IMPACT OF TENNESSEE INITIATIVES TO REDUCE EARLY ELECTIVE DELIVERIES

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BACKGROUND
- EEDs = elective deliveries ≥37 to <39 weeks
- ↑ Cesarean deliveries and complications
- ↑ Adverse outcomes and costs

Table. Tennessee EED Initiative cohorts and implementation dates.

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Hospitals</th>
<th>N</th>
<th>Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort 1</td>
<td>All Davidson County hospitals</td>
<td>5</td>
<td>1/1/2009</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>Regional One (Memphis), Erlanger Medical Center (Chattanooga), Jackson-Madison County General (Jackson), Maury Regional Hospital (Columbia)</td>
<td>4</td>
<td>1/1/2010</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>All remaining TN hospitals</td>
<td>59</td>
<td>5/1/2012</td>
</tr>
</tbody>
</table>

OBJECTIVE
- Evaluate the impact of TN EED initiatives
  1. Incidence of EEDs
  2. Costs saved from averted EEDs

METHODS
- Data Sources: Vital Records (2007-2013)
- Definitions:
  - Cohorts
  - EEDs (Table)
  - Adverse Events

Table. Criteria for evidence of an EED.

- Singleton birth, i.e. excluded plural births
- Gestational age of ≥37 to <39 weeks
- Non-spontaneous delivery, i.e. induction or cesarean delivery
- Non-medically indicated, i.e. excluded if any of the following indications were present:
  - Previous cesarean section
  - Pre-pregnancy or gestational diabetes
  - Pre-pregnancy or gestational hypertension
  - Birth weight <2500 grams (small for gestational age)

METHODS
- Interrupted time series analysis
- Change in EED rate
- Change in EED trend
- Comparison to national rates
**Figure.** Interrupted time series trends for monthly EED pre- (blue) and post-implementation (red).

**Table.** Interrupted time-series analysis on the effect of EED initiatives.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Size</th>
<th>Pre-Implementation</th>
<th>Post-Implementation</th>
<th>Change in EED Rates</th>
<th>Crude OR (95% CI)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>115,189</td>
<td>6.3%</td>
<td>111,312</td>
<td>4.9%</td>
<td>0.90 (0.85-0.95)</td>
<td>0.754</td>
</tr>
<tr>
<td>Cohort 1</td>
<td>29,333</td>
<td>8.0%</td>
<td>29,974</td>
<td>4.8%</td>
<td>0.62 (0.46-0.83)</td>
<td>0.001</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>22,062</td>
<td>8.2%</td>
<td>20,796</td>
<td>5.4%</td>
<td>0.76 (0.53-1.10)</td>
<td>0.181</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>99,695</td>
<td>5.2%</td>
<td>84,333</td>
<td>4.9%</td>
<td>0.99 (0.82-1.21)</td>
<td>0.947</td>
</tr>
</tbody>
</table>

Odds ratios (OR) adjusted for child gender and mother’s age, race/ethnicity, education level, insurance type, WIC status, income level, and prenatal care status.

**INCIDENCE OF EEDS – NATIONAL COMPARISON**

- TN EED rates higher than national averages in 2007-2008
- In 2009, rates dropped below national average

**METHODS – RETURN ON INVESTMENT**

- Number of EEDs averted and savings ($)
- Delivery method
- Presence of adverse event
- Costs
- Administrative (internal accounting)
- In-kind (hospital surveys)

<table>
<thead>
<tr>
<th>Adverse Event Occurred</th>
<th>Delivery Method</th>
<th>Vaginal</th>
<th>Cesarean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Delivery Costs</td>
<td>$11,132</td>
<td>$9,079</td>
</tr>
</tbody>
</table>

**RETURN ON INVESTMENT**

**Table.** Summary of return on investment (ROI) analysis.

<table>
<thead>
<tr>
<th>Hospitals, N</th>
<th>EEDs Averted*</th>
<th>Savings</th>
<th>Costs</th>
<th>Net</th>
<th>ROI Analysis ($ in Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>68</td>
<td>1,825</td>
<td>($18,695)</td>
<td>$1,178</td>
<td>($17,517)</td>
</tr>
<tr>
<td>Cohort 1</td>
<td>5</td>
<td>952</td>
<td>($10,012)</td>
<td>$161</td>
<td>($9,851)</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>4</td>
<td>577</td>
<td>($5,627)</td>
<td>$174</td>
<td>($5,453)</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>59</td>
<td>296</td>
<td>($3,056)</td>
<td>$843</td>
<td>($2,213)</td>
</tr>
</tbody>
</table>

* EEDs averted as observed – expected EEDs comparing pre- and post-implementation rates.

**SUMMARY OF FINDINGS**

- Initiatives were successful in reducing the practice of EEDs in Cohorts 1 and 2
- Low pre-implementation rates in Cohort 3
- Initiatives led to an estimated 1,825 fewer EEDs in the two years following implementation
- Estimated net-savings of $17.5 million

**ACKNOWLEDGMENTS**

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  - Association of Maternal & Child Health Programs