2019

AN ANALYSIS OF THE ECONOMIC IMPACT OF MISSOURI HOSPITALS

MHA
MISSOURI HOSPITAL ASSOCIATION

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EXECUTIVE SUMMARY

In the communities they serve, hospitals underpin individual, community and economic health. Hospitals are a lifeline to emergency care, support a network of health care providers and offer a safety net for care for those without access. At the same time, they are an economic driver. Hospitals often are the leading employer in a community, they are a valued asset to individuals considering expanding or relocating a business, and their spending on local goods and services creates jobs and economic activity throughout the economy.

In this report, data from 143 Missouri hospitals were used to determine the impact of hospital operations and capital spending at the state and local level. The research demonstrates that hospitals have a large and widely dispersed economic impact in Missouri. Nearly 310,000 jobs in Missouri are attributable to either hospitals' day-to-day operations or capital spending. These jobs delivered more than $19.3 billion in labor income, wages and benefits to Missourians. In addition, $27.1 billion in Gross State Product for Missouri can be linked to hospitals. In all, hospitals' economic activities generated nearly $1.6 billion in taxes for state and local governments, while contributing $4.1 billion in taxes to the federal government.

Although every community with a hospital, an ancillary hospital infrastructure or local hospital employees, benefits from the social and economic value hospitals create — geography can play a role. For example, hospitals in communities on the peripheries of the state benefit from medical tourism significantly more than communities in the state's interior. Moreover, rural communities receive an outsized economic benefit from the influence of rural hospitals, which provide comparatively high wages and stable employment, in otherwise low-wage, higher unemployment areas.

While the overall spending on hospital operations and hospitals' capital investments generate economic activity, this benefit also is distributed unevenly. Certain industry sectors gain an outsized benefit in employment, wages generated and value added from hospitals' operational spending. Other industry sectors benefit from employment, wages and value added impacts from hospitals' capital investments in medical equipment, and construction and renovation activities. The state's economy benefits from the value of these investments, cumulatively.

All Missourians have a stake in the strength of the state's hospitals. Hospitals contribute to improved access to care and improved overall health. At the same time, hospitals create a strong economic foundation, supporting jobs and commerce, locally and statewide.

INTRODUCTION

Most Missourians can identify the blue highway signs with the white "H" indicating that a hospital is nearby. However, few would be able to articulate the full value of having a hospital in their community. Approximately one-third of health care is delivered through hospitals. Hospitals are the foundation of the state's health care system — available 24-7 to provide emergency and inpatient care — and they increasingly support access to primary and specialty care on the hospital campus, locally and in neighboring communities.

Few organizations have the ability to provide the health care services, or the scope of health care leadership, that hospitals provide. Emergency care is often the most visible component. For example, in 2015, there were 43.3 emergency department visits for every 100 people in the U.S.; of these ED visits, 35.4 percent of patients receive care in fewer than 15 minutes. Nonetheless, hospitals also deliver highly specialized medical services and procedures, provide medical education for future physicians and other members of the health care workforce, and act as the primary source of medical care in a natural disaster.

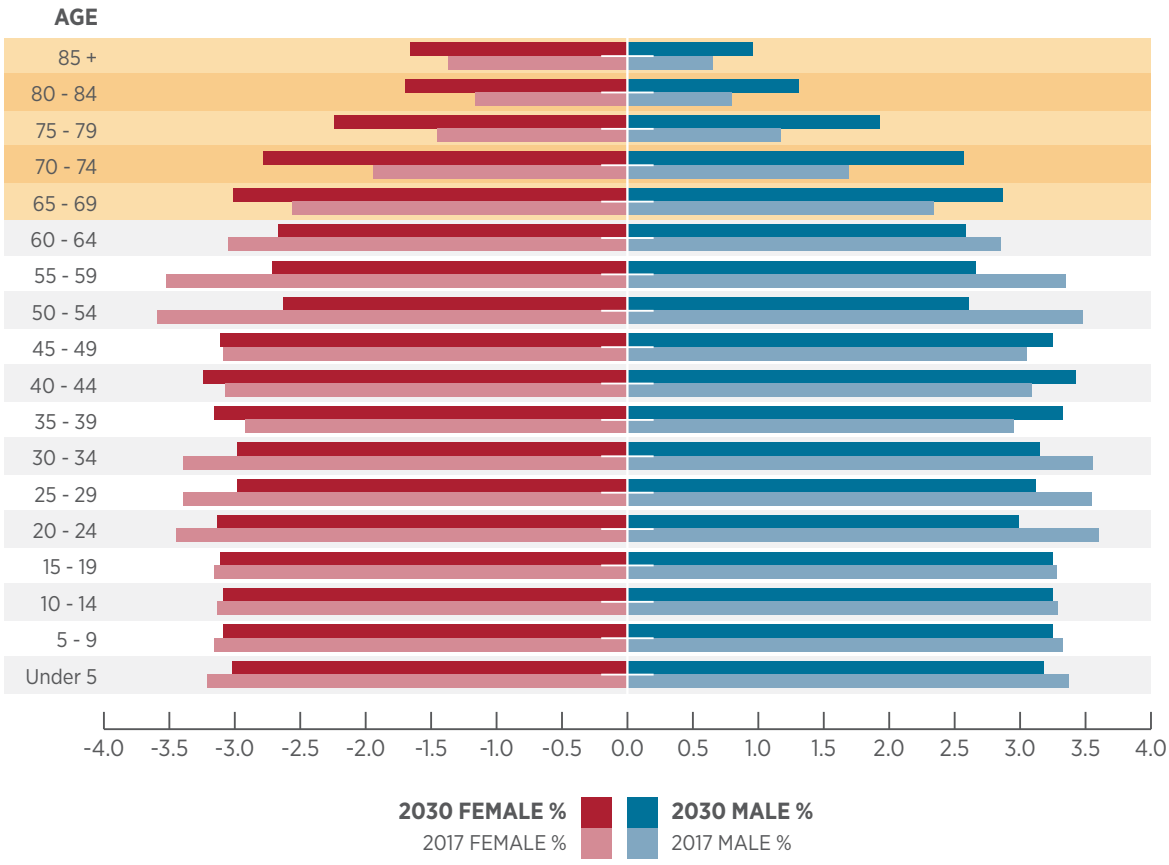
Not only do hospitals provide high quality medical care for their patients, they also play a significant part in the social, public health and economic structure of communities throughout the state. In most communities, hospitals are significant contributors to public health education and services. Frequently, hospitals are the primary provider of health care for poor and rural Missourians who lack sufficient access to primary care services.[1]

Missouri's population is growing, and the percent of seniors among the population is increasing. These factors, and the rising prevalence of chronic conditions, indicate that the demand for hospital care will continue to increase in the future.[2] As the 'population pyramid' becomes a 'population column,' there will be increased societal demands placed on hospitals. **Figure 1** displays the current and the 2030 projected population pyramids for the state of Missouri. The notable increase in the population age 65 and older signals the growing need for health care services.

[1] Centers for Disease Control and Prevention, National Hospital Ambulatory Medical Care Survey, 2015. https://www.cdc.gov/nchs/fastats/emergency-department.htm

[2] See Mc Dermott, Elixhauser, and Sun, 2017.

Figure 1 Missouri Population Pyramids, 2017 and 2030 (projected)



Source: Missouri Office of Administration, 2018

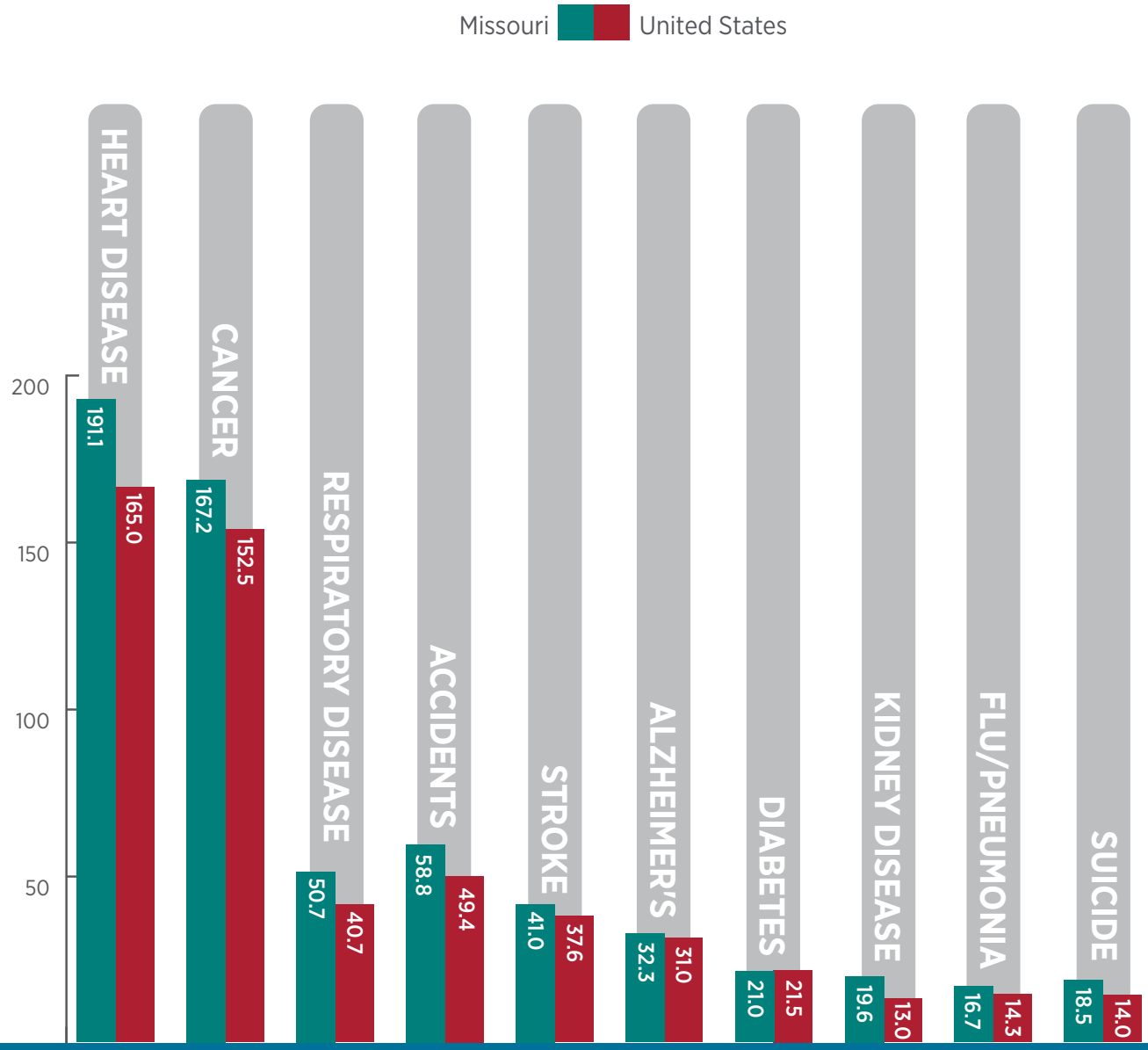


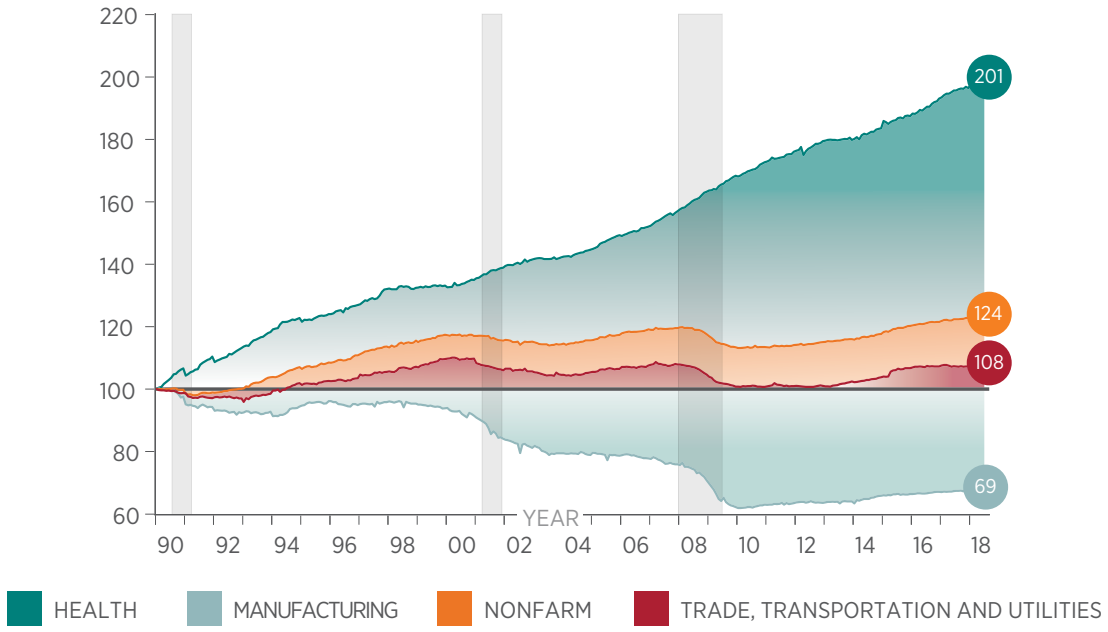
Figure 2 10 Leading Causes of Death in Missouri and the U.S., Rate per 10,000 Population

Source: National Center for Health Statistics, CDC, 2017

Additionally, the increase in chronic disease rates in Missouri will place a strain on hospitals. **Figure 2** shows the 10 leading causes of death in Missouri and the U.S., per 10,000 people. Of these 10 leading causes of mortality, only accidents and suicide are not related to a medical condition. Sadly, Missouri exceeds the national average in nine of the 10 leading causes of mortality.[3] Diabetes is the only condition where Missouri currently is doing better than the nation as a whole.

[3] Centers for Disease Control and Prevention, National Center for Health Statistics, 2017. https://www.cdc.gov/nchs/hus/contents2017.htm?search=Health_expenditures

Figure 3 Index of Employment Growth in Missouri
January 1990 = 100

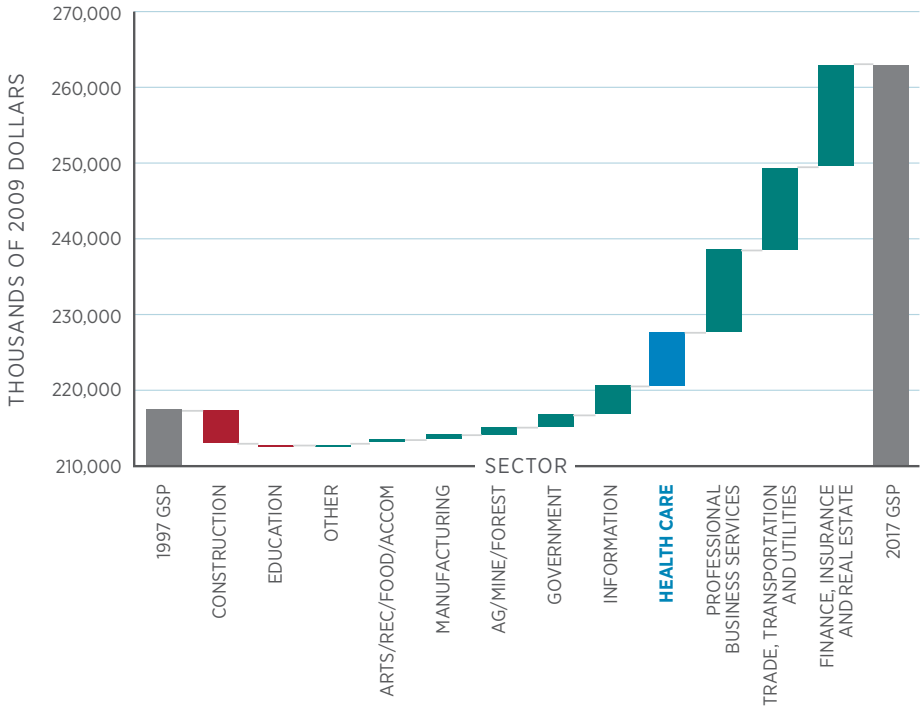


Source: Bureau of Economic Analysis, 2018

While hospitals are necessary to address the health challenges of tomorrow, they also add economic value. In many cities, hospitals are the largest employer. This means that they have a significant impact on the local and state economies. **Figure 3** examines employment growth in Missouri.[4] Employment in January of 1990 has been indexed to 100 and periods of recession have been shaded. Since 1990, total nonfarm employment in Missouri has grown by 24 percent to reach a value of 124. Employment in the Trade, Transportation and Utilities sector has grown only 8 percent throughout the past 28 years. Manufacturing employment in Missouri has actually shrunk by almost one-third. In contrast, health care-related employment in Missouri has doubled in size. In fact, of the 559,000 jobs created in Missouri since 1990, 212,000 — or more than one-third — have been in the health care sector.

[4] Bureau of Labor Statistics, State and Metro Area Employment, 2018. https://www.bls.gov/sae/

Figure 4 Components of Change in Missouri Gross State Product Thousands of 2009 Dollars



Source: Bureau of Economic Analysis, 2018

The large employment growth contribution from health care also shows up in Gross State Product.[5] As illustrated in the waterfall chart of GSP in **Figure 4**, there has been significant growth in the state of Missouri over the past 20 years. In 1997, Missouri's GSP was nearly $217.5 billion. By 2017, GSP had grown to more than $263.1 billion — a change of $45.6 billion or 20.9 percent, in inflation-adjusted 2009 dollars.

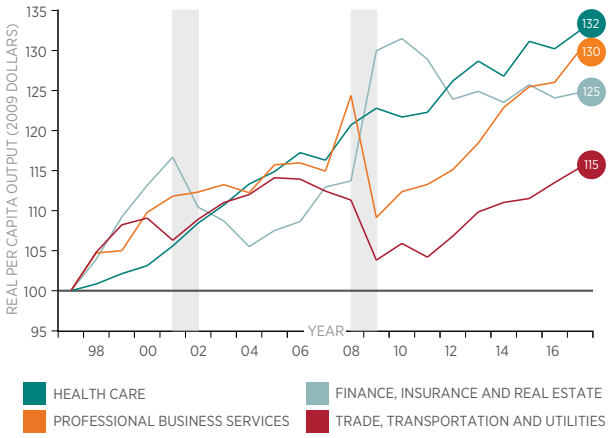
The education and construction sectors have actually decreased in size relative to their contribution to output in 1997. This is an actual decline in the size of these industries. In 1997, the construction industry created output worth $13.564 billion while education created $3.05 billion in 2009 dollars. By 2017, these industries' contribution to output had fallen to $9.01 billion and $2.73 billion respectively, in 2009 dollars.

GSP continues to grow, and as **Figure 4** demonstrates, Professional Business Services; Trade, Transportation and Utilities (TTU); and Finance, Insurance and Real Estate have been the largest contributors to Missouri economic growth. Health care has followed closely. However, this does not mean that health care has contributed less to growth than the other three leading industries. The health care sector began with a smaller base than the other three leading industries.

Figure 5 reexamines this GSP data in a different form — real per capita output for each industry indexed to 100 in 1997, using 2009 dollars. Using this model, health care output per capita has grown 32 percent since 1997, while

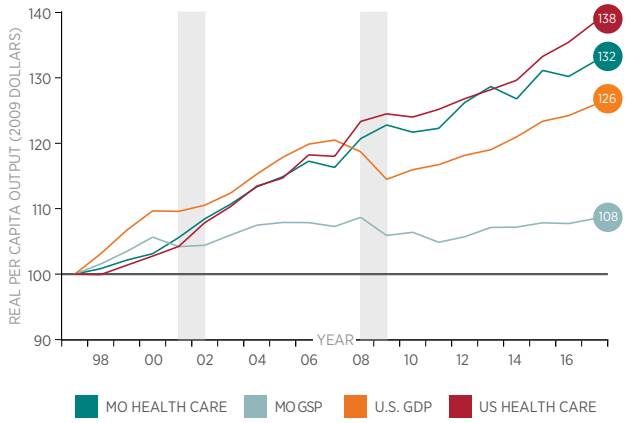
[5] Bureau of Economic Analysis, GDP by state, 2018. http://www.bea.gov/data/gdp/gdp-state

Figure 5 Indexed Growth in Real per Capita Output
in Missouri (1997 = 100)



Source: Bureau of Economic Analysis, 2018

Figure 6 Indexed Growth in Real per Capita Output



Source: Bureau of Economic Analysis, 2018

Finance, Insurance and Real Estate has grown 25 percent. Similarly, Professional Business Services and Trade, Transportation and Utilities have grown 30 percent and 15 percent respectively. It also is interesting to note that health care output is growing consistently and the rate does not decline during recessions. However, the other three leading industries exhibit a greater degree of volatility in their performance. They also tend to decline before, during or immediately after a recession. Therefore, as health care continues to become a larger share of the economy, its influence should help to diminish the negative consequences of future recessions and depressions. In other words, health care is a 'recession proof' industry, not only in terms of employment, but in terms of output.

Local economies that have a strong health care presence relative to the size of other industries will be more resistant to recessions than other communities.

The importance of the health care industry to the Missouri economy is demonstrated in **Figure 6**, where again, real per capita output in 2009 dollars has been indexed to 100 in 1997. In this example, health care output in Missouri has grown at roughly the same rate as in the U.S. — 38 percent nationally, and 32 percent in Missouri. However, more fascinating than this is the comparison of the growth of per capita output from health care when equated to the growth of total per capita output in Missouri. Missouri GSP has grown only 8 percent since 1997. At the same time, Missouri's health care output has grown four times faster than total output in the state. This exhibits the importance of the health care sector to Missouri's future economic growth and development.

To put Missouri's nearly $22.8 billion health care sector in perspective, consider that it is only slightly smaller than the GSP of Vermont. Throughout the past 20 years, the increasing value of output from health care has increased Missouri's GSP by $7.36 billon — the equivalent of $1 of every $6 of increased GSP in the state. Evidence suggests this will continue into the future.

HOSPITAL DATA & STUDY METHODOLOGY

In order to understand the economic impact that hospitals have on the state and local economy, data from the Annual Survey of Hospitals provided by the Hospital Industry Data Institute was analyzed. The data are from 2017 and there were 143 hospitals that participated in the survey. The data then were organized by Workforce Development Regions.[7] These hospitals, and their locations, are shown in **Figure 7**. There are clusters of hospitals in the Kansas City and St. Louis regions. However, this is not surprising since these two regions contain 52 percent of the state's population. Even with the cluster of hospitals around Kansas City and St. Louis, these regions represent only 39 percent of the state's hospitals. **Table 1** outlines some of the demographic and economic characteristics by region.[8]

[7] Workforce Development Regions are designated by the U.S. Department of Labor. They help to direct federal, state, and local funding for local programs geared toward job and skill training, employment, employee retention, earnings enhancement of employees, and other workforce development goals. They are run by a board of appointed members who are unpaid. Local Workforce Investment Boards often times work with other local economic development organizations on projects that will augment the workforce in a community. https://jobs.mo.gov/sites/jobs/files/dwd-wdb-map_12052017.pdf

[8] Since the hospital survey data is proprietary in nature, individual hospital data and county level results will not be discussed in the report. The smallest geographic area of disaggregation for the data and economic impact results is the Workforce Development Region.

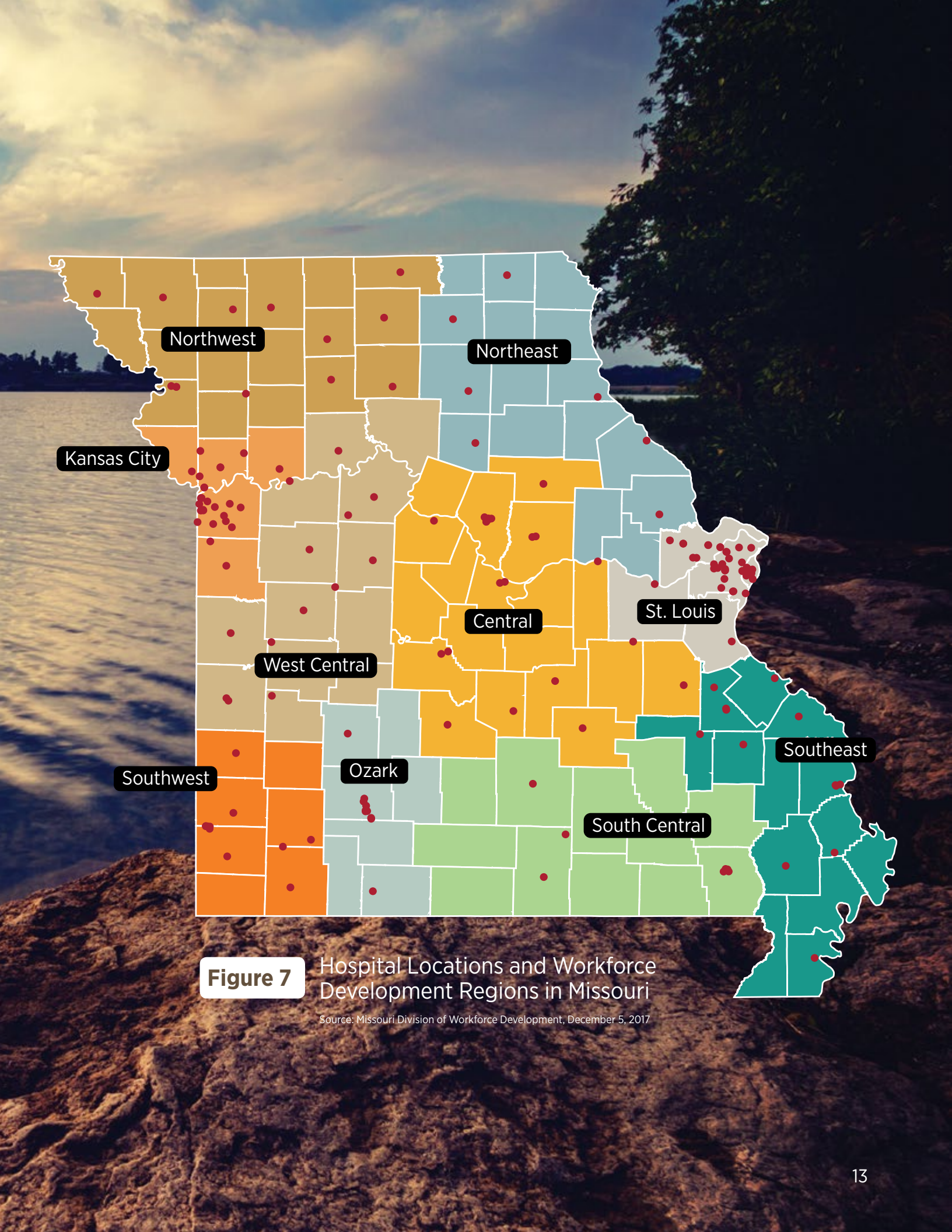


Figure 7 Hospital Locations and Workforce Development Regions in Missouri

Source: Missouri Division of Workforce Development, December 5, 2017

Table 1. Socioeconomic Characteristics of WDRs in Missouri - 2016

WDR	Population	Per Capita Income	Employment	Surveyed Hospitals	Population per Hospital
Northwest	258,812	$36,045	143,038	13	19,909
Northeast	268,520	$35,467	126,730	7	38,360
Kansas City	1,154,794	$43,795	716,858	23	50,208
West Central	278,312	$35,334	136,981	12	23,193
Central	692,638	$38,118	406,051	19	36,455
St. Louis	2,027,967	$52,701	1,406,955	33	61,454
Southwest	294,077	$34,021	156,556	9	32,675
Ozark	544,712	$36,885	329,765	7	77,816
South Central	208,141	$29,181	95,775	6	34,690
Southeast	365,027	$35,166	194,751	14	26,073
Missouri	6,093,000	$42,926	3,713,460	143	42,608

Source: Bureau of Economic Analysis, 2018, www.bea.gov

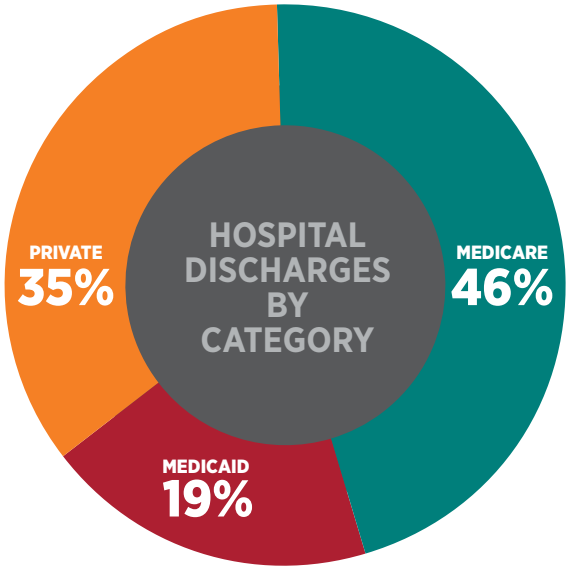
In **Table 1**, there is a wide variance in the socioeconomic characteristics of the different WDRs. For example, the South Central part of the state only has a population of 208,000 people and has a per capita income of slightly more than $29,000. Since the South Central part of the state is rather large in geographic size at approximately 9,584 square miles, it has a population density of 21.7 people per square mile. On the other hand, St. Louis has a population of over 2 million people with a per capita income of nearly $53,000. Here, there is a large number of people living in a relatively small area of only 2,777 square miles creating a population density of 730 people per square mile. These differences mean that there can be variances in the service population of each hospital. For example, there are six hospitals located in the South Central WDR meaning there is a hospital for every 35,000 people. In St. Louis there are 33 hospitals with each one serving almost 62,000 people. This does not necessarily mean that there is a 'shortage' of hospitals in the St. Louis area — hospitals in St. Louis are much larger in size than the ones in the South Central area. In fact, the average hospital in the South Central part of the state is only 39 percent of the size of an average hospital in the St. Louis area. Hospitals in the South Central Missouri WDR have an average of 80.3 staffed beds while hospitals in St. Louis have an average of 252.2 staffed beds. On a population per staffed bed basis, there is one staffed hospital bed for every 431.8 persons living in the South Central WDR and one staffed hospital bed for every 243.7 persons living in the St. Louis WDR.

Table 2. Hospital Statistics for the State of Missouri - 2017

Number of Hospitals	143
Number of Licensed Beds	23,382
Number of Staffed Beds	20,956
Total Number of Inpatient Days	4,774,234
Total Admissions Inpatient	783,894
Average Length of Stay (in Days)	6.1
Total Number of Medicare Inpatient Days	1,983,543
Average Length of Stay - Medicare Days	5.5
Total Number of Medicaid Inpatient Days	925,018
Average Length of Stay - Medicaid Days	6.4
Total Number of Outpatient Visits	13,444,366
Total Births	71,906
Total Newborn Days	146,090
Total Surgeries	588,602
Inpatient Surgical Operations	189,630
Outpatient Surgical Operations	398,972
Total Emergency Department Visits	3,084,111
Number of Employees (FT and PT)	155,346
Full-Time Employees	118,742
Part-Time Employees	36,604
Total Full-Time Equivalent Employees	127,023
Payroll	$8,456,089,733
Employee Benefits	$2,155,142,535
Non-Payroll Expenses	$14,618,598,127
Total Operating Expenses	$23,074,687,860
Capital Expenditures	$1,674,521,128
Net Patient Revenue	$22,186,709,041
Medicare	$7,731,668,090
Medicaid	$3,448,312,944
Other Government	$122,430,111
Insurance	$9,981,243,942
Self-Pay	$803,101,032
Other Nongovernment	$99,952,922

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017

Figure 9 2017 Hospital Discharges by Category



Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017

Table 2 illustrates some of the more pertinent statistics about hospitals in the state of Missouri. During 2017, Missouri hospitals admitted nearly 784,000 persons for inpatient care and 13,444,000 for outpatient care. To put these numbers in perspective, consider that approximately one in eight Missourians was admitted to a hospital in 2017 and on average, each Missourian had almost 2.2 outpatient visits to a hospital.

As shown in **Figure 9**, approximately half of the discharges from Missouri hospitals are for Medicare patients while one-fifth are for Medicaid patients. Of the $22.2 billion in net patient revenue that hospitals collected, one-third is from Medicare and approximately 15 percent is from Medicaid.

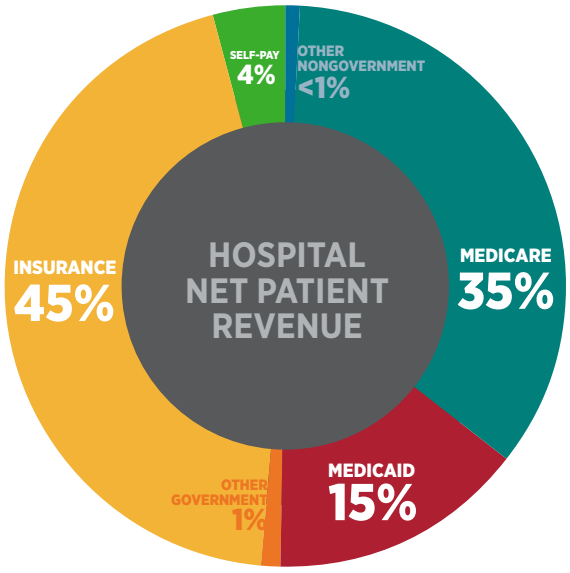
Private insurance comprises the largest individual category with 45 percent of net patient revenue. These numbers are shown in **Figure 10**.

Other areas of note are the number of full-time and part-time employees. In 2017, Missouri hospitals employed more than 155,000 persons in some capacity. This is roughly equal to the population of Springfield, Missouri, which is the state's third largest city by population.

Missouri hospitals paid these employees $8.5 billion in wages and $2.2 billion in benefits for a total wage package of $10.6 billion — an "average wage" of $83,537. When interpreting "average wages" it is important to understand that since hospitals employ a relatively large proportion of high wage earners, such as physicians and other highly specialized personnel, the values of an "average wage" are higher when compared to the state as a whole.

Nevertheless, since the average wage in Missouri is $38,531, **it is clear that hospitals provide a region or city with high paying, relatively stable, and recession-proof employment.** Missouri hospitals also purchase a steady stream of medical supplies and other products that are needed to produce medical care. In 2017, these purchases totaled $14.6 billion.

Figure 10 2017 Hospital Net Patient Revenue



Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017

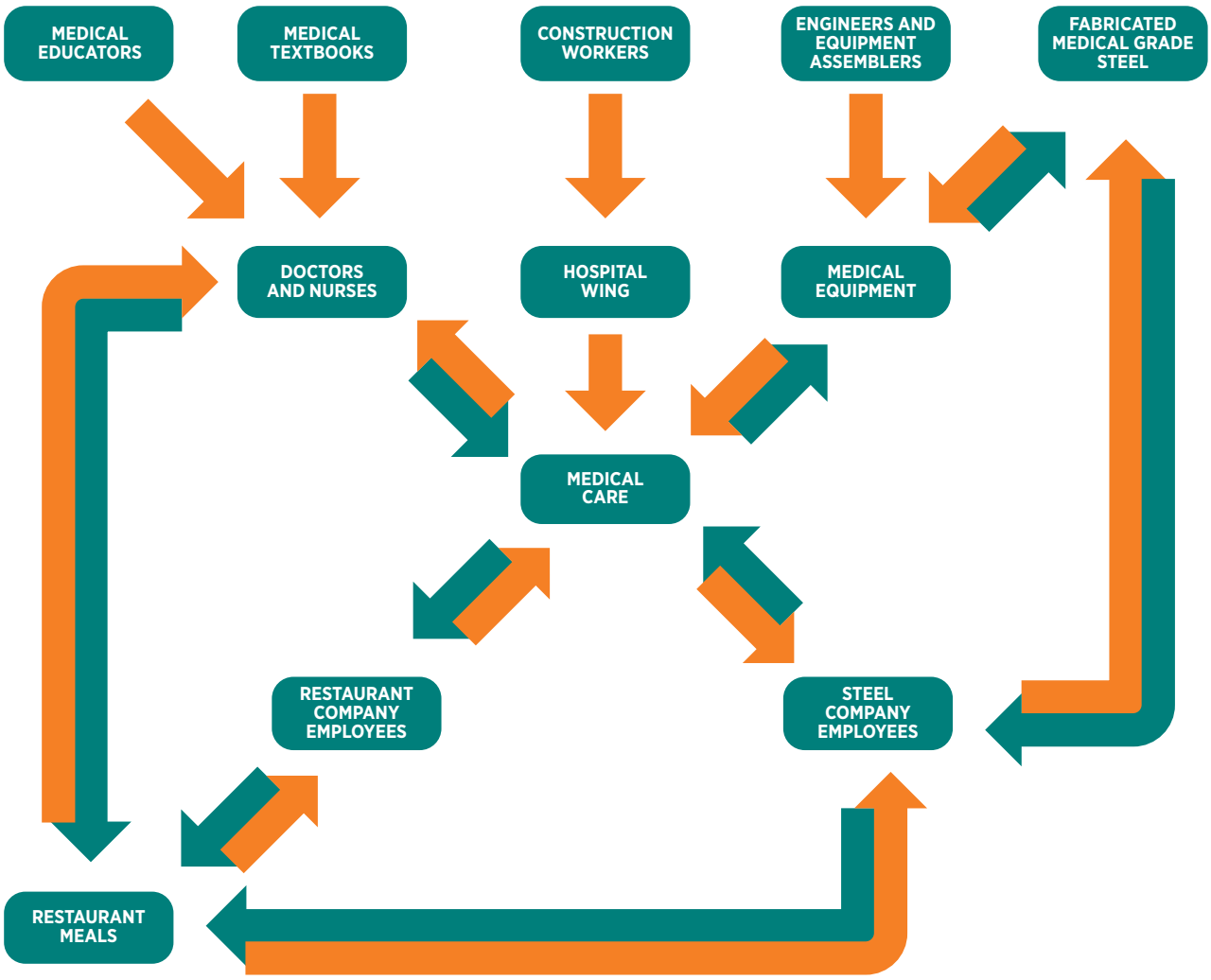
INPUT-OUTPUT MODELING ILLUSTRATED

A county level Input-Output model was developed and implemented using IMPLAN[9] to trace the economic impacts of hospitals in 2017. Input-Output analysis assumes that in order for the economy of a region (such as a state or county) to generate output, it requires inputs. Therefore, when there is an increase in demand for the output of industry Z, it requires inputs from industries X and Y in order to make this additional output. Of course, the outputs from industries X and Y, which are inputs for industry Z, also require inputs from industries W and V. These inter-industry linkages between different industries are traced, compiled, and then aggregated to understand the backward and forward flow of economic activity within the region.

Figure 11 illustrates the concept more clearly. The purchase of these goods and services helps to create demand for the products and induces demand for other goods and services that are related, both in forward and backward linkages, to the original product purchased. In the illustration of Input-Output modeling, the orange lines represent a good or service being provided while the green lines represent firm or consumer expenditures to purchase these goods or services. For simplicity, only a few of these transactions are modeled. The services of medical educators in universities and colleges combine with medical textbooks to create doctors and nurses. Similarly, construction workers are used to help build a hospital wing. Finally, engineers are used to design medical equipment and equipment assemblers are used to actually assemble the equipment. The fabricated medical grade steel used in the production of medical equipment is created by the steel company employees. This medical equipment is then combined with the hospital wing and the services of doctors and nurses to create medical care for

[9] IMPLAN is a software package that is used in Input-Output analysis to determine the size and nature of economic shocks using a classification system of 509 different sub-sectors of the economy.

Figure 11 Input-Output Illustrated



both restaurant company employees and steel company employees.

The restaurant and steel company employees' purchase of medical care is a consumer expenditure for medical care that is used to help pay the salaries of doctors and nurses who provided the care in the first place. Doctors and nurses might then use part of their salary to purchase a meal from a restaurant. The restaurant must hire labor to create restaurant meals and pays the restaurant employees a salary. Furthermore, the consumer expenditures for medical care are also used by the hospital to purchase medical equipment such as patient monitors. Since patient monitors are needed to provide medical care in the first place, they are purchased from a medical equipment firm. However, in order to produce patient monitors, the firm must purchase fabricated medical grade steel from the steel company which, of course, used the labor of steel company employees to produce the steel used in the patient monitors. These steel workers can then use part of their salaries to purchase restaurant meals. These additional purchases of meals by steel workers stimulates the restaurant to hire even more employees and thus pay even more in wages.

In this way, the provision of medical care by Missouri hospitals produces many forward and backward linkages to many different sectors of the economy. These economic impacts show up as direct, indirect and induced effects. The direct effects are represented by the initial purchase of medical care whereas the indirect effects are represented by the increased use of inputs that are needed to meet the increased demand for medical care. Finally, the induced effects come from the additional purchases from the additional income generated and spent by households and business from the direct and indirect effects. For example, since doctors, waiters and steel workers now have more income, they might purchase more movie tickets, haircuts and new carpet for their home. The total economic impact is then the sum of the direct, indirect and induced spending. When the total economic impact is divided by the initial spending, one can calculate the value of the multiplier. This multiplier allows one to determine the total economic impact on the economy from an initial injection of spending on medical care.

Medicaid Spending and Differential Economic Impacts

As was noted in an earlier section, approximately 15 percent of net inpatient revenue derives from Medicaid. This distinction is important due to the nature of the state's Medicaid program.

Currently, states spend state level taxes on their Medicaid program and the federal government matches at least dollar for dollar state level Medicaid spending.[10] The size of this federal match varies from state to state.

Some states like California receive a dollar-for-dollar match from the federal government

[10] Centers for Medicare and Medicaid Services, State Expenditure Reports from MBES/CBES 1997 to 2016, https://www.medicaid.gov/medicaid/financing-and-reimbursement/state-expenditure-reporting/expenditure-reports/index.html.

for state government Medicaid spending. Other states such as Mississippi receive a three dollar-for-one-dollar match from the federal government. In other words, for every dollar of state tax dollars spent on Medicaid in Mississippi, the state receives $3 in matching federal Medicaid dollars. In other words, if the state of Mississippi has as its goal to spend a total of $400 million on Medicaid in 2017, the state government needs only spend $100 million of its own tax dollars that have been derived from taxes on its own citizens. The other $300 million comes from outside the state of Mississippi and would be considered an external injection of funds into the state economy.

What is true for Mississippi is also true for Missouri. Currently Missouri receives $1.89 in matching federal dollars for every $1 of state tax dollars spent on Medicaid.[11] This means that if the state of Missouri has as its goal to spend a total of $400 million on Medicaid, it would only need a tax of $138 million. The $138 million that is taxed from Missouri and spent on Medicaid receives $262 million in matching federal dollars. Once again, this additional $262 million federal match is akin to an external injection of dollars devoted to medical spending into the state economy. The existence of this federal match to Medicaid spending alters the value of the economic impact multipliers that one would calculate in any standardized economic impact analysis. In order to accurately measure the economic impact from hospitals on the state economy, the percentage of inpatient revenue from Medicaid for each hospital was calculated and this dollar amount was accounted for in the determination of economic impact calculations.

[11] The Federal Medical Assistance Percentage is currently $1.89 for every $1 in state Medicaid spending. However, the Federal Reimbursement Allowance (FRA) that hospitals receive is currently $1.74 for every $1 in state Medicaid spending. The Kaiser Family Foundation policy brief (2012) on Medicaid financing in general explains Medicaid financing in layman's terms: https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8352.pdf. The Federal Reimbursement Allowance works in a similar, but slightly different fashion. Detailed information on it can be found on the Missouri Hospital Association's website at https://web.mhanet.com/fra.aspx.

RESULTS

This economic impact analysis of Missouri hospitals examined hospital spending on a variety of items including labor, benefits for employees, medical supplies, pharmaceuticals, construction/maintenance/repair of existing and new buildings, land and other building acquisitions/improvements, medical equipment, and so forth. This spending was separated out into operational spending and capital investment spending. The economic impact of the hospitals was calculated at the county level and then aggregated to the WDR to ensure the confidentiality of proprietary hospital data. Operational economic impact analysis data is reported first in **Tables 3 through 7**.

Economic Impacts From Operations

Tables 3 through 5 show the direct, indirect, and induced economic impacts from hospital operations in 2017 on the Missouri economy. In 2017, Missouri hospitals employed slightly more than 155,000 workers. The direct and indirect impacts from hospitals lead to an additional 164,657 jobs within the state of Missouri. This means that almost 292,000 jobs in the state can be tried directly or indirectly to the operations of hospitals. This number of jobs is equal to the total population of 36 of Missouri's 115 counties. An alternative way to view the total number of jobs created in the state because of hospitals is to consider that this employment count is roughly equal to the population of the city of Cincinnati.

Table 4 outlines the impact on Missouri wages that is ascribed to hospitals. These figures are stated in thousands of dollars. Furthermore, even though the term 'wage' can be used to mean one's monetary paycheck, it can also mean the value of their paycheck plus the level of benefits a person receives. Throughout this report, the terms 'wage' and 'labor income' are

Another way to think of the amount of wage income attributable to the hospital sector in Missouri is that a stack of one-dollar bills worth $18.4 billion would reach 1,249 miles into the sky — approximately 6 times higher than the orbiting distance of the International Space Station.

used interchangeably and refer to an employee's total pay package, money income plus the value of benefits, unless otherwise noted. Hospitals are directly or indirectly responsible for $18.4 billion in wages statewide. To place numbers of this size in perspective, consider that the total wage income earned from all employment sources in the Albuquerque, New Mexico metro area is $18.5 billion.[12] The Albuquerque metro area's population of 910,000 is roughly equal to half the population of the entire state of New Mexico.

Finally, we can examine the total increase in Gross State Product (GSP) to the Missouri economy from the activities of Missouri hospitals. GSP is the state equivalent of Gross Domestic Product (GDP) for a country. GSP measures the increase in value added from an economic activity and focuses on the value of final production. On the other hand, total output measures the intermediate economic activity that occurs in the production of goods and services. An example will help to clarify. Assume that the Ford plant in Kansas City needs to purchase $4,000 of steel to produce a $30,000 truck. The purchase of steel is a separate economic transaction and the steel becomes an input into the final value of the truck. When the truck is sold, GSP increases by $30,000 and total output increases by $34,000 — the value of the truck and the value of the steel and truck together respectively.

Table 3. Economic Impact of Hospitals on the Missouri Economy: Employment - 2017

Region	Direct	Indirect	Induced	Total
Northwest	6,895	2,634	4,694	13,074
Northeast	2,581	978	1,605	4,657
Kansas City	30,074	12,746	19,972	55,700
West Central	4,634	1,459	2,576	7,725
Central	17,929	6,652	11,896	33,645
St. Louis	53,860	25,337	38,470	107,519
Southwest	6,177	2,415	4,245	11,822
Ozark	20,996	6,778	10,036	34,588
South Central	2,728	1,161	1,752	5,450
Southeast	9,742	3,358	5,893	17,601
Missouri	155,346	63,518	101,139	291,781

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

[12] U.S. Department of Commerce, Bureau of Economic Analysis, 2018. www.bea.gov

Economists typically prefer to use GSP as a measure of output since using 'total output' leads to 'double counting.' **Table 5** illustrates that Missouri hospitals have helped to increase Missouri GSP by $26.1 billion.[13]

This number is conservative in nature for a variety of socioeconomic reasons. There is a strong correlation between health and wages in that "good health" leads to "higher wages" since healthy persons are able to work more and produce higher levels of output. On the flip side, people who are "sick" are oftentimes not able to work as much as "healthy" people; thus, sick people often produce less output and receive lower wages.

The fact that hospitals help to keep people healthy, and thus increase their potential lifetime wages, means that the 'true' economic impact from hospitals is much higher than has been stated in this report. To see that this is true, consider a vivid example of a carpenter who breaks his arm but does not get the bone set by medical professionals. Instead he chooses to set the bone himself. It is unlikely that he will be able to set the bone properly. This will seriously diminish his ability to build homes in the future and thus reduce his future income.

[13] Hsieh, et. al. (2012); Andren and Palmer (2008); Contoyannis and Rice (2001); Luft (1975); and Mushkin, (1962).

Table 4. Economic Impact of Hospitals on the Missouri Economy: Labor Income

(in thousands of dollars) - 2017

Region	Direct	Indirect	Induced	Total
Northwest	$525,784	$140,677	$201,572	$868,034
Northeast	$176,093	$52,242	$68,931	$297,266
Kansas City	$2,124,794	$680,463	$857,730	$3,662,987
West Central	$280,565	$77,903	$110,692	$469,160
Central	$1,267,373	$355,159	$510,889	$2,133,421
St. Louis	$3,955,952	$1,352,638	$1,652,123	$6,960,712
Southwest	$465,785	$128,969	$182,312	$777,066
Ozark	$1,053,431	$361,863	$430,991	$1,846,285
South Central	$175,297	$61,983	$75,230	$312,509
Southeast	$628,635	$179,307	$$253,111	$1,061,053
Missouri	$10,653,710	$3,391,204	4,343,581	$18,388,494

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 5. Economic Impact of Hospitals on the Missouri Economy: Value Added

(in thousands of dollars) - 2017

Region	Direct	Indirect	Induced	Total
Northwest	$613,450	$225,520	$365,119	$1,204,090
Northeast	$208,674	$83,750	$124,860	$417,284
Kansas City	$2,541,702	$1,090,853	$1,553,673	$5,186,228
West Central	$327,838	$124,887	$200,503	$653,228
Central	$1,477,658	$569,358	$925,401	$2,972,417
St. Louis	$4,813,425	$2,168,420	$2,992,630	$9,974,475
Southwest	$549,985	$206,751	$330,233	$1,086,969
Ozark	$1,289,237	$580,104	$780,692	$2,650,033
South Central	$213,601	$99,365	$136,270	$449,235
Southeast	$742,470	$287,448	$458,475	$1,488,392
Missouri	$12,778,041	$5,436,455	$7,867,855	$26,082,352

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 6. State and Local Taxes Collected Due to Hospital Economic Impacts
(in thousands of dollars) - 2017

Region	Employee Compensation	Indirect Business Tax	Households	Corporations	Total
Northwest	$232	$45,725	$20,973	$1,356	$68,286
Northeast	$79	$16,277	$7,184	$486	$24,026
Kansas City	$976	$205,061	$88,536	$6,141	$300,714
West Central	$125	$24,809	$11,336	$736	$37,007
Central	$570	$112,179	$51,547	$3,326	$167,623
St. Louis	$1,864	$398,204	$169,282	$11,954	$581,304
Southwest	$209	$41,432	$18,887	$1,230	$61,759
Ozark	$494	$106,968	$44,906	$3,217	$155,585
South Central	$84	$17,934	$7,600	$539	$26,157
Southeast	$285	$56,612	$25,790	$1,681	$84,368
Missouri	$4,918	$1,025,202	$446,041	$30,668	$1,506,829

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 7. Federal Taxes Collected Due to Hospital Economic Impacts
(in thousands of dollars) -2017

Region	Employee Compensation	Proprietor Income	Indirect Business Tax	Households	Corporations	Total
Northwest	$98,606	$1,888	$5,947	$56,836	$18,235	$181,513
Northeast	$33,697	$673	$2,117	$19,468	$6,532	$62,487
Kansas City	$414,703	$8,491	$26,672	$239,925	$82,571	$772,362
West Central	$53,284	$1,025	$3,227	$30,720	$9,900	$98,156
Central	$242,373	$4,633	$14,591	$139,689	$44,724	$446,009
St. Louis	$792,133	$16,499	$51,794	$458,741	$160,722	$1,479,889
Southwest	$88,764	$1,712	$5,389	$51,183	$16,540	$163,588
Ozark	$209,959	$4,434	$13,913	$121,691	$43,256	$393,254
South Central	$35,557	$743	$2,333	$20,596	$7,242	$66,472
Southeast	$121,200	$2,339	$7,363	$69,888	$22,602	$223,393
Missouri	$2,090,276	$42,437	$133,347	$1,208,738	$412,323	$3,887,122

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Tables 8 through 10 show the ten largest non-hospital industries that are impacted by hospital operations. These are broken down by employment, wages and value added. In terms of employment, recall that hospitals help to create an additional 165,000 jobs in Missouri, in addition to the direct employment by hospitals of 155,000 persons. Approximately one-third, or 51,636, of these jobs are created in ten industries. To simplify the reporting, only total employment has been shown. Similarly, when examining enhanced wages from hospital activities, 30 percent, or $2.3 billion, goes to ten different industries. Finally, the top ten industries to increase GSP for the state of Missouri are shown in **Table 10**. These industries contribute an additional $5.3 billion to the Missouri economy because of the initial spending by hospitals.

Table 8. Top Ten Non-Hospital Industries Impacted from Hospital Operations in Employment - 2017

Rank	Industry Sector	Total Employment
1	Real estate	8,444
2	Employment services	8,341
3	Full-service restaurants	8,257
4	Limited-service restaurants	5,910
5	Wholesale trade	4,501
6	Other financial investment activities	3,567
7	Management consulting services	3,269
8	Services to buildings	3,267
9	Insurance agencies, brokerages, and related activities	3,084
10	Retail - General merchandise stores	2,996

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 9. Top Ten Non-Hospital Industries Impacted from Hospital Operations in Wages Generated (in thousands of dollars) - 2017

Rank	Industry Sector	Total Wages
1	Wholesale trade	$373,681
2	Employment services	$302,761
3	Offices of physicians	$260,061
4	Management consulting services	$242,728
5	Insurance carriers	$238,459
6	Insurance agencies, brokerages, and related activities	$221,414
7	Management of companies and enterprises	$211,900
8	Legal services	$173,711
9	Full-service restaurants	$172,904
10	Accounting, tax preparation, bookkeeping, and payroll services	$151,440

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 10. Top Ten Non-Hospital Industries Impacted from Hospital Operations in Total Value Added (in thousands of dollars) - 2017

Rank	Industry Sector	Total Value Added
1	Owner-occupied dwellings	$958,237
2	Real estate	$948,461
3	Wholesale trade	$674,354
4	Insurance carriers	$600,110
5	Employment services	$485,533
6	Monetary authorities and depository credit intermediation	$443,950
7	Legal services	$323,160
8	Insurance agencies, brokerages, and related activities	$315,657
9	Management of companies and enterprises	$262,690
10	Offices of physicians	$256,434

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Economic Impacts From Capital Spending

Economic impacts from capital spending is reflected in many forms including medical equipment, new buildings, renovation of existing buildings, etc., and consists of expensive infrequent purchases. In other words, expenditures for the the purchases of medical supplies, such as tubing and gauze, employing medical personnel, and paying utility bills necessary for the day-to-day operations of a hospital, occur on a continuous basis. The economic impact of these operational purchases was calculated in the previous section. However, capital spending for a hospital has a different economic impact then operational purchases. One of the reasons for this is the way that the spending occurs. Consider the example of a hospital that is building a new wing with patient rooms and a Magnetic Resonance Imaging suite. It will hire a general contractor and pay for the labor services of plumbers, electricians, drywallers and other laborers. In addition to this, it will purchase concrete, lumber, tile, etc. to construct the wing. All of these purchases will stimulate demand in the industries that are linked in a forward and backward manner to the construction of the new wing. However, once the hospital wing is completed, the services of the plumbers, electricians, and drywallers are no longer needed. Thus, the economic impact from the construction of the hospital wing stops once the wing is completed.

What is true about the economic impact from constructing the wing, is also true for the purchases of the medical equipment. The purchase of medical equipment as a capital expense will generate an economic impact in the year that the purchase is completed. For example, a patient monitor can cost $2,300 for a standard base model whereas other more sophisticated models can cost upwards of $8,900.[14] Another example would be a standard Magnetic Resonance Imaging machine, also known as an MRI. These diagnostic machines produce images of organs and bones from magnetic fields and radio waves produced by powerful electromagnets. The strength of an MRI magnetic field is measured in units called Teslas. A low-field MRI machine might measure 0.2 or 0.3 Teslas and can cost between $150,000 to $1.2 million depending upon whether it's new or used. The most powerful MRI machines, which produce magnetic field strengths of 3 Teslas, will cost close to $3 million. Furthermore, MRI machines must be housed in specially constructed suites that can easily cost between several hundred thousand dollars to $2 million to build. These additional steps are necessary to keep persons who are standing right outside the magnetic field safe, to prevent other electromagnetic forces from interfering with the operation and accuracy of the MRI machine, and for additional patient support.[15] Once all of the medical equipment for the new hospital wing has been purchased, the economic impact from the equipment purchase ceases.[16]

[14] The patient monitor sits next to the patient's bed and continuously monitors their vital signs such as blood pressure, temperature, blood oxygen content, pulse rate, etc. The price of a patient monitor can vary drastically based upon the size of the monitor screen, the number of different vital signs that are measured, whether a paper printout is produced by the monitor, etc. The prices listed in this report represent actual prices found by searching.

[15] Glover, Lacie, "Why Does an MRI Cost So Darn Much?", Time, July, 16, 2014. http://time.com/money/2995166/why-does-mri-cost-so-much/

[16] In the case of a hospital that has a yearly 'rotation schedule' for staggering the replacement of medical equipment such as patient monitors, it will be the case that there is an economic impact every year from the purchases made in that year.

Table 11. Capital Expenditures
(in thousands of dollars) by Hospitals in 2017 Aggregated by WDR

Region	Capital Expenses
Northwest	$38,369
Northeast	$10,851
Kansas City	$333,983
West Central	$79,967
Central	$110,615
St. Louis	$815,769
Southwest	$19,829
Ozark	$98,063
South Central	$9,701
Southeast	$157,374
Missouri	$1,674,521

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017

Table 11 shows the capital expenses in 2017 for the hospitals in the different WDRs of Missouri. Of the $1.674 billion in capital expenditures that were made in 2017, approximately half occurred in the St. Louis region. Since the purchase of medical equipment and construction/renovation projects will have different linkages to different industries, the economic impacts from equipment capital spending and construction/renovation capital spending is broken out into different tables represented by **Tables 12 and 13**. Furthermore, to simplify the reporting of the economic impacts from capital spending only the total amount of employment, wages, value added, and taxes is reported. As before, the dollar figures in **Tables 11, 12 and 13** are in thousands of dollars. For instance, St. Louis hospitals spent $815.8 million in capital expenditures on equipment and new building construction/existing building renovations. These dollars spent on medical equipment purchases created 1,128 total jobs which paid $73 million in employee compensation in the St. Louis area. The funds that were spent on construction and renovation created 7,633 jobs that paid $383 million in wages while generating $30.7 million in total tax revenue for the state of Missouri.

Table 14 traces the top ten industries that have been impacted by hospital capital spending and is similar to **Tables 8, 9 and 10** in the type of data presented. In other words, just as **Table 8** shows the top ten industries from hospital operations vis-à-vis employment impacts, **Table 14** illustrates the top ten industries to be impacted by capital spending. However, to simplify the presentation and minimize the number of tables, only total jobs created, wages paid, and value added are shown in **Table 14** and these totals are combined into one table. The industries are ranked according to the size of their impact whether it be in relation to employment, wages or Gross State Product.

For example, normal day-to-day hospital operations led to an increase in employment in the real estate sector of 8,444 jobs, increased wages in the wholesale trade sector by $373.7 million, and increased value added by $958.2 million in the owner-occupied dwelling sector according to **Tables 8-10**. But monies spent by

hospitals on new medical equipment and other capital expenditures had the largest employment impact on the surgical and medical equipment manufacturing industry with an increase of 968 jobs. If we turn our focus to wages, the reader will see that, once again, the surgical and medical equipment manufacturing sector saw the largest impact. Wages in this sector increased by $81 million. Finally, GSP saw the largest increase of $205.7 million in the same sector — surgical and medical equipment manufacturing. However, when we examine the sectors ranked tenth in terms of employment, wages and value-added impacts, we see something different. The tenth largest sector that was impacted, measured via employment, was the service to buildings sector, which hired an additional 39 employees. The management consulting services sector was the tenth largest sector impacted in terms of wages at $2.3 million, while the legal service sector saw the tenth largest impact in relation to GSP at $4.6 million. **Table 15** is similar to **Table 14** but examines the impact from hospital construction and renovation spending.

Table 12. Economic Impacts From Capital Spending on Medical Equipment
(in thousands of dollars) - 2017

Region	Jobs	Wages	Value Added	State and Local Taxes	Federal Taxes
Northwest	69	$4,481	$9,251	$453	$1,136
Northeast	41	$2,687	$5,548	$272	$681
Kansas City	578	$37,513	$77,444	$3,795	$9,507
West Central	195	$12,637	$26,088	$1,279	$3,203
Central	278	$18,056	$37,276	$1,827	$4,576
St. Louis	1,128	$73,131	$150,975	$7,399	$18,534
Southwest	64	$4,181	$8,631	$423	$1,060
Ozark	120	$7,754	$16,007	$785	$1,965
South Central	18	$1,149	$2,372	$116	$291
Southeast	352	$22,806	$47,081	$2,307	$5,780
Missouri	2,844	$184,395	$380,673	$18,656	$46,732

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 13. Economic Impacts From Capital Spending on New Buildings and Renovation/ Remodeling of Existing Buildings and Facilities
(in thousands of dollars) - 2017

Region	Jobs	Wages	Value Added	State and Local Taxes	Federal Taxes
Northwest	326	$16,363	$22,784	$1,314	$3,295
Northeast	47	$2,361	$3,288	$190	$475
Kansas City	2,884	$144,819	$201,642	$11,625	$29,158
West Central	574	$28,841	$40,158	$2,315	$5,807
Central	776	$38,974	$54,267	$3,128	$7,847
St. Louis	7,633	$383,249	$533,627	$30,763	$77,163
Southwest	109	$5,480	$7,630	$440	$1,103
Ozark	950	$47,726	$66,453	$3,831	$9,609
South Central	82	$4,112	$5,725	$330	$828
Southeast	1,196	$60,052	$83,615	$4,820	$12,091
Missouri	14,578	$731,977	$1,019,188	$58,755	$147,375

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 14. Top Ten Industries Impacted from Medical Equipment Capital Spending by Missouri Hospitals
(in thousands of dollars) - 2017

Rank	Industry	Employment	Industry	Wages	Industry	Value Added
1	Surgical and medical instrument manufacturing	968	Surgical and medical instrument manufacturing	$80,999	Surgical and medical instrument manufacturing	$205,668
2	Wholesale trade	147	Wholesale trade	$12,208	Wholesale trade	$22,030
3	Management of companies and enterprises	106	Management of companies and enterprises	$12,067	Management of companies and enterprises	$14,959
4	Limited-service restaurants	69	Hospitals	$3,912	Owner-occupied dwellings	$10,134
5	Full-service restaurants	68	Surgical appliance and supplies manufacturing	$3,598	Surgical appliance and supplies manufacturing	$9,157
6	Real estate	68	Other electronic component manufacturing	$3,112	Real estate	$7,611
7	Hospitals	55	Securities and commodity contracts intermediation and brokerage	$2,781	Monetary authorities and depository credit intermediation	$6,616
8	Surgical appliance and supplies manufacturing	46	Offices of physicians	$2,745	Other electronic component manufacturing	$6,123
9	Employment services	42	Legal services	$2,448	Hospitals	$4,686
10	Services to buildings	39	Management consulting services	$2,296	Legal services	$4,555

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 15. Top Ten Industries Impacted From Hospital Construction/Renovation Capital Spending by Missouri Hospitals

(in thousands of dollars) - 2017

Rank	Industry	Employment	Industry	Wages	Industry	Value Added
1	Construction of new health care structures	5,267	Construction of new health care structures	$276,566	Construction of new health care structures	$321,187
2	Maintenance and repair construction of nonresidential structures	3,226	Maintenance and repair construction of nonresidential structures	$165,540	Maintenance and repair construction of nonresidential structures	$194,226
3	Wholesale trade	399	Wholesale trade	$33,114	Wholesale trade	$59,758
4	Real estate	285	Hospitals	$15,428	Owner-occupied dwellings	$40,453
5	Full-service restaurants	241	Architectural, engineering, and related services	$11,574	Real estate	$31,986
6	Limited-service restaurants	226	Offices of physicians	$10,875	Monetary authorities and depository credit intermediation	$19,522
7	Hospitals	217	Truck transportation	$9,434	Hospitals	$18,478
8	Retail - Miscellaneous store retailers	173	Management of companies and enterprises	$7,939	Commercial/industrial machinery and equipment rental	$12,530
9	Truck transportation	159	Monetary authorities and depository credit intermediation	$6,632	Truck transportation	$12,072
10	Employment services	145	Commercial/ industrial machinery and equipment rental	$6,530	Architectural, engineering, and related services	$11,421

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Economic Impacts From Medical Tourism

Finally, there is the economic impact from medical tourism to consider. Medical tourism is when persons who do not reside in the state of Missouri seek medical care within Missouri.

This can be for a variety of reasons including emergency care, cost, convenience, quality or lack of access in one's home state. Data on the number of out-of-state inpatient and outpatient visits was examined and is shown in **Table 16**. Not surprisingly, areas inside the state, such as the Central and West Central WDR exhibit relatively little inpatient medical tourism at less than 3 percent. Kansas City, St. Louis and the Southwest WDR though, stand out as centers for medical tourism with inpatient medical tourism percentages of 10.9 percent, 14.1 percent and 28.1 percent respectively. This is not surprising since the metro areas of both Kansas City and St. Louis have a substantial population living on the Kansas and Illinois sides of the state line. The hospitals in the Southwest region also are centers of medical tourism due to the lack of health care facilities in Southwest Kansas, Northeast Oklahoma and Northwest Arkansas. In fact, while the state inpatient medical tourism average is 10.9 percent, the Southwest WDR of 28.1 percent rate represents more than one in four patients and is the highest rate of any WDR. Their outpatient rate however is only 8.7 percent.

Although this 8.7 percent rate is still the third highest rate in the state, it is far below the inpatient medical tourism rate.

Table 17 shows the economic impact of medical tourism for the state of Missouri.

As the table shows, medical tourism represents a significant amount of economic activity for the state. Nearly 30,000 jobs and $1.94 billion in wages to Missourians is the result of medical tourism. The activities of medical tourism also add more than $2.7 billion to the Missouri GSP. Almost all of these wage and output gains are from the Kansas City and St. Louis area. Of the total gain in wages and output to the state from medical tourism, 82 percent are accruing to Kansas City and St. Louis, while these areas are receiving 80 percent of the employment gains.

Table 16. Medical Tourism in Missouri

Region	Out-of-State Inpatient discharges	Total Inpatient Discharges	Medical Tourism Inpatient Percentage	Out-of-State Outpatient Discharges	Total Outpatient Discharges	Medical Tourism Outpatient Percentage
Northwest	1,716	22,545	7.6%	67,399	1,333,473	5.1%
Northeast	783	10,486	7.5%	8,198	311,607	2.6%
Kansas City	17,162	157,584	10.9%	230,045	1,378,047	16.7%
West Central	506	18,087	2.8%	5,747	597,004	1.0%
Central	1,009	73,592	1.4%	15,365	2,445,178	0.6%
St. Louis	47,187	335,328	14.1%	485,694	2,558,130	19.0%
Southwest	6,981	24,888	28.1%	75,987	869,660	8.7%
Ozark	4,786	80,115	6.0%	34,969	1,710,397	2.0%
South Central	1,031	18,299	5.6%	15,770	520,810	3.0%
Southeast	3,503	36,768	9.5%	56,585	1,226,424	4.6%
Missouri	84,664	777,692	10.9%	995,759	12,950,730	7.7%

Source: Hospital Industry Data Institute, Discharge Data, 2013-2017

Table 17. Economic Impact from Medical Tourism in Missouri

(in thousands of dollars)

Region	Total Employment	Total Wages	Total Value Added
Northwest	741	$49,764	$68,562
Northeast	198	$12,784	$17,830
Kansas City	7,146	$476,919	$669,942
West Central	108	$6,616	$9,126
Central	301	$19,415	$26,734
St. Louis	16,805	$1,106,128	$1,571,249
Southwest	1,862	$123,947	$172,113
Ozark	1,200	$64,300	$91,722
South Central	209	$12,111	$17,222
Southeast	1,102	$67,295	$93,465
Missouri	29,671	$1,939,279	$2,737,965

Source: Hospital Industry Data Institute, Discharge Data, 2013-2017

Economic Impacts on Urban and Rural Areas

Interestingly enough, economic impacts for urban areas can differ in significant ways from rural areas. Generally speaking, but not always, economic impacts from activities are smaller in their size in rural areas than in urban areas. This is due primarily to the makeup of the local economy and the number and type of local firms available in each local area. For example, rural areas are less likely to have a wholesale grocer than an urban area like St. Louis. This means that local grocery stores in a rural area must purchase their supplies from outside the region whereas as a local grocery store in St. Louis could purchase their supplies from a wholesaler located within the St. Louis urban area. In this case, the dollars that go to the grocery wholesaler are 'leaving' the rural area and are 'staying' within the urban area. This gives the dollars in the urban area more opportunities to be used locally and thus they help to increase the size of the multiplier. On the other hand, the dollars leaving the rural area for the grocery wholesaler in St. Louis are no longer available to be used in the rural area and are now in fact helping to contribute to the urban economy.

Figure 12 shows the counties within the state of Missouri that were designated as urban areas. Hospitals located within these counties are treated as urban hospitals while other hospitals were designated as rural hospitals. The economic activities, e.g. hiring employees, purchasing capital equipment, buying medical supplies, etc., was aggregated for the rural and urban hospitals and the economic impacts were determined. **Table 18** outlines the economic impact results for employment, labor income and value added output for urban and rural hospitals' operations, while **Table 19** shows the economic impact from capital spending. The majority of the economic impact from hospitals occurs in urban areas. This is not surprising because not only do urban areas tend to have a larger economic impact multiplier, but there is more initial economic activity occurring in the urban counties to begin with. For example, urban hospitals employ 77 percent of all the hospital employees in the state and pay 80 percent of the wages for all hospital employees. As another illustration, 79.5 percent of all capital spending by hospitals in the state is made by urban hospitals. Nevertheless, the types of capital spending are not proportional throughout the state — nearly 30 percent of all capital spending by hospitals on equipment is made by the rural hospitals.

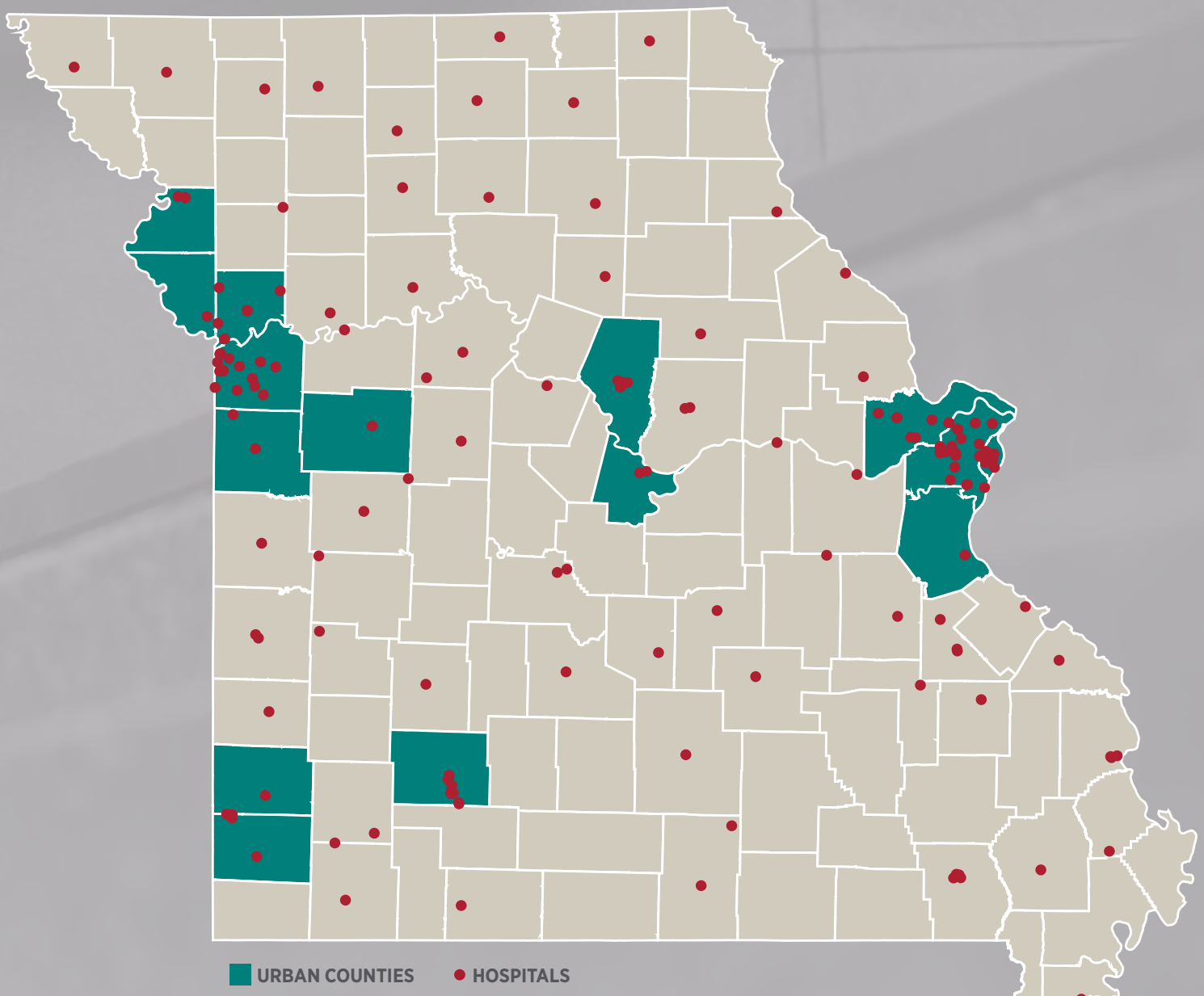


Figure 12 Urban and Rural Counties in Missouri

Table 18. Economic Impact of Hospitals on the Missouri Economy — Urban and Rural

(Wages and Value Added in thousands of dollars) - 2017

Region	Direct	Indirect	Induced	Total
Urban Hospitals				
Employment	126,308	46,611	76,515	221,558
Wages	$8,918,802	$2,488,400	$3,285,997	$14,692,802
Value Added	$10,671,556	$3,989,166	$5,952,157	$20,612,879
Rural Hospitals				
Employment	29,038	10,631	18,505	57,829
Wages	$2,212,487	$567,590	$794,719	$3,574,796
Value Added	$2,592,207	$909,906	$1,439,521	$4,941,634

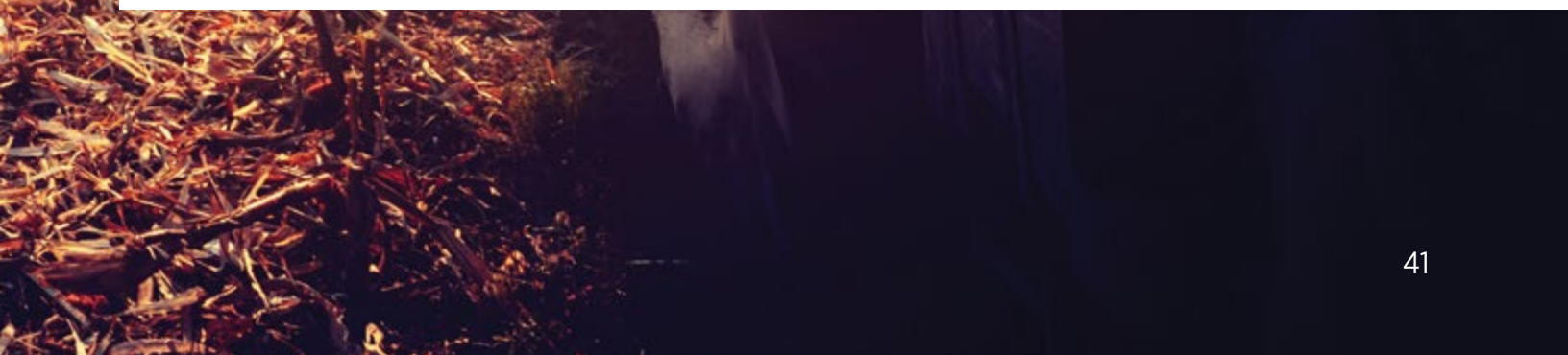
Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016

Table 19. Economic Impact of Capital Spending on the Missouri Economy — Urban and Rural

(Wages and Value Added in thousands of dollars) - 2017

Region	Jobs	Wages	Value Added	State and Local Taxes	Federal Taxes
Urban Hospitals					
Equipment	12,064	$606,280	$843,826	$48,584	$122,060
Construction	2,027	$131,414	$271,298	$13,295	$33,305
Rural Hospitals					
Equipment	2,500	$125,312	$174,668	$10,103	$25,234
Construction	820	$53,153	$109,731	$5,378	$10,328

Source: Hospital Industry Data Institute, Annual Licensing Survey, 2017 and IMPLAN Group data, 2016



CONCLUSIONS

Hospitals provide an important contribution to the economic structure of state and local economies. The day-to-day operations of hospitals are responsible for significant numbers of jobs, wages, and Gross State Product within the state of Missouri. More than $26 billion in GSP and almost 300,000 jobs are directly or indirectly the result of hospital operations in the state. These jobs tend to be high wage jobs and generate total wage income for the state of $18.4 billion. All of these day-to-day operations generated over $1.5 billion in state and local taxes and nearly $3.9 billion in federal taxes. When one considers the yearly capital expenditures made by hospitals, these total numbers are even larger. For example, in 2017 hospitals made almost $1.7 billion in capital expenditures for medical equipment, land acquisition and improvement, new construction and renovation of buildings, etc. These capital expenditures generated another 17,000 jobs, $916 million in wages, and $1.4 billion in GSP which generated $77.4 million in state and local taxes and $194 million in federal taxes.

Combining the economic impact from operations and capital expenditures yields an increase in GSP of more than $27.1 billion, creating almost 310,000 jobs which paid wages of $19.3 billion. This economic activity generated an additional $4.1 billion in federal taxes and almost $1.6 billion in state and local taxes.

Tables 19, 20 and 21 provide a summary of the combined direct, indirect and induced economic impacts from hospitals in Missouri. This includes hospital operations, capital spending on things such as medical equipment, and spending on the construction and/or renovation of physical structures such as buildings or hospital wings.[17]

[17] Although the impact from medical tourism was listed separately in Table 17, it is ultimately just a breakout of the economic impacts that are reflected in Tables 3 through 7. In other words, the economic impacts listed in Tables 3 through 7, include spending from both the instate population and medical tourism from the out-of-state population.

Table 19 tallies the employment effects while **Tables 20 and 21** summarize wage and GSP effects. These tables show the strength of hospitals to the economic structure of the state and the WDR regions in which they operate. For example, in the Ozark WDR, hospitals contribute either directly or indirectly to 35,638 jobs—or about 11 percent of the entire workforce of the region.

Finally, **Table 22** summarizes the employment, labor income and value-added multipliers for each region and for the state as a whole. These numbers can be used by economic development offices, legislators, and other important stakeholders to understand how future changes in hospital spending, hiring and other activities can impact the regional or state-level economy. For example, every time a hospital in the Northwest WDR region hires a new person, it will create an additional 0.95 jobs for a total change in employment of 1.95 jobs. Furthermore, for every $100 of wages paid out by a hospital in the Northwest WDR, it will generate an additional $65 in wages from other positions in the economy so total wages in the region grow by $165.

Furthermore, hospitals tend to be economic anchors for their communities and are, as an industry, somewhat immune to economic booms and busts that states and local areas face. In this sense, hospitals act like an economic stabilizer for local and state economies. Finally, the economic impact of hospitals goes far beyond just the purchase of gauze and tubing. The provision of medical care allows for the citizens of a community to remain healthy and thus increases their productivity, wages and general quality of life.

Table 19. Total Economic Impact of Hospitals on the Missouri Economy — Employment

Region	Direct	Indirect	Induced	Total
Northwest	6,895	2,710	4,802	13,469
Northeast	2,581	998	1,631	4,745
Kansas City	30,074	13,408	20,916	59,162
West Central	4,634	1,615	2,791	8,494
Central	17,929	6,867	12,191	34,699
St. Louis	53,860	26,970	40,832	116,280
Southwest	6,177	2,453	4,295	11,995
Ozark	20,996	6,975	10,323	35,658
South Central	2,728	1,180	1,779	5,550
Southeast	9,742	3,666	6,322	19,149
Missouri	155,346	66,843	105,882	309,203

Table 20. Total Economic Impact of Hospitals on the Missouri Economy — Labor Income
(in thousands of dollars)

Region	Direct	Indirect	Induced	Total
Northwest	$537,570	$145,105	$206,202	$888,878
Northeast	$178,754	$53,508	$70,053	$302,314
Kansas City	$2,228,098	$718,990	$898,231	$3,845,319
West Central	$303,569	$87,163	$119,906	$510,638
Central	$1,298,920	$367,973	$523,558	$2,190,451
St. Louis	$4,217,036	$1,446,564	$1,753,494	$7,417,092
Southwest	$470,993	$131,275	$184,458	$786,727
Ozark	$1,085,307	$373,144	$443,314	$1,901,765
South Central	$178,270	$63,103	$76,399	$317,770
Southeast	$674,884	$197,510	$271,517	$1,143,911
Missouri	$11,173,402	$3,584,334	$4,547,131	$19,304,866

Table 21. Total Economic Impact of Hospitals on the Missouri Economy — Value Added

(in thousands of dollars)

Region	Direct	Indirect	Induced	Total
Northwest	$630,045	$232,569	$373,509	$1,236,125
Northeast	$213,488	$85,739	$126,893	$426,120
Kansas City	$2,686,028	$1,152,220	$1,627,066	$5,465,314
West Central	$362,706	$139,569	$217,200	$719,474
Central	$1,525,937	$589,665	$948,358	$3,063,960
St. Louis	$5,164,377	$2,318,370	$3,176,331	$10,659,077
Southwest	$558,720	$210,388	$334,122	$1,103,230
Ozark	$1,331,337	$598,133	$803,023	$2,732,493
South Central	$217,798	$101,147	$138,388	$457,332
Southeast	$810,913	$316,348	$491,828	$1,619,088
Missouri	$13,501,350	$5,744,146	$8,236,717	$27,482,213

Table 22. Economic Impact Multipliers by Region

Region	Employment	Labor Income	Value-Added
Northwest	1.95	1.65	1.96
Northeast	1.84	1.69	1.99
Kansas City	1.96	1.73	2.03
West Central	1.83	1.68	1.98
Central	1.95	1.69	2.01
St. Louis	2.16	1.75	2.06
Southwest	1.94	1.67	1.97
Ozark	1.70	1.75	2.05
South Central	2.03	1.78	2.09
Southeast	1.97	1.69	2.00
Missouri	1.99	1.73	2.04

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