The Economic Impact of Potential Closures of Rural Hospitals in Mississippi:

A Focus on the Economic and Policy Implications & Alternative Models for Rural Hospitals in Mississippi.

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August 2015

Acknowledgments

The authors would like to express appreciation to the following groups who supported our important work:

Center for Mississippi Health Policy

Social Science Research Center at Mississippi State University

Sparks Bureau of Business and Economic Research at The University of Memphis

Methodist Le Bonheur Center for Healthcare Economics at The University of Memphis

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Executive Summary

Rural hospitals across the nation are facing a crisis due to ever-changing economic, policy, and population factors. To better understand how the present economic climate and policies are impacting rural hospitals in Mississippi, this report provides a comprehensive assessment of the: **(1)** health and economic characteristics of hospitals and the communities they serve, **(2)** factors that impact hospital viability, **(3)** economic impacts of the "most at-risk" hospitals in Mississippi, and **(4)** potential innovations and policy considerations to address the challenges facing rural Mississippi hospitals. The results include:

Rural Hospitals & Populations

- Compared to the rest of Mississippi's counties, rural hospitals are located in counties that are smaller, poorer and less healthy, and contain a high proportion of population subgroups commonly considered to be at risk for health-related concerns.

- A high proportion of Mississippi's rural facilities were designated as critical access hospitals. Nineteen of the 41 rural facilities were so designated and formed 65.5% of all the critical access hospitals in the state.

- Rural counties overwhelmingly had an inadequate physician workforce, and 39 rural counties were designated as complete or partial health professional shortage areas.

External & Internal Threats to Hospitals

- Factors that originate outside of a hospital's control have wide-reaching impacts on rural hospitals in Mississippi including:

    - Macroeconomic stressors from the 2008 financial crisis
    - Population loss in rural areas
    - Reduction of Disproportionate Share Hospital (DSH) payments
    - Expiration of rural hospital programs
    - Loss in hospital reimbursement
    - Potential decrease in the cost-plus reimbursement
    - Quality of care

- Factors that originate at an institutional level also have wide-reaching impacts on rural hospitals in Mississippi including:

    - Rising cost of providing care
    - Small hospital size and lack of capital
    - Hospital loss of autonomy
    - Costs related to providing tertiary and ancillary care services

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At-Risk Hospitals in Mississippi

- At-risk hospitals were defined based on three financial measures: profitability, uncompensated care, and Medicaid shortfalls. Based on these measures, five broad risk groups *(Stable, Watch, Level I Risk, Level II Risk, and Level III Risk)* were used to classify at-risk hospitals in Mississippi.

- 31 hospitals state-wide (33.0%) were identified as at-risk (Watch - Level III), including 20 rural hospitals (49.0% of all rural hospitals), seven micropolitan hospitals (23.3% of all micropolitan hospitals), and four metropolitan hospitals (17.4% of all metropolitan hospitals).*

- The analysis focused on five "most at-risk" hospitals (Level II or III) identified by the three financial measures and the six identified in the 2014 State Auditor's report. Because two of these hospitals overlap, the report focused on ***nine hospitals*** that have the greatest potential for closure:

    - Covington County Hospital
    - Highland Community Hospital
    - Holmes County Hospital & Clinics
    - Tippah County Hospital
    - Hardy Wilson Memorial Hospital
    - Montfort Jones Memorial Hospital
    - Natchez Regional Medical Center
    - Noxubee County General
    - Tallahatchie County General Hospital

- Economic impact analyses conducted using IMPLAN modeling estimated the employment, income, and output generated by the nine "most at-risk" Mississippi hospitals. The three rural counties with Level III risk hospitals, Covington, Holmes and Tippah, were estimated to lose a total output of $15.1 million in Holmes County, $20.4 million in Tippah County and $34.4 million in Covington County. ***The total effect of the closure of all nine hospitals would be the loss of 2,603 jobs, nearly $126.7 million in labor income, nearly $155.7 million in value added by the hospitals, and a total output of $289.2 million.***

- ***The largest estimated losses by industry would be from the closure of the hospitals themselves (2,001 jobs, $108.2 million in income, $118.7 million in value added losses, and $225.9 in total output losses).*** But other industries would also be affected negatively by hospital closings.

- In the event that some or all of the hospitals would close, taxes would be negatively impacted. The impact would range from a high of $2.3 million if the hospital in Adams County were to close to a low of $525.1 thousand if the hospital in Holmes County were to close. ***If all nine "most at-risk" hospitals were to close, nearly $8.6 million in state and local tax revenue could be lost if gains for other areas did not take place.***

** Metropolitan areas contain an urban core with a population of 50,000 or more; (b) micropolitan areas contain an urban core with a population 10,000 to 50,000; and (c) rural areas do not fit either criteria.*

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Key Implications

This study highlights the urgent need to institute a broad mix of solutions to ensure that the "most at-risk" hospitals in Mississippi remain open for both economic and health benefits of the communities they serve. While this study identifies the health and economic characteristics of all hospitals in Mississippi, *the main analyses identify that rural hospitals (49.0% of all rural hospitals) are "most at-risk" among all hospitals in the state*. The challenges presented by the dynamic nature of economic climate, policy, and institutional factors impacts a hospital's potential risk of closure. Innovative solutions to address rural hospital viability must encompass fiscal, efficiency, quality, organizational, and technological options to ensure hospital survival.

Summary of recommendations that may address the challenges facing Mississippi's rural hospitals:

- ***Employ both health care and economic approaches based on the roles that the at-risk hospitals serve in their communities***
- ***Integrate existing health services to improve efficiency, quality, and coordination of services via:***
  - ◊ Hybrid models focused on preventive outpatient care and bolstering primary care networks
  - ◊ Regional accountable care organizations
  - ◊ System hub models that increase coordination between rural hospitals and tertiary hospitals
- ***Adopt new service delivery models to improve stability including:***
  - ◊ Create freestanding emergency departments
  - ◊ Enhance and expand opportunities for telehealth
- ***Align stakeholder perspectives in seeking common ground and new funding sources and support:***
  - ◊ Promote marketing strategies to compete for newly insured patients
  - ◊ Forge new alliances for coordinated investment in rural hospitals via state, national, and local stakeholders
  - ◊ Increase participation in innovation programs such as the Delivery System Reform Incentive Payment Program (DSRIP) or State Innovation Models Initiatives (SIM)

In brief, this study provides decision-makers with avenues to address some of the challenges rural hospitals may encounter. The findings suggest that although rural hospitals in Mississippi face a host of challenges, there is also ample opportunity for hospitals to leverage a broad base of federal and state initiatives and self-help actions that ensure rural communities can meet the health needs of their local populations.

I. Introduction

A prime topic of current news headlines is the condition of the United States health care system. With the ever-changing economic climate, population trends, and federal and state policies, serious questions arise as to how these factors will impact hospitals. These concerns are especially cogent for hospitals located in the rural regions of the United States. Approximately 46 million people in the United States (15.0% of the U.S. population) live in nonmetropolitan counties[1] in the coverage areas of the 1,971 rural, nonfederal, acute care general hospitals.[2]

These rural hospitals are important health service providers in areas that often have insufficient access to the continuum of health services, are key institutions within the social fiber of a community, and are often the principal economic driver for the rural communities they serve. Thus, a local hospital's influence extends beyond provision of health care.

This analysis describes economic, social infrastructure, and policy factors related to hospital viability in rural Mississippi counties. Several overarching questions are addressed:

1. What are the characteristics of rural hospitals in Mississippi and the populations they serve?

2. What are the key sources of internal and external threats that might cause rural hospitals in Mississippi to close?

3. What are the economic impacts at both state and county levels of at-risk rural hospitals?

4. What are key policy and health care system innovations and interventions that could be made to improve the viability of rural hospitals?

II. Rural Hospitals and Populations

This section will present important characteristics of the rural population of Mississippi and selected features of the hospitals located in those counties. "Rural" counties were defined based on the U.S. Census Bureau and the Office of Management and Budget's 2013 definitions of Core Based Statistical Areas (CBSA)[3] which includes: (a) *metropolitan areas* contain an urban core with a population of 50,000 or more; (b) *micropolitan areas* contain an urban core of with a population 10,000 to 50,000; and (c) *rural areas* that do not fit either criteria.[4]

This report focuses primarily on hospitals located in the rural counties of Mississippi. However, to better understand the overall impacts of hospital closure in Mississippi as a whole, micropolitan and metropolitan areas were included in the at-risk analyses as well. A total of 94 acute/general-care, nonfederal hospitals that served Mississippi's 82 counties as of 2012 were examined **(Map 1)**. Nine hospitals were identified as "most at-risk" and detailed analyses on these hospitals are provided in section IV. In addition, People's Choice Medical Center of Humphreys County was excluded, as it closed in August 2013. Selected data for all 94 Mississippi hospitals are presented in the Appendices A, B, and C. Also, by examining all rural hospitals regardless of ownership, this report extends beyond the scope of publicly-owned hospitals highlighted in the 2014 State Auditor's report "The Financial Health of Publicly Owned Rural Mississippi Hospitals."[5]

The data presented in this report were derived from 2008-2012 data† from the American Hospital Association (AHA) Annual Survey[6] and supplemental AHA Financial Data,[7] Mississippi Annual Hospital Report,[8] U.S. Census Bureau Reports,[9] County Health Rankings reported by the Robert Wood Johnson Foundation,[10] and the Area Health Resources File compiled by the Health Resources and Services Administration, United States Department of Health and Human Services.[11]

A. County and Population Characteristics.

Based on the CBSA classification, 39 of Mississippi's 82 counties were designated as rural, 26 as micropolitan, and 17 as metropolitan **(Figure 1, Table 1)**. Demographic and socioeconomic characteristics of the populations in the three county groups are shown in **Tables 1 and 2** and are illustrated in **Figures 1 and 2**. The population of rural counties totaled 678,829, or 22.9% of the state's total population, **(Figure 1, Table 1)**. Rural counties, were on average, smaller (average population of 17,406) than the counties in the other categories (36,962 for micropolitan and 78,056 for metropolitan counties).

Residents of rural counties included 400,437 non-Hispanic whites (23.2% of the state's total), 247,781 non-Hispanic African Americans (22.7% of the state's total), 15,374 Hispanics (18.9% of the state's total), 1,384 Asians (5.4% of the state's total), and 13,853 members of other or multiple races **(Table 1)**. In comparison with the proportion of the state's population residing in non-rural counties, non-Hispanic whites and African Americans were proportionately represented whereas Hispanics and Asians were underrepresented in the rural counties.

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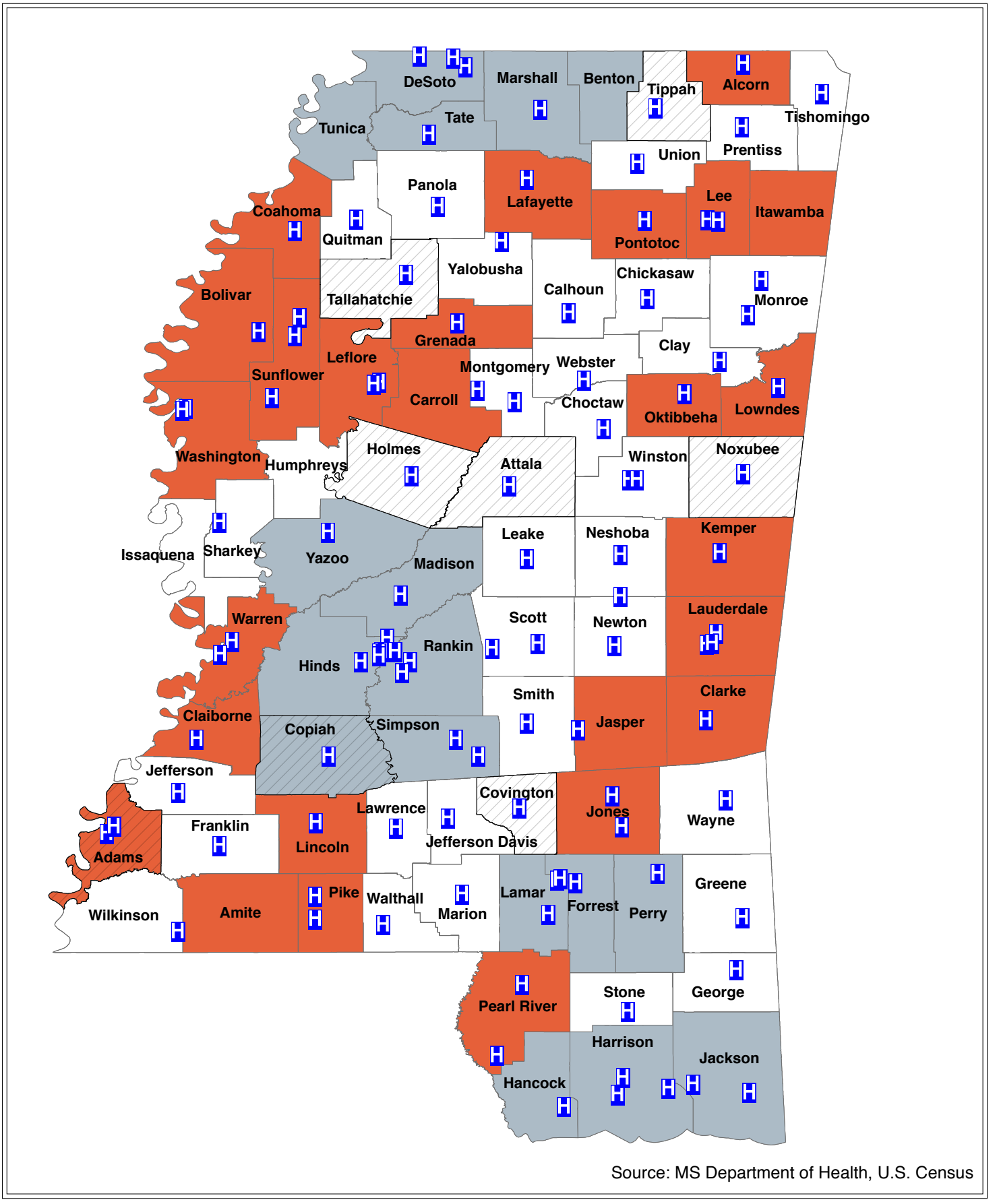
† See Appendix D for detailed information.



Source: MS Department of Health, U.S. Census

Map 1: Mississippi's Hospitals and Locations of the 9 Most At-Risk Hospitals

CBSA Classification

Metro

Micro

At-Risk

Figure 1: Distribution of Mississippi Counties and Population by CBSA Category

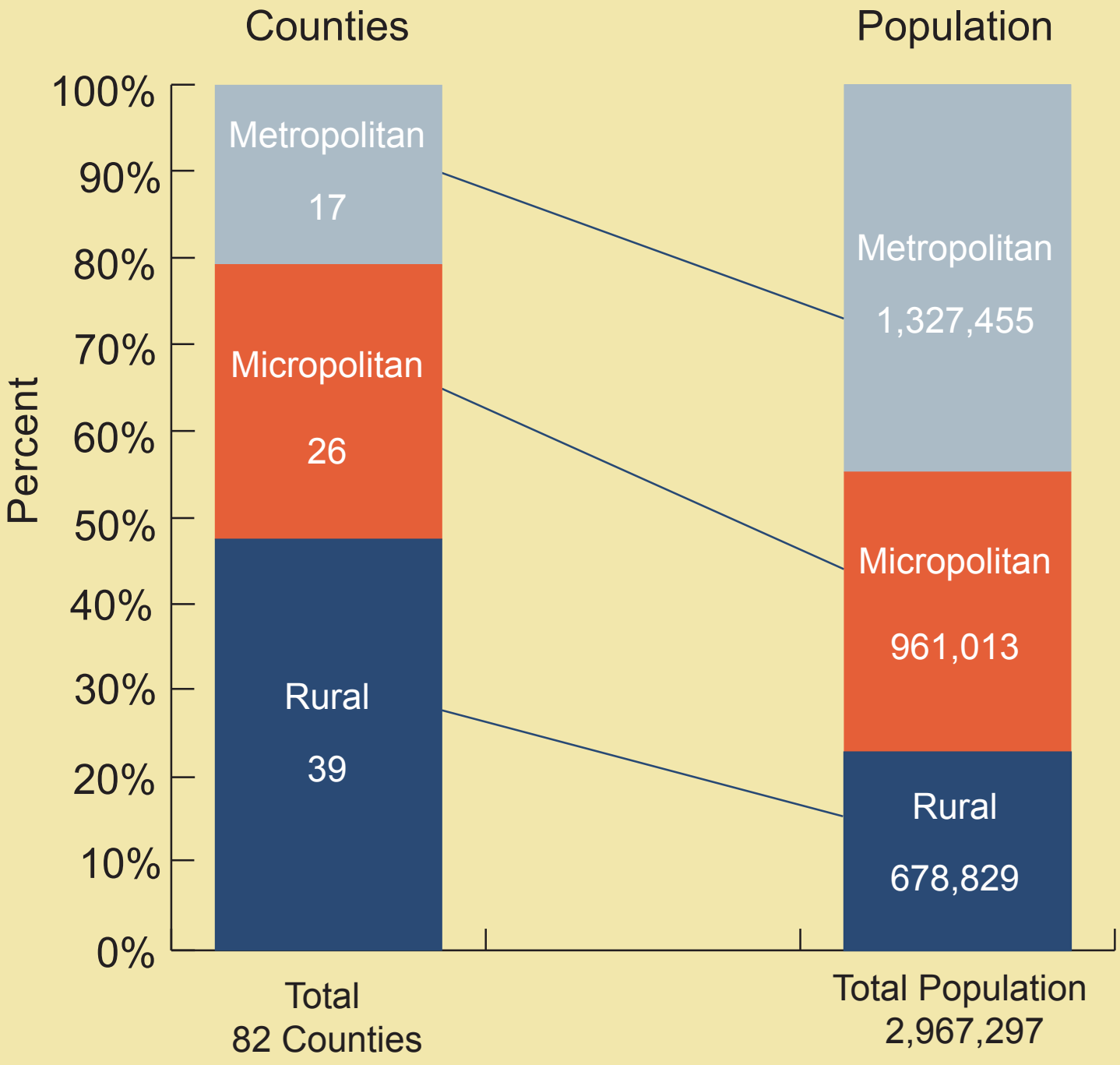


Figure 1: The left panel illustrates the number and proportions of Mississippi counties designated as rural, microplitan, or metropolitan based on Core Based Statistical Area criteria of the U.S. Census Bureau. The right panel presents the populations residing in each of the three county cohorts in 2010.
Source: Health Resources and Services Administration, Area Resource File, 2013-14 edition.

Table 1: Demographic Features of Mississippi Counties by CBSA Classification

	Total	Rural	Micropolitan	Metropolitan
Number of Counties	82	39	26	17
Pct. of Total	100.0%	47.6%	31.7%	20.7%
Census Population, 2010	2,967,297	678,829	961,013	1,327,455
Pct. of Total	100.0%	22.9%*	32.4%	44.7%
White Non-Hispanic Population, 2010	1,722,287	400,437	535,440	786,410
Pct. of Total	100.0%	23.3%	31.1%	45.7%
Pct. of Population	58.0%	59.0%	55.7%	59.2%
African American Non-Hispanic Population, 2010	1,093,512	247,781	387,294	458,437
Pct. of Total	100.0%	22.7%	35.4%	41.9%
Pct. of Population	36.9%	36.5%	40.3%	34.5%
Hispanic Population, 2010	81,481	15,374	21,383	44,724
Pct. of Total	100.0%	18.9%	26.2%	54.9%
Pct. of Population	2.7%	2.3%*	2.2%	3.4%
Asian Non-Hispanic Population, 2010	25,477	1,384	6,304	17,789
Pct. of Total	100.0%	5.4%*	24.7%	69.8%
Pct. of Population	0.9%	0.2%*	0.7%	1.3%
Other or Multiple Races/Ethnicities, 2010	44,540	13,853	10,592	20,095
Pct. of Total	100.0%	31.1%	23.8%	45.1%
Pct. of Population	1.5%	2.0%	1.1%	1.5%
Population Over 65 Years, 2010	404,075	102,540	135,215	166,320
Pct. of Total	100.0%	25.4%	33.5%	41.2%
Pct. of Population	13.6%	15.1%*	14.1%	12.5%

*Source: Area Resource File, 2013-14 Edition; * = $p<0.05$, analysis of variance, rural vs. non-rural counties.*

A large percentage of the populations of rural counties were in cohorts likely to be underserved, including African Americans, the elderly, the poor, the uninsured, the unemployed, and the less educated **(Figure 2, Table 2)**. For example, 36.5% of rural counties' populations were African American, 15.1% were elderly, 20.5% of those under 65 years of age were uninsured, 25.5% were living in poverty, and 16.8% of persons 25 years of age or older did not have a high school diploma. The proportion of persons 16 years of age or older who were unemployed and the corresponding unemployment rate in rural counties was higher than the overall state level. The proportion of rural county populations that was undereducated, elderly, or unemployed were significantly greater than the proportion in non-rural counties.

Figure 2: Proportion of County Populations by CBSA Categories That Were in High Risk Cohorts

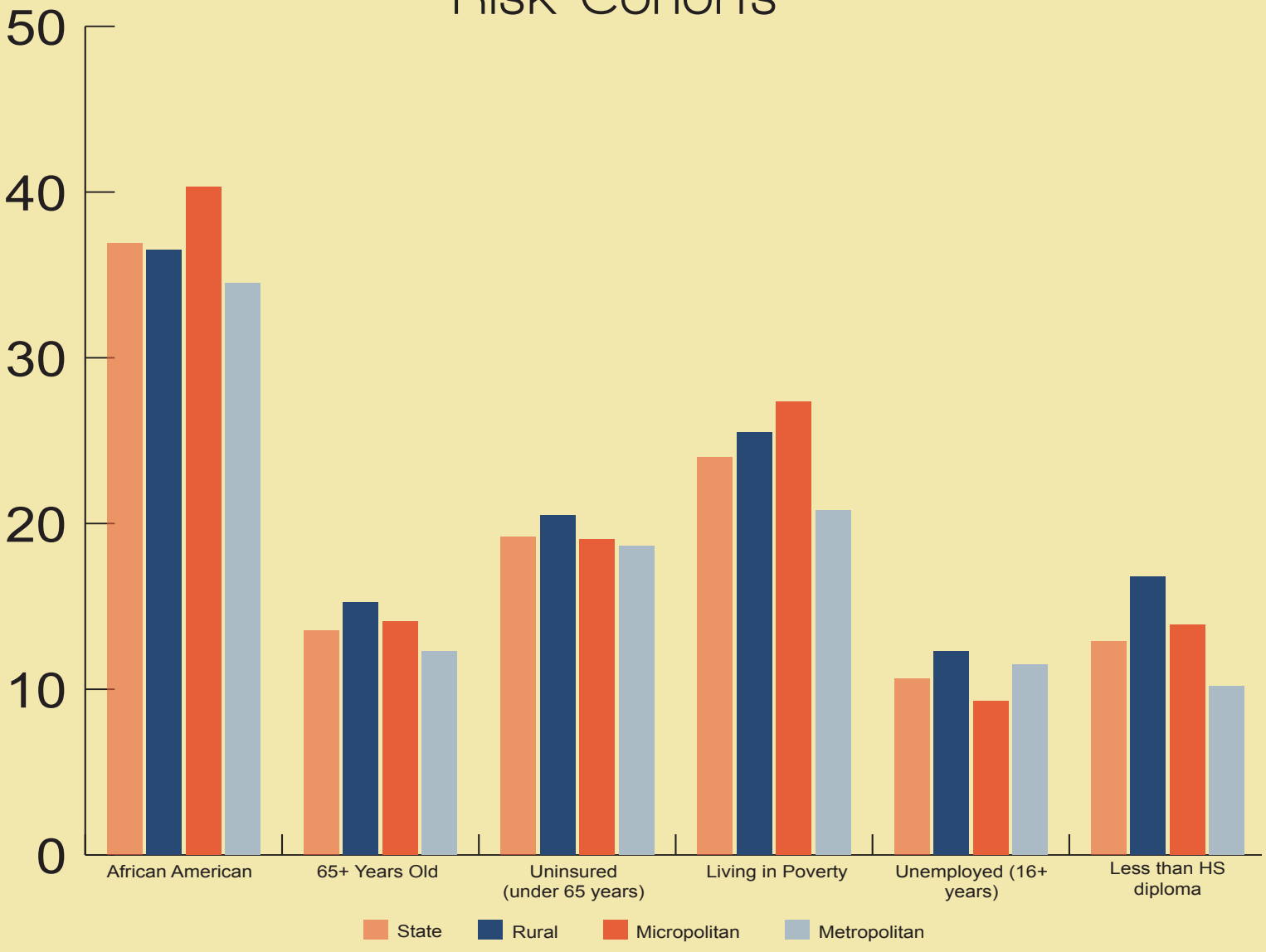


Figure 2: Bars represent the proportion of the population in each of the three CBSA county cohorts who were non-Hispanic African American, 65 years of age or older, under 65 years of age and uninsured, living in poverty, over 16 years of age and unemployed or over 25 years of age and without a high school diploma in 2010. *Source: Health Resources and Services Administration, Area Resource File. 2013-14 edition.*

In addition, over half (26) of rural counties (52.0%) were designated by the U.S. Department of Agriculture as high poverty counties, a proportion significantly greater than for non-rural counties. Per capita incomes were lower in the rural counties than in the other county groups than in the state as a whole **(Table 2)**.

Table 2: Socioeconomic Measures of Mississippi Counties by CBSA Classification

	Total	Rural	Micropolitan	Metropolitan
Persons In Poverty, 2008-12	689,116	167,429	252,787	268,900
Pct. of Total	100.0%	24.3%	36.7%	39.0%
Pct. of Population	23.2%	24.7%	26.3%	20.3%
Average Per Capita Income, 2012	$31,204	$29,509*	$32,402	$33,260
Uninsured <65 years, 2012	491,938	118,228	157,361	216,349
Pct. of Total	100.0%	24.0%	32.0%	44.0%
Pct. of Population	19.2%	20.5%*	19.1%	18.6%
USDA High Poverty Designation (no. counties)	50	26	17	7
Pct. of Total	100.0%	52.0%	34.0%	14.0%
Pct. of Counties	61.0%	66.7%**	65.4%	41.2%
Food Stamp/SNAP Recipients, 2011	648,211	161,818	233,471	252,922
Pct. of Total	100.0%	25.0%	36.0%	39.0%
Pct. of Population	21.8%	23.8%	24.3%	19.1%
Number 16+ years unemployed, 2011†	143,136	35,234	59,899	48,003
Pct. of Total	100.0%	24.6%	41.8%	33.5%
Pct. of Population	10.7%	12.3%*	9.3%	11.5%
Average Unemployment Rate of 16+ years, 2013	10.1	10.8*	9.9	8.6
Persons 25+ years With Less Than HS Diploma, 2006-10	382,391	113,978	133,327	135,086
Pct. of Total	100.0%	29.8%	34.9%	35.3%
Pct. of Population	12.9%	16.8%*	13.9%	10.2%

Source: Area Resource File, 2013-14 Edition; * = p<0.05, rural vs non-rural counties, analysis of variance. ** = p<0.05, chi square. † Note: the denominator is calculated from the total civilian labor force in 2011 (n= 1,343,855).

Health features of the rural and other counties are shown in **Table 3 and Figure 3**. Data from the County Health Rankings provides insights into the health and well-being of rural counties in relation to the other Mississippi counties. The 39 rural counties exhibited poorer health measures, as indicated by higher rankings, than did either micropolitan or metropolitan counties. On overall health status, rural counties had higher rankings among all 82 counties (average rank of 46.7 of 82 counties) than did micropolitan (average ranking of 38.9) or metropolitan (average ranking of 28.8) counties. Similarly, rural counties had higher rankings on measures of length of life, clinical care, and access to care than did the other two county groups. The number of rural counties in each quartile of counties for these measures are shown in **Figure 3**. Rural counties were underrepresented among the first two quartiles; that is, the quartiles including counties with the best results, and overrepresented in the last two quartiles including counties with the worst results. These low county-level rankings are particularly problematic when viewed in the context of the overall low ranking of Mississippi among all states in health measures; Mississippi ranked 50th among the states in the United Health Foundation State Health Rankings.[12]

Figure 3: Quartiles of Rankings of Counties on Health and Well-Being by CBSA Categories

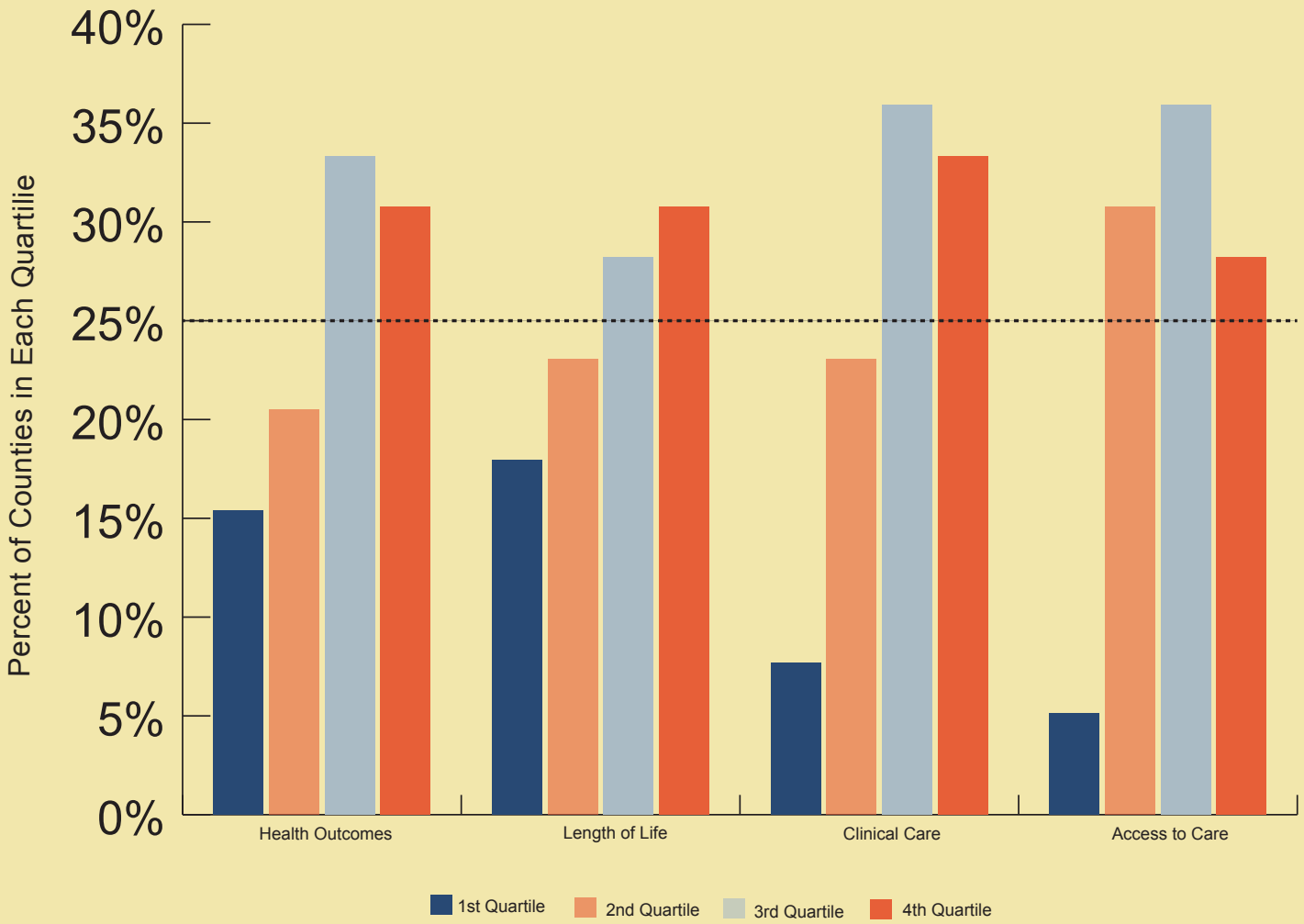


Figure 3: Each bar represents the percent of rural counties (total = 39) that were in each quartile of county rankings for each of four health-related measures. Counties in the 1st quartile had the best overall health outcomes, length of life, level of clinical care, and access to care among all 82 Mississippi counties based on criteria of the County Health Rankings of the Robert Wood Johnson Foundation; counties in the 4th quartile had the worst levels for each measure. The horizontal dotted line represents the expected percentage of counties for each quartile (that is, 25%); proportions above this line indicate an over-representation of rural counties in that quartile. Rural counties were over-represented in each of the two worst quartiles for each measure.

Table 3: Health Status Measure by CBSA Categories

	Total	Rural	Micropolitan	Metropolitan
Average Health Outcome Rank	--	46.7*	38.9	28.8
Average Length of Life Rank	--	45.6	39.2	30.8
Average Clinical Care Rank	--	50.4*	30.8	32.5
Access to Care Rank	--	48.9*	34.8	30.1
No. Medicaid Beneficiaries	768,408	212,488	283,532	272,388
Pct. of Total	100.0%	27.7%	36.9%	35.4%
Pct. of State Population	25.9%	31.3%**	29.5%	20.5%
No. Ambulatory Care Sensitive Admissions, 2011	7,622	3,952	2,178	1,492
Pct. of Total	100.0%	51.8%**	28.6%	19.6%
No. Diabetics, 2011	425,643	241,086	98,955	85,602
Pct. of Total	100.0%	56.6%**	23.2%	20.1%
Infant Mortality Rate (deaths per 1000 live births)	10.5	11.0**	10.5	9.5

*Source: County Health Rankings, 2014 Edition; * = p<0.01 rural vs non-rural counties, nonparametric tests. ** = p<0.05 rural vs non-rural counties, analysis of variance.*

The same pattern was evident in key individual measures of health, as listed in **Table 3**. Rural counties included a disproportionately higher share of diabetics (56.6% of all diabetics in the state), and they had a higher infant mortality rate (11.0 deaths per 1000 live births) than other counties and in the state as a whole.

The high proportion of the state's ambulatory care sensitive admissions (51.8% of the all such admissions in the state) is an indication of the limitations of the primary care systems in rural counties that would optimally be expected to prevent such hospital admissions. These include admissions for, as examples, hospital admission for diabetes, hypertension, and asthma.

Thus, these data suggest that rural counties, when compared to all Mississippi counties and to counties in the other CBSA categories, are smaller, poorer and less healthy, and contain a high proportion of population subgroups commonly considered to be at risk for health-related concerns.

B. Hospital and Health Care Characteristics

There were a total of 94 acute/general-care, nonfederal hospitals that served Mississippi's 82 counties as of the writing of this report.[13] Of these hospitals, 41 (43.6%) were located in rural counties, 30 (31.9%) were in micropolitan counties, and 23 (24.5%) were in metropolitan counties **(Figure 4, Table 4)**. Most rural counties (32 counties) had a single hospital, four counties had two, and two counties had no hospital (data not shown).

Figure 4: Distribution of Hospitals and Licensed Acute Care Beds by CBSA County Categories

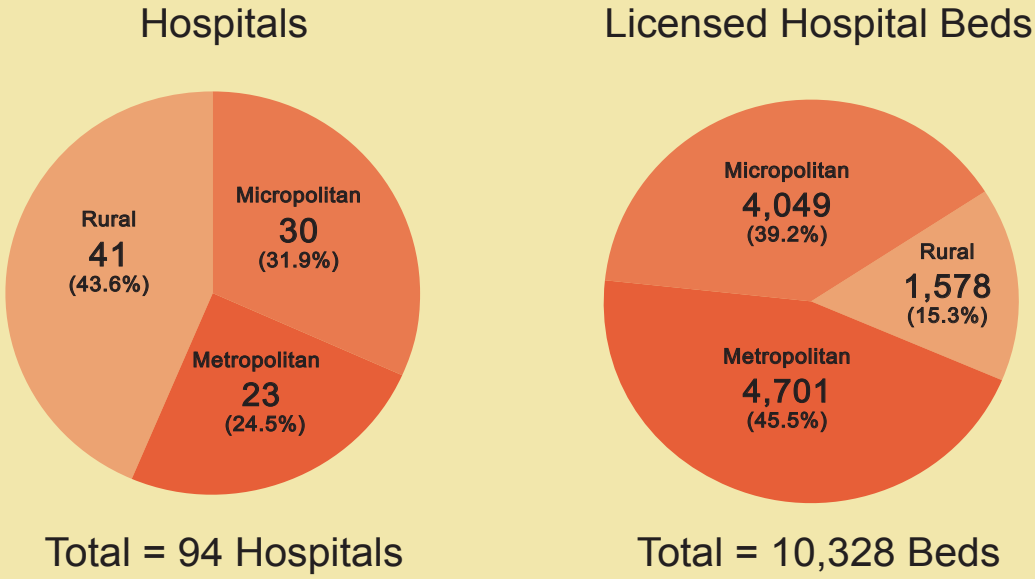


Figure 4: The number and propotion of acute care, general nonfederal hospitals (left) and hospital beds (right) in the three subgroups of Mississippi counties. *Source: Mississippi Department of Health, 2012 Hospital Report.*

Table 4 and **Figures 4 and 5** present selected characteristics of rural and other hospitals. The majority of rural hospitals (29 hospitals, 70.7%) were publicly owned, including six hospitals that were publicly owned but leased to another organization for management. Approximately 63.0% of micropolitan and 47.8% of metropolitan hospitals were publicly owned. In contrast, a smaller proportion of rural than other hospitals were owned by for-profit or not-for-profit corporations or organizations **(Table 4)**.

The 41 hospitals in rural counties were smaller and treated fewer patients than those in either micropolitan or metropolitan areas. They accounted for only 15.3% of state's acute care licensed beds, with an average of 38.5 beds per hospital **(Table 5)**. In contrast, the 30 micropolitan and the 23 metropolitan housed 39.2% (135.0 beds average per hospital) and 45.5% (204.4 beds average per hospital) of the state's licensed beds, respectively. Similarly, rural hospitals had lower average daily censuses (total ADC of 330.6 patients or 7.8% of the state's total ADC) and lower average daily occupancy rates (22.9%) than did either the micropolitan or the metropolitan hospitals **(Figure 5, Table 4)**.

Table 4: Health Care Resources in Mississippi Counties by CBSA Categories

	Total	Rural	Micropolitan	Metropolitan
Number of Hospitals, 2012*	94	41	30	23
Pct. of Total	100.0%	43.6%‡	31.9%	24.5%
No. Acute Care Licensed Beds, 2012*	10,328	1,578	4,049	4,701
Pct. of Total	100.0%	15.3%‡	39.2%	45.5%
Population/Licensed Acute Beds	287.3	430.2†	237.3	282.4
No. Acute Care Beds Set Up, 2012*	9,249	1,447	3,538	4,264
Pct. of Total	100.0%	15.6%‡	38.3%	46.1%
Total Inpatient Daily Census*	4,233.75	330.58	1,531.20	2,371.97
Pct. of Total	100.0%	7.8%†	36.2%	56.0%
Average Daily Occupancy Rate, 2012*	45.8%	22.8%†	43.3%	55.6%
Critical Access Designation, 2012*	29	19	6	4
Pct. of All Hospitals	30.9%	46.3%‡	20.0%	17.4%
Pct. of Total CAH	100.0%	65.5%	20.7%	13.8%
Hospital Ownership, 2012*				
Public	42	23‡	13	6
Proprietary For Profit	15	5	3	7
Not for Profit Corp/Org	18	7	8	3
Church	2	–	–	2
Public, Leased to Another Org for Management	17	6	6	5
HPSA Primary Care Levels, 2012-13**				
All Shortage	53	33	11	9
Pct. of All Hospitals	56.4%	80.5%‡	36.7%	39.1%
Partial Shortage	27	6	14	7
Pct. of All Hospitals	28.7%	14.6%‡	46.7%	30.4%

*Source: *Mississippi Department of Health, 2012 Hospital Report; **Area Resource File, 2013-2014 Edition; †: < 0.05 rural vs non rural, analysis of variance. ‡: p<0.05 rural vs non-rural, chi square.*

Figure 5: Average Daily Census and Occupancy Rates by CBSA County Categories

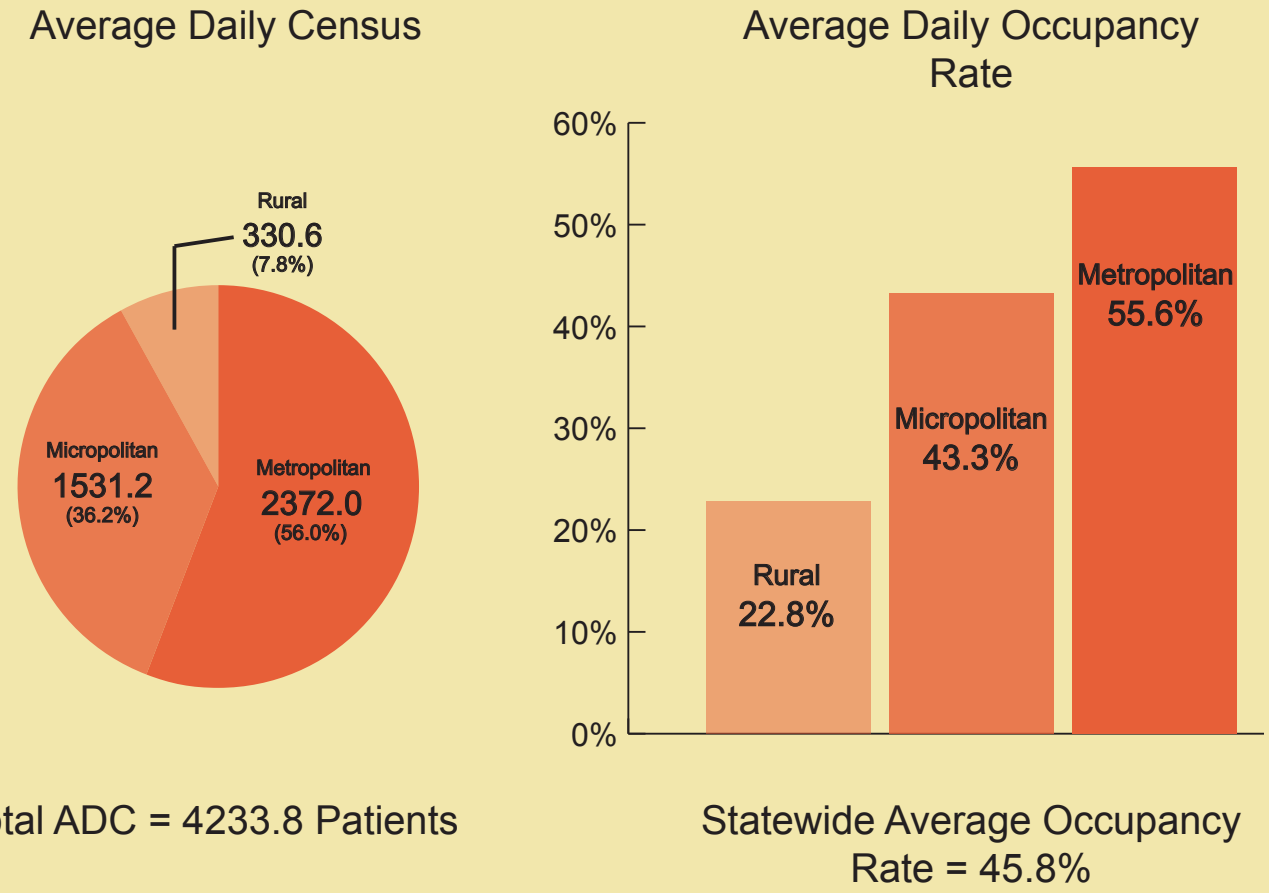


Figure 5: Average daily censuses (left) and occupancy rates (right) for acute care general, nonfederal Mississippi hospitals grouped by CBSA categories. *Source: Mississippi Department of Health, 2012 Hospital Report*

Rural hospitals fall into several subcategories reflecting both the scale and scope of services they deliver. These designations include: *Critical Access Hospitals* that have fewer than 25 acute-care beds, are located at least 35 miles (or 15 miles in mountainous terrain) from the nearest hospital, and have an average length of stay less than 96 hours[14]; *Sole Community Hospitals* that are located at least 50 miles from the nearest hospital and have fewer than 50 acute-care beds[15]; and *Rural Referral Center Program* -- tertiary-care hospitals that receive referrals from adjacent rural hospitals and meet several additional criteria related to location, volume of patient referral patterns, discharges, and bed size.[16]

A high proportion of Mississippi rural facilities were designated as critical access hospitals. Nineteen of the 41 rural facilities were so designated, and formed 65.5% of all the critical access hospitals in the state. In addition, five were designated as sole community hospitals; none were described as rural referral centers. Thus, even though these hospitals are small, their importance is high.

Many rural hospitals provided limited advanced services according to the American Hospital Association Survey. Almost all (38 hospitals) had a CT scanner, but fewer than half (17 hospitals) had an MRI unit. Only three were listed as having adult cardiac services, and none had an adult cardiac catheterization laboratory. Although 33 rural facilities had a trauma center, only two had what was classified as a regional referral trauma center. According to the American Hospital Association Survey, only one rural hospital was able to handle uncomplicated and most (but not all) complicated obstetric cases, only one had a neonatal intensive care unit, and none had burn units or pediatric intensive care units. None of the rural hospitals had residency training programs, medical school affiliations, or accredited nursing schools.

In addition, rural counties had significant physician shortages. Mississippi has the worst physician shortage in the nation, with a physician-to-population ratio of 180.8 per 100,000 population as compared to the U.S. average of 260.5 per 100,000 population.[17] However, health care workforce shortages are exacerbated in rural areas in general. Based on Health Professional Service Area designations published by the Health Resources and Services Administration, 33 rural counties and parts of an additional six were designated as having shortages of primary care physicians. No rural county was determined to have an adequate physician workforce **(Figure 6, Table 4)**. Of the 53 Mississippi counties with all-county shortages, 80.5% were rural. The rural counties with full county shortages included 84.7% of the total rural population **(Figure 6)**.

Figure 6: Primary Care Shortage Designations by CBSA Categories and Underserved Rural Populations

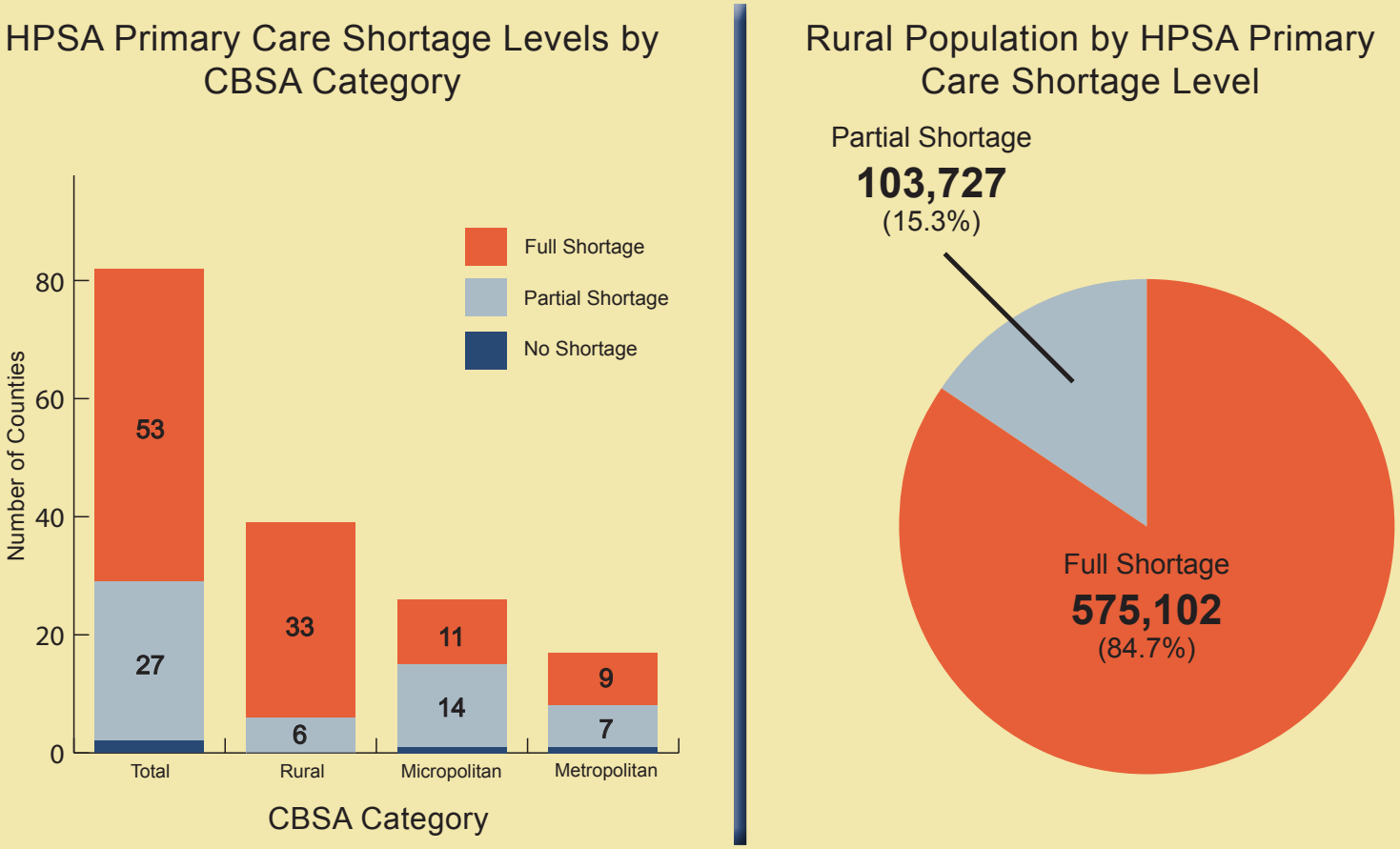


Figure 6: Left - distribution of primary care physician shortage area designations according to the Health Professional Service Area (HPSA) designations in all and among the three CBSA county groups. Right - number and proportion of rural county residents residing in counties with partial or full primary care physician shortages.
Source: Health Resources and Services Administration, Area Resource File, 2013-14 edition

III. External and Internal Threats to Hospitals

To better understand how the present economic climate and policies are impacting rural hospitals in Mississippi, two broad areas were examined: external threats and internal threats. *External threats* were defined as factors that originate outside the hospitals' control, such as policy, economic, or population-level challenges. *Internal threats* were defined as factors that originate inside a hospital at an institutional level, such as shortage of employees, shortage of capital, and choosing to remain autonomous or choosing to affiliate with a network of hospitals.

A. External Threats

Macroeconomic Downturns and the Slow Recovery from the 2008 Financial Crisis – Recession, Unemployment, and Loss of Health Insurance Coverage

The great recession brought on by the 2008 financial crisis, coupled with the slow and jobless recovery, has hit the hospital industry hard in recent years. National hospital expenditures grew at historically low rates during the recession period from 2007 to 2010 as patients delayed care when the family budget became tight or when heads of households lost their insurance coverage.[18] Small hospitals in rural areas are particularly vulnerable to economic downturns when workers lose their jobs and employers discontinue or reduce health insurance coverage or increase employee costs. Small rural hospitals do not have the financial depth to withstand the pressure from external market forces. They are particularly hard pressed to find the necessary resources to comply with the new mandates under the Affordable Care Act (ACA), including the need to develop electronic medical records systems and develop or participate in new delivery models and upgrade facilities in order to compete with larger hospitals in metropolitan areas. The decision to expand or not to expand Medicaid through the provisions in the ACA already have had effects on hospitals nationally.

To cope with the financial pressure, hospitals across the country reduced their scope of services, trimmed their costs, and reduced payrolls in order to weather the financial storm. Many rural hospitals have been particularly hard hit, and Mississippi has had its share of this retrenching trend. Between January 2010 and April 2015, for example, ACA expansion states have had fewer hospital closings (13) in rural areas compared to non-expansion states (37).[19] The majority of these hospitals are in the South. These include two rural hospitals in Mississippi, People's Choice Medical Center of Humphreys County (closed in August 2013) and Kilmichael Hospital (which closed in January 2015, but maintained a rural health clinic after closure). The Kilmichael rural health clinic received a loan from the U.S. Department of Agriculture Rural Development Community Facilities Program in 2009 and opened clinic doors in 2012. The clinic provides increased access to outpatient primary care services for patients and receives enhanced reimbursement rates from CMS.[20] When the hospital closed in 2015, the outpatient services continued to be delivered through the clinic. Thus, the community has access to limited medical care, although inpatient and emergency care are no longer available. Nationally, while many hospitals have attempted to convert their services after closure, the majority (54.0%) of these closures resulted in total loss of the principal health service provider in rural areas.[19] The reasons for these closures vary, but include many of the reasons highlighted in the sections below, including inability to recruit and retain staff, Medicaid shortfalls, uncompensated care, and unstable profitability margins. Additionally, when hospitals close, "ripple effects" such as longer travel time to seek care at a nearby hospital may compound the problem of access and increase risk for mortality.[21]

The occurrence or even the threat of closings represent the tip of the iceberg of underlying social and economic issues that can affect health and access to quality health care by rural residents. Long before the final closing of a hospital, local hospitals struggle to survive by implementing a number of self-help and cost-cutting actions. These cost-cutting measures often include employee layoffs, purchase reductions from local businesses, and reduction of the breadth and depth of health services offered. In April 2014, for example, two rural hospitals in Mississippi laid off employees, with Pearl River County Hospital and Nursing Home in Poplarville, Mississippi, eliminating 19 positions and Montfort Jones Memorial Hospital in Kosciusko in central Mississippi laying off 39 employees.

In the last three years, the national economy has begun to show signs of recovery, but the weak recovery and the lingering effects of the severe recession continue to adversely affect the financial health of hospitals.[22] In 2013, for example, hospital admissions fell for the first time, according to a report by Moody's Investor Services which analyzed 383 hospital systems.[23] Hospital revenue growth also slowed to a new low of 3.9% in 2013 as compared to normal growth of about 7.0% annually across the U.S.[23] Many experts have pointed out that the great recession and its aftermath were not the sole source of financial pressure facing hospitals. Some have cited evidence that the downward trend for hospital revenue growth began before the 2008 financial crisis,[24] and others have credited the passage of ACA for inducing many hopefully beneficial structural changes (e.g., bundled hospital payments and Patient Centered Medical Homes pilot programs) in the health care delivery system.[25] While this debate continues, it is widely believed that the health economy is still feeling the lingering effects of the deep recession and slow recovery eight years after the beginning of the recession.[26, 27]

In many rural Mississippi communities, hospitals are the largest or one of the largest employers. According to a recent economic impact report commissioned by the Mississippi Hospital Association, 26 hospitals have more than 500 employees.[28] In fact, according to 2012 County Business Patterns Estimates, employees in the health care and social assistance sector comprised the largest percent (18.0%) of all business sectors in Mississippi.[29] In addition to providing well-paid jobs, hospitals contribute to the state economy by spending money on their operations and capital projects, thereby creating more jobs and expenditures in other parts of the state economy. Throughout the recent recession, Mississippi hospitals have served as a firm foundation for the state and local economies. However, hospitals are not immune to the ups and downs of the general economy. Hospitals contribute to the economy and are themselves affected by the general health of the economy.

Population Challenges in Rural Areas

Population loss in rural areas, attributable to net migration, births, and deaths, has been growing at a steady rate. In fact, the 2010-2013 period was the first time that all nonmetropolitan areas in the United States experienced population loss as a whole.[30] In Mississippi, the population of the rural counties fell by approximately 1.0% between 2010 and 2013 while the state's population grew by approximately 1.0%.[11] This population shift represents a growing demographic challenge for rural regions across the United States. Rural populations are more likely to be sick, uninsured, and older than urban populations.[31,32] Rural residents who remain in rural areas for medical care are more likely to be older and on Medicare than are those who travel to urban areas for care.[33] This represents an additional barrier for hospitals in rural areas to have sufficient patient volume, patient mix, scale for certain medical procedures, and to remain profitable. And, these barriers to profitability are a reality for the state of Mississippi, where almost half of the counties are rural,[11] the majority of the population has poor health outcomes—with high prevalence of chronic disease—and is medically underserved **(also see Figures 2 and 6)**.[34] Mississippi also has a concentration of older residents who live in rural or micropolitan areas **(also see Table 1)**.[22] Older rural residents in Mississippi are more likely to be sick, with more (55.0% of total rural residents ages 65+) having some kind of disability than those residents in the urban areas (51.1% of total urban residents ages 65+).[22]

The Patient Protection and Affordable Care Act and Rural Hospitals in Mississippi

President Barack Obama signed the ACA into law in March 2010. This major change in federal health policy defined a comprehensive health care reform that, once fully implemented, will impact virtually every portion of the health care system at national and local levels. The reduction of hospitals' uncompensated care costs through increased health care coverage was intended to be a key benefit of the law. However, the 2012 Supreme Court decision made the Medicaid expansion optional and may have unintended impacts leaving safety-net and rural hospitals with substantial uncompensated care costs that threaten their survival. The ACA has had significant impacts on rural hospitals in Mississippi. Some of the impacts, such as those stemming from the gradual reduction of the Medicaid and Medicare disproportionate-share hospital (DSH) payments and those from Medicare's exclusion of most critical-access hospitals in rural areas from the pay-for-performance program under ACA, have been the result of federal policy shifts. Others have been rooted in the policy decisions made by the state, and these include the decision not to expand Medicaid and not to actively engage in patient education and outreach activities to assist in taking actions to sign up those potentially eligible for coverage. These impacts are analyzed and summarized below.

The Reduction of DSH Payments & Other Rural Specific Hospital Programs.

Realizing the structural weakness of rural hospitals and the vital role they play in serving the health care needs of rural residents, the federal government has for years subsidized the operation of rural hospitals with grants, subsidies, and other favorable polices.[14–16,35] Many safety-net hospitals, including many small hospitals that are often the sole hospital in a rural county, treat a disproportionate share of uninsured, Medicare, and Medicaid patients. The uncompensated care costs and shortfalls related to treating these patients places a significant financial strain on these hospitals. For example, rural hospitals in Mississippi had higher average Medicaid shortfalls ($60.8 million) compared to urban or micropolitan hospitals ($8.6 million and $6.5 million, respectively) from 2008 to 2012.[7] These shortfalls may further be compounded by the lower reimbursement rates for Medicare and Medicaid patients compared to privately insured patients. Of note, while Medicare reimbursements are lower than privately insured patients, the vast majority of hospitals accept Medicare payments, and Medicare reimbursements are, on average, significantly higher than Medicaid.

The federal government has helped hospitals absorb these uncompensated care expenses through both its Medicaid and Medicare DSH payments. The federal government distributed more than $11 billion annually in Medicaid DSH funds to the states and, under this program, Mississippi received $162.6 million in fiscal year (FY) 2014, the latest year for which data are available.[36,37] The ACA originally included decreases in Medicaid DSH payments that would have totaled $18.1 billion in the period from 2014 to 2020. The University Research Center of the Mississippi Institutes of Higher Learning estimates that if Mississippi adopted expansion, uncompensated care would decline by 57.0%; however, if Mississippi does not, uncompensated care would decline by 6.0% in addition to a 52.0% decline in DSH payments in FY 2014-2020 for a total loss of $261.8 million.[38] The cuts in DSH payments were thought to be a reasonable cost-saving trade-off in the original design of ACA, since the mandatory expansion of Medicaid in every state and the expansion of insurance coverage through state-level insurance exchanges would have greatly reduced the amount of uncompensated care and the need for the DSH payments.

While the June 2012 Supreme Court decision made the Medicaid expansion optional, the reduction of DSH payments has remained in force regardless of a state's decision to expand or not—thus, hospitals must find ways to offset the federal reductions in DSH payments. The passage of the Protecting Access to Medicare Act of 2014 has delayed the implementation of these reductions, and the DSH cuts are now set to begin in fiscal year 2017 and end in fiscal year 2024.

Although, DSH cuts are delayed until 2017, four rural-specific hospital payment provisions that were extended through the Protecting Access to Medicare Act have expired as of April 1, 2015 -- including the Medicare-Dependent Hospital program, the Low-Volume Hospital Payment Adjustment program, the Ambulance Add-On Payments program, and the Outpatient Therapy Caps Exception Process program.[35,39] The impact of these expired provisions have yet to be fully realized, but will certainly impact all rural hospitals.

Loss in Hospital Reimbursement

While hospitals in all states will be impacted by cuts to DSH funding, hospitals in the 24 states that have not expanded Medicaid (as of the end of 2014, including Mississippi) stand to lose the most. Hospitals in these 24 states are projected to lose $167.8 billion in hospital reimbursements and revenue over the next seven years.[40] Expansion would have cost the state about $1.05 billion of total state matching funds in the ten years between 2013 and 2022.[40] But, the state would have gained a total of $14.5 billion of federal subsidies that would have included about $4.8 billion of hospital reimbursements from the period 2013-2022.[40]

The Cost-Plus Lifeline is Under Threat

Many rural hospitals in Mississippi rely on the so-called “cost-plus” Medicare reimbursement to stay afloat. Under the federal Critical Access Program (CAP), rural hospitals so designated, including 29 Mississippi hospitals **(Table 4)**, are paid on a “reasonable cost” basis, and this is meant to be 101.0% of the actual costs experienced by a hospital for treating Medicare patients. Most experts have recently come to the conclusion that the tightening of the federal budget and the threat of the Congressional repeal of ACA will eventually reduce the Critical Access Hospital payment rates to 100.0% of costs or lower. With the federal government stepping up the implementation of its Value-Based Purchasing Program, the cost-plus Medicare reimbursements for rural hospitals will likely be reduced, if not totally phased out, in the near future. Recent data suggest that 63.0% of all safety net hospitals, many of which are rural, were receiving a reduced payment rate because of the penalties under the Value-Based Purchasing Program.[41]

Ineffective Take-up of Insurance Coverage and Lack of Patient Outreach and Education

Among the 284,000 Mississippi residents who could have gained health care coverage through the federal Marketplace under the ACA, only 104,538 or 37.0%, actually selected a plan as of February 2015.[42,43] Analysts and commentators have attributed this lackluster performance to a combination of factors, including the confusing and ineffective implementation of the federal health exchange website and an inability to secure all of the available resources and assistance for outreach and patient education.

Furthermore, the June 2015 Supreme Court ruling on the King v. Burwell challenge to the tax subsidies for people who purchase health insurance on the federal marketplace had and may continue to have implications for health care spending and for hospitals. The Surpreme Court ruled in favor to uphold the tax subsides. However, the Urban Institute estimated that a ruling in favor of the plaintiffs to strike down the tax subsides, could have resulted in a decrease in total personal health care spending by the population who would have lost their tax subsidies, while the demand for uncompensated care would have increased.[44] For Mississippi, this could have potentially been a decrease of $196.8 million in direct expenditures and uncompensated care spending, totaling $387.3 million in 2016.[44] In addition, it could have resulted in a substantial decline in hospital revenues among states that rely upon the federal marketplace -- with the largest decreases occurring in hospitals that serve a larger proportion of low- and moderate-income patients,[44] such as rural hospitals in Mississippi. However, since the ruling occurred recently, the long-term effects on hospitals will need to continue to be studied.

Perception of Diminished Quality of Care

Urban hospitals are commonly perceived to deliver better quality of care than rural hospitals. Existing literature suggests that patient perceptions of quality of care are important because (1) they are an important driver of patient choice and health outcomes and (2) they are currently a key focus within the health care system.[45] A recent study from the Department of Health and Human Services found that approximately a third of rural patients are hospitalized in urban hospitals.[46] The study also found that Medicare patients were significantly less likely to "cross over" or to leave rural areas to be hospitalized elsewhere. Similarly, previous studies have shown that individuals with private insurance are more likely to cross over, and those with Medicaid were less likely to cross over.[47] As described above, some of this patient migration may be due to limited access to specialized and advanced care,[48] consumer perception and choice may be a key driver of the patient cross over. Consumer perceptions related to provider shortages and perception that they can receive better care outside of their local health care market have a strong impact on whether they select health care in an external market.[49] While it is likely that many patients leave their local markets to receive specialized care that is unavailable at rural facilities (e.g. interventional cardiology, mental health, and intensive care), the loss of patients who provide higher reimbursements (privately insured, etc.) may have unintended and adverse financial consequences for rural providers and hospitals.[50]

B. Internal Threats

Rural hospitals have long suffered from a number of internal treats to their financial vitality and their capacity to care for the inpatient and outpatient needs of the residents they serve. These include, but are not limited to, the following:

Rising Costs of Providing Care

Rural hospitals have long experienced financial pressure from the high and rising cost of providing inpatient and outpatient services. But, unlike their counterparts in urban and metropolitan areas, rural hospitals are smaller, and similar to national trends across all hospitals, they face a dwindling number of patient admissions.[23] Rural hospitals still need to maintain vital hospital services provided in high-cost units such as the emergency department, to upgrade their patient care technologies to meet advancing patient care standards and health information systems to comply with the higher standards demanded by the ACA. However, the rise in hospital emergency departments' current role as the "safety-net" for many vulnerable populations seeking primary care[51] have made it particularly difficult for rural hospitals to obtain payment and reimbursement for patients who, on average, are more likely to be uninsured or underinsured. Ideally, hospitals would combat these financial pressures by finding ways to generate more revenue. However, many rural hospitals with fewer resources often have to eliminate low reimbursement services such as obstetrics[52] and have less flexibility to raise revenues through profitable services, such as specialty surgeries or oncology services. This decline in volume and services might be an indicator for quality of care as well.

Small Size and Lack of Access to Capital to Invest in Plant and Equipment

Hospitals are capital-intensive institutions that require regular capital investments to keep up with the advances in medical science and clinical research. However, rural hospitals are often operating with chronic budget deficits, and thus are unable to obtain capital or loans to update their aging equipment, buildings, and technology. The use of technology, such as telemedicine or electronic medical records (EMR), is critical in medically-underserved rural areas. For example, most rural hospitals do not have EMR or the personnel or capacity to maintain these systems.[53] Without adequate patient volume, rural hospitals lack the ability to generate net patient revenues from more profitable services, such as cardiac surgery, cardiac catheterization, or oncology. Low occupancy rates in rural hospitals also make establishing EMR systems within these institutions challenging.[54–56] Furthermore, the lack of investment in services, such as an EMR, may ultimately cause hospitals to lag behind in quality improvement, patient safety, efficiency, and performance on the processes-of-care guidelines to measure population health status set by Hospital Quality Alliance.[56,57]

Balance between Remaining Autonomous and Affiliation with Larger Organizations or Rural Networks

With increasing costs and the inability to provide acute- and chronic-care services in rural areas, the ability of rural hospitals to remain autonomous remains challenging. As a large proportion of rural hospitals are publicly-owned or non-profit,[58] many rural hospitals have limited capital access and are subject to the changes of public policies. With the passage of the ACA and the recent 2009 economic downturn, many rural hospitals are being forced to ally with larger hospitals to reduce costs and increase services.[58,59] However, the merger of a larger urban hospital and a smaller rural hospital creates complexity for a hospital's business and institutional models.[60] The decision to ally with larger hospitals may have unintended consequences that result from trying to meet corporate and shareholders' objectives in lieu of local needs. As an example, there can be a great need for OB/GYN services in a community, but a hospital might phase out this service line due to lack of profitability. Rural hospitals have various options, including merging with loss of autonomy to a larger hospital or system, merging as an equal or junior partner, merging as an affiliate, forming a network with other rural hospitals, or modifying services and remaining independent.[58] For example, in August 2013, the University of Mississippi Medical Center agreed to fully manage Grenada Lake Medical Center in Grenada, Mississippi. This transition resulted in all practice models, operations, and services being fully merged into the University of Mississippi Medical Center's oversight.[61]

Tertiary Care in Rural Hospitals

Advances in health care procedures that were considered exclusively tertiary care are now becoming part of routine management in many hospitals. For example, urgent cardiac catheterization is now considered basic care for patients with myocardial infarction. Rural hospitals generally have limited resources; thus, the quality of care they can deliver may be reduced. When examining in-hospital mortality rates among patients with acute myocardial infarction (AMI) in rural hospitals, most of the hospitals were able to provide care to patients with AMI; however, cases that required advanced cardiac care needed time to transfer to a larger hospital for specialized consultative care.[62] Of those who were transferred to tertiary hospitals for advanced treatment of AMI, less than 6.0% died, compared to the 16.7% who were not transferred from the rural hospital to the tertiary care hospital.[62] Telemedicine has become an option for solving the problem of lack of specialty providers, but adequate infrastructure, access to broadband internet, capital, and technical expertise are required before it can become a viable option for expanding specialty care.[63,64]

Provision of Ancillary Care in Rural Hospitals

As a growing number of baby boomers reach advanced ages, there is an increasing need for long-term ancillary medical care in rural areas.[65] Rural hospitals are often primary locations for patient care in rural communities and often provide ancillary services that would not be available elsewhere, such as hospice, nursing home services, and assisted living communities.[66] However, these services may come at a steep price for the hospital. The patient mix among rural hospital patients is often heavily dependent on Medicare and Medicaid. Thus, rural hospitals often do not have enough capital or generate enough revenue to maintain ancillary services, resulting in financial instability and the reduction or independent conversion of these services.[67]

IV. At-Risk Hospitals in Mississippi

A. Definition of At-Risk Hospitals

At-risk hospitals are considered to be those that are so financially vulnerable that they are at risk of closure because of either money-losing decisions made internally or unexpected external events (e.g., DSH payment cutbacks) they cannot control. Under this definition, at-risk hospitals can be identified on the basis of three key financial measures used commonly in hospital finance: profitability, uncompensated care, and Medicaid shortfalls.

The following discussion will consider how these three financial measures can be applied to the AHA Financial Data for defining and identifying at-risk hospitals in Mississippi.‡

1. Profitability

Profit is the amount of money a business makes after accounting for total costs. Hospitals, even not-for-profit ones, need to be profitable to carry out their mission and serve their communities. They cannot survive for long if they consistently lose money. ***In this study, the authors used "total revenue margin" to measure a hospital's overall profitability. All income sources, including patient revenues and other sources of net income earned by a hospital, were captured by this measure and defined as:***

Profitability Formula§

$$\text{Total Revenue Margin} = \frac{\text{"Net income (or loss) for the period"}}{\text{"Net patient revenues"} + \text{"Total other income"}}$$

With four years' worth of financial data available, the authors analyzed both the four-year trend of each hospital's total revenue margin and the four-year average of this measure in determining whether the hospital is financially at risk.

‡ The raw calculated values for our financial measures (profitability, uncompensated care, and Medicaid shortfalls) provide little information about how a particular hospital compares to other hospitals. Thus, the calculated values are transformed into a z-score to understand a hospital's relative rank compared to other hospitals. The sign of the z-score (positive or negative) indicates whether the calculated values are above (positive) or below (negative) the mean. The numerical value of the z-score relates the number of standard deviations between the calculated values and the mean of the selected financial measures. Example: z-score that is located 1 standard deviation above the mean will have a z-score of +1.0.

§ The numerator, "Net income (or loss) for the period," is Total revenues – Total expenses; the denominator captures all sources of net income earned by a hospital, including DSH payments. This is the broadest definition of margin using the variables from the AHA financial data set.

2. Uncompensated Care

A hospital's uncompensated care (which includes bad debt and charity care, but not contractual discounts) is care provided without receiving direct compensation from patients or third-party payers to defray costs. This leads to financial losses and, therefore, contributes to a hospital's financial vulnerability. All hospitals provide uncompensated care, and the national average of uncompensated care is about six-percent ($46.4 billion in 2013) of total hospital expenses.[68] Uncompensated care becomes a serious problem if a hospital is consistently plagued with a high level of care delivered to patients with no insurance and those who cannot pay. ***A consistent level of high uncompensated care is defined as a percentage of total hospital charges that are two standard deviations above the mean level for all comparable hospitals.***

*Uncompensated Care Cost Formula***

$$\text{Uncompensated Care Cost as \% of Total Expenses} = \frac{\text{“Total uncompensated care cost”}}{\text{“Total operating expenses” + “Total other expenses”}}$$

3. Medicaid Shortfalls††

Medicaid's reimbursements for hospital care are almost universally low in comparison with the payment levels of Medicare and, especially other private major third-party payers. In Mississippi, for example, Medicaid pays approximately 90.0% of Medicare rates, while Medicare pays approximately 80.0% of private insurance rates. If a hospital treats a disproportionate share of Medicaid patients (such as many rural hospitals, as described above) and cannot manage its costs, the financial shortfalls (operating losses) from delivering care to Medicaid patients can contribute to its financial vulnerability. ***A hospital is said to have a Medicaid shortfall if it has a negative average Medicaid operating margin during the last four years.***

Medicaid Shortfalls Formula

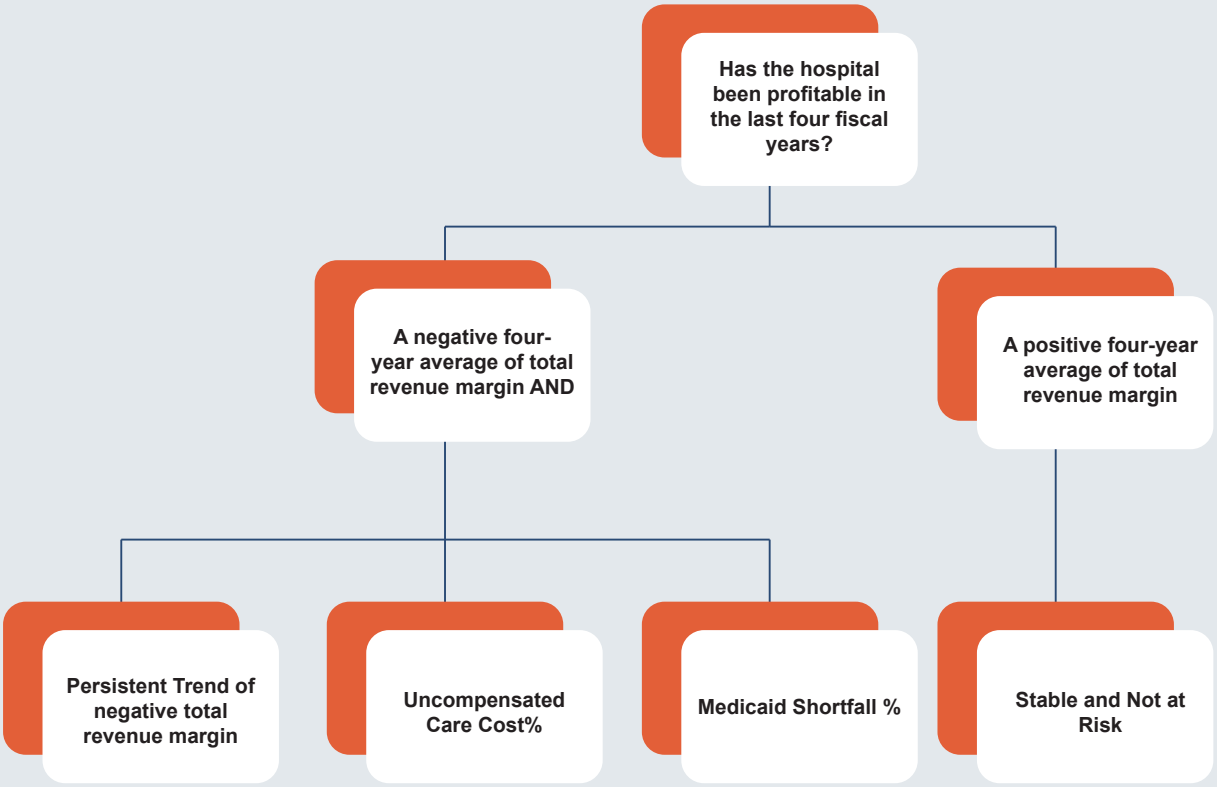
$$\text{Medicaid shortfalls (\%)} = 1 - \frac{\text{“Total gross medicaid cost”}}{\text{“Net revenue from medicaid”}} = 1 - \frac{\$105}{\$100} = 0.05 \text{ or a } 5.0\% \text{ shortfall}$$

*** This formula of uncompensated care burden is based upon the unpaid costs (not charges) to the hospital and total expenses because AHA has excellent data on uncompensated costs and total expenses. The uncompensated care burden can alternatively be calculated on the basis of uncompensated charges. Then, the denominator should also be gross hospital charges. A cost-based formula was used because AHA has converted all uncompensated charges to costs.*

†† Only the most recent three fiscal years of Medicaid reimbursement data was used in calculation of the Medicaid shortfalls due to severe missing data for fiscal year 2008-2009.

B. At-Risk Algorithm

Hospitals were classified into the different risk categories guided by the following At-Risk Algorithm:



Thus, all hospitals analyzed are classified into the following profitability categories:

A. A hospital is financially ***stable*** and not at risk of closing if it has a positive four-year average of total revenue margin.

B. If a hospital has a negative four-year average of total revenue margin but none of the three additional vulnerable conditions (a persistent [three out of four years] trend of negative margins, high uncompensated care percentage, and high Medicaid shortfalls), it is on the ***Watch List***.

C. A hospital is on the ***Level I Risk List*** if a hospital's four-year average total revenue margin is negative AND it has one additional vulnerable condition.

D. A hospital is on the ***Level II Risk List*** if a hospital's average total revenue margin is negative AND has two of the additional vulnerable conditions.

E. A hospital is on the ***Level III Risk List*** if a hospital's average total revenue margin is negative AND has all three of the additional conditions.

In sum, rural hospitals can be classified into five broad risk groups: ***Stable, Watch, Level I Risk, Level II Risk, and Level III Risk.***

C. The Nine "Most At-Risk" Hospitals in Mississippi

The main focus of this report pertains to rural hospitals; however, a comprehensive and inclusive perspective, that included micropolitan and metropolitan counties, was employed to understand the overall impacts of potential hospital closure in Mississippi as a whole. The analyses were further focused on the "most at-risk" hospitals (Level III or Level II) in Mississippi – these hospitals had the greatest potential for closure.

Table 5 contains data on the calculated risk level of the nine "most at-risk" hospitals in Mississippi. The first *five hospitals were identified as "most at-risk" based on the calculated risk algorithm* used in this study. Six of the nine at-risk hospitals were located in rural regions and all were public hospitals. The six hospitals that were identified at-risk as identified by the 2014 State Auditor's report "The Financial Health of Publicly Owned Rural Mississippi Hospitals" were included for comparison. Two hospitals, Tippah County and Hardy Wilson Memorial Hospitals, were identified by both the calculated risk algorithm and the State Auditor's report.

Table 5: Calculated Risk Level of Most At-Risk Hospitals

At-Risk Hospital	County	Metro/ Micro/ Rural Status	Ownership	Calculated Risk Level	Watchline‡‡ Financial Strength Index	Aggregate Mean Score‡‡
Covington County Hospital	Covington	Rural	Public	Level III	--	--
Highland Community Hospital	Pearl River	Micro	Public	Level III	--	--
Holmes County Hospital & Clinics	Holmes	Rural	Public	Level III	--	--
Tippah County Hospital§§	Tippah	Rural	Public	Level III	Yes	Yes
Hardy Wilson Memorial Hospital§§	Copiah	Metro	Public	Level II	--	Yes
Montfort Jones§§ Memorial Hospital	Attala	Rural	Public	Level II	Yes	Yes
Natchez§§ Regional Medical Center	Adams	Micro	Public	--	Yes	Yes
Noxubee§§ County General Critical Access Hospital	Noxubee	Rural	Public	--	--	Yes
Tallahatchie§§ County General Hospital	Tallahatchie	Rural	Public	--	Yes	Yes

‡‡ Measure developed in the 2014 report "The Financial Health of Publicly Owned Rural Mississippi Hospitals" and used for comparison.

§§ Hospital Identified at risk in the 2014 report "The Financial Health of Publicly Owned Rural Mississippi Hospitals."

In total, 31 hospitals state-wide (33.0%) were identified as at-risk (Watch- Level III), including 20 rural hospitals (49.0% of all rural hospitals), seven micropolitan hospitals (23.3% of all micropolitan hospitals), and four metropolitan hospitals (17.4% of all metropolitan hospitals). Appendices A, B, and C contains additional selected data for all 94 Mississippi hospitals including both the calculated risk level and State Auditor's risk level.

Table 6 contains data on the characteristics of the "most at-risk" hospitals. The number of acute care licensed beds range from 18 beds in Tallahatchie County General Hospital to 147 beds in Natchez Regional Medical Center.

Table 6: Characteristics of Most At-Risk Hospitals***

At-Risk Hospital	Number of Acute Care Licensed Beds†††	Number of Acute Beds Set-up	Average Daily Acute Care Census	Average Daily Acute Care Occupancy Rate	Drive Time In Minutes	Miles to Nearest Hospital (Hospital Name)	Multiple Hospitals In County	Critical Access Hospital
Covington County Hospital	25	24	4.24	17.0%	25	20 (Magee General)	No	Yes
Highland Community Hospital	60	56	16.19	27.0%	33	25 (South Mississippi State)	Yes	No
Holmes County Hospital & Clinics	25	25	2.77	11.1%	36	29 (Montfort Jones)	No	Yes
Tippah County Hospital	45	29	6.7	14.9%	33	21 (Baptist Mem-Union)	No	No
Hardy Wilson Memorial Hospital	25	25	15.16	60.6%	34	23 (King's Daugthers)	No	Yes
Montfort Jones Memorial Hospital	60	60	11.75	19.6%	38	25 (Baptist Medical Center Leake)	No	No
Natchez Regional Medical Center	147	123	29.84	20.3%	9	4 (Natchez Community)	Yes	No
Noxubee County General Critical Access Hospital	25	25	8.25	33.0%	42	31 (John C. Stennis Memorial)	No	Yes
Tallahatchie County General Hospital	18	18	2.95	16.4%	49	27 (University of Miss. Medical Center- Grenada)	No	Yes

The average daily occupancy rate ranged from 11.1% (Holmes County Hospital) to 60.6% (Hardy Wilson Memorial Hospital). The distance to the nearest Mississippi hospital was greater than 20 miles or 25 minutes' drive time for eight of the nine hospitals; the only exception was Natchez Regional Medical, which had another hospital in the county. Five hospitals were critical access hospitals. Of note, if Holmes County Hospital and Clinics were to close, the closest hospital would be Montfort Jones Memorial Hospital, which is also an at-risk hospital.

*** *See text for source information*
††† *All bed numbers exclude Geriatric-Psychiatric and Distinct Part/Skilled Nursing Facility beds*

D. Hospital Impact Analysis

The financial condition of hospitals is frequently a reflection of the varied history, economic development, and demographic composition of the counties and communities the hospitals serve. Most rural counties have an exaggerated dependence upon agriculture and natural resources industries; however, these are not the only economic engines. Counties with a broad-based economic structure will have strengths in a mix of both public sector, private sector, and health services employment, and will not be overly dependent on any single industry. Hospitals in high-growth and dynamic counties that are mostly urban tend to be financially stronger than hospitals in distressed counties that are mostly rural. The availability of hospitals and health services is an essential asset for the existing population, employers, and new residents attracted to a county. As a result, the loss of a hospital would represent a serious setback for the economic future of the county.

Economic impact analyses were conducted to estimate the employment, income, and output (the value of the goods and services) generated by the nine "most at-risk" Mississippi hospitals. To examine these effects, an IMPLAN model was used. IMPLAN estimates are based on the U.S. Department of Commerce Input-Output tables that were first generated in the 1970s.[69] IMPLAN is a static model and cannot forecast future economic impacts. IMPLAN has been used extensively for modeling the impact of a wide array of projects and is widely accepted as one of three types of models for impact studies. RIMS-II and REMI were the alternative models considered but not used in this analysis.

The total economic contribution of the nine "most at-risk" hospitals is determined in three parts.[70] The direct effect is the change in employment, income, and output associated with the direct expenditures of hospitals. The indirect effect is the change in employment, income, and output associated with the purchases of goods and services by the industries that supply hospitals. The induced effect is the change in employment, income, and output associated with increased income and spending by workers that receive income as a result of the direct spending by the hospitals and the indirect spending of suppliers. The total effect is the sum of the three components of the model—direct, indirect, and induced spending.

Table 7 contains data on the estimated total impact of all nine "most at-risk" hospitals in Mississippi. The data are the positive contribution of the nine hospitals in summary, and the closure of the nine hospitals would be the negative values of the numbers shown. ***The total effect of the closure of all nine hospitals would be the loss of 2,603 jobs, nearly $126.7 million in labor income, nearly $155.7 million in value added by the hospitals, and a total output of $289.2 million.*** These numbers represent a substantial loss to each of the nine counties and the communities served by the hospitals that are most at risk of closure. For example, the three rural counties with Level III risk hospitals, Covington, Holmes and Tippah, were estimated to lose total output of $15.1 million in Holmes County, $20.4 million in Tippah County and $34.4 million in Covington County (data not shown). The estimated total output loss associated with the impact of the hospital in Copiah County, a metro county with a hospital with Level II risk, was $23.0 million (data not shown). Employment losses in the three rural counties with high risk hospitals ranged from 147 jobs in Holmes County, 163 jobs in Tippah County, and 272 jobs in Covington County (data not shown). Job losses for the single metro county with an at risk hospital, Copiah County, was 260 (data not shown).

Table 7: Economic Impact Summary, All Counties

Impact Type	Employment	Labor Income ($)	Value Added ($)	Output ($)
Direct Effect	1,980	106,989,243	117,353,717	223,417,418
Indirect Effect	225	6,907,494	12,345,029	22,319,517
Induced Effect	398	12,789,541	26,010,719	43,450,746
Total Effect	2,603	126,686,277	155,709,465	289,187,682

Table 8 contains summary data on the specific industries that are impacted by hospital operations and the losses that would occur if all nine hospitals were to close. The IMPLAN model uses the estimates from Table 7 and relates those impacts to growth or decline in the major industries that comprise the county's local economic base. These impacts are modeled using aggregated state and local financial data available from the U.S. Census Bureau and the U.S. Department of Commerce. Clearly, the most significant implication is that hospitals are an important economic engine for every community, and the closure of any hospital would have a negative impact on the broad economic base in each county.

Table 8: Top Ten Industries Affected, Ranked by Employment, All Counties

Description	Employment	Labor Income ($)	Value Added ($)	Output ($)
Private hospitals	2,001	108,196,193	118,667,779	225,875,845
Food services and drinking places	65	1,202,537	1,705,415	3,497,495
Real estate establishments	45	562,999	3,668,098	5,082,615
Services to buildings and dwellings	33	469,526	614,557	1,446,886
Offices of physicians, dentists, and other health practitioners	25	1,690,000	1,832,698	3,015,918
Medical and diagnostic labs and outpatient and other ambulatory care services	17	929,927	1,089,733	1,972,343
Retail stores - General merchandise	16	436,731	603,046	878,363
Nursing and residential care facilities	15	445,953	512,301	813,124
Civic, social, professional, and similar organizations	14	278,579	81,317	456,536
Wholesale trade business	11	532,739	1,171,287	1,907,237

The largest losses would be from the closure of the hospitals (2,001 jobs, $108.2 million in income, $118.7 million in value added losses, and $225.9 in total output losses). But other industries would also be harmed by hospital closings, including 65 jobs lost in food services, 57 in health-related industries, 45 in real estate, 33 in building services, and 443 in other industries.

For the nine counties with at-risk hospitals, the loss of an average of 289 jobs, $14.1 million in earnings, and $32.1 million in output would be a serious setback to the businesses and the residents of the county.

More detailed case-by-case evaluations of each hospital's status, options, and outlook need to be conducted. But, the negative impact of the closure of hospitals is clear-- the closure of one or more hospitals will have a negative impact on the workers in many industries, on the economic base of the community, and on the county where a hospital is located. The impact estimates measure the negative aspects of such a closure, but they fail to account for the fact that other counties, communities, and other hospitals will gain from the shift in economic activity. The health care implications of increased distances to hospitals and the economic development disadvantages that result from the loss of a vital community asset will not be reduced by the advantages that take place for other areas.

Table 9 contains summary state and local tax impact estimates for all nine counties with high-risk hospitals. These estimates are based on average state and local tax estimates (inclusive of property and sales taxes[‡‡‡]) for Mississippi included in the IMPLAN model for the counties with at-risk hospitals. In the event that some or all of the hospitals would close, taxes would be negatively impacted. The impact would range from a high of $2.3 million if the hospital in Adams County were to close to a low of $525.1 thousand if the hospital in Holmes County were to close. To the extent that the economic activity shifts to another hospital or community, the negative tax implications would be offset by gains in those communities. The shifting tax base would represent gains for some communities and losses to others. If all nine "most at-risk" hospitals were to close, nearly $8.6 million in state and local tax revenue could be lost if gains for other areas did not take place.

Table 9: State and Local Taxes

County	Total ($)
Holmes	525,115
Attala	721,246
Covington	1,138,102
Noxubee	751,658
Tallahatchie	833,928
Tippah	574,126
Copiah	688,952
Pearl River	1,016,616
Adams	2,318,517

The loss of jobs, income, and output understates the importance of a hospital to a local area. Hospitals provide massive amounts of indigent care, improve health outcomes for area residents, and add significantly to the overall quality of life in the counties they serve. The impact analysis simply provides a snapshot of the economic losses that might occur. In a state challenged by the need to generate employment and income opportunities for its citizens, the loss of 2,603 jobs and $126.7 million in income would not only be a major setback for the state, but a setback for each county and community involved in the loss of a hospital.

[‡‡‡]See the Annual Survey of State and Local Government Finances for additional details http://www.census.gov/govs/local/

V. Policy Considerations & Potential Impact of Alternative Service Models

The findings in the previous sections highlighted the health and economic impacts that would result if rural and at-risk hospitals closed in Mississippi. **In view of these findings, what recourse and opportunities do hospitals have to restore vitality and strengthen their ability to serve their local communities long-term?** Thus, the following policy and strategic considerations are suggested:

A. General approaches that may address the challenges facing Mississippi's rural hospitals

B. Adoption of new service delivery models and revenue-enhancing actions that at-risk hospitals can take to remain viable

C. Alignment of a broad spectrum of external political and stakeholder group perspectives in seeking new funding sources and support

A. General approaches that may address the challenges facing Mississippi's rural hospitals

The data and information presented in this report provide a basis for two general approaches to the challenges facing rural hospitals in Mississippi. *On one hand, the concerns may be viewed from a health care perspective.* Most rural hospitals and the hospitals at the greatest risk of financial failure **(Tables 5 and 6)** are the only inpatient facilities in their counties and many have been designated as critical access hospitals; five of the nine hospitals that were designated as "most at-risk" were critical access hospitals. Closure would thus result in the loss of potentially important clinical facilities. In addition, hospital closures may have spillover effects, e.g., reducing outpatient services (in addition to inpatient care) and the recruitment of physicians to areas already having significant shortages **(Table 4)** and in which health status is low **(Figure 2)** and health care needs are great. The challenge posed by closure is how to maintain needed health care services to residents in the areas currently served by these hospitals.

However, many of the at-risk facilities are small and have low occupancy rates, are under-resourced with limited technological capabilities, and have limited clinical services. Some of the at-risk hospitals have fewer than 20 beds, an average daily census as low as 3 patients, and occupancy rates under 20% **(Table 7)**. Furthermore, questions about hospital efficiency in controlling costs while delivering quality care are paramount for the sustainability of these hospitals. Given the low case volumes in rural hospitals, it is often difficult for these hospitals to achieve national quality standards and optimal patient outcomes.[53] These findings suggest that alternative service delivery models to replace the functions of these inpatient facilities may be suggested as realistic and possibly more efficient options that could deliver quality health care.

A second general perspective is based on the economic roles that the hospitals serve in their counties. As indicated in this report, rural hospitals and the hospitals we identified as at-risk provide substantial economic benefit. The nine "most at-risk" hospitals provide almost $300 million in total economic impact and over 2,600 jobs in their communities **(Table 7)**. The impacts of closure would affect virtually all economic sectors as well as having more direct impacts on the health care industry. Hence, if a hospital were to close, the resulting local economic loss would be substantial and difficult, if not impossible, to replace. Thus, options that would prevent closure may be driven primarily by economic rather than health issues.

Thus, the concerns presented by the information in this report are critical. Possible approaches are made more vexing by the complex context in which the challenges exist. The at-risk hospitals are predominantly publicly owned **(Table 4)**, limiting some market-based options and increasing political issues. The regions in which the hospitals are located are relatively unhealthy and poor, increasing the need for health care while limiting the availability of local resources and making the relative health and economic consequences of hospital failure greater. And the complexity of the problems, as discussed in Section III, suggest that it is likely that no one intervention will be successful; rather, valuable approaches will likely cross health, business, and political boundaries so that intersectoral cooperation and planning will be vital.

In the sections that follow, we will present a selection of options that policy makers and all health care stakeholders may consider. Two fundamental sets of strategic alternatives will be considered: (1) adoption of new service delivery models and revenue-enhancing actions at-risk hospitals can take to remain viable and (2) alignment of a broad spectrum of external political and stakeholder group perspectives in seeking new funding sources and support.

B. Adoption of new service delivery models and revenue-enhancing actions that at-risk hospitals can take to remain viable

Innovation and the opportunity to develop alternative service delivery models can lead to progress in stabilizing health care in rural Mississippi. And, as outlined in the Mississippi's Rural Health Plan, supporting and engaging in rural health network development and support, and hospital improvement initiatives are major objectives to sustain the state's rural health care infrastructure.[71] Two categories of innovation pathways provide options for at-risk hospitals, including (1) those pertaining to integration and coordination of existing health services while making care delivery more efficient and reliable in rural Mississippi and (2) those pertaining to the adoption of new service delivery models appropriate for rural Mississippi hospitals. Below, we outline prominent innovation options; however, these are not an exhaustive list of all potential options.

Formation of partnerships and coordination of existing health services in rural areas is an innovation that can impact the viability of rural hospitals. These partnerships can take many forms, including vertical integration of hospitals and primary care clinics through a hybrid model that combines low-level emergency services with primary care services, regional accountable care organization (ACO), and system hubs.

- *Hybrid models* focus on preventive care in an attempt to reduce emergency department use. This can include bolstering local primary care networks to reduce emergency care for ambulatory sensitive conditions and chronic disease in favor of coordination of care at the hospital or community level. This can occur through increasing non-physician providers' (e.g. nurse practitioners or physician assistants) capacity and redefining scope of practice to meet demand for primary care in rural areas. It can also include increasing capacity of rural health clinics and community health centers to deliver coordinated care.[48] An example of a hybrid model is Carolina's HealthCare System Anson in Wadesboro, North Carolina.[72] This hospital is part of a large health care system, but has halved its inpatient capacity in favor of a patient-centered medical home model to coordinate preventive, acute, wellness, and chronic care for patients. While this model is innovative, it might not be a success for hospitals that are independently owned or not affiliated with a larger hospital system, as the hospital required major capital infusion to downsize the inpatient capacity.

- A *regional ACO* is a payment and delivery model that ties provider reimbursement to reductions in total cost of care.[73] This is a formal arrangement where groups of providers unite to form a new legal entity that contracts with payers to coordinate quality care for shared savings. Incentives are created to reward providers for coordinating care and meeting quality standards. However, the capital constraints and necessary patient volume could be a major barrier for implementation in rural settings. While providers may face higher uncertainty regarding expenditures for rural or smaller ACOs, the regional ACO model has worked in rural areas. Examples of successful regional ACOS include: Trinity Pioneer ACO in Iowa, which is the most rural and has the smallest population base of the Medicare Pioneer ACOs,[74] and the National Rural ACO, comprised of 30 community health systems in nine states, designed to pool knowledge, patients, and resources to enable successful community health system participation in ACOs.[75]

- And finally, a *system hub model* between rural hospitals and tertiary hospitals in an urban center can operate either with (1) a larger hospital system that aligns with smaller hospitals by sending providers into rural areas, similar to the way that North Mississippi Medical Center operates and (2) smaller hospitals that align with a larger hospital system and refer patients to the larger facility for specialty care, similar to the pilot program proposed in Georgia.[76] Urban and rural hospitals in the same referral area frequently draw patients from the same population base and compete for the same pool of limited federal and state support. But these potential competitors can also be strategic partners in joint ventures and strategic partnerships that are win-wins for both sides. The system hub model in particular helps to maintain local health services for rural providers with the intent to reduce duplication and increase efficiency. The alignment of perspectives and interests of potential competitors can turn rivals into collaborators.

Adoption of new service delivery models for rural hospitals is another innovative service delivery pathway that might impact rural hospital viability.

- For example, one model that is expanding nationwide is the creation of *freestanding emergency departments*. The organization of these facilities vary, including a satellite hospital emergency department and an independent freestanding emergency center (IFEC).[77] Creation of these alternative facilities can ensure that rural populations have access to emergency care if the local hospital closes. These facilities can be a beneficial temporary measure to stabilize and transfer patients to larger hospitals for further care. If a rural hospital converted to a free-standing emergency department-only, patients in rural communities would have an additional travel burden when seeking primary-care services.

This would make the hospitals less accessible for preventive and routine care, which could lead to unnecessary emergency room use.[78] Currently, the Centers for Medicare and Medicaid Services (CMS) does not recognize IFECs as emergency departments.[79] Therefore, CMS does not allow Medicare or Medicaid payments for the technical component of services provided by IFECs. Thus, the long-term sustainability of these facilities in rural areas may be challenging unless regulatory and fiscal policies can address funding, reimbursement or subsidies for uncompensated care, and licensing.

- Another alternative service delivery model that has gained significant traction in the past few years is *telehealth*. Telehealth connects rural and underserved populations to virtual medical care through computers and other electronic platforms. Mississippi, in particular, has been a national leader in the telehealth movement and received an "A" grade from the American Telemedicine Association for state telehealth legislation and policy.[80] This includes a telemedicine parity law that provides comparable coverage and reimbursement to in-person services, Medicaid reimbursement that is equivalent to private insurers, as well as reimbursement for patient monitoring and chronic disease management. In addition, efforts by the Center for Telehealth at the University of Mississippi Medical Center have not only expanded the provision of medical care to patients throughout Mississippi, but also has been a national telehealth delivery model. The Center for Telehealth has partnered with over 100 sites, including schools, clinics, workplaces, and other hospitals.[81] The Center has over 30 medical specialties—increasing workforce capacity and providing over 100,000 telemedicine visits annually. Telemedicine services can be a critical component to provide access to specialty care in rural hospitals and may offer savings when integrated into home health care settings.[82] Expanded telehealth use has great potential to reduce costs through less costly and timely interactions,[83] to produce equivalent or superior outcomes to traditional care,[84] and to deliver care more efficiently by reducing unnecessary services.[84] However, the adequacy of broadband internet, startup costs, and interstate compacts that allow interstate medical practice and regulation for telehealth must also be considered. As the infrastructure to support telemedicine continues to grow, evaluating emerging evidence will be critical to expand the reach of telemedicine in rural areas.

C. Alignment of a broad spectrum of external political and stakeholder group perspectives in seeking new funding sources and support

As suggested in the preceding section, rural hospitals can improve their financial conditions by implementing effective new operating strategies and innovative delivery models to maximize revenues and minimize costs. These self-help actions, while necessary, may not be sufficient in and of themselves for rural at-risk hospitals to cope with the internal and external threats they face. They must seek and receive external support from federal and state sources as well as from private charitable foundations and philanthropic organizations to remain viable so they can continue to serve their patients and communities. The consequences of their failure to seek and receive external funding when opportunities come their way can be detrimental as demonstrated by the recent decisions by many states, including Mississippi, to not expand Medicaid.

In addition to closures, many hospitals have not been able to fully realize hospital revenue to offset the Medicare and Medicaid DSH cuts. Most hospitals in urban and metropolitan areas have a mixture of revenue sources including private insurance payers, Medicare, and Medicaid. Rural hospitals, in comparison, rely heavily on Medicaid and Medicare for revenues. The combination of increased Medicaid and privately insured patients was expected to generate enough revenue to compensate for the DSH cuts; however, among hospitals in non-expansion states, a projected $15.9 billion will be lost in Medicaid reimbursement nationally for 2016 and $167.8 billion for the period of 2013-2022.[40] Mississippi is projected to lose $500 million for 2016 and $4.8 billion in hospital reimbursements for the period of 2013-2022.[40]

In order to offset these losses, hospitals must find ways to adapt. This would likely be through generating new revenue by increasing efficiency or cutting high-cost services. For example, some rural hospitals have transformed operations to deal with the higher-than-average patient mix of Medicaid, Medicare, and uncompensated care patients to prepare for future risks.[85] Rural hospitals might also change admission criteria to reduce admissions from high-risk, low-reimbursement patients. They can also develop marketing strategies to compete for insured patients who have recently gained insurance coverage through, for example, the federal insurance marketplace. This can include also leveraging resources to attain continuation of DSH and other rural-specific hospital payments.

Furthermore, an increasing number of states are utilizing the State Innovation Models Initiatives (SIM)[86] and Medicaid Delivery System Reform Incentive Payment Program (DSRIP)[87] to support hospitals and providers in changing payment and delivery system reforms. The SIM provides financial support for states to develop and test state-led models that will improve health system performance, increase quality of care, and decrease costs for all residents of the participating states.[86] The main goals of the SIM is to establish public and private collaboration with multi-payer and multi-stakeholder engagement, improve population health, transform health care payment and delivery systems, and decrease total per capita health care spending. Arkansas and Tennessee both have been awarded funds to pursue strategies that address population health care, support collaboration between both public and private payers, and transform primary care.[88,89] The DSRIP is an evolving component of health care payment and delivery system and improvement efforts. The program provides states with funding that can be used to support hospitals and other health care organizations that aim to improve health care delivery. Under DSRIP hospitals must meet certain performance metrics and ultimately improve both clinical and population-based outcomes. For example, California requested authority for innovations in 42 safety-net organizations in predominantly rural areas to increase and improve the managed care system, improve the fee-for-service system used to pay for dental and maternity care, and promote regionally-based “whole-person” integrated care pilot projects[87]; whereas, Texas used the DRSIP to increase collaboration between urban teaching hospitals and rural health care providers.[87]

In summary, rural hospitals and their stakeholders must carve out a new path to forge new alliances in order to overcome the political division that has prevented many states from working with the federal government for creation of new funding sources and support. The ability of rural hospitals and their key stakeholders to form alliances across geographic boundaries and political lines are critical in this effort.

VI. Conclusions

An important motivation of this report is to help inform the discussion about the economic and population impacts of rural hospitals in Mississippi. Local and state policy-makers often face the challenge of balancing their philosophical principles while securing programs and policies that can provide benefits for their constituents. The findings from this study confirm that while rural communities face endemic disadvantages to provide health care for their residents, communities have much to gain if hospitals can remain viable. While hospital closures are not a common outcome, closures mean longer distances when seeking care and uncertain outcomes during emergency situations.

These findings also suggest that rural hospitals in Mississippi can leverage both federal and state initiatives that ensure rural communities can meet the health needs of their populations. A broad mix of solutions, outlined in this report, are necessary for rural hospital survival. Without policy, fiscal, technological, and organizational options specifically targeted toward rural hospitals, these hospitals may not be able to survive or may have to provide scaled-down services -- ultimately no business can operate indefinitely with chronic financial losses. Our hope is that our study can facilitate further economic and policy analyses that suggest solutions which may help rural hospitals remain viable.

References

1. United States Department of Agriculture Economic Research Service. Rural Economy & Population and Migration. Econ Res Serv. http://www.ers.usda.gov/topics/rural-economy-population/population-migration.aspx#.U0cBQ_ldUUX. Accessed October 8, 2014.

2. American Hospital Association. Fast Facts on U.S. Hospitals. January 2015. http://www.aha.org/research/rc/stat-studies/101207fastfacts.pdf. Accessed March 10, 2014.

3. United States Census Bureau. Geographic Terms and Concepts - Core Based Statistical Areas and Related Statistical Areas. https://www.census.gov/geo/reference/gtc/gtc_cbsa.html. Accessed April 22, 2015.

4. United States Census Bureau. Metropolitan and Micropolitan Statistical Areas Main. http://www.census.gov/population/metro/. Accessed March 27, 2015.

5. Pickering SE. The Financial Health of Publicly Owned Rural Mississippi Hospitals. The Office of the State Auditor, Mississippi; 2014:1-32. http://www.osa.ms.gov/documents/performance/Rural%20Hospital%20Assessment%20-%202014.pdf. Accessed July 1, 2014.

6. American Hospital Association. AHA Annual Survey Database Fiscal Year 2013. Am Hosp Assoc. http://www.ahadataviewer.com/book-cd-products/AHA-Survey/.

7. American Hospital Association. Financial Data. http://www.ahadataviewer.com/Overview/Financial-Data/. Accessed November 28, 2014.

8. Mississippi State Department of Health. 2012 Report on Hospitals.; 2013. http://msdh.ms.gov/msdhsite/_static/resources/5418.pdf. Accessed January 14, 2015.

9. United States Census Bureau. United States Census Bureau. http://www.census.gov/about/what.html#par_textimage. Accessed March 27, 2015.

10. How Healthy is your County? | County Health Rankings. Cty Health Rank Roadmaps. http://www.countyhealthrankings.org/homepage. Accessed April 21, 2015.

11. U.S. Department of Health and Human Services. Area Health Resources Files. http://ahrf.hrsa.gov/overview.htm.

12. United Health Foundation. 2014 - Americas Health Rankings report. Am Health Rank. http://www.americashealthrankings.org/. Accessed May 3, 2015.

13. Mississippi State Department of Health. Directory of Mississippi Health Facilities.; 2014:1-124. http://msdh.ms.gov/msdhsite/_static/resources/5235.pdf. Accessed July 1, 2014.

14. Department of Health and Human Services, Centers for Medicare & Medicaid Services. Critical Access Hospital, Rural Health Fact Sheet Series. September 2014. http://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/CritAccessHospfctsht.pdf. Accessed March 5, 2015.

15. Department of Health and Human Services, Centers for Medicare & Medicaid Services. Sole Community Hospital, Rural Health Fact Sheet Series. November 2014. http://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/solecommhospfctsht508-09.pdf. Accessed March 5, 2015.

16. Department of Health and Human Services, Centers for Medicare & Medicaid Services. Rural Referral Center Program, Rural Health Fact Sheet Series. May 2014. http://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/Rural_Referral_Center_Fact_Sheet.pdf. Accessed March 5, 2015.

17. American Association of Medical Colleges, Center for Workforce Studies. 2013 State Physician Workforce Data Book. November 2013. https://www.aamc.org/download/362168/data/2013statephysicianworkforcedatabook.pdf. Accessed November 24, 2014.

18. Bazzoli GJ, Fareed N, Waters TM. Hospital Financial Performance In The Recent Recession And Implications For Institutions That Remain Financially Weak. Health Aff (Millwood). 2014;33(5):739-745.

19. North Carolina Rural Health Research Program. Rural Hospital Closures: January 2010-Present. Rural Hosp Clos January 2010-Present. April 2015. http://www.shepscenter.unc.edu/wp-content/uploads/2014/07/Rural-Hospital-Closure-List-and-Map-4-8.pdf. Accessed April 21, 2015.

20. USDA Blog » USDA Helps to Expand Healthcare Services in Kilmichael, Mississippi. October 2012. http://blogs.usda.gov/2012/10/05/usda-helps-to-expand-healthcare-services-in-kilmichael-mississippi/. Accessed June 11, 2015.

21. Liu C, Srebotnjak T, Hsia RY. California Emergency Department Closures Are Associated With Increased Inpatient Mortality At Nearby Hospitals. Health Aff (Millwood). 2014;33(8):1323-1329.

22. Mississippi State University Extension Service. Smart Aging: Healthy Futures. http://msucares.com/health/smart_aging. Accessed November 29, 2014.

23. Moody's Investor Service. Announcement: U.S. Fiscal Year 2013 NFP Hospital Medians Show All-time Lows for Revenues and Cash Flow. August 2014. https://www.moodys.com/research/Moodys-US-fiscal-year-2013-NFP-hospital-medians-show-all--PR_307265. Accessed November 22, 2014.

24. Chandra A, Holmes J, Skinner J. Is This Time Different? The Slowdown in Healthcare Spending. National Bureau of Economic Research; 2013. http://www.nber.org/papers/w19700. Accessed April 17, 2015.

25. Trends in Health Care Cost Growth and the Role of the Affordable Care Act. Exec Off Pres U S. November 2013:1-28.

26. American Hospital Association. Low spending growth persists through 2013. December 2014. http://www.aha.org/content/13/slow-hc-spending.pdf. Accessed April 17, 2015.

27. Dranove D, Garthwaite C, Ody C. Health Spending Slowdown Is Mostly Due To Economic Factors, Not Structural Change In The Health Care Sector. Health Aff (Millwood). 2014;33(8):1399-1406.

28. DataGen Health Care Analytics. The Economic Impact of Hospitals on Mississippi's Economy, A Report Commissioned by the Mississippi Hospital Association. January 2012. http://mhanewsnow.typepad.com/pressroom/2012/01/critical-care-the-economic-impact-of-hospitals-on-the-states-economy.html. Accessed November 22, 2014.

29. United States Census Bureau. 2012 County Business Patterns (NAICS). http://censtats.census.gov/cgi-bin/cbpnaic/cbpsect.pl. Accessed March 27, 2015.

30. United States Department of Agriculture, Economic Research Service. Rural Economy & Population and Migration. http://www.ers.usda.gov/topics/rural-economy-population/population-migration.aspx#.U0cBQ_ldUUX. Accessed October 8, 2014.

31. Ziller EC, Coburn AF, Loux SL. Health Insurance Coverage in Rural America. Kaiser Family Foundation; 2003. http://kff.org/uninsured/report/health-insurance-coverage-in-rural-america/. Accessed December 5, 2014.

32. Institute of Medicine Committee on the Future of Rural Health Care. Quality Through Collaboration: The Future of Rural Health. Washington, DC: National Academies Press; 2005.

33. Hall MJ, Owings MF. Rural Residents Who Are Hospitalized in Rural And Urban Hospitals: United States, 2010. U.S. Department of Health and Human Services: Centers for Disease Control and Prevention; 2014. http://www.cdc.gov/nchs/data/databriefs/db159.pdf.

34. Logue BJ. Urban and Rural Populations in Mississippi: A Comparison. Mississippi Institutions of Higher Learning; 2011:1-6. http://www.ihl.state.ms.us/urc/downloads/business/0311msbs.pdf.

35. American Hospital Association. Rural and Small Hospitals Fact Sheet. February 2015. http://www.aha.org/content/13/fs-rural-small.pdf. Accessed November 28, 2014.

36. Kaiser Family Foundation. State Health Facts: Federal Medicaid Disproportionate Share Hospital (DSH) Allotments. 2014. http://kff.org/medicaid/state-indicator/federal-dsh-allotments/. Accessed November 22, 2014.

37. Mitchell A. Medicaid Disproportionate Share Hospital Payments. Washington, D.C.: Congressional Research Service; 2013:1-50. http://fas.org/sgp/crs/misc/R42865.pdf. Accessed November 22, 2014.

38. Neal B. The Fiscal and Economic Impacts of Medicaid Expansion in Mississippi, 2014-2025. Mississippi University Research Center, Institutes of Higher Learning; 2012. http://www.mississippi.edu/urc/downloads/medicaid-oct-16.pdf.

39. Centers for Medicare and Medicaid Services. Update on the Status of Provisions Expiring on April 1. April 2015. http://www.cms.gov/Outreach-and-Education/Outreach/FFSProvPartProg/Provider-Partnership-Email-Archive-Items/2015-04-01-eNews-SE.html. Accessed April 22, 2015.

40. Dorn S, McGrath M, Holahan J. What Is the Result of States Not Expanding Medicaid?. The Urban Institute; 2014. http://www.urban.org/UploadedPDF/413192-What-is-the-Result-of-States-Not-Expanding-Medicaid.pdf. Accessed November 28, 2014.

41. Gilman M, Adams EK, Hockenberry JM, Milstein AS, Wilson IB, Becker ER. Safety-Net Hospitals More Likely Than Other Hospitals To Fare Poorly Under Medicare's Value-Based Purchasing. Health Aff (Millwood). 2015;34(3):398-405.

42. U.S. Department of Health and Human Services. Health Insurance Marketplaces 2015 Open Enrollment Period: March Enrollment Report. March 2015. http://aspe.hhs.gov/health/reports/2015/MarketPlaceEnrollment/Mar2015/ib_2015mar_enrollment.pdf. Accessed May 26, 2015.

43. Kaiser Family Foundation. Marketplace Enrollment as a Share of the Potential Marketplace Population. February 2015. http://kff.org/health-reform/state-indicator/marketplace-enrollment-as-a-share-of-the-potential-marketplace-population-2015/. Accessed May 26, 2015.

44. Buettgens M, Holahan J, Blumberg LJ, Recht H. Health Care Spending by Those Becoming Uninsured If the Supreme Court Finds for the Plaintiff in King v. Burwell Would Fall by at Least 35 Percent. The Urban Institute; 2015. http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000106-Health-Care-Spending-by-Those-Becoming-Uninsured-if-the-Supreme-Court-Finds-for-the-Plaintiff-in-King-v-Burwell-Would-Fall-by-at-Least-35-Percent.pdf. Accessed April 1, 2015.

45. Sofaer S, Firminger K. Patient Perceptions of the Quality of Health Services. Annu Rev Public Health. 2005;26:513-559.

46. Hall MJ, Marsteller J, Owings MF. Factors Influencing Rural Residents' Utilization of Urban Hospitals. National Center for Health Statistics, United States Department of Health and Human Services; 2010. http://www.cdc.gov/nchs/data/nhsr/nhsr031.pdf.

47. Radcliff TA, Brasure M, Moscovice IS, Stensland JT. Understanding Rural Hospital Bypass Behavior. J Rural Health. 2003;19(3):252-259.

48. Goodwin K, Tobler L. Improving Rural Health: State Policy Options. Natl Conf State Legis. November 2013. http://www.ncsl.org/documents/health/RuralHealth_PolicyOptions_1113.pdf.

49. Borders TF, Rohrer JE, Hilsenrath PE, Ward MM. Why Rural Residents Migrate for Family Physician Care. J Rural Health. 2000;16(4):337-348.

50. Dear M. Locational Factors in the Demand for Mental Health Care. Econ Geogr. 1977;53(3):223-240.

51. Zibulewsky J. The Emergency Medical Treatment and Active Labor Act (EMTALA): What it is and What it Means for Physicians. Proc Bayl Univ Med Cent. 2001;14(4):339.

52. Miller A. Economic Changes Hurt The Bottom Line For Rural Ga. Hospitals. Kais Health News. March 2013. http://kaiserhealthnews.org/news/rural-hospitals-face-financial-problems-in-georgia/. Accessed April 24, 2015.

53. Joynt KE, Harris Y, Orav E, Jha AK. Quality of Care and Patient Outcomes in Critical Access Rural Hospitals. JAMA. 2011;306(1):45-52.

54. Kazley AS, Ozcan YA. Organizational and Environmental Determinants of Hospital EMR Adoption: A National Study. J Med Syst. 2007;31(5):375-384.

55. Stensland J, Knott A, Moscovice I, Davidson G. Rate of Return of Capital Investments at Small Rural Hospitals: Working Paper #45. Univ Minn Rural Health Res Cent. January 2003. http://rhrc.umn.edu/wp-content/files_mf/workingpaper045.pdf.

56. Reschovsky JD, Staiti AB. Access And Quality: Does Rural America Lag Behind? Health Aff (Millwood). 2005;24(4):1128-1139.

57. Silow-Carroll S, Edwards JN, Rodin D. Using Electronic Health Records to Improve Quality and Efficiency: The Experiences of Leading Hospitals. The Commonwealth Fund; 2012. http://www.commonwealthfund.org/~/media/files/publications/issue-brief/2012/jul/1608_silowcarroll_using_ehrs_improve_quality.pdf.

58. Ricketts TC, Heaphy PE. Hospitals in Rural America. West J Med. 2000;173(6):418-422.

59. Holleman J. Rural SC Hospitals Explore Avenues for Help. The State. http://www.thestate.com/news/local/article13843541.html. Published March 23, 2014. Accessed October 10, 2014.

60. Reddy MC, Purao S, Kelly M. Developing IT Infrastructure for Rural Hospitals: A Case Study of Benefits and Challenges of Hospital-to-Hospital Partnerships. J Am Med Inform Assoc. 2008;15(4):554-558.

61. Carter T. UMMC Takes Over $37M in Debt, Grenada Lakes Medical Center. Mississippi Business Journal. http://msbusiness.com/blog/2013/08/22/ummc-takes-37m-debt-grenada-lakes-medical-center/. Published August 22, 2013. Accessed November 24, 2014.

62. Muus KJ, Knudson AD, Klug MG, Wynne J. In-Hospital Mortality Among Rural Medicare Patients With Acute Myocardial Infarction: The Influence of Demographics, Transfer, and Health Factors. J Rural Health. 2011;27(4):394-400.

63. Menon PR, Stapleton RD, McVeigh U, Rabinowitz T. Telemedicine as a Tool to Provide Family Conferences and Palliative Care Consultations in Critically Ill Patients at Rural Health Care Institutions: A Pilot Study. Am J Hosp Palliat Care. May 2014.

64. Kaushal M, Patel K, Darling M, Samuels K, McClellan M. Closing the Rural Health Connectivity Gap: How Broadband Funding Can Better Care. Health Aff Blog. April 2015. http://healthaffairs.org/blog/2015/04/01/closing-the-rural-health-connectivity-gap-how-broadband-funding-can-better-improve-care/.

65. The Housing Assistance Council. Rural Seniors and Their Homes. August 2011. http://www.ruralhome.org/storage/documents/elderly.pdf. Accessed March 26, 2015.

66. American Hospital Association. The Opportunities and Challenges for Rural Hospitals in an Era of Health Reform. Am Hosp Assoc. April 2011. http://www.aha.org/research/reports/tw/11apr-tw-rural.pdf.

67. Bowblis JR. Ownership conversion and closure in the nursing home industry. Health Econ. 2011;20(6):631-644.

68. American Hospital Association. Uncompensated Hospital Care Cost Fact Sheet. January 2015. http://www.aha.org/content/15/uncompensatedcarefactsheet.pdf. Accessed April 16, 2015.

69. AKRF, Inc. IMPLAN, RIMS-II, and REMI Economic Impact Models: Comparisons, in Context of EB-5 Analysis. May 2013. http://www.ilw.com/seminars/JohnNeillCitation.pdf. Accessed April 16, 2015.

70. IMPLAN. 2015. http://implan.com/. Accessed April 16, 2015.

71. State Rural Health Plan. Mississippi State Department of Health: Office of Rural Health; 2008. http://msdh.ms.gov/msdhsite/_static/resources/66.pdf.

72. Modern Healthcare. Free-standing emergency departments with primary care seen as new rural model. September 2014. http://www.modernhealthcare.com/article/20140927/MAGAZINE/309279952. Accessed April 29, 2015.

73. Centers for Medicare and Medicaid Services. Accountable Care Organizations. January 2015. http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO/index.html?redirect=/ACO/. Accessed April 29, 2015.

74. Fort Dodge ACO Services | UnityPoint Health - Trinity. 2015. https://www.unitypoint.org/fortdodge/aco.aspx. Accessed June 9, 2015.

75. National Rural ACO | Home. 2014. http://www.nationalruralaco.com/index.shtml. Accessed June 11, 2015.

76. England T, Lucas D. Rural Hospital Stabilization Committee: Final Report to the Governor. Rural Hospital Stabilization Committee; 2015. https://gov.georgia.gov/sites/gov.georgia.gov/files/related_files/document/Rural%20Hospital%20Stabilization%20Committee%20Report%20022315%20FINAL.pdf. Accessed April 1, 2015.

77. American College of Emergency Physicians. Freestanding Emergency Departments. June 2014. http://www.acep.org/Clinical---Practice-Management/Freestanding-Emergency-Departments/. Accessed March 27, 2015
.

78. Lofton L. Rural Healthcare Challenges Abound in Communities Around Mississippi. Mississippi Business Journal. October 27, 2008.

79. Department of Health and Human Services, Centers for Medicare & Medicaid Services. Requirements for Provider-based Off-campus Emergency Departments and Hospitals that Specialize in the Provision of Emergency Services. Cent Medicaid State Oper Certif Group. January 2008. http://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/downloads/SCletter08-08.pdf. Accessed March 27, 2015.

80. Thomas L, Capistrant G. 50 State Telemedicine Gaps Analysis: Coverage & Reimbursement. American Telemedicine Association; 2014. http://www.americantelemed.org/docs/default-source/policy/50-state-telemedicine-gaps-analysis---coverage-and-reimbursement.pdf. Accessed March 27, 2015.

81. Center for Telehealth Home - University of Mississippi Medical Center. https://www.umc.edu/telehealth/. Accessed June 11, 2015.

82. Gellis ZD, Kenaley B, McGinty J, Bardelli E, Davitt J, Have TT. Outcomes of a Telehealth Intervention for Homebound Older Adults With Heart or Chronic Respiratory Failure: A Randomized Controlled Trial. The Gerontologist. 2012;52(4):541-552.

83. Dávalos ME, French MT, Burdick AE, Simmons SC. Economic Evaluation of Telemedicine: Review of the Literature and Research Guidelines for Benefit-Cost Analysis. Telemed J E-Health Off J Am Telemed Assoc. 2009;15(10):933-948.

84. Hicks LL, Fleming DA, Desaulnier A. The application of remote monitoring to improve health outcomes to a rural area. Telemed J E-Health Off J Am Telemed Assoc. 2009;15(7):664-671.

85. Spade JS, Strickland SC. Rural Hospitals Face Many Challenges in Transitioning to Value-Based Care. N C Med J. 2015;76(1):38-39.

86. State Innovation Models Initiative: General Information | Center for Medicare & Medicaid Innovation. http://innovation.cms.gov/initiatives/state-innovations/. Accessed May 16, 2015.

87. Guyer J, Shine N, Rudowitz R, Gates A. Key Themes From Delivery System Reform Incentive Payment (DSRIP) Waivers in 4 States – Issue Brief – 8716. http://kff.org/report-section/key-themes-from-delivery-system-reform-incentive-payment-dsrip-waivers-in-4-states-issue-brief/. Accessed May 16, 2015.

88. Arkansas Center for Health Improvement. State Innovation Model Award. http://www.achi.net/pages/OurWork/Project.aspx?ID=67. Accessed May 16, 2015.

89. Health Care Finance and Administration. Tennessee Health Care Innovation Initiative. http://www.tn.gov/HCFA/strategic.shtml. Accessed May 16, 2015.

Appendices

Appendix A. Rural Hospitals

Hospital	County	Risk Level	Watchline Financial Strength Index*	Aggregate Mean Score*	No. Acute Care Licensed Beds	No. Acute Care Beds Set-up	Average Acute Care Daily Census	Acute Care Occupancy Rate	Critical Access Hospital	Ownership
Baptist Medical Center Leake	Leake	Level I	N/A	N/A	25.0	25.0	6.7	26.8	No	Not for Profit Corp or Org
Baptist Memorial Hospital - Booneville	Prentiss	Level I	N/A	N/A	99.0	51.0	10.2	10.3	No	Public, Leased for Manage-ment
Franklin County Memorial Hospital	Franklin	Level I	No	No	25.0	25.0	2.2	8.6	Yes	Public
North Mississippi Medical Center - West Point	Clay	Level I	N/A	N/A	60.0	60.0	18.3	30.6	No	Not for Profit Corp or Org
Patients Choice Medical Center of Smith County	Smith	Level I	N/A	N/A	19.0	0.0	7.1	24.4	No	Public, Leased for Manage-ment
Sharkey-Issaquena Community Hospital	Sharkey	Level I	N/A	N/A	19.0	19.0	2.7	14.1	No	Public
Jefferson Davis Community Hospital	Jefferson	Level II	N/A	N/A	12.0	12.0	3.4	28.5	Yes	Public
Lawrence County Hospital	Lawrence	Level II	N/A	N/A	25.0	25.0	4.3	17.3	Yes	Public
Marion General Hospital	Marion	Level II	N/A	N/A	49.0	49.0	10.5	21.4	No	Public
Montfort Jones Memorial Hospital	Attala	Level II	Yes	Yes	60.0	60.0	11.8	19.6	No	Public
North Mississippi Medical Center - Eupora	Webster	Level II	N/A	N/A	38.0	38.0	16.7	43.9	No	Not for Profit Corp or Org
North Mississippi Medical Center - Iuka	Tishomingo	Level II	N/A	N/A	48.0	48.0	6.5	13.5	No	Not for Profit Corp or Org
Trace Regional Hospital	Chickasaw	Level II	N/A	N/A	66.0	66.0	5.0	7.6	No	Proprietary for Profit
Walthall County General Hospital	Walthall	Level II	N/A	N/A	25.0	25.0	3.2	12.9	No	Public
Covington County Hospital	Covington	Level III	No	No	25.0	24.0	4.2	17.0	Yes	Public

Hospital	County	Risk Level	Watchline Financial Strength Index*	Aggregate Mean Score*	No. Acute Care Licensed Beds	No. Acute Care Beds Set-up	Average Acute Care Daily Census	Acute Care Occupancy Rate	Critical Access Hospital	Ownership
Holmes County Hospital and Clinics	Holmes	Level III	N/A	N/A	25.0	25.0	2.8	11.1	Yes	Public
Tippah County Hospital	Tippah	Level III	Yes	Yes	45.0	29.0	6.7	14.9	No	Public
Baptist Memorial Hospital - Union County	Union	Stable	N/A	N/A	153.0	153.0	34.0	24.2	No	Public, Leased for Manage-ment
Calhoun Health Services	Calhoun	Stable	No	No	21.0	21.0	2.6	12.4	Yes	Public
Field Memorial Community Hospital	Wilkinson	Stable	No	No	25.0	25.0	5.7	22.6	Yes	Public
George Regional Hospital	George	Stable	No	No	48.0	48.0	14.2	29.5	No	Public
Gilmore Memorial Regional Medical Center	Monroe	Stable	N/A	N/A	95.0	95.0	35.5	37.4	No	Proprietary for Profit
Greene County Hospital	Greene	Stable	N/A	N/A	3.0	3.0	0.3	8.8	Yes	Public
Jefferson County Hospital	Jefferson	Stable	N/A	N/A	25.0	25.0	2.2	8.8	No	Public
Kilmichael Hospital	Montgomery	Stable	N/A	N/A	19.0	19.0	1.8	9.7	No	Public
Laird Hospital	Newton	Stable	N/A	N/A	25.0	25.0	4.4	17.4	Yes	Not for Profit Corp or Org
Neshoba County General Hospital	Neshoba	Stable	No	No	72.0	38.0	9.2	12.7	No	Public
Noxubee General Hospital	Noxubee	Stable	No	Yes	25.0	25.0	8.3	33.0	Yes	Public
Pioneer Community Hospital of Choctaw	Choctaw	Stable	N/A	N/A	25.0	12.0	1.6	6.2	yes	Public
Pioneer Community Hospital of Newton	Newton	Stable	N/A	N/A	21.0	21.0	5.6	26.5	Yes	Proprietary for Profit
S.E. Lackey Memorial Hospital	Scott	Stable	N/A	N/A	25.0	25.0	11.0	43.8	No	Not for Profit Corp or Org

Hospital	County	Risk Level	Watchline Financial Strength Index*	Aggregate Mean Score*	No. Acute Care Licensed Beds	No. Acute Care Beds Set-up	Average Acute Care Daily Census	Acute Care Occupancy Rate	Critical Access Hospital	Ownership
Scott Regional Hospital	Scott	Stable	N/A	N/A	25.0	25.0	6.8	27.2	Yes	Not for Profit Corp or Org
Tallahatchie General Hosptial	Tallahatchie	Stable	Yes	Yes	18.0	18.0	3.0	16.4	Yes	Public
Tri-Lakes Medical Center	Panola	Stable	N/A	N/A	55.0	55.0	12.9	23.4	No	Proprietary for Profit
Tyler Holmes Medical Center	Montgomery	Stable	No	No	25.0	25.0	5.5	22.1	Yes	Public
Wayne General Hospital	Wayne	Stable	No	No	80.0	80.0	25.2	31.6	No	Public
Winston Medical Center	Winston	Stable	N/A	N/A	27.0	27.0	3.9	14.5	No	Public, Leased for Manage-ment
Yalobusha General Hospital	Yalobusha	Stable	No	No	26.0	26.0	3.9	15.1	No	Public
Pioneer Community Hospital of Aberdeen	Monroe	Stable	N/A	N/A	25.0	25.0	2.2	8.7	Yes	Public, Leased for Manage-ment
Quitman County Hospital	Quitman	Stable	N/A	N/A	25.0	25.0	5.2	20.8	Yes	Public, Leased for Manage-ment
Stone County Hospital	Stone	Stable	N/A	N/A	25.0	25.0	3.7	14.7	Yes	Proprietary for Profit

**Source: Mississippi State Auditor, "The Financial Health of Publicly Owned Rural Hospitals", April 2014*
***N/A=Hospital not evaluated in Auditor's report*

Appendix B. Micropolitan Hospitals

Hospital	County	Risk Level	Watchline Financial Strength Index*	Aggregate Mean Score*	No. Acute Care Licensed Beds	No. Acute Care Beds Set-up	Average Acute Care Daily Census	Acute Care Occupancy Rate	Critical Access Hospital	Ownership
Patient's Choice Medical Center of Claiborne County	Claiborne	Level I	N/A	N/A	22.0	22.0	4.2	19.0	Yes	Public, Leased for Management
University of MS Medical Center -Grenada	Grenada	Level I	N/A	N/A	128.0	112.0	25.5	19.9	No	Public
Anderson Regional Medical Center - South Campus	Lauderdale	Level II	N/A	N/A	49.0	49.0	2.5	5.1	No	Not for Profit Corp or Org
North Mississippi Medical Center - Pontotoc Hospital and Nursing Home	Pontotoc	Level II	N/A	N/A	25.0	25.0	3.4	13.5	Yes	Public, Leased for Management
Highland Community Hospital	Pearl River	Level III	N/A	N/A	60.0	56.0	16.2	27.0	No	Public
Rush Foundation Hospital	Lauderdale	Stable	N/A	N/A	215.0	182.0	77.7	36.1	No	Not for Profit Corp or Org
South Central Regional Medical Center	Jones	Stable	No	No	257.0	166.0	85.2	33.2	No	Public
Alliance Health Center	Lauderdale	Stable	N/A	N/A	66.0	48.0	5.0	6.4	No	Proprietary for Profit
Baptist Memorial Hospital -Golden Triangle	Lowndes	Stable	N/A	N/A	262.0	183.0	74.5	27.9	No	Not for Profit Corp or Org
Baptist Memorial Hospital -North Mississippi	Lafayette	Stable	N/A	N/A	204.0	204.0	93.2	45.7	No	Not for Profit Corp or Org
Beacham Memorial Hospital	Pike	Stable	N/A	N/A	37.0	37.0	13.1	35.5	No	Public, Leased for Management
Bolivar Medical Center	Bolivar	Stable	N/A	N/A	153.0	80.0	35.7	23.3	No	Public, Leased for Management
Delta Regional Medical Center (Main+West)	Washington	Stable	No	No	271.0	171.0	101.0	44.5	No	Public
Greenwood Leflore Hospital	Leflore	Stable	No	No	157.0	145.0	68.6	43.7	No	Public
H.C. Watkins Memorial Hospital	Clarke	Stable	N/A	N/A	25.0	25.0	4.6	18.6	Yes	Not for Profit Corp or Org

Hospital	County	Risk Level	Watchline Financial Strength Index*	Aggregate Mean Score*	No. Acute Care Licensed Beds	No. Acute Care Beds Set-up	Average Acute Care Daily Census	Acute Care Occupancy Rate	Critical Access Hospital	Ownership
Jasper General Hospital	Jasper	Stable	No	No	16.0	16.0	0.1	0.8	No	Public
John C. Stennis Memorial Hospital	Kemper	Stable	N/A	N/A	25.0	25.0	1.1	4.4	Yes	Not for Profit Corp or Org
King's Daughters Medical Center	Lincoln	Stable	N/A	N/A	122.0	103.0	29.6	24.3	No	Public, Leased for Manage-ment
Magnolia Regional Health Center	Alcorn	Stable	No	No	145.0	145.0	85.0	58.6	No	Public
Natchez Community Hospital	Adams	Stable	N/A	N/A	101.0	101.0	43.4	43.0	No	Proprietary for Profit
Natchez Regional Medical Center	Adams	Stable	Yes	Yes	147.0	123.0	29.8	20.3	No	Public
North Mississippi Medical Center- Tupelo	Lee	Stable	No	No	526.0	526.0	309.1	21.2	No	Not for Profit Corp or Org
North Sunflower Medical Center	Sunflower	Stable	No	No	25.0	25.0	6.4	25.7	Yes	Public
Northwest Mississippi Regional Medical Center	Coahoma	Stable	N/A	N/A	181.0	181.0	57.5	31.8	No	Public, Leased for Manage-ment
OCH Regional Medical Center	Oktibbeha	Stable	No	No	96.0	96.0	31.7	33.0	No	Public, Leased for Manage-ment
Pearl River County Hospital	Pearl River	Stable	N/A	N/A	24.0	24.0	1.0	4.2	Yes	Public
River Region Medical Center	Warren	Stable	N/A	N/A	241.0	216.0	107.3	44.5	No	Proprietary for Profit
South Sunflower County Hospital	Sunflower	Stable	N/A	N/A	49.0	49.0	9.8	20.0	No	Public
Anderson Regional Medical Center	Lauderdale	Stable	N/A	N/A	260.0	260.0	144.1	55.4	No	Not for Profit Corp or Org
Southwest Mississippi Regional Medical Center	Pike	Watch	No	No	160.0	143.0	65.0	40.6	No	Public

**Source: Mississippi State Auditor, "The Financial Health of Publicly Owned Rural Hospitals", April 2014*
***N/A=Hospital not evaluated in Auditor's report*

Appendix C. Metropolitan Hospitals

Hospital	County	Risk Level	Watchline Financial Strength Index*	Aggregate Mean Score*	No. Acute Care Licensed Beds	No. Acute Care Beds Set-up	Average Acute Care Daily Census	Acute Care Occupancy Rate	Critical Access Hospital	Ownership
Madison River Oaks Medical Center	Madison	Level I	N/A	N/A	67.0	67.0	18.7	27.9	No	Proprietary for Profit
University Hospitals and Health System, University of Mississippi Medical Center	Hinds	Level I	N/A	N/A	664.0	628.0	452.6	68.2	No	Public
Hardy Wilson Memorial Hospital	Copiah	Level II	No	Yes	25.0	25.0	15.2	60.0	Yes	Public
Alliance HealthCare System	Marshall	Stable	N/A	N/A	20.0	20.0	4.6	23.0	No	Public, Leased for Manage-ment
Baptist Memorial Hospital -Desoto	Desoto	Stable	N/A	N/A	309.0	248.0	198.6	64.3	No	Not for Profit Corp or Org
Biloxi Regional Medical Center	Harrison	Stable	N/A	N/A	141.0	141.0	64.6	45.8	No	Proprietary for Profit
Central Mississippi Medical Center	Hinds	Stable	N/A	N/A	382.0	320.0	75.9	19.9	No	Public, Leased for Manage-ment
Crossgates River Oaks Hospital	Rankin	Stable	N/A	N/A	134.0	119.0	54.4	40.6	No	Public, Leased for Manage-ment
Forrest General Hospital	Forrest	Stable	N/A	N/A	380.0	380.0	256.2	67.4	No	Public
Garden Park Medical Center	Harrison	Stable	N/A	N/A	118.0	118.0	34.8	29.5	No	Proprietary for Profit
Hancock Medical Center	Hancock	Stable	N/A	N/A	47.0	47.0	18.3	39.0	No	Public
King's Daughters Hospital	Yazoo	Stable	N/A	N/A	25.0	25.0	9.3	37.4	Yes	Public, Leased for Manage-ment
Memorial Hospital At Gulfport	Harrison	Stable	N/A	N/A	303.0	303.0	187.6	61.9	No	Public

Hospital	County	Risk Level	Watchline Financial Strength Index*	Aggregate Mean Score*	No. Acute Care Licensed Beds	No. Acute Care Beds Set-up	Average Acute Care Daily Census	Acute Care Occupancy Rate	Critical Access Hospital	Ownership
Mississippi Baptist Medical Center	Hinds	Stable	N/A	N/A	517.0	517.0	278.4	26.8	No	Church
North Oak Regional Medical Center	Tate	Stable	N/A	N/A	64.0	41.0	9.4	10.3	No	Public, Leased for Manage-ment
Perry County General Hospital	Perry	Stable	N/A	N/A	22.0	22.0	1.5	8.6	No	Proprietary for Profit
River Oaks Hospital	Rankin	Stable	N/A	N/A	160.0	158.0	60.3	30.6	No	Proprietary for Profit
Simpson General Hospital	Simpson	Stable	N/A	N/A	25.0	25.0	4.7	24.4	Yes	Not for Profit Corp or Org
Singing River Health System/ Ocean Springs	Jackson	Stable	N/A	N/A	521.0	335.0	186.0	14.1	No	Public
St. Dominic-Jackson Memorial Hospital	Hinds	Stable	N/A	N/A	417.0	417.0	313.5	28.5	No	Church
Wesley Medical Center	Lamar	Stable	N/A	N/A	187.0	187.0	92.7	17.3	No	Proprietary for Profit
Woman's Hospital	Rankin	Stable	N/A	N/A	109.0	60.0	18.4	21.4	No	Proprietary for Profit
Magee General Hospital	Simpson	Stable	N/A	N/A	64.0	61.0	11.8	25.5	No	Not for Profit Corp or Org

**Source: Mississippi State Auditor, "The Financial Health of Publicly Owned Rural Hospitals", April 2014*
***N/A=Hospital not evaluated in Auditor's report*

Appendix D. Data Sources

1. The AHA Annual Survey takes a snapshot of hospital-specific data on nearly 6,500 hospitals and 400-plus systems.[6] The database contains data relating to organizational structure, facility and service lines, inpatient and outpatient utilization, expenses, physician arrangements, staffing, corporate and purchasing affiliations, and geographic indicators.

2. The AHA Financial Data contains hospital financial data for Medicare-certified hospitals.[7] This includes 4-years of rolling data of nearly 200 data fields in several categories: general information, financial reports, revenues & expense, utilization and other financial details. AHA obtains quarterly updates sourced from Centers for Medicare and Medicaid Services Healthcare Cost Report Information System.

3. The Mississippi Annual Hospital Report contains data gathered in the hospital licensure process.[8] The report compiles data from the "Annual Hospital Report and Application for Renewal of Hospital Licensure" from the Bureau of Health Facilities Licensure and Certification, "Annual Survey of Hospitals" from the American Hospital Association, and the direct questions asked to the hospitals in Mississippi. Data include: hospital ownership and certification, employees, bed changes, utilization, and hospital use statistics.

4. The United States Census Bureau collects data in various fields to aid in various topics such determining the distribution of Congressional seats to states as well as determine school districts and other important functional areas of government.[9] The Census Bureau conducts more than 130 surveys each year collecting and analyzing information on social, population, economic, and geographic data at the national, state, and county level.

5. The County Health Rankings is a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute.[10] These rankings provide an annual snapshot of how health plays a role in the community. Data are compiled from many sources including: the United States Census, Centers for Disease Control and Prevention, and National Center for Health Statistics, etc. This data is then categorized into eight fields: overall health outcomes, length of life, quality of life, overall health factors, health behaviors, clinical care, social and economic factors, and physical environment. To calculate ranks each of the measures are standardized. The ranks are then calculated based on weighted sums of the standardized measure within each state. The county with the lowest score gets a rank of #1 for that state (best health) and the county with the highest score (worst health) is assigned a rank corresponding to the number of counties ranked in the state.

6. The Area Health Resources Files (AHRF) uses databases from county, state and national levels to provide a comprehensive set of data offering a broad range of health resources and socioeconomic indicators that impact the demand for health care.[11] This database contains information on health facilities, health professions, measures of resource scarcity, health status, economic activity, health training programs, and socioeconomic and environment characteristics. Both the state and national AHRF both include in-depth demographic, workforce, employment, and training data for 50 health care professions.

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