The association between county-level NTSV cesarean delivery rates and severe unexpected newborn complications

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Objective
- To investigate the relationship between county-level cesarean delivery rates among nulliparous women with term, vertex-presenting singletons (NTSV) and severe unexpected newborn complications (UNCs)

Methods
- Design: observational, 2015-2017
- Population: term, non-anomalous, liveborn, singleton neonates born in counties with >1,000 deliveries, as identified using birth certificate data
- Exposure: county-level NTSV cesarean rates
- Outcome: severe UNCs (death, transfer, 5 min Apgar ≤3, assisted ventilation for ≥6 hours, seizures or neurologic injury)

Results
- Sample size: 9,303,008 neonates from 1,044 counties
- NTSV cesarean delivery rates: Range: 0.1 to 51.4 per 100 live births
- Severe unexpected complication rates: Range: 0.6 to 88.7 per 1,000 live births
- Counties with higher NTSV cesarean delivery rates had lower newborn complication rates:
  - Unadjusted coefficient: -0.31 [95% CI -0.40, -0.21]
  - Adjusted coefficient: -0.14 [95% CI -0.23, -0.04]

Conclusions
- Counties with lower cesarean delivery rates had higher newborn complications rates
- Unexpected newborn complications may be a useful neonatal-focused metric of obstetric quality that can be interpreted with maternal-focused metrics (e.g., cesarean delivery rates)
- Additional research into these findings is needed to help providers, hospitals, and policymakers understand and establish cesarean delivery rate targets that balance both maternal and neonatal risks