

# Impact of a labor and delivery safety bundle on a modified adverse outcomes index

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## Background

The Obstetrics Adverse Outcomes Index was designed to measure the quality of perinatal care and includes 10 adverse events that may occur at or around the time of delivery. We hypothesized that adverse outcomes in the labor and delivery suite, including hypoxic ischemic encephalopathy, could be decreased with a combination of interventions, even among high-risk pregnancies.

## Objective

The objective of the study was to evaluate the impact of a labor and delivery care bundle on adverse obstetrics outcomes as measured by a modified Obstetrics Adverse Outcomes Index, Weighted Adverse Outcomes Index, and Severity Index.

## Study Design

This is a retrospective cohort study including all women who delivered at our academic, tertiary care institution over a 3 year period of time, before and after the implementation of an intervention to decrease adverse outcomes. Outcome measures consisted of previously reported indices that were modified including the addition of hypoxic ischemic encephalopathy. The adverse outcomes index is a

percentage of deliveries with 1 or more adverse events, the weighted adverse outcomes index is the sum of the points assigned to cases with adverse outcomes divided by the number of deliveries, and the severity index is the sum of the adverse outcome scores divided by the number of deliveries with an identified adverse outcome. A segmented regression analysis was utilized to evaluate the differences in the level and trend of each index before and after our intervention using calendar month as the unit of analysis.

## Results

During the study period, 5826 deliveries met inclusion criteria. Comparing the pre- and post-intervention periods, high-risk pregnancy was more common in the postintervention period (73.5% vs 79.4%,  $P < .001$ ). Overall, there was a decrease in both the Modified Weighted Adverse Outcomes Index ( $P = .0497$ ) and the Modified Severity Index ( $P = 0.01$ ) comparing the pre- and postintervention periods; there was no difference in the Modified Adverse Outcomes Index ( $P = .43$ ). For low-risk pregnancies, there was no significant difference in the levels for any of the measured indices over the study period ( $P = .61$ ,  $P = .41$ , and  $P = .34$  for the Modified Adverse Outcomes Index, Modified Weighted Adverse Outcomes Index, and Modified Severity

Index, respectively). Among the high-risk pregnancies, the monthly Modified Weighted Adverse Outcomes Index decreased by  $4.2 \pm 1.8$  ( $P = .03$ ). The monthly Modified Severity Index decreased by  $53.9 \pm 17.7$  points from the pre- to the postintervention periods ( $P = .01$ ) and was  $< 50\%$  of the predicted Modified Severity Index had the intervention not been implemented. The cesarean delivery rate was increasing prior to the intervention, but the rate was stable after the intervention, and the absolute rate did not differ between the pre- and the postintervention periods (28.4% vs 30.0%,  $P = .20$ ) (Figure).

## Conclusion

Overall and for high-risk pregnancies, the implementation of the labor and delivery care bundle had a positive impact on the Modified Weighted Adverse Outcomes Index and Modified Severity Index but not the Modified Adverse Outcomes Index. ■

## Author and article information

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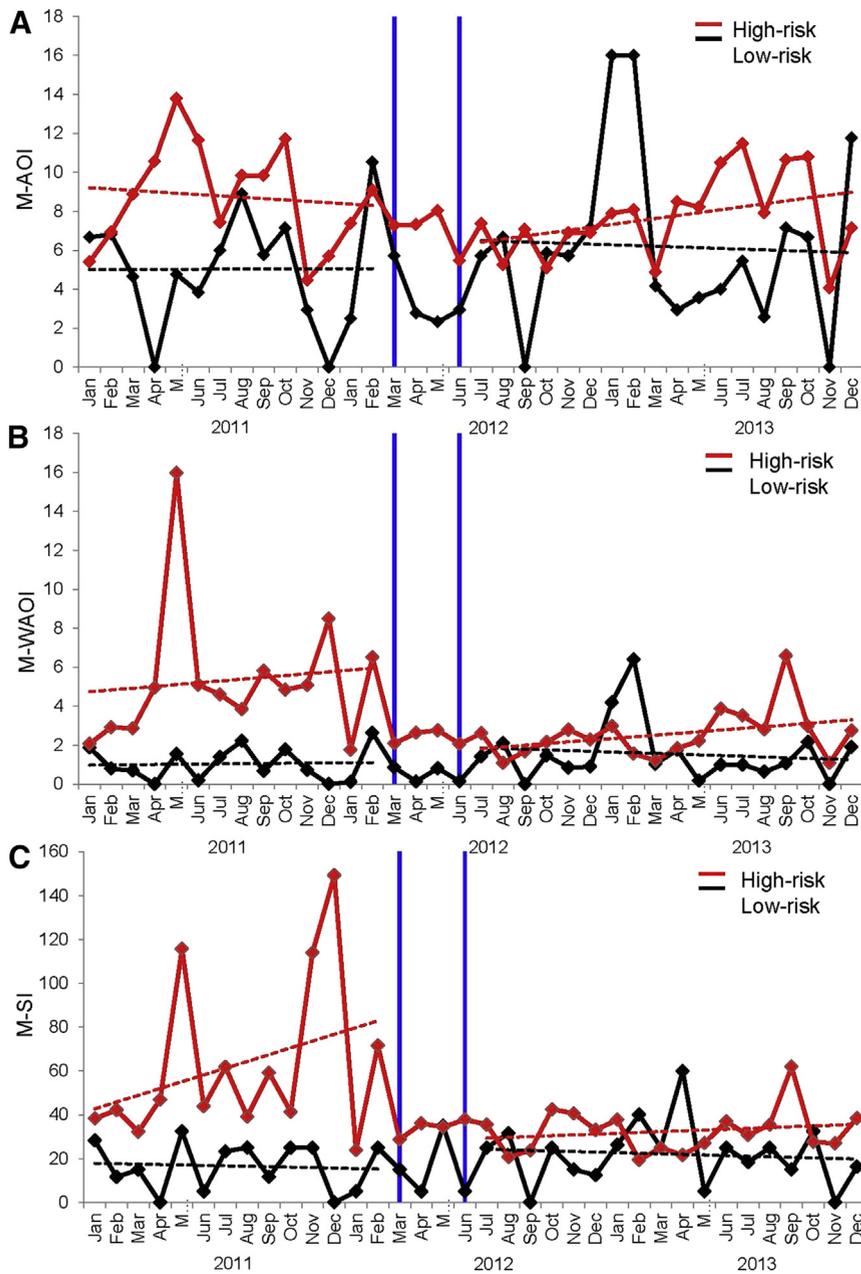
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**FIGURE**  
Modified indices of groups stratified by high- and low-risk



Modified adverse outcomes index (A), Modified Weighted Adverse Outcomes Index (B), and Modified Severity Index (C), stratified by high- and low-risk. The *dashed lines* denote the estimated monthly values from the segmented regression analysis. The *period between the vertical blue lines* denotes the transition period.

M-AOI, Modified Adverse Outcomes Index; M-SI, Modified Severity Index; M-WAOI, Modified Weighted Adverse Outcomes Index.  
Tolcher et al. Modified obstetrics adverse outcomes index. *Am J Obstet Gynecol* 2016.