Prevalence and Disparities of Cardiac Conditions in Obstetric Care: A Comprehensive Analysis

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AcademyHealth
ANNUAL RESEARCH MEETING

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Developed under contract to the SC Department of Health and Human Services

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DISCLAIMER:

This work was prepared under contract to the South Carolina Department of Health and Human Services with López-De Fede, A., and Mayfield-Smith, K. as Principal Investigators, 2025. The views and opinions expressed in this presentation are those of the authors and do not necessarily reflect any agency or organization's official policy or position.

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About the Study

Background:

- Cardiovascular disease (CVD) has become the primary cause of maternal illness and death during the first year after childbirth, responsible for over 25% of all maternal fatalities in the United States[1] and about one in six maternal fatalities in SC.[2]

- Most pregnancy-related cardiac deaths occurred without a prior cardiovascular diagnosis during the pregnancy or the postpartum period. Over 80% of all such deaths were preventable and disproportionately affected non-Hispanic Black individuals.

1. Luther, J., Johnson, D., Joynt Maddox, K., & Lindley, K. (2021). Reducing cardiovascular maternal mortality by extending Medicaid for postpartum women. Journal of the American Heart Association, 10(15), e022040. https://doi.org/10.1161/JAHA.121.022040
2. South Carolina Department of Public Health. (2024). *South Carolina Maternal Mortality Review Committee legislative brief*. https://dph.sc.gov/sites/scdph/files/media/document/New%20PDFs/2024-SC-MMMRC-Legislative-Brief.pdf

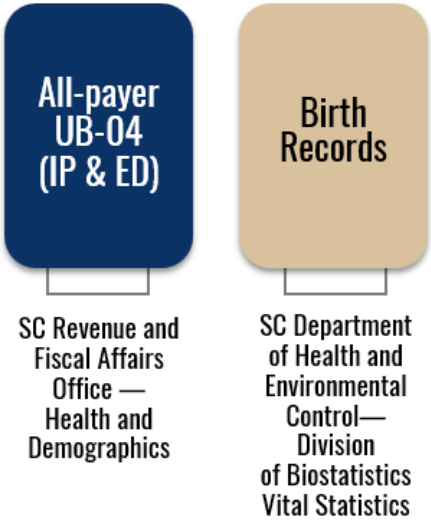
About the Study (continued)

Objective:

As cardiovascular disease is one of the leading causes of pregnancy-related mortality in SC, this study aimed to explore disparities in AIM-defined cardiac conditions in obstetric care (CCOC) and their association with adverse maternal outcomes.

Study Population:

The study analyzed 51,502 SC deliveries for calendar year 2023, identified using data linking Medicaid eligibility, birth, and hospital (UB-04) records.



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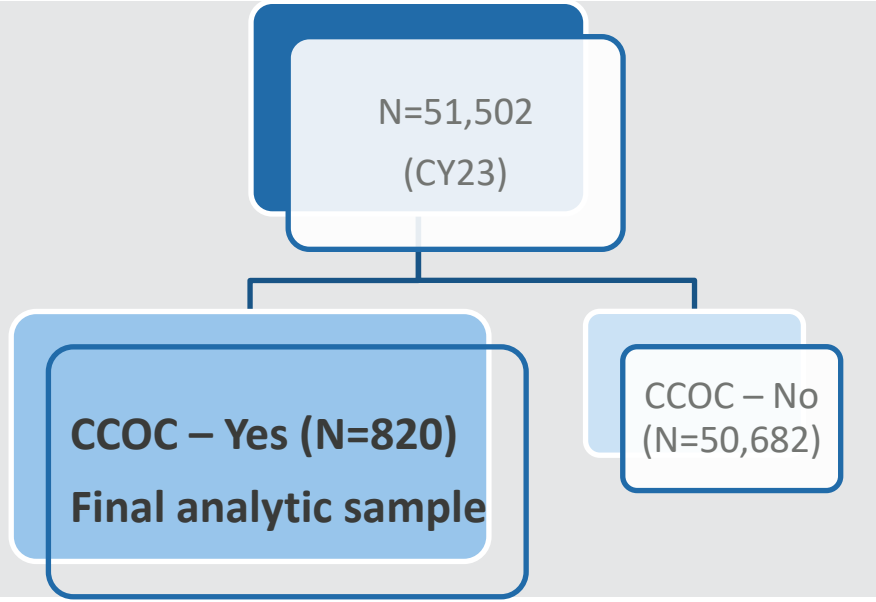
Final Study Sample



CCOC refers to the following disorders of the cardiovascular system present at the time of delivery, as defined by AIM (Alliance for Innovation on Maternal Health):

- Congenital Heart disease (Q200-Q259, Q796, Q8740-Q743)
- Cardiac Valve Disorders (I050-I099, I340-I390)
- Cardiomyopathies (I420-I429, I43, I502-I508, O903)
- Arrhythmias (I440-I446, I447, I451-I459, I470-I479, I480-I489, I490-I499)
- Coronary Artery Disease (I200-I209, I251-I259, M300-M308)
- Pulmonary Hypertension (I272, I278)
- Other/Not Specified (I300-I319, I400-I409, I41, O994, Z941-Z959)

Methods

Statistical Analysis

- Identified the prevalence of CCOC among SC deliveries
- We used the Chi-squared test to examine the association between mothers with CCOC at delivery and those without, across the following outcomes: Severe Maternal Morbidity (SMM), avoidable primary cesarean sections (TJC PC-02), low birthweight, and preterm birth.
- Multivariate logistic regression models were used to estimate odds ratios, adjusting for race, insurance type, rural residence, and co-occurring health conditions.

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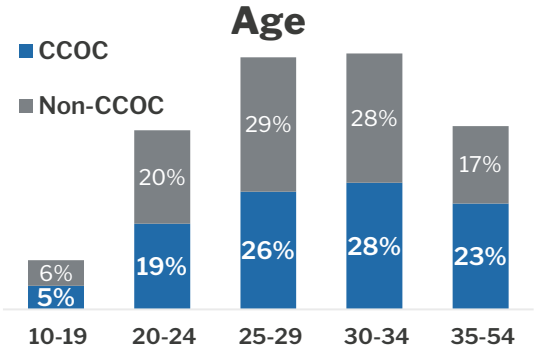
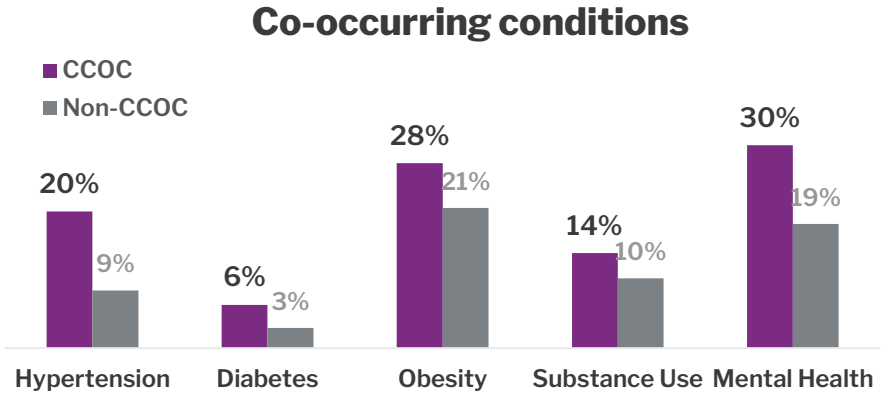
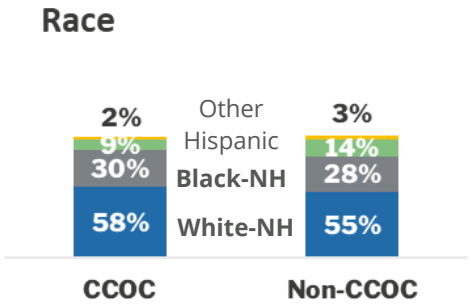
CCOC vs Non-CCOC Delivery characteristics: CY23

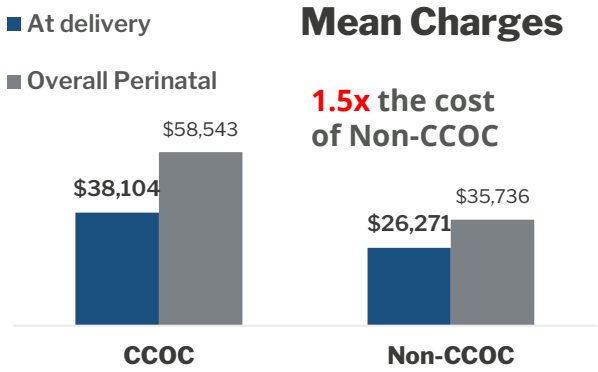






Perinatal Level III/IV

CCOC	Non-CCOC
61%	39%



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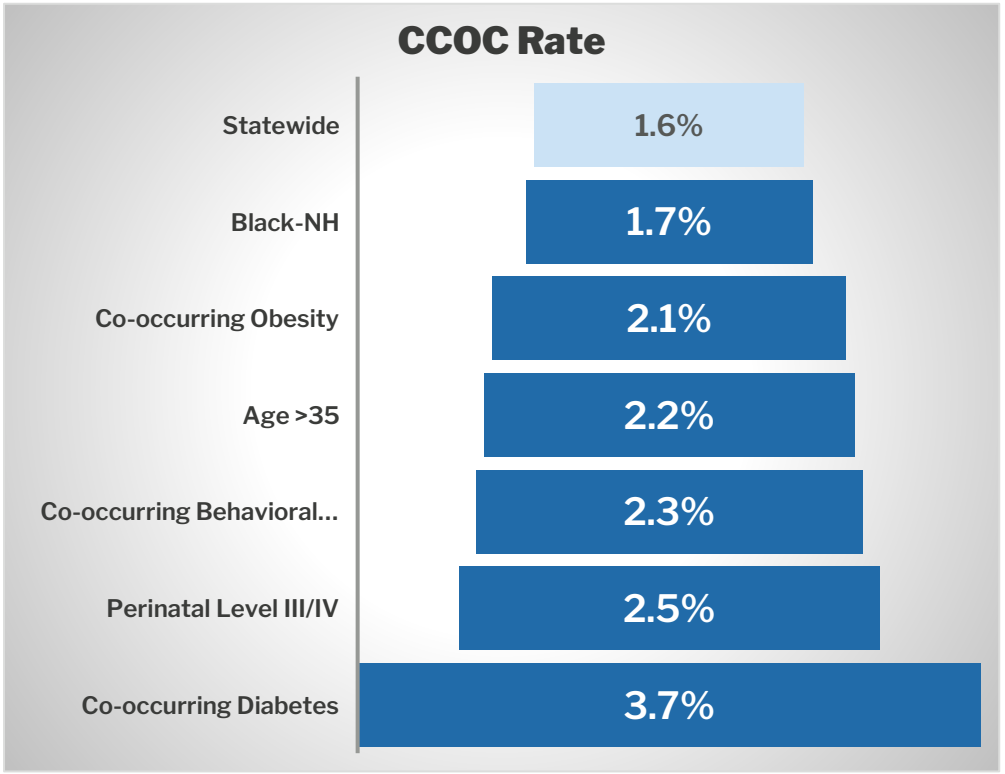
CCOC Delivery Disparities



Compared to non-CCOC individuals, those with CCOC had significantly ($p<0.05$) higher risks for:

- 6x for SMM
- 2x for LBW and prematurity
- 1.4x for primary avoidable cesareans

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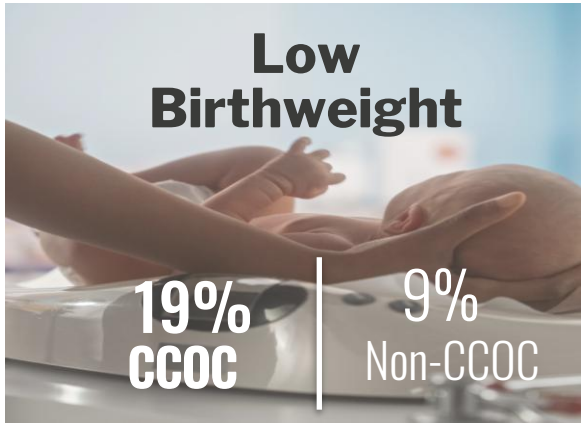
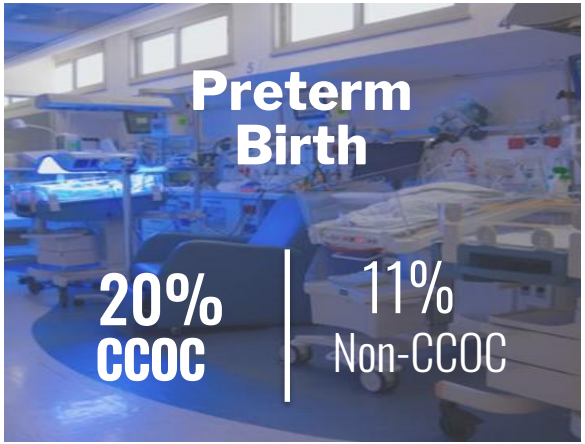
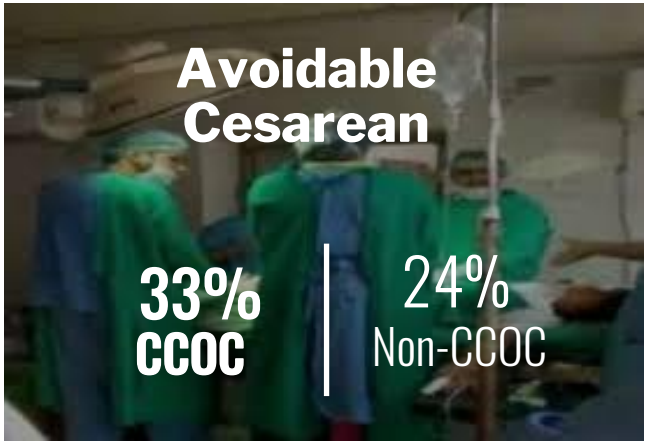
CCOC vs Non-CCOC: Maternal Outcomes







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Summary of Findings

- Approximately **1 in 7 patients who delivered with a cardiac condition of concern (CCOC)** had already been hospitalized for a related cardiac issue during the prenatal period. This finding emphasizes that many cardiac complications do not emerge suddenly at delivery but often develop and escalate during pregnancy.
- The presence of CCOC at the time of delivery was strongly associated with significantly **higher rates of adverse maternal health outcomes**, including severe morbidity, as well as **increased hospital costs and resource utilization** during delivery.
- Our analysis also underscores a clear relationship between **specific clinical characteristics (such as preexisting conditions)** and **demographic factors (such as race, ethnicity, and socioeconomic status)** that help identify patients at **elevated risk** for experiencing severe complications.

Discussion | Implications

Impact of Cardiac Conditions in Pregnancy

- Cardiac conditions at delivery worsen maternal and neonatal outcomes
- Disproportionately affects non-Hispanic Black individuals and those with co-existing health issues
- Many conditions are present during the prenatal period, highlighting the need for early detection

Recommendations for Providers

- Train all OB providers in basic cardiac screening
- Use standardized cardiac risk assessment tools
- Establish protocols for identifying and managing cardiac conditions in all care settings

System-wide Interventions

- Mobilize resources for newly diagnosed cardiac patients to reduce preventable harm
- Implement multidisciplinary care planning, including admission huddles and post-event debriefs
- Ensure continuity of care through coordinated consultations, transfers, and hand-offs

Discussion | Implications (cont.)

Fair & Available Service Delivery Focus

- Prioritize care and outreach for high-risk and underserved populations
- Address gaps in rural and underserved areas, even without cardio-obstetrical teams
- Tailor patient education to risk level, literacy, language, and cultural needs

Non-Medical Drivers & Considerations for Effective Service Delivery

- Screen for structural and social drivers affecting treatment
- Build referral networks between OB care, community resources, and public health
- Train teams in trauma-informed care and bias awareness to improve outcomes

Additional Resources

1) AIM-defined Cardiac Conditions in Obstetric Care
https://saferbirth.org/psbs/cardiac-conditions-in-obstetric-care/

2) Potential benefits of low-dose aspirin during pregnancy
https://www.marchofdimes.org/our-work/health-professionals/low-dose-aspirin-during-pregnancy

3) AIM patient safety bundles
https://saferbirth.org/patient-safety-bundles/

4) Urgent maternal warning signs
https://www.cdc.gov/hearher/index.html

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