Diminishing Access to Rural Maternity Care and Associated Changes in Birth Location and Outcomes

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Agenda

• Background on access to rural maternity care
• Declining access to maternity care in rural counties
• Changes in birth location and outcomes following rural obstetric unit loss
Access to Rural Maternity Care

- 18 million reproductive-age women live in rural US communities
- Half a million babies born in rural hospitals each year
- Declining access to obstetric services at rural hospitals
  - In 1985, 24% of rural counties lacked OB services
  - By 2002, this number had risen to 44%
- Distance to maternity care is correlated with outcomes (NICU, infant mortality)
Who Takes Care of Rural Mothers?

- Hospitals with lower birth volume (<240 births per year) are more likely to have family physicians and general surgeons attending deliveries.
- Hospitals with a higher birth volume more frequently have obstetricians and midwives attending deliveries.
- Employment of physicians decreases as birth volume increases.
- ¾ of rural hospitals with <300 births a year have shared nurse staff.
- Midwives attend deliveries in 1/3 of rural hospitals.
- Workforce challenges reported by surveyed hospitals are related to their rural location and low birth volume.
Rural Obstetric Unit and Hospital Closures

• What is the scope of obstetric unit and hospital closures resulting in loss of obstetric services in rural US counties between 2004-2014?
# Data Sources

<table>
<thead>
<tr>
<th>Level</th>
<th>Source</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital-level</td>
<td>American Hospital Association Annual Survey</td>
<td>2003-2014</td>
</tr>
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<td>County-level</td>
<td>Area Health Resources Files</td>
<td>2004, 2014</td>
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<td></td>
<td>US Census data</td>
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Methods

• Measurement of closure status:
  – Counties without obstetric services during 2004-2014
  – Counties with continual obstetric services
  – Counties experiencing full closures of obstetric services

• Analysis:
  – County-level multivariate regression, focusing on correlates of full closures
Number of Rural Hospitals with OB Services, 2004-2014
Number of Rural Counties with OB Services, 2004-2014
Percent of Rural Counties with Hospital OB Services, 2004-2014

Micropolitan: 82.0% in 2004, 77.9% in 2014
Noncore: 40.4% in 2004, 30.2% in 2014

Source: University of Minnesota Rural Health Research Center
Counties with Lower Birthrates Had Higher Odds of Losing OB Services

<table>
<thead>
<tr>
<th>County-level Number of Annual Births</th>
<th>Adjusted Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; = 90</td>
<td>8.32 [3.49, 1.75, 1]</td>
</tr>
<tr>
<td>91-200</td>
<td>3.49</td>
</tr>
<tr>
<td>201-400</td>
<td>1.75</td>
</tr>
<tr>
<td>&gt; 400</td>
<td>1</td>
</tr>
</tbody>
</table>
Counties with More Black Residents Had Higher Odds of Losing OB Services

Adjusted Odds Ratio (95% CI)

- Non-Hispanic White: 1
- Non-Hispanic Black: 1.57
- AIAN: 4.73
- Asian: 0.02
- Hispanic: 0.32
- Others: 4.06
Higher Workforce Supply was Associated with Lower Odds of Losing OB Services

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Adjusted Odds Ratio (95% CI)</th>
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<tbody>
<tr>
<td>OBGYN per 1,000 females aged 15-44</td>
<td>0.86</td>
</tr>
<tr>
<td>Family physicians per 1,000 county residents</td>
<td>0.88</td>
</tr>
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</table>

UNIVERSITY OF MINNESOTA RURAL HEALTH RESEARCH CENTER
Variability Across States

• More than two-thirds of rural counties in FL (78%), NV (69%), and SD (66%) had no in-county hospital obstetric services.

• Rural counties in SC (25%), WA (22%), and ND (21%) experienced the greatest decline in access.

• ND (15%), FL (17%), and VA (21%) had the lowest percentage of rural counties with continual hospital obstetric services.
  – Closures in rural noncore areas of ND and VA
  – Closures in micropolitan areas of FL
Key Findings on Rural Maternity Care Access

• More than half of rural counties have no hospital-based obstetrics services
  – 9% of rural counties lost OB services between 2004-2014
  – Most vulnerable communities: black, low-income, shortage areas, remote, stingy Medicaid programs
Changes in Birth Location and Outcomes Following Obstetric Services Loss

• For rural counties that lost hospital-based obstetric services between 2004-2014, what were the associated changes in birth location and birth outcomes?
Kozhimannil, Hung, Henning-Smith, et al.

Association Between Loss of Hospital-Based Obstetric Services and Birth Outcomes in Rural Counties in the United States

Published online March 8, 2018
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</tr>
<tr>
<td>Individual-level</td>
<td>Restricted Use Natality Detail File (NDF) with county identifiers (maternal location)</td>
<td>2004-2014</td>
</tr>
</tbody>
</table>
Outcomes

• Birth location:
  – Out-of-hospital birth
  – Birth in a hospital without an obstetric unit

• Birth outcomes: Preterm birth (<37 weeks’ gestation)
Methods

• Multivariable linear regression models in an interrupted time series approach
• Separate models for urban-adjacent and non-urban-adjacent rural counties
Changes in Out-of-Hospital Birth

A Out-of-hospital births

- Rural counties not adjacent to urban areas
  - Unadjusted mean (95% CI) per county
  - Linear trend

- Rural counties adjacent to urban areas
  - Unadjusted mean (95% CI) per county
  - Linear trend

Births Occurring Outside of a Hospital per County, Mean %

Time Prior to Obstetric Services Loss, y

Time Following Obstetric Services Loss, y
Changes in Births in Hospitals without Obstetric Services
Changes in Preterm Birth

Graph showing changes in preterm births per county over time. The x-axis represents time prior to and following obstetric services loss, and the y-axis represents the number of births occurring preterm (<37 wk gestation) per county, mean %.

Legend:
- Rural counties not adjacent to urban areas:
  - Unadjusted mean (95% CI) per county
  - Linear trend
- Rural counties adjacent to urban areas:
  - Unadjusted mean (95% CI) per county
  - Linear trend
Key Findings on Changes in Birth Location and Outcomes

• After losing obstetric services, rural counties that are not adjacent to urban areas had higher rates of preterm birth, out-of-hospital birth, and births in hospitals without obstetric units.

• In rural counties next to urban areas, there was also an increase in births in hospitals without obstetric units, although this declined as time went on.
The Way Forward – Federal Policy

• Federal policy efforts to address workforce shortages.
  – Improving Access to Maternity Care Act

• Federal policy efforts to improve maternity care quality
  – Quality of Care for Moms and Babies Act
The Way Forward – State and Local Policy

• Medicaid policy
• State scope of practice laws
• State and local efforts
  – Subsidies; “home-grown” rural workforce
  – Education and training; rotations that include obstetrics in rural areas
  – Capacity building/training: CME support
  – Telemedicine for obstetrics
  – Training for law enforcement, EMTs, and others who might encounter births
  – Housing and transportation support for rural families
  – Insurance regulation/costs
    (for hospitals, doctors)
The Goal for Rural Communities

• Workable solutions to the challenges that rural communities face to ensure maternity care access and quality
For Additional Information


Hung P, Kozhimannil KB, Casey M, Moscovice IS. Why are obstetric units in rural hospitals closing their doors? Health Services Research, 2016; 51(4):1546-60.


Thank You!

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