SOAR Return on Investment Evaluation

Executive Summary

A summary of the final evaluation of the Supporting Vaginal Deliveries for Low-Risk Mothers (SOAR) initiative, conducted in partnership with Ariadne Labs' Delivery Decisions Initiative, covering cesarean delivery rates and costs for first-time, low-risk births across 32 Colorado hospitals, 2017–2025.

SOAR's goal: Reduce preventable harm by helping hospitals reach and stay at or below the Healthy People 2030 goal for cesarean deliveries among first-time, low-risk births (known in clinical reporting as the NTSV rate): 23.6% or lower. This is the same benchmark used by Colorado's Hospital Quality Incentive Payment program (HQIP), the federal Centers for Medicare & Medicaid Services (CMS), and Colorado's Hospital Transformation Program (HTP).

Primary findings

Across the 32 hospitals that participated in SOAR, the average NTSV cesarean rate fell from 23.3% in the 12 months before enrollment to 21.1% in the 12 months after, successfully moving the group further below Colorado's clinical target of 23.6%. Every SOAR cohort'post-enrollment average now sits at or below that target.

For comparison, hospitals that never joined SOAR moved in the opposite direction over the same years, from 21.8% in 2017 to 25.6% in 2025. This is a useful context, not a controlled comparison (see Limitations).

Cohort	Pre-SOAR rate	Post-SOAR rate
2018 Starters	24.8%	19.7%
COVID-Era Starters	21.9%	20.7%
2022–23 Rolling	24.1%	23.1%
2024 Closed Cohort	22.4%	19.9%
2025 Closed Cohort	23.0%	20.4%
All SOAR Participants	**23.3%**	**21.1%**
Non-SOAR hospitals, same time period	**21.8%**	**25.6%**

Figures are cohort-level averages, not individual hospital rates.

Statistical vs. clinical significance

The shift described above is clinically meaningful: it reflects a wider margin below the target rate. However, it is not yet proven, statistically, that SOAR itself caused this change rather than other factors or chance. But the clinical outcome stands on its own regardless of attribution: mothers at SOAR hospitals are experiencing fewer unnecessary cesareans today, a real benefit independent of whether we can yet prove SOAR directly influenced the result.

The evaluation team also ran a stricter statistical test that accounts for each hospital's trend before joining SOAR, along with other time-varying factors. Under that stricter test, no individual hospital group showed a decline reliable

enough to rule out chance. A simpler comparison across all 32 hospitals combined did pass a standard statistical threshold, but that comparison blends hospital groups with very different program structures and lengths of follow-up, so the evaluators caution against treating it as solid proof of SOAR's direct impact.

The hospitals that joined SOAR earliest (2018) showed the largest individual change, but they were specifically recruited because their rates were unusually high to begin with. Unusually high C-section rates tend to naturally drift back down over time on their own, which makes it hard to credit the full improvement to SOAR rather than this natural pattern.

Cost findings

There is no evidence that SOAR participation increased or decreased the cost of care: none of the groups of hospitals showed a cost change reliable enough to rule out chance, whether using a simple before/after comparison or a more rigorous adjusted analysis.

Costs rose sharply for both SOAR and non-SOAR hospitals over the study period. Among hospitals that never joined SOAR, median quarterly costs (the combined maternal and newborn costs tied to these cesarean deliveries, not hospital-wide costs for all births) grew from about $61,000 in 2017 to about $342,000 in 2025, roughly a 5-fold increase, far more than ordinary healthcare cost inflation would explain. SOAR hospitals' costs also rose substantially over their own pre/post-enrollment windows, following the same broad pattern.

The evaluation can't fully explain this rise. Part of it is likely due to gaps in the underlying data: the conversion rate used to estimate real costs from hospital billing wasn't available for 2025, so last year's figure had to be reused, and a small number of unrealistically high billing values at three hospitals were removed after being flagged as likely data errors. Because the increase appears at a similar scale in both SOAR and non-SOAR hospitals, it does not look like a SOAR-specific effect, but it also means this evaluation cannot explain what is driving overall cost growth, which is a separate question from SOAR's impact. At this stage, the evaluation shows no proven cost savings and no proven added cost from SOAR specifically.

Context and limitations

- SOAR cohorts were segmented by enrollment period rather than analyzed as one group because the program itself changed substantially between 2018 and 2025, and lumping all years together would blur what "participating in SOAR" actually meant at different points in time. Each group of hospitals studied together was small (4–10 hospitals), making it hard to detect a real effect with confidence, even if one exists.
- The current standardized program model (annual closed cohort) has only two years of post-enrollment data.
- Newborn-specific costs and the costs of preventing repeat cesarean deliveries were outside the scope of this analysis.
- The appropriate length of follow-up after SOAR engagement needed to detect a true effect is still an open question.
- Hospitals with fewer births show large swings in their rates from one quarter to the next, which makes group statistics of mean and median less stable.

Recommendation

Continue the current standardized SOAR cohort model (in place since 2024) and repeat this analysis in one to two years. This allows time for more hospitals to have completed a closed-cohort enrollment under a now more homogeneous program structure.

We recommend the next evaluation cycle also prioritize four things the current data can't answer:

- **Balancing measures.** The cesarean rate is a proxy for reducing preventable harm, not a direct measure of it. We recommend tracking actual harm outcomes alongside the rate, such as severe maternal morbidity, NICU admissions, and newborn complications, along with costs associated with preventing repeat cesarean deliveries,

to confirm that a lower rate is translating into better outcomes, not just shifting risk elsewhere.

- **Equity.** The underlying data include race and ethnicity, but it was beyond the scope of this evaluation to report whether clinical outcomes are shared equitably across racial and ethnic groups. We recommend this be included as a standard part of future reporting.
- **Implementation fidelity.** Under SB24-175, CPCQC is now tracking hospital engagement, in addition to clinical outcomes. Beginning in 2025, this engagement tracking can help us better understand SOAR as a standardized intervention, targeting support as needed.
- **Why hospitals don't participate.** Nineteen eligible hospitals have never enrolled, and they skew rural and critical-access. Understanding those barriers directly informs our recruitment and spread strategy.

The key takeaway: hospitals working with SOAR are meeting Colorado's clinical goal for cesarean rates, and the trend is moving in the right direction.
