Assessing the Scope of Evidence-Based Interventions and Policy Mobilization Efforts on CMV Infection Prevention in U.S. Pregnant Women: A Scoping Review

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Background

Cytomegalovirus (CMV) is a common global infection with significant implications for pregnant individuals. Congenital CMV (cCMV) is the leading cause of hearing loss and neurodevelopmental disabilities in children, affecting an estimated 15–18% of births in the United States. Pregnant women with frequent exposure to young children, close contact with bodily fluids, or occupational risks are at higher risk of infection. Despite its prevalence, the lack of routine prenatal screening and national guidelines limits detection and prevention, particularly in low-resource and minority communities. Barriers such as financial constraints, limited provider knowledge, challenges interpreting serologic tests, and low health literacy exacerbate disparities in awareness and care. Although ACOG has issued CMV prevention recommendations, implementation remains inconsistent nationwide.

This project serves to assess current interventions and policy efforts focused on CMV prevention in pregnancy across the US.

Methods

The Arksey and O'Malley (2005) York methodology was used as guidance for this review: (1) identifying research questions; (2) searching for relevant studies; (3) selecting studies relevant to the research questions; (4) charting the data; (5) collating, summarizing, and reporting results.

A total of 1979 articles were identified across PubMed (n = 833), EMBASE (n = 2033), and Cochrane Library (n = 102). After screening and exclusions, six studies published between 2014–2022 were retained. The PRISMA-Scr checklist was used as the main reference checklist. Study identification, screening and exclusion are shown in Figure A.

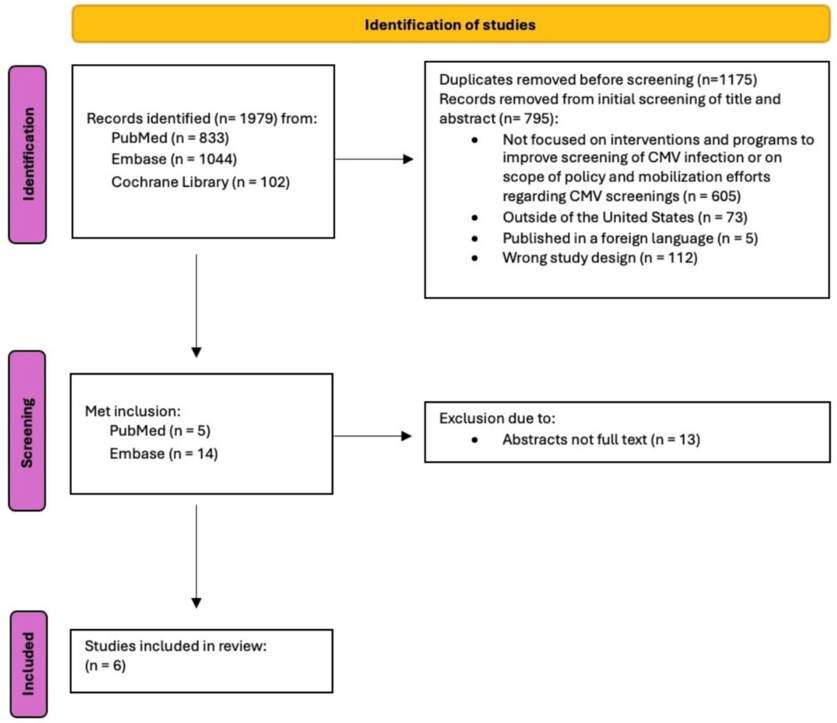

Figure A (above): Scoping Review study identification, inclusion and exclusion criteria

Results

Study designs included decision analysis (n = 1), randomized controlled trial (n = 1), cross-sectional (n = 2), and cohort (n = 2). Sample sizes ranged from 100–4,000,000, with most participants aged 18–45. Five studies (83%) focused on education, and two (33%) on policy or mobilization efforts.

- Educational interventions for CMV prevention included web-based materials (n = 2), physical handouts (n = 1), digital reminders (n = 1), and interviews (n = 1). Tools such as videos, testimonials, and hygiene-based education improved awareness, motivation, and behavioral compliance among pregnant women.
- Two studies examined CMV policies and mobilization. Decision analysis showed universal prenatal screening can be cost-effective, while in-clinic education based on CDC guidelines reduced high-risk behaviors, highlighting the value of combining policy and education.
- Barriers included small sample sizes, limited generalizability, low provider knowledge, and time constraints during prenatal visits. Cultural resistance and emotional discomfort in changing behaviors, such as avoiding child saliva contact, also hindered CMV prevention uptake.

Conclusion

- CMV education improves awareness, knowledge, and engagement in preventive behaviors among pregnant women
  - This can be successfully achieved through web-based fact sheets, videos, motivational counseling, and story-based interventions.
  - Such education may be most effective when integrated into routine prenatal care to support behavior change, risk perception, and preventive compliance consistently throughout pregnancy.
- Culturally tailored, multilingual, and community-based programs increase acceptability, screening uptake, and adherence to hygiene and risk-reduction behaviors.
- Universal CMV screening may be cost-effective depending on incidence and intervention effectiveness, but barriers include limited treatment options, provider time constraints, cultural norms, and low health literacy.
- Continued research, funding, and policy development are critical to implement effective screening and reduce cCMV burden and promote equitable maternal and infant health outcomes..

References

Ssentongo et al., 2021; Sartori et al., 2023; Lantos et al., 2018; Manicklal et al., 2013; Cannon et al., 2012; Chan et al., 2024; Thackeray et al., 2018; ACOG, 2015; Dollard et al., 2007; Kenneson & Cannon, 2007; Arksey & O'Malley, 2005; Pollock et al., 2023; Tricco et al., 2018; Albright et al., 2019; Hughes et al., 2017; Levis et al., 2017; Price et al., 2014; Schaefer et al., 2020; Thackeray et al., 2017; Vandrevala et al., 2024; Hussein et al., 2024; Torres et al., 2017; Ezeanolue et al., 2015; ACOG, 2025; Walker et al., 2013; Meyers et al., 2019; Weil et al., 2022.