Assessing Risk for Loss of Pharmacy Services in Rural America

Andrew P. Traynor, Pharm.D., BCPS
Assistant Professor
Assistant Director, Ambulatory Care Residency Program

Plum City, WI  Population -611

Hospital Closes – 1970
Pharmacy Closes - 1987
Clinic Closes - 1991
Rural Population and Workforce

• Roughly 21% of US population lives in rural communities\(^1\)
• National ratios of pharmacists\(^2\)
  – Rural areas – 66 pharmacists / 100,000 population
  – Overall – 78 pharmacists / 100,000 population

1. U.S. Census Data, 2000
2. Knapp K, et. al. JAPhA, 1999

A Fragile Environment

• Challenges to the ability to deliver pharmacy services in rural areas
• Cumulative effects
  – 102 non-metro MN pharmacy closures since 1996 vs. 87 closures in seven-county metro\(^1\)
  – Nine of 38 pharmacy closures in rural MN, resulted in a community with no local pharmacy access from 1996-1999.\(^2\)

1. MN Dept of Health ORHPC 10/2003
Impact to Rural Communities with Closure

- Loss of access point for medications and services of a pharmacist
  - Prescription claims decrease\textsuperscript{1,2}
  - Travel distance increases\textsuperscript{3}
  - Patient satisfaction decreases\textsuperscript{2}
- Loss of a “Main Street” business
- Impact on delivery of health services
  - Loss of pharmacist services
  - Utilization of health services in other communities


Rural Communities at Risk

Minnesota 2003

- 124 Rural “One-Pharmacy Towns”
- 214,000 people in city limits
**Project Purpose**

*Give government, colleges and schools of pharmacy, professional associations and/or other interested parties a framework to identify and target rural communities at greatest risk for loss of pharmacy services.*

**Project Objectives**

- Identify factors that indicate heightened risk for loss of pharmacy services in rural communities.
- Develop an assessment tool that prospectively and comparatively identifies rural communities potentially at risk.
- Demonstrate the application of the assessment tool.
- Map service areas of one pharmacy towns.
- Determine how many patients will lose local access to pharmacy services and the pharmacist upon closure.
Methods – Risk Assessment Survey

- Survey developed from interview with rural pharmacy owners/managers, pharmacy sales consultants and faculty
- Survey pre-tested with 4 pharmacy owners
- Administered as a mail survey to pharmacists-in-charge in one pharmacy towns outside metropolitan areas (BOP database)
  - MN 2003 and 2006
    - N=124 and 126
  - AR, AZ, IA, ME, MS, MT, NC, WY, WV in 2008
    - N=571

- Survey responses assigned a weighted score
  - Positive and negative points assigned
  - Summed to give a cumulative risk score
- Quartile Analysis
What Factors Would Impact Successful Succession in Rural Pharmacies?

- Desired years to ownership transition
- Gross revenue
  - $\geq 1.5M$ for owner/operator
  - $\geq 2.5M$ for absentee owner
  - Average sale price, $3.5M
  - Most requests for $\geq 3M$
  - $\geq 95\%$ from Rx Dept
- Is it staffed appropriately?

What Factors Would Impact Successful Succession in Rural Pharmacies and Increase Rural Risk?

- Presence of health care services
- Distance to nearest community with pharmacy services
Question Categories for Rural Pharmacy Risk Index

Community Dynamics (4 Questions)
• Distance to Next Nearest Pharmacy

Ownership Analysis (7 Questions)
• Owner’s Ideal Number of Year’s to Sale of Pharmacy

Prescription Revenue (3 Questions)
• Revenue from Prescriptions

Pharmacy Workforce (7 Questions)
• Recruitment for Full-time Pharmacist Employment

Rural Health-System Analysis (8 Questions)
• Primary Care Clinic Access

Example of Scoring Contributing to Risk Score

Respondents to the survey were asked to report their Total Revenue from all pharmacy sales. Responses to this question were assigned points as follows:
• <$1.5M = +2
• $1.5 – $2.5M = +1.5
• $2.5M – 3.5M = +1
• >$3.5M = 0
MN Closures 2003-2008

- Nine closures resulting in no local pharmacy and pharmacist access since August 1, 2003
- Seven of nine responded to survey in 2003 and/or 2006

<table>
<thead>
<tr>
<th>Town</th>
<th>Risk Score</th>
<th>Risk Quartile</th>
<th>Pop.</th>
<th>Owner Type</th>
<th>Yrs to retire</th>
<th>Nearest Rx</th>
<th>Rx Dept. Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-06</td>
<td>3</td>
<td>3</td>
<td>1200</td>
<td>Corp.</td>
<td>9</td>
<td>16</td>
<td>&lt;$1.5M</td>
</tr>
<tr>
<td>1-03</td>
<td>4</td>
<td>3</td>
<td>1200</td>
<td>Corp.</td>
<td>9</td>
<td>16</td>
<td>&lt;$1.5M</td>
</tr>
<tr>
<td>2-06</td>
<td>8</td>
<td>1</td>
<td>1300</td>
<td>Corp.</td>
<td>0</td>
<td>20</td>
<td>&lt;$1.5M</td>
</tr>
<tr>
<td>2-03</td>
<td>4.5</td>
<td>3</td>
<td>1300</td>
<td>Corp.</td>
<td>0</td>
<td>20</td>
<td>&lt;$1.5M</td>
</tr>
<tr>
<td>3-06</td>
<td>6.5</td>
<td>1</td>
<td>2300</td>
<td>Corp.</td>
<td>7</td>
<td>10</td>
<td>$2.5-3.5M</td>
</tr>
<tr>
<td>4-03</td>
<td>10.5</td>
<td>1</td>
<td>400</td>
<td>Sole</td>
<td>-6</td>
<td>30</td>
<td>&lt;$1.5M</td>
</tr>
<tr>
<td>5-03</td>
<td>9</td>
<td>1</td>
<td>1200</td>
<td>Corp.</td>
<td>2</td>
<td>28</td>
<td>&lt;$1.5M</td>
</tr>
<tr>
<td>6-03</td>
<td>8.5</td>
<td>1</td>
<td>2400</td>
<td>Corp.</td>
<td>0</td>
<td>12</td>
<td>&lt;$1.5M</td>
</tr>
<tr>
<td>7-03</td>
<td>10.5</td>
<td>1</td>
<td>600</td>
<td>Sole</td>
<td>0</td>
<td>8</td>
<td>&lt;$1.5M</td>
</tr>
</tbody>
</table>
**2008 Results**

- 571 One-pharmacy towns
  - 6 surveys returned undeliverable
- 214 responses (37.9%)
  - ME 11/57 (19.3%)
  - WV 17/74 (23%)
  - MS 16/55 (29.1%)
  - MT 15/45 (33.3%)
  - NC 39/105 (37.1%)
  - AZ 9/22 (40.9%)
  - IA 68/132 (51.5%)
  - AR 35/66 (53%)
  - WY 6/9 (66.7%)

**2008 Risk Scores**

Average = 6.57, Median = 6.5
2008 Demographics

- Ownership Type
  - Sole Ownership – 109
  - Partnership – 45
  - Corporation – 43
  - Chain – 25
  - Owner a pharmacist – 183
  - Owner is PIC - 143

Primary Owner Age

Average = 53.3, Median = 53
Years to Desired Transition Age
Primary Owner

Average = 8.6 yrs, Median = 7 yrs

75 owners wish to transition within 6 years

Prescriptions Dispensed and Revenue

- Average Rx’s/day = 129.3
- Revenue
  - <$1.5M = 6
  - $1.5-2.5M = 75
  - $2.5-3.5M = 37
  - >$3.5M = 9
- 71 generate >95% of revenue from Rx Dept.
**Difficulty Recruiting Staff Pharmacists in Rural Communities**

How difficult has it been to recruit full-time staff pharmacists in the last 5 years?

- Very Difficult
- Moderately Difficult
- Somewhat Difficult
- Not Difficult

How difficult has it been to recruit part-time staff pharmacists in the last 5 years?

- Very Difficult
- Moderately Difficult
- Somewhat Difficult
- Not Difficult

**Reported Distance to Next Nearest Community with a Pharmacy**

(Avg. = 19.4 miles)
Health Care in One-Pharmacy Communities

- 198 medical clinics in 214 communities
- 112 nursing homes
  - Average census = 56.6
  - 42 pharmacies provide > 75% of prescriptions
  - 30 provide consultant services
- 56 hospitals
  - 35 with less than 25 beds
  - 20 pharmacies provide on average 13.3 hours of hospital services/week
- 49 have additional service agreements in communities

Summary of Observations

- Largely independently owned
- Pharmacist workforce is aging
- Many wish to transition soon
- Revenues and volume challenges
- Difficult to recruit when attempted
- Average distance to obtain prescriptions if pharmacy closed = 19 miles
- Impact is more than on local medication access
How many people will be impacted by one pharmacy town closure?

One Pharmacy Town Mapping

- 2,019 rural one pharmacy communities
  - 1,044 are >10 miles away from another pharmacy
  - Population = 1,667,386
    - 3% of rural U.S. population
- Utilized NCPDP data to identify communities
- 10-mile Euclidian buffer
- Census data for communities?

Schambaugh-Miller, et. al., RUPRI Policy Brief, November 2007
Service Area Mapping

- Market area analysis is common in retail to assess supply and demand
- May utilize a variety of methods with GIS
  - Given that the distance of many of the one pharmacy towns we surveyed is greater than 10 miles, transport distance was chosen to define a service area

Service Area Mapping Methodology

Road Network
A road network was built using tools in Network Analyst. The roads data used in this study are from ESRI Streetmap, USA.

University of Minnesota
Service Area Mapping Methodology

Census Block Center Points
Overlayed service areas with census points to identify population and age-related demographics

Minnesota Service Area Map
### Service Area Characteristics

<table>
<thead>
<tr>
<th>State</th>
<th>RUPRI OPT Pop.</th>
<th>MIN COP OPT Census Pop.</th>
<th>Service Area Pop.</th>
<th>Service Area: Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona</td>
<td>37,648</td>
<td>75,431</td>
<td>236,967</td>
<td>3.14</td>
</tr>
<tr>
<td>Arkansas</td>
<td>31,178</td>
<td>216,272</td>
<td>358,314</td>
<td>1.66</td>
</tr>
<tr>
<td>Iowa</td>
<td>104,067</td>
<td>239,453</td>
<td>617,298</td>
<td>2.58</td>
</tr>
<tr>
<td>Maine</td>
<td>8,861</td>
<td>328,398</td>
<td>534,475</td>
<td>1.63</td>
</tr>
<tr>
<td>Minnesota</td>
<td>95,568</td>
<td>216,132</td>
<td>1,067,533</td>
<td>4.94</td>
</tr>
<tr>
<td>Mississippi</td>
<td>26,853</td>
<td>86,356</td>
<td>398,120</td>
<td>4.61</td>
</tr>
<tr>
<td>Montana</td>
<td>40,733</td>
<td>64,142</td>
<td>190,770</td>
<td>2.97</td>
</tr>
<tr>
<td>North Carolina</td>
<td>12,862</td>
<td>243,266</td>
<td>863,757</td>
<td>3.55</td>
</tr>
<tr>
<td>West Virginia</td>
<td>11,214</td>
<td>99,434</td>
<td>379,755</td>
<td>3.82</td>
</tr>
<tr>
<td>Wyoming</td>
<td>14,865</td>
<td>17,577</td>
<td>45,548</td>
<td>2.59</td>
</tr>
<tr>
<td>Totals</td>
<td>383,849</td>
<td>1,370,461</td>
<td>4,692,537</td>
<td>3.42</td>
</tr>
</tbody>
</table>

1. Schambaugh-Miller, et. al., RUPRI Policy Brief, November 2007

### Service Area Characteristics

<table>
<thead>
<tr>
<th>State</th>
<th>Pop 50-64</th>
<th>Pop&gt;65</th>
<th>State’s Sq. miles</th>
<th>Service Area Sq. miles</th>
<th>Sq. miles % of state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona</td>
<td>39,021</td>
<td>31,896</td>
<td>113,635</td>
<td>40,682</td>
<td>35.8%</td>
</tr>
<tr>
<td>Arkansas</td>
<td>61,764</td>
<td>52,972</td>
<td>52,068</td>
<td>19,470</td>
<td>37.4%</td>
</tr>
<tr>
<td>Iowa</td>
<td>96,999</td>
<td>104,227</td>
<td>55,869</td>
<td>26,565</td>
<td>47.5%</td>
</tr>
<tr>
<td>Maine</td>
<td>93,543</td>
<td>76,493</td>
<td>30,862</td>
<td>22,745</td>
<td>73.7%</td>
</tr>
<tr>
<td>Minnesota</td>
<td>175,356</td>
<td>167,706</td>
<td>79,610</td>
<td>48,425</td>
<td>60.8%</td>
</tr>
<tr>
<td>Mississippi</td>
<td>60,830</td>
<td>49,779</td>
<td>46,907</td>
<td>12,675</td>
<td>27%</td>
</tr>
<tr>
<td>Montana</td>
<td>34,163</td>
<td>27,124</td>
<td>145,552</td>
<td>79,244</td>
<td>54.4%</td>
</tr>
<tr>
<td>North Carolina</td>
<td>146,533</td>
<td>108,936</td>
<td>48,710</td>
<td>11,854</td>
<td>24.3%</td>
</tr>
<tr>
<td>West Virginia</td>
<td>68,574</td>
<td>55,013</td>
<td>24,077</td>
<td>7,599</td>
<td>31.6%</td>
</tr>
<tr>
<td>Wyoming</td>
<td>8,275</td>
<td>6,435</td>
<td>97,100</td>
<td>22,663</td>
<td>23.3%</td>
</tr>
<tr>
<td>Totals</td>
<td>746,037</td>
<td>648,685</td>
<td>694,390</td>
<td>251,240</td>
<td>36.2%</td>
</tr>
</tbody>
</table>
Additional Service Area Mapping Work

• Maximum and average travel distance for closure via road network mapping
• Comparison with RUCA, RUCC and population density designations for rural

Summary of where we are...

• Most small rural communities are serviced by independent pharmacies
• Rural pharmacists are aging
• Independent owners would like to sell
• Communities are at-risk
• Greater populations than previously anticipated may be impacted
Acknowledgements

• Anne Spenningsby, Research Assistant
• Stacey Stark, GIS Laboratories, UMD
• Community Pharmacy Foundation