Cesarean delivery (CD) is a public health issue because…

Choice of CD reflects social norms that public health tries to shape.

Utilization of CD depends on capacities and incentives in the larger healthcare system.

Consequences of CD falls within states’ responsibilities for surveillance.
State Surveillance Objectives

- Trends in cesarean rates
- Population shifts in risk factors
- Compare hospitals using risk adjustment
- Complications attributable to cesarean
- Contribution to prematurity (CD and labor induction)

Perinatal Surveillance System

- Electronic Birth Certificate Program
  - 400 field extract of PNC and L&D record
  - Direct data entry at 50 maternity hospitals
- Hospital Discharge Files
  - Universal Billing format
  - ICD-9 coding
- Pregnancy Risk Assessment Monitoring System (PRAMS)
Key Methodological Issues

Clinical issue: Imprecise standards on indications for cesarean.

Data issue: “Elective” status is not recorded.

Statistical issue: Methodologies for evaluation of “medically unnecessary” or “potentially preventable” are underdeveloped.
Annual Growth in Cesarean Rates 1999-2004

Primary Cesareans:
- Standard nullipara
- Standard multipara
- Malpresent nullipara
- Malpresent multipara
- All multiple gestation
- Singleton preterm

Repeat Cesarean:
- Standard with prior cesarean
- All other with prior cesarean

* Standard presentation = singleton, full term, head down.

Primary Cesareans, Standard Delivery, Nullipara by Circumstances of Labor

- Spontaneous labor
- Induction of labor
- No trial of labor
- Not spontaneous

1.3% yr; 16% cum
6% yr; 102% cum
14% yr; 368% cum
Drilling Down

Standard operating procedure:
Identify high-risk or high-growth groups and quantify population impacts

- Socioeconomic differences
- Maternal request
- Advanced maternal age, other obstetric factors
Oh, sure …

“It’s the Medicaid population.”
Cesarean Delivery in New Jersey
September 30, 2009

16

Standard Multip, Primary Cesarean

17

Standard Multip, Prior/Repeat Cesarean
On the one hand ...

“There is increasing demand among some groups for scheduled deliveries.”
Cesarean with No Medical Indication

Primary Cesareans, No Recorded Indications, Nullipara by Circumstances of Labor

Cesarean deliveries with no coded risk factors or L&D complications grew by 13.2% annually over 1999-2004.

But no-indication no-trial is still <3% of all cesareans.
On the flip side …

“Our maternal population is older, sicker and more ART.”

More High-Risk Deliveries?
Standard Nullipara, Diabetes

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live births</td>
<td>771</td>
<td>1,077</td>
</tr>
<tr>
<td>Cesarean rate (%)</td>
<td>39.2</td>
<td>39.8</td>
</tr>
<tr>
<td>Increase in sections: observed</td>
<td>127</td>
<td></td>
</tr>
<tr>
<td>Increase extrapolating 1999 rate</td>
<td>120</td>
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</tr>
</tbody>
</table>
### More High-Risk Deliveries?
#### Standard Nullipara, Maternal Age 35+

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live births</td>
<td>3,861</td>
<td>4,419</td>
</tr>
<tr>
<td>Cesarean rate (%)</td>
<td>39.4</td>
<td>48.1</td>
</tr>
<tr>
<td>Increase in sections: observed</td>
<td></td>
<td>603</td>
</tr>
<tr>
<td>Increase extrapolating 1999 rate</td>
<td></td>
<td>218</td>
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</tbody>
</table>

### More High-Risk Deliveries?
#### Standard Multipara, Maternal Age 35+

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live births</td>
<td>9,897</td>
<td>10,594</td>
</tr>
<tr>
<td>Cesarean rate (%)</td>
<td>8.2</td>
<td>13.0</td>
</tr>
<tr>
<td>Increase in sections: observed</td>
<td></td>
<td>570</td>
</tr>
<tr>
<td>Increase extrapolating 1999 rate</td>
<td></td>
<td>59</td>
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</table>
### More High-Risk Deliveries?
#### All Multiple Gestations

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live births</td>
<td>3,956</td>
<td>4,317</td>
</tr>
<tr>
<td>Cesarean rate (%)</td>
<td>62.3</td>
<td>75.3</td>
</tr>
<tr>
<td>Increase in sections: observed</td>
<td></td>
<td>787</td>
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<tr>
<td>Increase extrapolating 1999 rate</td>
<td></td>
<td>224</td>
</tr>
</tbody>
</table>

### High-Risk Pregnancies
#### Don’t Even Lead the Charge

<table>
<thead>
<tr>
<th></th>
<th>Relative Risk</th>
<th>1999</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Nullip, Maternal Age 35+</td>
<td></td>
<td>1.8</td>
<td>1.6</td>
</tr>
<tr>
<td>Standard Nullip, Macrosomia</td>
<td></td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td>Standard Nullip, Hypertensive Dis</td>
<td></td>
<td>1.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Standard Multip, Maternal Age 35+</td>
<td></td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Standard Nullip, Diabetes</td>
<td></td>
<td>1.7</td>
<td>1.2</td>
</tr>
<tr>
<td>All Multiple Gestations</td>
<td></td>
<td>2.4</td>
<td>2.1</td>
</tr>
</tbody>
</table>
The medical context of most cesareans is relatively low-risk.

Low antepartum risk of cesarean and/or complication:
- **Standard presentation**: singleton, full term, head down
- **Maternal risk factors**: serious antepartum bleeding, severe hypertension, preeclampsia, eclampsia, uterine tissue abnormality, macrosomia

79% of standard, low-risk deliveries to women with a prior cesarean are sectioned without trial of labor

60% of VBAC attempts in this group achieve a vaginal delivery
2006 Hospital Comparisons

MCH-Epi report documents variations across hospitals.

- Variations persist after risk adjustment
- Not explained by size or intensive care designation (eg RPC)

New Jersey’s Intensive Care Delivery Hospitals
Cesarean Delivery Index (2006 State Avg. 38%)
Adjusted for Robson Mix

<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Cesarean Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hackensack University Med</td>
<td>50%</td>
</tr>
<tr>
<td>St. Joseph's Regional Med</td>
<td>45%</td>
</tr>
<tr>
<td>Triniti Barnabas Med</td>
<td>40%</td>
</tr>
<tr>
<td>Mendham Jersey Shore</td>
<td>35%</td>
</tr>
<tr>
<td>Virtua West Jersey-Woodess</td>
<td>30%</td>
</tr>
<tr>
<td>KIA Old Trenton Hospital</td>
<td>25%</td>
</tr>
</tbody>
</table>

Liberty HCS - Jersey City
Saint Peter’s Univ Med
Overlook Med Center
Robert Wood Johnson Med
UMDNJ University Hospital
Kennedy Med Center
Englewood Hospital
Monmouth Medical Center
Bayshore Memorial Hospital
The Cooper Health System
Our Lady of Lourdes Med
Is there an optimal cesarean rate?

- Healthy People 2010 calls for 15% primary rate!
- Are alternatives, diagnostics and decision processes improving?
- Are obstetric resources available to lower the rate?
- What interventions first?

NJHA Perinatal Collaborative

- Focus on Patient Safety generally
- IQI Protocols and Training
- Pushing back: 38 should not be (but is) the new 39
Next steps at DHSS

• Completing report on maternal complications.
• Still investigating neonatal complications.
• Use PRAMS to learn more about intentions and informed consent, starting in 2009.

I’m with the government, I’m here to help.

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  /fhs/professional/mchepi.shtml
• PRAMS
  … /fhs/professional/prams.shtml