.
- Multi-Modal Access: Recognition that different populations may require different technology approaches, with support for audio-only consultations, text-based communication, and in-person backup options when technology fails.
- Cultural Adaptation: Systematic adaptation of technology interfaces, educational content, and care protocols to meet the linguistic, cultural, and social needs of diverse populations.

4.0 Policy Recommendations for Sustainable Integration

To ensure that telehealth contributes to closing maternal health disparities, this paper offers the following key recommendations:

- Infrastructure and Access: By investing in federal and state initiatives to close the digital divide through broadband infrastructure expansion, particularly in rural areas and underserved communities, and provide device loaner programs and subsidized internet for Medicaid-eligible and low-income households to ensure pregnant and postpartum women have access to connectivity resources. Health systems should partner with libraries, schools, and community-based organizations to deliver community-based digital education programs tailored to pregnant and postpartum women to teach patients how to use telehealth platforms.
- Health Workforce and Training: Health workers should receive the necessary training to provide service on the telehealth platform, and users should be culturally matched with providers based on their needs and requirements.
- Regulatory and Reimbursement Reform: Regulatory requirements of telehealth practice, irrespective of delivery model, should be standardized across the board. Ensure parity in telehealth reimbursement across Medicaid and private insurers and maintain Medicaid and Medicare reimbursement parity for audio-only services to accommodate patients with limited digital resources, while ensuring that such care meets quality standards.
- Equity Metrics and Evaluation: Collaborate with local organizations, faith-based institutions, and community health workers to increase outreach, patient trust, and care continuity and support hybrid models combining virtual care with in-home or community-based services, particularly for maternal and chronic care management. Develop standardized measures of telehealth access, satisfaction, and outcomes stratified by race, income, language preference, geography, disability status, and insurance status, then use these metrics to monitor progress, inform continuous improvement, and hold systems accountable. Telehealth delivery models should be patient-centered and outcomes-driven.

5.0 Conclusion

Maternal health disparities represent one of the most pressing equity challenges in American healthcare, with technology-enabled solutions offering unprecedented potential to address systemic inequities that have long plagued our maternal care system. The MCEI framework presented in this study provides a comprehensive, equity-centered approach for implementing telehealth interventions that directly address the root causes of maternal health disparities through coordinated, multi-level interventions.

Technology-enabled maternal care delivery has transformative potential, but only if guided by deliberate, equity-focused strategies that address the digital divide and ensure meaningful access for the most vulnerable populations. The evidence demonstrates that telehealth can extend high-quality prenatal and postpartum care services to underserved communities, but realizing this potential requires moving beyond simple technology deployment to comprehensive equity-centered implementation.

The MCEI framework's emphasis on community partnership, digital navigation support, cultural adaptation, and multi-modal access provides a roadmap for healthcare systems seeking to harness technology's power for health equity. This approach recognizes that effective interventions must address underlying social inequities through coordinated efforts spanning infrastructure development, workforce training, policy reform, and community engagement.

As healthcare systems continue integrating telehealth into routine maternal care delivery, the imperative for equity-centered design and implementation cannot be overstated. Without deliberate attention to disparities, technology risks becoming another mechanism that advantages the already privileged while leaving behind those who need care most. The MCEI framework offers healthcare leaders and policymakers a concrete approach to ensure technology serves as a bridge rather than a barrier to equitable maternal care.

Future research must continue examining the long-term impacts of equity-centered telehealth implementation on maternal health outcomes across diverse communities. Continued innovation in user-centered design, artificial intelligence applications, and care delivery models will expand technology's potential for addressing health disparities, while maintaining focus on equity and access to prevent telehealth from becoming another source of health disparities.

The potential for telehealth to reduce maternal mortality is significant, but its realization depends on sustained commitment to the comprehensive, equity-centered approach exemplified by the MCEI framework. Through deliberate attention to structural barriers, community-centered implementation, and policy reform, technology can contribute to the ultimate goal of eliminating preventable maternal deaths and creating a healthcare system that truly serves all women with equity and justice.

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