

# FINDINGS BRIEF

Charity B. Breneman, PhD • Janice C. Probst, PhD  
Elizabeth Crouch, PhD • Jan M. Eberth, PhD  
University of South Carolina – Columbia, SC

## Rural-Urban Trends in Number of Physicians by Type of Practice Organization

### Key Findings

- The landscape for physician practice organization is in greater transition in rural counties as compared to metropolitan counties given the more pronounced shift away from self-employment in solo practices toward physician employment.
- The number of physicians in independent solo practices decreased between 1995 and 2015 by 44% to 65 %, depending on level of rurality.
- The number of employed physicians increased between 1995 and 2015 by 350% to 533%, depending on level of rurality.
- Among metropolitan and micropolitan counties, there was a continual increase in the number of license renewals over time. Small adjacent/remote rural counties also experienced an increase until 2005, followed by a slight decline thereafter.

### BACKGROUND

In the past decade, there has been a transition from self-employment among physicians toward employment within hospitals, integrated delivery systems, or other health care settings, with an overall decline in the number of independent physicians and an increase in the number of physicians employed by hospitals (1-3). Rates of physician employment by hospitals vary by geographic region. The rates of hospital employment are highest in the Midwest, where 53% of all physicians were employed by hospitals in 2016 (3). The lowest rates are in the South, with just over one third of physicians employed by hospitals (3). Yet, the South and the West have experienced the greatest growth in hospital-employed physicians (71% increase) between 2012 and 2016 (3), which make these regions ideal for examining current changes in employment trends.

In addition to regional differences, there are also notable differences in the location of where hospital-employed physicians work by level of rurality. Generally, hospital-employed physicians work in urban areas compared to rural/micropolitan areas (4). Although the proportion of hospital-employed physicians increased in both areas, the absolute difference between the two has declined nationally over time as a result of rural/micropolitan areas experiencing a slightly faster rate of growth (4). Additional research into physician employment patterns is needed, however, to distinguish more carefully among rural communities. Large and small rural areas may experience different rates of change in physician practice organization; more remote rural areas already suffer from lower physician availability.].

Over the past 20 years, employment within the health services sector has continued to grow in South Carolina (5, 6). Hospitals are distributed throughout rural and urban counties in the state, making hospital employment a viable option for physicians in locations at varying levels of rurality. Thus South Carolina (SC) offers an ideal location for examining changes in physician practice

organization over time, across rural and urban settings. This brief describe these changes in physician/population ratios by type of physician practice organization over time for three levels of rurality (i.e., metropolitan, micropolitan, and small adjacent/remote rural counties) in SC.

**Technical note:** The analysis that follows uses physician licensure information to develop a count of physicians. In every state, physicians must establish and subsequently renew their license every one to two years to practice medicine. Given this requirement, physician counts are generally based on licensure data (7). In SC, physicians must renew their license every two years. The analysis is restricted to physicians who sought or renewed licensure in each year, who were not in residency training, and who indicated their mode of employment. The last restriction limits the observations to physicians, in active practice. Because large urban counties would logically contain more physicians than small rural counties, physician numbers are standardized by being expressed as physicians per 1,000 residents.

## RESULTS

### Trends in Physician/Population Ratios by Type of Practice Organization

The number of physicians per 1,000 population, by type of practice organization and level of rurality in 1995, 2005, and 2015 is described below (Table 1). The percent change in the number employed physicians per 1,000 population increased for all levels of rurality, with the greatest change occurring among small adjacent/remote rural counties between 1995 and 2015. The number of physicians in independent solo practices decreased at all levels of rurality during this time period, with the greatest decline observed in small adjacent/remote rural counties. Between 1995 and 2005, there was an increase in the number of physicians in independent group practices per 1,000 population, followed by a decline thereafter for all levels of rurality.

**Table 1. Number of Physicians per 1,000 Population by Type of Practice Organization and Level of Rurality, 1995, 2005, and 2015**

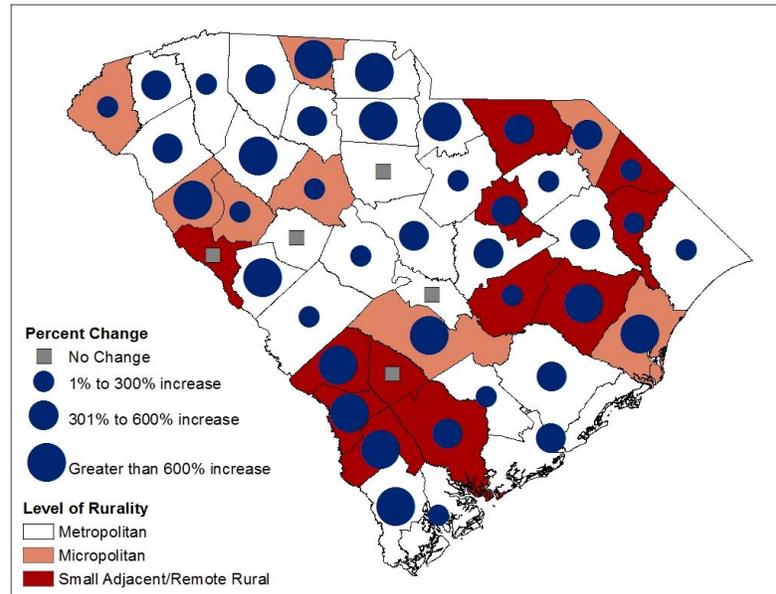
Type of Practice Organization	1995	2005	2015	% Change, 1995-2015
<b>Employed (n)</b>	400	800	2,458	
Metropolitan	0.12	0.21	0.54	+350.00%
Micropolitan	0.06	0.10	0.34	+466.67%
Small Adjacent/Remote Rural	0.03	0.10	0.19	+533.33%
<b>Group (n)</b>	2,935	4,804	4,971	
Metropolitan	0.88	1.21	1.08	+22.73%
Micropolitan	0.65	1.00	0.90	+38.46%
Small Adjacent/Remote Rural	0.21	0.40	0.34	+61.90%
<b>Solo (n)</b>	1,187	1,027	855	
Metropolitan	0.32	0.24	0.18	-43.75%
Micropolitan	0.38	0.30	0.19	-50.00%
Small Adjacent/Remote Rural	0.26	0.18	0.09	-65.38%
<b>Total (n)</b>	5,821	7,796	10,108	
Metropolitan	1.73	1.96	2.20	+27.18%
Micropolitan	1.25	1.56	1.74	+39.20%
Small Adjacent/Remote Rural	0.64	0.80	0.74	+15.63%

## Changes in the Number of Employed Physicians

The majority of the counties in SC experienced an increase in the number of physicians characterizing their practice as “employed.” There were five counties that experienced no change (three Metropolitan and two small adjacent/remote rural; see Figure 1) because they did not have any employed physicians in 1995 or in 2015. The majority of the counties that experienced large increases in the number of employed physicians per 1,000 population were rural.

Specifically, there were eight rural counties (micropolitan and small adjacent/remote rural), compared to only six metropolitan counties, which had greater than a 600% increase in the number of employed physicians. Among the fourteen counties with the greatest growth, nine counties did not have any employed physicians in 1995 (six rural and three metropolitan) but gained several employed physicians in 2015.

Figure 1. Percent Change in the Number of Employed Physicians per 1,000 Population between 1995 and 2015<sup>1</sup>



### Technical Notes

Information on the type of practice organization was obtained from physician license renewal forms collected by the Revenue and Fiscal Affairs Office of the SC Budget and Control Board on a biennial basis (collected on odd years). Physicians were divided into four categories based on their type of practice organization: physicians in independent solo practices, physicians in independent group practices, employed, and other. All analyses were performed at the county level, aggregated to rural classifications and subdivided by the category of interest.

### Geographic definitions

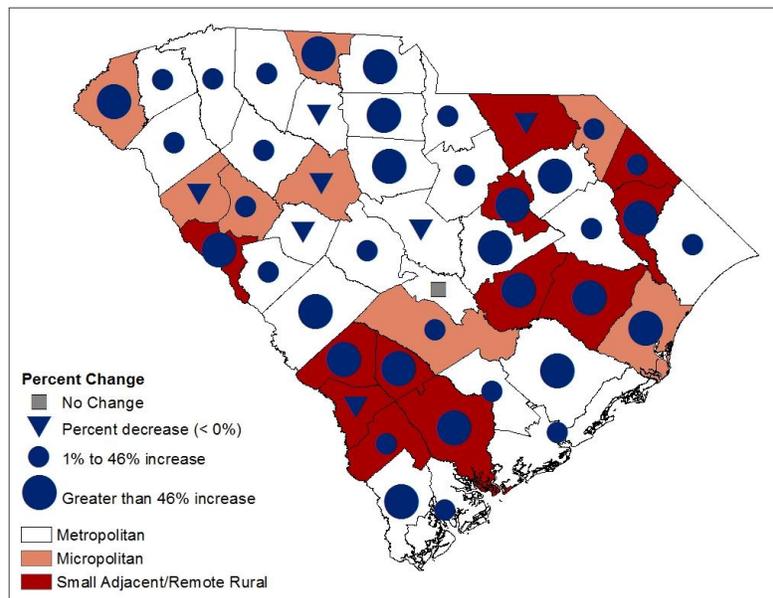
Our geographic analysis is based on the county of residence. Counties were characterized based on level of rurality using Urban Influence Codes: Metropolitan (UICs 1, 2), Micropolitan (UICs 3, 5, 8), and Small adjacent/remote rural counties (UICs 4, 6, 7, 9, 10, 11, & 12). Small adjacent and remote rural counties were combined due to small numbers.

<sup>1</sup> Sources used for all Figures: Revenue and Fiscal Affairs Office of the SC Budget and Control Board – Physician License Renewal Form, 1995 and 2015; U.S. Census Bureau, 2010 TIGER/Line shapefiles; United States Department of Agriculture, Economic Research Service, 2013 Urban Influence Codes.

### Changes in the Number of Physicians in Independent Group Practices

There were seven SC counties (three metropolitan and four rural counties) that experienced a decline in the number of physicians in independent group practices per 1,000 population between 1995 and 2015 (Figure 2). The county with the greatest decline was Allendale County, a small adjacent/remote rural county, which had no physicians in independent group practices by the end of 2015. The majority of the counties (83%) experienced an increase in the number of physicians in independent group practices per 1,000 population (22 metropolitan counties and 16 rural counties). Of those counties with an overall increase between 1995 and 2015, there were more rural counties (3 micropolitan rural and 8 small adjacent/remote rural counties) with a greater than 46% increase in the number of physicians in independent group practices compared to metropolitan counties (n=8).

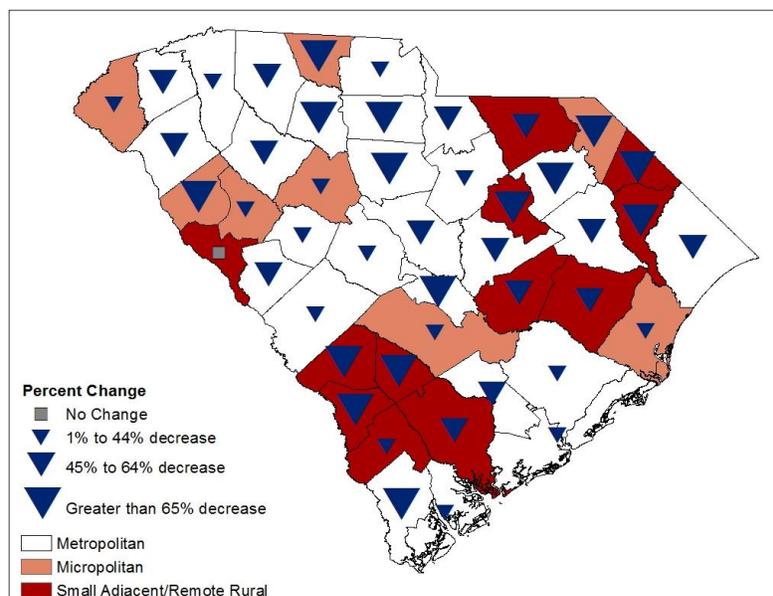
Figure 2. Percent Change in the Number of Physicians in Independent Group Practices per 1,000 Population between 1995 and 2015



### Changes in the Number of Physicians in Independent Solo Practices

All counties in SC experienced a decline in the number of physicians in independent solo practices between 1995 and 2015, with the exception of one small adjacent/remote rural (Figure 3). This particular county did not have any physicians in independent solo practices in 1995 or in 2015. Rural counties experienced a greater decline as compared to metropolitan counties. Specifically, there were nine rural counties (3 micropolitan and 6 small adjacent/remote rural) that had greater than a 65% decrease in the number of physicians in independent solo practices per 1,000 population.

Figure 3. Percent Change in the Number of Physicians in Independent Solo practices per 1,000 Population between 1995 and 2015



## CONCLUSION

Overall, the changes in type of practice organization in SC parallel national trends, with an increasing number of employed physicians and a decreasing number of physicians in independent solo practices across the state. These changes were specifically pronounced by level of rurality, with small adjacent/remote rural counties experiencing the greatest growth in the number of employed physicians compared to metropolitan and micropolitan counties. Small adjacent/remote rural counties also had the greatest decline in the number of physicians in independent solo practices between 1995 and 2015.

These findings suggest that the landscape for physician practice organization is in greater transition in rural counties as compared to metropolitan counties given the more pronounced shift away from self-employment in solo practices toward physician employment. This trend toward physician employment within hospitals, integrated delivery systems, or other health care settings may adversely affect some rural communities due to a lack of young physicians willing to practice in rural areas. For example, a recent survey found that the majority of medical residents in their final year (92% of the surveyed residents) indicate a preference for practicing in communities with at least 50,000 people (8). Additionally, small rural communities are predicted to lose close to 20% of their physician workforce to retirement by 2020 as compared to only 14% in urban areas (9). More remote rural areas will be particularly impacted by the number of their aging physicians nearing retirement in the near future, especially when very few medical residents express an interest in practicing in those areas (9).

These changes deserve further investigation to better understand how physician retirement and the shift toward physician employment impacts the current shortage of physicians in rural areas. Additionally, these changes are not uniform across all counties in SC and therefore, an individual county-level investigation is warranted in order to adequately assess how physician employment impacts access to health care.

**RURAL &  
MINORITY**  
Health Research Center  

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*at the University of South Carolina*

This work was funded through the South Carolina Center for Rural and Primary Healthcare as part of the state's rural health initiative ([www.sc.edu/ruralhealthcare](http://www.sc.edu/ruralhealthcare)).

For more information about the Rural and Minority Health Research Center, contact the Director Dr. Jan M. Eberth ([jmeberth@mailbox.sc.edu](mailto:jmeberth@mailbox.sc.edu)) or Deputy Director Dr. Elizabeth C. Crouch ([crouchel@mailbox.sc.edu](mailto:crouchel@mailbox.sc.edu)).

## APPENDIX

### Population

All counties in the state of South Carolina (n=46) were included in this analysis.

### Data Sources

Data on type of practice organization was obtained from the physician license renewal forms collected by the Revenue and Fiscal Affairs Office of the SC Budget and Control Board on a biennial basis (odd years). All post-residency physicians who renewed their license between 1995 and 2015 and who indicated a type of employment were included in this analysis. Physicians were divided into four categories based on their type of practice organization where they worked: physicians in independent solo practices, physicians in independent group practices, employed physicians, and other. Physicians were classified based on how they identified their form of practice/source of income on the license renewal form (see Table A-1).

**Table A-1. Categories for Type of Practice Organization**

<b>Category</b>	<b>Form of Practice</b>
<b>Solo</b>	Self, Solo
<b>Group</b>	Self, Partnership/Group Self, Group, Same Specialty Self, Group, Multi-Specialty
<b>Employed</b>	Other Private Employer
<b>Other</b>	State Government County Government Non-profit Health Agency Federal Civilian (includes USPHS) Federal, Military Volunteer Other

### Measures

The number of license renewals in each category of practice organization was calculated by dividing the number of license renewals identifying that specific category by the total population in their respective county. Percent change was calculated for the number of license renewals in each type of practice organization between 1995 and 2015. These were then mapped using ArcGIS to display county-specific changes over time. For those counties with no license renewals in any of the categories in 1995, 0.01 was used in order to calculate percent change. Counties were characterized based on level of rurality using Urban Influence Codes (UICs, divided into metropolitan [UICs 1, 2], micropolitan [UICs 3, 5, 8], small adjacent/remote rural [all other codes]).

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