Predicting Financial Distress of Rural Hospitals

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Agenda

- The rising rate of rural hospital closures
- Predicting financial distress and closure in rural hospitals
- Trends in risk of financial distress among rural hospitals
- Financial performance of rural hospitals in CA
- Risk of financial distress among rural hospitals in CA
- Summary
What is a hospital closure?

- Sometimes difficult to identify because:
  - Open, closed, open, closed
  - No media coverage because it is a community non-event or part of a system reconfiguration
  - Inpatient stays open, but ER closes, inpatient closes, but ER stays open, and other permutations
  - Hospital is being replaced by a new facility
  - For this study, we defined closure as permanent cessation of acute inpatient care

### 2005-16 rural hospital closures: Where were they?

- Colusa Regional Medical Center
  - Colusa
  - SCH
  - Apr 2016
  - 42 beds
- Corcoran District Hospital
  - Corcoran
  - PPS
  - Mar 2013
  - 32 beds
- Kingsburg Medical Center
  - Kingsburg
  - PPS
  - May 2010
  - 15 beds
- N M Holderman Memorial Hospital
  - Roundville
  - PPS
  - Aug 2009
  - 20 beds
- Indian Valley Hospital
  - Greenville
  - SCH
  - Apr 2008
  - 26 beds
- Tuolumne General Hospital
  - Sonora
  - PPS
  - Jun 2007
  - 80 beds
- Chowchilla District Mem Hospital
  - Chowchilla
  - PPS
  - Jun 2006
  - 24 beds
- Dos Palos Memorial Hospital
  - Dos Palos
  - PPS
  - Jun 2006
  - 17 beds
2005-16 rural hospital closures: When did they close?

2005-16 rural hospital closures: What types of hospital were they?

2005-16 rural hospital closures: How far away is the next closest hospital?

A closure in August 2015 (Nye Regional in Tonopah, NV has 114 driving miles to the nearest hospital) is not pictured in the graph.
2010-16 rural hospital closures:
Why did they close? (As reported by news media)

**Market Factors**
- Small or declining populations
- High unemployment (as high as 18%)
- High or increasing uninsured patients
- High proportion of Medicare and Medicaid patients
- Competition in close proximity

**Hospital Factors**
- Low daily census
- Lack of consistent physician coverage
- Deteriorating facility
- Fraud, patient safety concerns, and poor management

**Financial Factors**
- High and increasing charity care and bad debt
- Severely in debt
- Insufficient cash-flow to cover current liabilities
- Negative profit margins

2005-16 rural hospital closures:
How bad was their financial performance and condition?

In the year before they closed:
- Most hospitals were unprofitable, illiquid, and unable to service debt
- Most had less than:
  - 150 FTEs, $10 million in salary expense, and 30% occupancy rate
  - Negative or close to zero net income and net assets
- Most had already closed obstetrics

2005-16 rural hospital closures:
Summary

- Most closures in South (60%)
- Annual number of closures increasing
- Most are CAHs (40%) and PPS (40%) hospitals (vs MDH-16% and SCH-4%)
- Most are in states that have not expanded Medicaid (57%)
- Patients in affected communities are probably traveling between 5 and 30 or more miles to access inpatient care
- Most hospitals closed because of financial problems
Key findings

Compared with other rural hospitals that were at high risk of financial distress, but remained open over the same time period (2005-15), closed rural hospitals:

- Had a smaller market share, despite being in areas with higher population density;
- Were located nearer to another hospital, and
- Were located in markets that had a higher rate of unemployment and a higher percentage of black and hispanic residents.
Model of financial distress principles
- Developed specifically for rural hospitals
- Scientific approach: development and validation
- Used data publicly available for all rural hospitals
- Goals for the model
  1. Identify hospitals at risk for distress
  2. Model should have high face validity
  3. Model should be parsimonious and easy to understand

Accounting basis of financial distress
- Balance sheet equation:
  - Total assets - Total liabilities = Equity
- Income statement equation:
  - Total revenue – Total expenses = Net income
- And, assuming no dividends are paid out:
  - Equity (t+1) = Equity (t) + Net income (t+1)
- Therefore:
  - Profitability
  - Unprofitability
  - Growth in equity
  - Decline in equity
Financial distress is defined as:

- Unprofitability: Negative cash flow margin
- Equity decline: >20% decline in net assets
- Insolvency: Negative net assets
- Closure: No longer provides inpatient care

In some circumstances, there may not be financial distress even though the markers suggest otherwise.

2013 Rural hospitals with financial distress signals

<table>
<thead>
<tr>
<th>Financial distress signal</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unprofitability:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative cash flow margin</td>
<td>537</td>
<td>24%</td>
</tr>
<tr>
<td>Equity decline:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;20% decline in net assets</td>
<td>355</td>
<td>16%</td>
</tr>
<tr>
<td>Insolvency:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative net assets</td>
<td>237</td>
<td>11%</td>
</tr>
<tr>
<td>Closure:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No longer provides inpatient care</td>
<td>14</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

2013 Rural hospitals with financial distress signals

<table>
<thead>
<tr>
<th>Financial distress signals</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 signals</td>
<td>1524</td>
<td>68%</td>
</tr>
<tr>
<td>1 signal</td>
<td>425</td>
<td>19%</td>
</tr>
<tr>
<td>2 signals</td>
<td>204</td>
<td>9%</td>
</tr>
<tr>
<td>3 signals</td>
<td>99</td>
<td>4%</td>
</tr>
<tr>
<td>4 signals</td>
<td>5</td>
<td>0.2%</td>
</tr>
<tr>
<td>Total</td>
<td>2257</td>
<td>100%</td>
</tr>
</tbody>
</table>

Two years ago, could we have predicted hospitals that are under financial distress today?
Model of rural hospital financial distress

Current Information

Financial Performance:
- Profitability
- Reinvestment
- Benchmark performance

Government Reimbursement:
- Medicare
- Medicaid

Hospital Characteristics:
- Ownership
- Size

Market Characteristics:
- Competition
- Economic condition
- Market size

Risk of Financial Distress in 2 Years

- High
- Mid-high
- Mid-low
- Low

Predictors of financial distress

Financial performance
- Profitability: total margin, two year change in total margin
- Reinvestment: retained earnings as a percent of total assets
- Benchmark performance: percent of benchmarks met over two years

Government reimbursement
- Medicare: CAH status
- Medicaid: Medicaid to Medicare fee index (KFF)

Hospital characteristics
- Ownership: Government/not-for-profit, for-profit
- Size: Net patient revenue (millions)

Market characteristics
- Competition: Log of miles to nearest hospital >100 beds and market share (if <25%)
- Economic condition: Log of poverty rate in the market area
- Market size: Log of population in the market area

CAH-specific benchmarks

“High but attainable financial performance”
Established by a large sample of informed practitioners
Focus on absolute vs. relative performance
Robust enough to apply in all rural hospitals
Benchmarks in the model

- Total earnings > 1%
- Cash flow margin > 4%
- Return on equity > 8%
- Operating margin > 2%
- Current ratio > 1.5 times
- Days cash on hand > 60 days
- Days revenue in accounts receivable < 53 days
- Long-term debt to capitalization < 25%
- Average age of plant < 10 years
- Average percentage of benchmarks met in 2012 and 2013

<table>
<thead>
<tr>
<th>Average percentage of benchmarks met in 2012 and 2013</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%-19%</td>
<td>305</td>
<td>14%</td>
</tr>
<tr>
<td>20%-39%</td>
<td>538</td>
<td>24%</td>
</tr>
<tr>
<td>40%-59%</td>
<td>724</td>
<td>33%</td>
</tr>
<tr>
<td>60%-79%</td>
<td>507</td>
<td>23%</td>
</tr>
<tr>
<td>80%-100%</td>
<td>133</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>2207</td>
<td>100%</td>
</tr>
</tbody>
</table>

Model of rural hospital financial distress

- Distress is specified as a uni-dimensional index, with the probability of each event independent conditional on the index.
- Given a value of the “Financial distress index” (FDI) the probability of each event differs only due to a constant determined by the overall prevalence of the event.
- The equation is specified as
  \[ P(\gamma_{kt+2} = 1) = f(\chi_{kt}\beta + \phi_k) \]
  where \( \gamma \) is an indicator variable that equals one or zero depending on the value of one of the 4 markers of financial distress (indexed by \( k \)).
Rates of Financial Distress Events in 2 Years by Predicted Risk Level Using Theta Scores

Incomplete information
- System affiliation
  - 50 shades of gray between wholly owned and independent
- Medical staff
  - Number and type
- State and county government
  - Sales taxes and local levies
- Community circumstances
  - Fund-raising campaigns
- Recent changes
  - Newsflash: The hospital CEO has resigned

Implication of incomplete information

With complete information, a hospital could be classified differently.
Implication of high risk of financial distress

- If a hospital closes, it is highly probable that it was at high risk of financial distress, but...
- If a hospital is at high risk of financial distress, it is highly probable that it will not close.
- Why? Closure is still a relatively rare event.

Key Findings

- The FDI model has high specificity and predictive power relative to existing methods used to evaluate financial health of rural hospitals.
- Rural hospitals identified as high risk by the FDI face a closure rate 4 times the rate observed for mid-high and 28 times the rate observed for mid-low-risk hospitals.
- As the closure rate among rural hospitals continues to accelerate, future research should focus on the risk factors of closure among hospitals at high risk.

Findings Brief

Trends in Risk of Financial Distress among Rural Hospitals
Brystana G. Kaufman, MSPh; Randy Randolph, MRP;
George H. Pink, PhD; G. Mark Holmes, PhD

Overview
From January 2007 to July 2010, 118 rural hospitals have closed permanently, not including those others that closed and subsequently reopened. The number of hospitals peaked at 285 in 1995, and in the first half of 2010, the closure rate surpassed two closures per month. Hospital closures are driven by a variety of factors, including economic pressures, community needs, and changes in the reimbursement system. The closure rate among rural hospitals continues to accelerate, with rural hospitals being older, more dependent on public insurance programs, and face more barriers than urban hospitals to care for patients.

In a previous Findings Brief, we described the Financial Distress Index (FDI) model, which assigns hospitals to high, mid-high, mid-low, and low risk levels. The FDI is not limited to Medicare cost report and Medicare claims data, as original...
Key Findings

- The proportion of rural hospitals at high risk of financial distress has increased from:
  - 7.0% in 2015 to 8.1% in 2016, with the largest increases in the South and Northeast census regions (2.2 and 1.3 percentage points respectively).
  - 13% to 19% among Medicare Dependent Hospitals (MDH) and from 1% to 4% among Rural Referral Centers over the period 2013 to 2016.
Financial performance of rural hospitals in California

2015 Net patient revenue:
CAHs and ORHs in California

2015 Total margin:
CAHs and ORHs in California
2015 Outpatient revenue to total revenue:
CAHs and ORHs in California

2015 Patient deductions:
CAHs and ORHs in California

2015 Medicare inpatient payer mix:
CAHs and ORHs in California
Key Findings

Compared to ORHs, CAHS have:
- Less net patient revenue
- Higher outpatient to total revenue
- Lower patient deductions
- Higher Medicare inpatient and outpatient payer mix
- Higher Medicare outpatient cost to charge
- Lower ADC acute

Risk of financial distress among rural hospitals in California

<table>
<thead>
<tr>
<th>Risk</th>
<th>CA</th>
<th>%</th>
<th>US</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>6</td>
<td>11%</td>
<td>175</td>
<td>8%</td>
</tr>
<tr>
<td>Mid-high</td>
<td>10</td>
<td>18%</td>
<td>356</td>
<td>16%</td>
</tr>
<tr>
<td>Mid-low</td>
<td>22</td>
<td>39%</td>
<td>1016</td>
<td>47%</td>
</tr>
<tr>
<td>Low</td>
<td>18</td>
<td>32%</td>
<td>630</td>
<td>29%</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>100%</td>
<td>2177</td>
<td>100%</td>
</tr>
</tbody>
</table>
Risk of Financial Distress Among Rural Hospitals in CA

Risk of financial distress: CAHs and ORHs in California

<table>
<thead>
<tr>
<th>Risk of financial distress</th>
<th>Government Owned</th>
<th>Long term care</th>
<th>Rural health clinic</th>
<th>Net patient revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>High/Mid-high</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Median</td>
</tr>
<tr>
<td>Mid-low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>$18 million</td>
</tr>
<tr>
<td>Low</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>$56 million</td>
</tr>
<tr>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>$116 million</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>34</td>
<td>32</td>
<td>45</td>
</tr>
</tbody>
</table>

Risk of financial distress: CAHs and ORHs in California

<table>
<thead>
<tr>
<th>Risk of financial distress</th>
<th># Operating margin</th>
<th>Days cash on hand</th>
<th>Patient deductibles</th>
<th>Medicare output to charge</th>
<th>Acute ADC</th>
<th>Surgery / total charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>High/Mid-high</td>
<td>16</td>
<td>45</td>
<td>56</td>
<td>0.36</td>
<td>2.7</td>
<td>3.4%</td>
</tr>
<tr>
<td>Mid-low</td>
<td>22</td>
<td>46</td>
<td>57</td>
<td>0.27</td>
<td>9.7</td>
<td>9.6%</td>
</tr>
<tr>
<td>Low</td>
<td>18</td>
<td>98</td>
<td>72</td>
<td>0.18</td>
<td>23.0</td>
<td>13.5%</td>
</tr>
</tbody>
</table>
### Risk of financial distress: CAHs and ORHs in California

<table>
<thead>
<tr>
<th>Risk of financial distress</th>
<th>#</th>
<th>Distance to next hospital</th>
<th>Poverty rate</th>
<th>Unemployment rate</th>
<th>Population per square mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>High/Mid-high</td>
<td>16</td>
<td>29.1</td>
<td>12.6%</td>
<td>13.3%</td>
<td>11.7</td>
</tr>
<tr>
<td>Mid-low</td>
<td>22</td>
<td>26.5</td>
<td>12.4%</td>
<td>12.8%</td>
<td>35.6</td>
</tr>
<tr>
<td>Low</td>
<td>18</td>
<td>19.3</td>
<td>10.9%</td>
<td>12.4%</td>
<td>56.7</td>
</tr>
</tbody>
</table>

### Key Findings

- In our model, 16 rural hospitals in California are at high or mid-high risk of financial distress.
  - Long term care?
  - Lower net patient revenue
  - Lower total margin
  - Lower operating margin
  - Lower days cash on hand
  - Lower patient deductions
  - Higher hospital Medicare outpatient cost to charge
  - Lower acute ADC
  - Surgery, remoteness, uninsured?

### Summary

- Hospital closures will continue and occur relatively more frequently in disadvantaged communities.
- Financial distress is a complex phenomenon.
- Number of rural hospitals at high risk of financial distress is growing, and MDH and PPS are at highest risk.
- 29% of rural hospitals in CA are at high or mid-high risk of financial distress compared to 24% in US.
- Small size, unprofitability, market, and other factors influence financial distress of rural hospitals in CA.
North Carolina Rural Health Research Program

Location:
Cecil G. Sheps Center for Health Services Research
University of North Carolina at Chapel Hill
Website: http://www.shepscenter.unc.edu/programs-projects/rural-health/
Email: ncrural@unc.edu

Colleagues:
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George Pink, PhD
Kristin Reiter, PhD
Ann Howard
Brystana Kaufman, MSPH
Denise Kirk, MS
Julie Perry
Randy Randolph, MRP
Sharita Thomas, MPP
Kristie Thompson, MA

Resources

North Carolina Rural Health Research Program
http://www.shepscenter.unc.edu/programs-projects/rural-health/

Rural Health Research Gateway

Rural Health Information Hub
www.ruralhealthinfo.org

National Rural Health Association
www.nrha.org

National Organization of State Offices of Rural Health
www.nosorh.org

Questions?
Thank You!
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What happens after a rural hospital closes?
Sharita R. Thomas, Brystana G. Kaufman,
Randy K. Randolph, Julie R. Perry, Kristie W. Thompson,
George M. Holmes, and George H. Pink

[Link: bit.ly/1QFEVo0]

Conversion Models
- Urgent Care Clinic or Emergency Center
- Skilled Nursing Facility or Acute Rehabilitation Center
- Outpatient Facility or Primary Care Clinic
**Urgent Care Clinic or Emergency Center**

Urgent care clinic (5 hospitals):
- Operate 12 hours and 5-7 days per week
- Provide diagnostic, laboratory, and radiology services
- 2 facilities provide additional outpatient and specialty services

Emergency center (5 hospitals):
- Operate 24 hours and 7 days per week
- Provide diagnostic, laboratory, and radiology services
- 4 facilities provide additional outpatient and specialty services

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**Skilled Nursing Facility or Outpatient Rehabilitation Center**

Skilled nursing facility (3 hospitals):
- Have a range of 46-111 beds
- Provide physical, occupational and speech therapy

Acute rehabilitation center (1 hospital):
- Individuals are transferred from the inpatient unit of nearby regional campus location
- Operate 8 hours and 7 days per week
- Physical, occupational and speech therapy

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**Outpatient Facility or Primary Care Clinic**

Outpatient facility (3 hospitals):
- Operate 10-24 hours and 3-7 days per week
- Provides diagnostic and laboratory services
- 1 offers specialty care like cardiology and women’s services

Primary care clinic (4 hospitals):
- Operate 8 hours and 5 days per week
- Focus on family medicine and preventive care
- 1 offers urgent care services on weekends
**A Tale of Two Cities**

- **Blowing Rock Hospital**: Watauga and Caldwell Counties
  - Opened: March 2005
  - Closed: October 2013
  - Details: Nonprofit, Micropolitan, CAH, 25 beds

- **Vidant Pungo Hospital**: Beaufort and Hyde Counties
  - Opened: February 2002
  - Closed: June 2014
  - Details: Nonprofit, Micropolitan, CAH, 25 beds

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**Demographic Comparison**

<table>
<thead>
<tr>
<th>Total Population*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blowing Rock</td>
</tr>
<tr>
<td>133,728</td>
</tr>
<tr>
<td>Vidant Pungo</td>
</tr>
<tr>
<td>51,513</td>
</tr>
</tbody>
</table>

![Bar graph showing demographic comparison between Blowing Rock and Vidant Pungo](image)


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**Health Status Comparison**

- **Socioeconomic**
  - Education
  - Employment
  - Income
  - Violence

- **Clinical Care**
  - Uninsured
  - Health Services
  - Quality of Care

- **Health Behaviors**
  - Tobacco/Alcohol
  - Obesity Factors

![Graph showing health status comparison](image)

1 = Top quartile, low need area
4 = Bottom quartile, high need area

Data from County Health Rankings, 2013.
Timeline and Status

- 2007: ARHS buys financially distressed Blowing Rock Hospital
- 2009: ARHS makes multi-year plan to transition the hospital to a post-acute care facility
- October 2013: Blowing Rock Hospital discontinues Emergency Department and acute care services.

Social Context: Blowing Rock

Community Involvement
- Transparency: early community involvement
  - Town hall meeting minutes
  - Chamber of Commerce and community leaders actively involved
- Social Action: 2012 capital campaign to raise $10 million
  - Town invested grants ($1.2 million water and sewer)
  - NC Transportation Secretary helped secure road grant ($2.5 million)
  - NC Rural Economic Development Center awarded town grant ($586,000)

Media Coverage
- "transition," "closing soon"

"It's a great day for Blowing Rock."

Social Context: Vidant Pungo

Community Involvement
- Transparency: discrepancy on community and public officials' involvement:
  - Mayor says they were not informed or involved prior to the decision
  - Vidant says consulted with Pungo Director's Council (residents of Beaufort and Hyde, no regulatory voice, twice, and lease holders, Pantego Creek, Inc)
  - Pungo voting board has no members that reside or hold a practice in Beaufort or Hyde counties
- Social Action: Grassroots efforts
  - Committee
  - Social media
  - March to D.C.

Media Coverage
- "closing," "outrage," "rally," "save," "economy..."

"Vidant's leadership is immoral. You don't make $100 million and close a critical access hospital."

Questions?

Thank You!
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