Topic Brief: Digital Health Technology & Maternal Health

Date: 8/17/2022
Nomination Number: 999

Purpose: This document summarizes the information addressing a nomination submitted on June 2, 2022, through the Effective Health Care Website. This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

Issue: The nominator of this topic is interested in the harms and benefits of digital health technology, including remote monitoring, in prenatal and postpartum care.

Findings

We found multiple systematic reviews and a rapid review that address most of the nomination scope. After discussion with the nominator, this nomination will not be considered further by the EPC Program.

Background

The maternal mortality rate for 2020 was 23.8 deaths per 100,000 live births compared with a rate of 20.1 in 2019[1]. 17% of maternal deaths occur at delivery; 52% occur in the postpartum period. In the first week postpartum, severe bleeding, high blood pressure, and infection are the most common contributors to maternal deaths, while cardiomyopathy is the leading cause of late deaths. Previous research indicates that U.S. women experience more late maternal deaths than women in other high-income countries[2].

Rates of pregnancy-related complications have increased: The rate of hypertensive disorders in pregnancy increased substantially over the years, from 528.9 in 1993 to 912.4 in 2014. The rate of postpartum hemorrhage with procedures to control hemorrhage increased from 4.3 in 1993 to 21.2 in 2014[3].

Remote home monitoring in pregnancy can monitor pregnant people without requiring multiple check-ups in the office. Remote monitoring may include blood pressure monitors, blood glucose testing, weight, and home fetal monitoring[4]. The only FDA-cleared device specific to remote pregnancy monitoring is the INVU device that detects both the maternal and fetal heart rate, used for fetal monitoring and detection of uterine contractions[5].

The nominator plans to use the report in their engagement with stakeholders to support decision-making on maternal health policies related to digital health technology.

Scope

1. What is the comparative effectiveness and harms of telehealth for clinician and patient clinical encounters to augment or replace in-person encounters?
   a. For prenatal care
   b. For postpartum care

2. What is the comparative effectiveness and harms of remote monitoring?
    a. For prenatal care
    b. For postpartum care
3. What are the barriers and enablers of a successful telehealth strategy (e.g., setting, reimbursement, access to technology) for maternal health?

Table 1: PICOTS for Questions 1 and 2

Element	Questions 1 & 2
Population	Pregnant people a. In prenatal care (two weeks after conception to delivery) b. In postnatal care (24 hours post-delivery to up to 12-months post-delivery) Consider degree of access to in-person healthcare (e.g., rural areas, underserved communities), patient comorbidities, race/ethnicity, age, and other social determination of health (e.g., access to adequate broadband connectivity, access to transportation, access to healthy food sources).
Intervention	KQ 1: Telehealth • Telehealth only for maternal health, such as mental health evaluations, specialty consultations and treatment, chronic and acute condition management, care planning • Hybrid telehealth and in-person care for maternal health, such as mental health evaluations, specialty consultations and treatment, chronic and acute condition management, care planning KQ 2: Remote Monitoring • Remote monitoring of clinical data such as heart rate, temperature, physical activity, pain, etc. • Hybrid remote monitoring and in-person clinical data collection for measures such as heart rate, temperature, physical activity, pain, etc.
Comparator	KQ 1: Telehealth • Delivery of healthcare only in-person • Hybrid telehealth and in-person delivery of healthcare KQ 2: Remote monitoring • No remote monitoring • Hybrid remote monitoring and in-person data collection
Outcomes	Complications in childbirth; maternal mortality; maternal morbidity; resources (e.g., money, time) required of patients, providers, insurers, and caregivers; visit completion; patient psychological well-being/patient satisfaction/quality of life

Table 2: PerSPECTiF Framework for Question 3

Perspective	Setting	Phenomenon of interest/ Problem	Environment	Comparison (optional)	Timing	Findings
From the perspective of patients, providers, and insurers	Outpatient prenatal and postpartum care	Utilization of telehealth and remote monitoring	In the US with low uptake of telehealth and remote monitoring	NA	Up to and including the postpartum period	Barriers and facilitators of utilization of telehealth and remote monitoring

Assessment Methods

See Appendix A.

Summary of Literature Findings

We identified multiple evidence reviews that address KQ 1 and 2.

- For KQ 1a, AHRQ recently published a systematic review, "Schedule of Visits and Televisits for Routine Antenatal Care"[6] which was inclusive of hybrid antenatal schedules.
- For KQ 1b, AHRQ has an in-progress review "Post-partum care Up To One Year After Pregnancy."[7] As a part of included delivery strategies, the review will include information and communication technology – e.g., bidirectional telemedicine, virtual televisits, phone visits, bidirectional texting, real-time chat-bots, smartphone or computer applications designed to enhance provision of postpartum healthcare. In addition we identified a PCORI-funded rapid review on "Telehealth strategies for the delivery of maternal healthcare"[8] which encompasses preconception, prenatal, intrapartum, and postpartum periods. The rapid review focuses on two-way communication.
- For KQ 2a we identified two relevant systematic reviews and one rapid review, one focused on gestational diabetes[9] and another focused on home blood pressure monitoring[10]. The PCORI-funded rapid review on "Telehealth strategies for the delivery of maternal healthcare"[8] includes remote monitoring in the prenatal period. The two systematic reviews are less useful; in one the search date ended in 2018 and the other had limited details about the methods used. We also identified two in-progress reviews in PROSPERO[11, 12].
- For KQ 2b, we identified two relevant systematic reviews that partially addresses the question, both focus on postpartum blood pressure monitoring[10], and one is an AHRQ in-progress systematic review[13]. In addition we identified a PCORI-funded rapid review on "Telehealth strategies for the delivery of maternal healthcare"[8] which includes remote monitoring in the postpartum period.

For KQ 3, an AHRQ review on "Schedule of Visits and Use of Telemedicine for Routine Antenatal Care"[6] included a question on perspectives, preferences, barriers and facilitators related to telehealth for antenatal care. No reviews were found related to postpartum care or remote monitoring.

Key Question	Systematic reviews
KQ 1a: Telehealth for clinical encounters, prenatal care	Total-2 • AHRQ-1[6] • PCORI (rapid review)-1[8]
KQ 1b: Telehealth for clinical encounters, postpartum care	Total-2 • AHRQ-1[7] • PCORI (rapid review)-1[8]
KQ 2a: Remote monitoring for prenatal care	Total-3 • AHRQ-0 • Cochrane-0 • Pubmed-2[9, 10] • PCORI (rapid review)-1[8] • PROSPERO-2[11, 12]
KQ 2b: Remote monitoring for postpartum care	Total-3 • AHRQ-1[13] • Pubmed-1[10] • PCORI (rapid review)-1[8] • PROSPERO-1[11]
KQ 3: Facilitators and barriers	Total-1 • AHRQ-1[6]

AHRQ=Agency for Healthcare Research and Quality; KQ=key question;

Summary of Selection Criteria Assessment

This important topic is addressed by multiple systematic reviews including three AHRQ reviews and a PCORI-funded rapid review. Please see Appendix B for detailed assessments of individual EPC Program selection criteria.

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Conflict of Interest: None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

Acknowledgements
Emily Gean
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Appendix A: Methods

We assessed nomination for priority for a systematic review or other AHRQ Effective Health Care report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one. See Appendix B for detailed description of the criteria.

Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

Desirability of New Review/Absence of Duplication

We conducted a search for existing systematic reviews. We searched for high-quality, completed or in-process evidence reviews published in the last three years July 2019 to July 2022 on the questions of the nomination from these sources:

- AHRQ: Evidence reports and technology assessments
    - AHRQ Evidence Reports https://www.ahrq.gov/research/findings/evidence-based-reports/index.html
    - EHC Program https://effectivehealthcare.ahrq.gov/
- Cochrane Systematic Reviews https://www.cochranelibrary.com/
- PROSPERO Database (international prospective register of systematic reviews and protocols) http://www.crd.york.ac.uk/prospero/
- PubMed https://www.ncbi.nlm.nih.gov/pubmed/

Appendix B. Selection Criteria Assessment

Selection Criteria	Assessment
1. Appropriateness	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the U.S.?	Yes
1b. Is the nomination a request for an evidence report?	Yes
1c. Is the focus on effectiveness or comparative effectiveness?	Yes
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes
2. Importance	
2a. Represents a significant disease burden; large proportion of the population	The pregnancy rate for U.S. women in 2009 was 102.1 per 1,000 women aged 15–44[1]. There were nearly 2.5 million vaginal births in 2020, and over 1.1 million cesarean deliveries.
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large	Maternity care is a US departmental priority. The maternal mortality rate for 2020 was 23.8 deaths per 100,000 live births compared with a rate of 20.1 in 2019.

[1] Curtin SC, Abma JC, Ventura SJ, Henshaw SK. Pregnancy rates for U.S. women continue to drop. NCHS data brief, no 136. Hyattsville, MD: National Center for Health Statistics. 2013.

proportion of the US population or for a vulnerable population	Rates for non-Hispanic Black women were significantly higher than rates for non-Hispanic White and Hispanic women.
2c. Incorporates issues around both clinical benefits and potential clinical harms	Yes
2d. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Severe maternal morbidity affects over 50,000 women in the United States annually. This is driven by factors, such as increased maternal age, obesity, pre-existing chronic medical conditions, and history of cesarean delivery. The consequences include higher health service use, higher direct medical costs, and longer hospitalizations.
3. Desirability of a New Evidence Review/Absence of Duplication	
3. A recent high-quality systematic review or other evidence review is not available on this topic	We identified 7 completed and in-progress systematic reviews and a rapid review that address the majority of the nomination scope. Three are AHRQ systematic reviews and one is funded by PCORI.