



The Economic Impact of MUSC



Prepared For:

Medical University of South Carolina (MUSC)

Prepared by:

Joseph C. Von Nessen, Ph.D.

Research Economist

Darla Moore School of Business

University of South Carolina

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Executive Summary

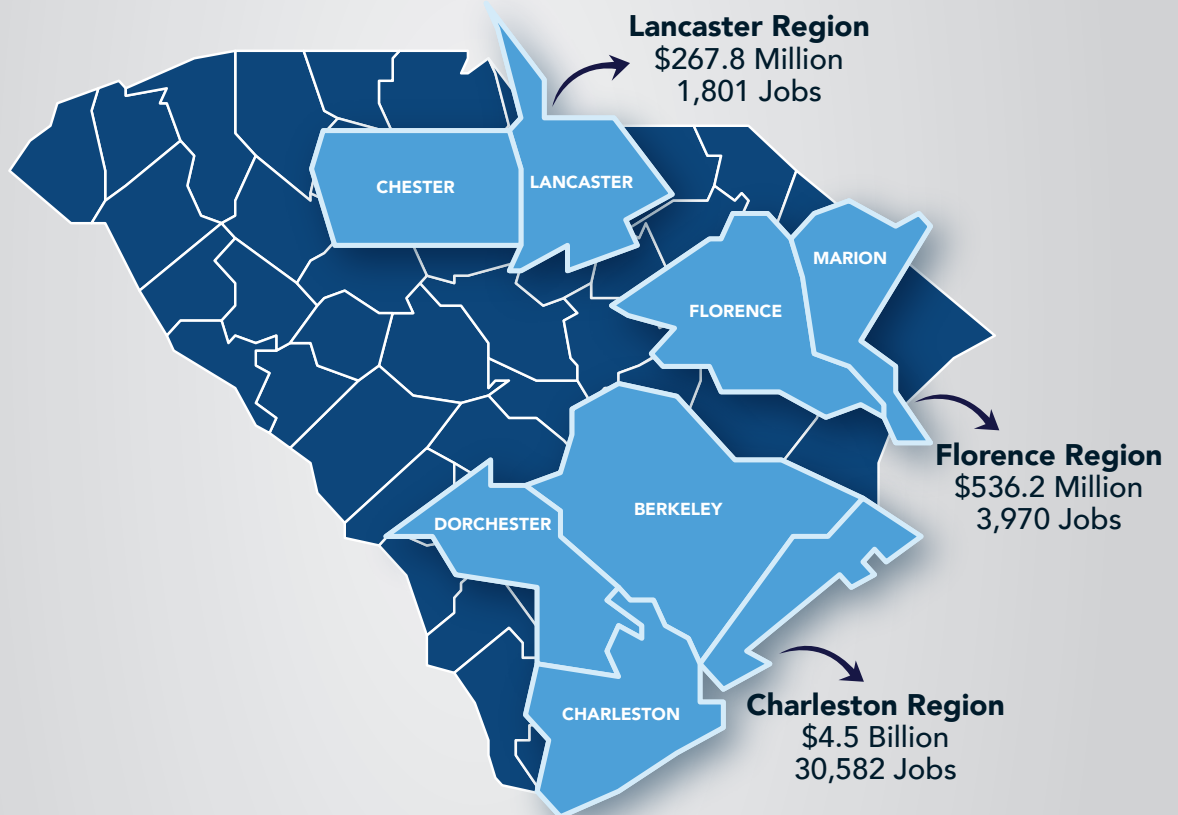
Note: The data used in this report, as well as the imagery throughout it, were collected and created prior to the COVID-19 pandemic. Due to the swift economic recovery of the MUSC enterprise since the pandemic began in March 2020, the information presented here is considered accurate and timely.

Since its founding in 1824, the Medical University of South Carolina (MUSC) has become a major economic driver for the state of South Carolina and the Tri-county region. MUSC is an academic medical center with a core tripartite mission that spans education, research and patient care. MUSC not only supports a sizable volume of economic activity through its role as a major employer that invests heavily in multiple regions across the state, it also plays a key role in educating future providers, supporting the health care needs of the community, and driving cutting-edge innovation and research. With the 2019 acquisition of four hospitals in Lancaster, Chester, Florence and Marion counties, MUSC also has the potential to expand its statewide impact even further, making sizable contributions to many rural areas of the state. The purpose of this study is to quantify specifically these economic and social benefits to South Carolina and its local regions. The key findings of this study are as follows:

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- The total annual economic impact of MUSC on South Carolina is approximately \$5.6 billion. This figure reflects the dollar value representing all final goods and services produced in the state that can be attributed, directly or indirectly, to MUSC. This level of economic activity also supports more than 38,000 jobs each year. Few organizations have an economic impact of this magnitude on South Carolina's economy.
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- The majority of MUSC's statewide impact occurs within the Charleston Tri-county region, where MUSC maintains an annual economic impact of approximately \$4.5 billion. This corresponds to 30,582 jobs and nearly \$1.9 billion in labor income that would not exist in the Tri-county region otherwise. The university component of MUSC, including its six colleges and associated research opportunities, contribute about 24% of this impact – or roughly \$1.1 billion annually.
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- MUSC's total economic impact also includes an employment multiplier of 2.1. For every 10 jobs created by MUSC, another 11 jobs, on average, are created elsewhere in South Carolina. This multiplier effect, which is normal for the health care industry, is significantly higher than that of the average industry in South Carolina.
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- The combination of MUSC's large employment base accompanied by an employment multiplier above that of the average industry makes MUSC a powerful economic engine for the Charleston economy. MUSC supports approximately 11% of the total employment base in Charleston and 42% of Charleston's health care industry. In addition, MUSC's Charleston-based expansion efforts in recent years have helped to drive the strong economic growth that Charleston has experienced relative to other major metropolitan areas in South Carolina.
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- Although the bulk of its total economic impact is contained within the Charleston Tri-county region, MUSC also has a broad reach that extends statewide. MUSC supports a large number of suppliers located throughout South Carolina, in addition to having acquired four regional hospitals in Lancaster, Chester, Florence and Marion counties that are now part of the MUSC Health system.
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- As a premier health organization focused on education, research and patient care, a sizable share of MUSC's employment base encompasses highly-skilled and educated health professionals that are an integral part of the state's knowledge economy. As a result, the average wage across all 38,168 jobs created directly and indirectly by MUSC is \$65,104, which is about 51% higher than that of the average job in South Carolina.

- The net annual contribution that MUSC makes to the South Carolina gross state product is approximately \$3.2 billion. This implies that MUSC generates economic activity, directly and indirectly, that brings in about \$149.6 million in tax revenue annually for the state of South Carolina.
- The demand for health care has been steadily rising in South Carolina throughout the 21st century, increasing from a 5.4% share of the state's economy in 2001 to 6.9% by 2018. This implies that the importance of the availability of high-quality medical care, like that provided by MUSC, will increase in the coming years.
- While a majority of MUSC patients are residents of the Charleston Tri-county region, more than 500,000 are South Carolina residents living elsewhere in the state. MUSC serviced more than 1.7 million total patient encounters in 2019, and with the acquisition of the four hospitals now comprising the Regional Health Network, MUSC is an even greater statewide medical provider.

The Economic Impact of MUSC South Carolina



Total Impact on South Carolina:

\$5.6 Billion

Total Employment:
38,168

Total Labor Income:
\$2.5 BILLION

Section I

Introduction

Since its founding in Charleston in 1824, the Medical University of South Carolina (MUSC) has become a major economic driver for the state of South Carolina and the Charleston Tri-county region. Focused on education, research and patient care, MUSC is the state's only comprehensive academic health sciences center, educating and training nearly 4,000 students and residents across six colleges. Comprising some 1,600 beds, more than 100 outreach sites, the MUSC College of Medicine, the physicians' practice plan and nearly 275 telehealth locations, MUSC Health owns and operates eight hospitals situated in Charleston, Chester, Florence, Lancaster and Marion counties. The more than 17,000 MUSC team members include world-class faculty, physicians, specialty providers and scientists who deliver groundbreaking education, research, technology and patient care.

As South Carolina's No. 1 ranked hospital by U.S. News & World Report, MUSC's impact results not only from its large workforce and student/resident base but also through the economic activity that emerges from the extensive supply chain network that MUSC supports throughout both the Charleston region and state that generates sizable economic ripple effects across many industries. These ripple effects include additional indirect job creation, which supports higher incomes for Charleston residents and a substantial increase in overall economic activity. Because of its ongoing growth and expansion, MUSC serves as one of the primary anchors for South Carolina's economy.

In addition, MUSC provides significant contributions to the state's knowledge economy, defined as the set of industrial sectors engaged in innovation and the commercialization of new ideas. For example, highly specialized medical professionals working at MUSC often combine the creative skills necessary for research and innovation with the practical applications of patient care. The intellectual talent required for jobs in these fields is highly sought after across the world. Regions with high concentrations of professionals working in the knowledge economy generate enormous human capital resources and knowledge spillover effects. More generally, regions in the U.S. with a large knowledge economy have typically grown at the fastest rates throughout the early 21st century.

Yet the impact of MUSC also goes beyond just economics. MUSC's footprint in the Charleston region is unique in that it offers both economic and social benefits in ways that most other organizations do not. MUSC not only supports a sizable amount of economic activity as a major employer that invests heavily in its local regions, but it also provides critical needs of the community – providing medical care, educating future health care workers and performing lifesaving research. Thus, MUSC is one of the few organizations that can enhance the quality of life for its community on multiple levels – enhancing the health of both the local economy and that of local residents. With the acquisition of the four hospitals in Lancaster, Chester, Florence and Marion counties, MUSC is expanding its statewide impact even further, making sizable contributions to many rural areas of the state.



The purpose of this study is to quantify both the economic and social impacts of MUSC on the state of South Carolina and on the three specific regions of Charleston, Lancaster and Florence.¹

This report is organized as follows:

- **Section II** provides an overview of the rise in demand for health care and education that has occurred in the United States in recent years and how these trends have been observed in South Carolina.
- **Section III** highlights the economic impact methodology used to quantify all estimates in this report.
- **Section IV** specifically documents the economic impact of MUSC on the regions of Charleston, Lancaster and Florence and the state of South Carolina as a whole, including all impacts resulting from the economic multiplier effect.
- **Section V** examines the role of MUSC in boosting long-run economic growth in South Carolina through its contribution to the knowledge economy.
- **Section VI** documents the social impact that MUSC provides through its high volume of patient care, education, and research.
- **Section VII** offers a brief conclusion.

¹ In this study, the Charleston region is defined as the counties of Berkeley, Charleston and Dorchester. The Lancaster region is defined as the counties of Lancaster and Chester. The Florence region is defined as the counties of Florence and Marion.

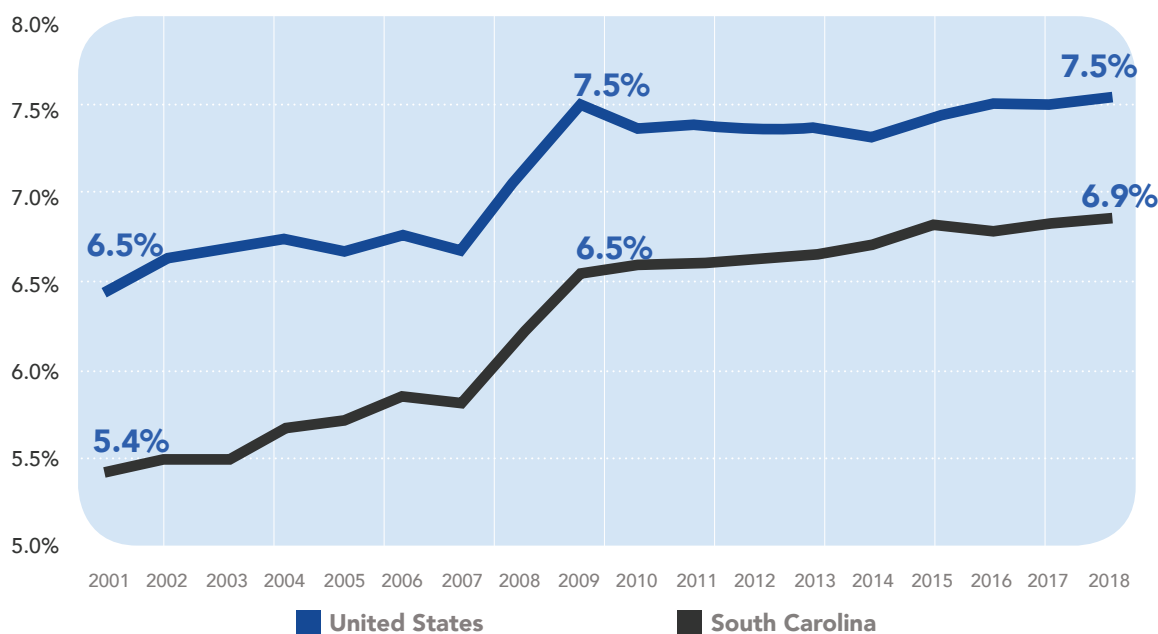
Section II

An overview of health care and education in South Carolina

Increases in demand in the 21st century: Health care

Health care is one of the largest industries in the economy, both at the state and national levels. In South Carolina, for example, health care is a \$14 billion industry that currently comprises approximately 6.9% of the state's economy. At the national level, health care has an even larger presence with a 7.5% share of the U.S. economy. Further, health care has been steadily rising as a share of both the state and national economies throughout the early 21st century. **Figure 1** specifically highlights this increase.

Figure 1 – Health care as a percentage of the S.C. and U.S. economies

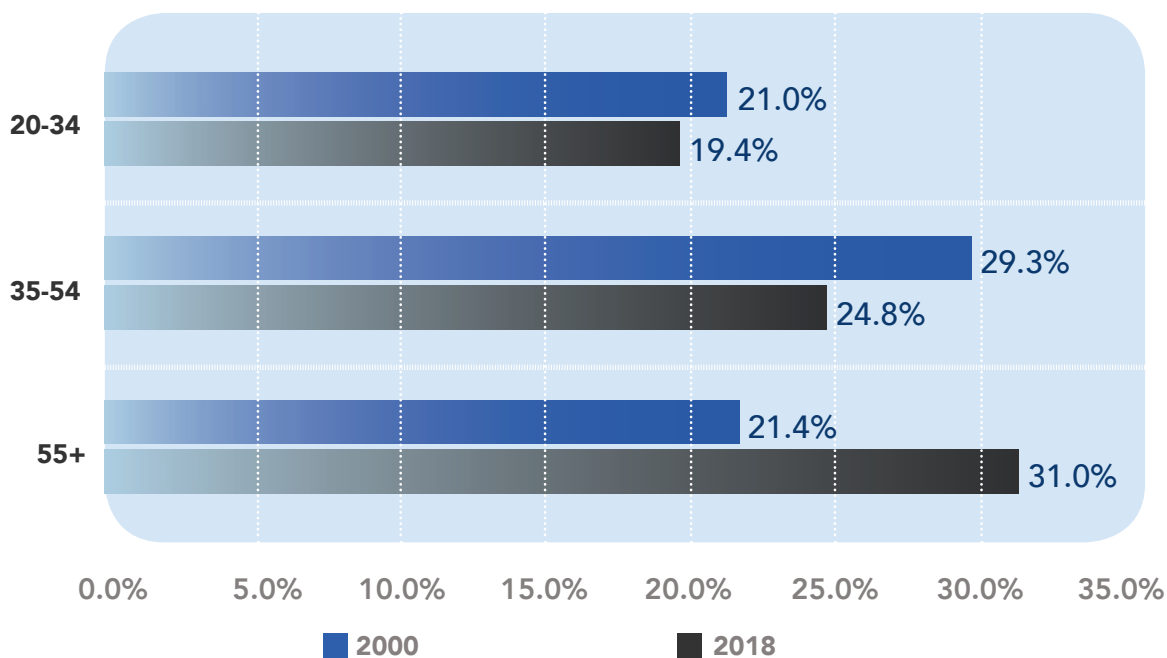


Note that **Figure 1** measures the share of health care in terms of the percentage of real (inflation adjusted) gross domestic product (GDP). This implies that the observed increases are primarily the result of a steady increase in demand for health care-related services. Perhaps the most prominent aspect of this trend is how the rise in demand is increasing at a faster rate in South Carolina than for the nation as a whole. The difference in the percentage of the economy that health care comprises in South Carolina and the United States drops from 1.1 percentage points in 2001 to 0.6 percentage points by 2018.



The increase in demand for health care-related services is largely due to the aging of the U.S. population and the accompanying retirement of the baby-boom generation. The U.S. Department of Labor projects that health care occupations and industries will have the fastest employment growth rates and add the most new jobs through – at a minimum – the year 2026.² **Figure 2** summarizes the trends for South Carolina’s aging population.

Figure 2 – Age distribution of the South Carolina population



Between the years 2000 and 2018, the percentage of South Carolinians ages 55 or above has risen from 21.4% to 31.0%. This represents an additional 720,000 senior residents for the state and an increase of nearly 45,000 senior residents in Charleston County alone.

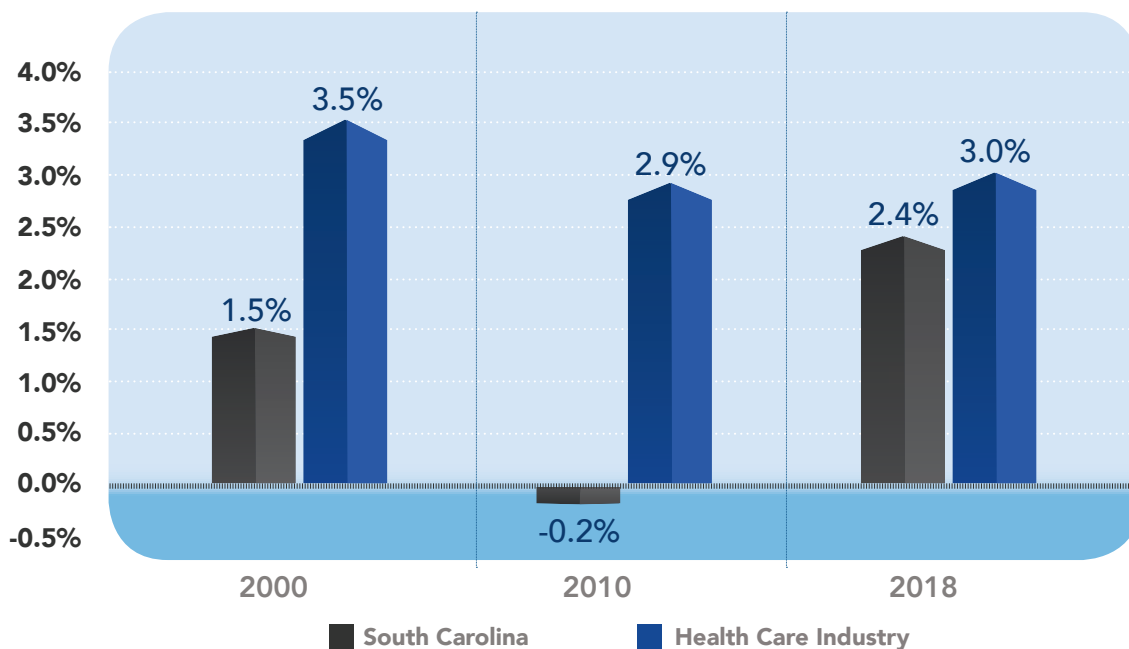
² U.S. Bureau of Labor Statistics – Occupational Outlook Handbook



A workforce profile of the South Carolina health care industry

The increase in demand for health care-related services in South Carolina has also led to an accompanying increase in demand for health care workers across a variety of occupations. **Figure 3** illustrates the extent to which overall employment growth in the health care industry has consistently outpaced that of South Carolina in recent years.

Figure 3 – South Carolina employment growth³



Further, as noted above, health care-related occupations are projected to have some of the highest growth rates through the year 2026. It is striking that while health care-related occupations represent 8.4% of the workforce, they represent two-thirds of the top 30 occupations projected to grow at the fastest rates through the year 2026, as shown in **Table 1**. In fact, MUSC provides the educational resources and infrastructure to serve much of this demand. In addition, a majority of these fast-growing health care occupations pay wages that are significantly above the average for South Carolina.

³ U.S. Bureau of Labor Statistics –Current Employment Statistics

Table 1 – South Carolina occupational growth rates: 2016-2026

*** Denotes health care-related occupations

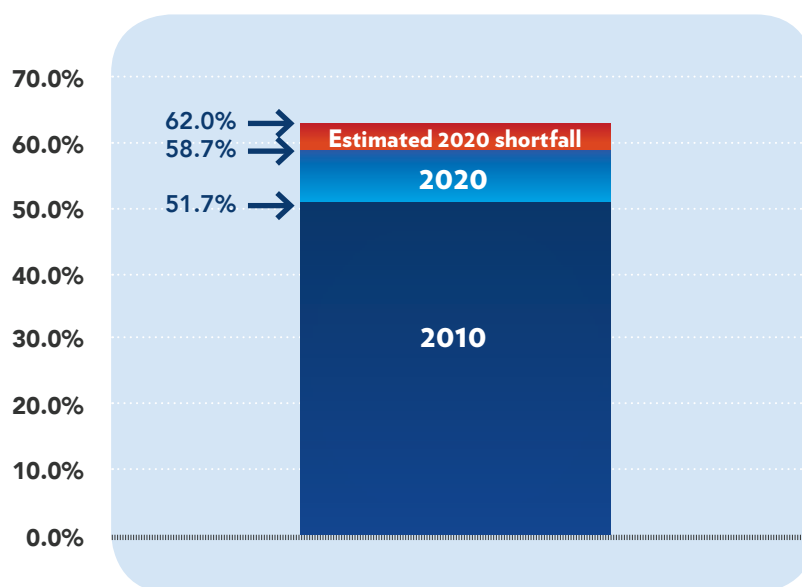
Occupation Description	Avg. Annual Growth Rate	Avg. Annual Wage
Home Health Aides***	3.9%	\$21,810
Physician Assistants***	3.5%	\$103,710
Nurse Practitioners***	3.3%	\$99,910
Statisticians	3.3%	\$68,320
Personal Care Aides***	3.3%	\$20,990
Operations Research Analysts	3.2%	\$76,670
Rail-Track Laying and Maintenance Equipment Operators	3.0%	\$39,250
Software Developers, Applications	2.9%	\$90,830
Physical Therapist Aides***	2.8%	\$30,440
Medical Assistants***	2.7%	\$32,120
Hearing Aid Specialists***	2.7%	\$53,690
Respiratory Therapists***	2.7%	\$55,990
Combined Food Preparation and Serving Workers, Including Fast Food	2.7%	\$18,910
Physical Therapist Assistants***	2.6%	\$56,880
Massage Therapists***	2.6%	\$41,440
Marriage and Family Therapists	2.6%	\$43,210
Physical Therapists***	2.5%	\$85,450
Health Specialties Teachers, Postsecondary***	2.5%	\$72,470
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	2.4%	\$51,870
Machine Feeders and Offbearers	2.4%	\$26,610
Bicycle Repairers	2.4%	\$28,280
Athletic Trainers***	2.4%	\$42,590
Occupational Therapists***	2.4%	\$78,470
Health Technologists and Technicians, All Other***	2.4%	\$42,820
Occupational Therapy Aides***	2.4%	\$29,330
Security and Fire Alarm Systems Installers	2.4%	\$40,720
Mental Health Counselors***	2.3%	\$35,330
Diagnostic Medical Sonographers***	2.3%	\$65,870
Occupational Therapy Assistants***	2.3%	\$64,060
Nursing Instructors and Teachers, Postsecondary***	2.3%	\$67,430
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Average Across All Occupations	1.1%	\$43,210

Given the current and projected growth trends for health care demand in South Carolina, the importance of MUSC will continue to grow in the coming years – both as a major economic driver for the Charleston region as well as one of the primary health care providers servicing the local and statewide populations.

Increases in demand in the 21st century: Education

In addition to the demand for health care-related services, the demand for education has also been steadily rising throughout the early 21st century in both South Carolina and the United States. Current estimates suggest that approximately 65 percent of jobs across the U.S. require some form of post-secondary education beyond high school. However, in South Carolina – as in most states – the current estimated educational attainment levels are below where they would need to be to fully satisfy this demand. This has generated an ongoing workforce shortage. For example, while an average of 62 percent of all new jobs require post-secondary education in South Carolina, current educational attainment levels show that the Palmetto State falls short of this need by about 3.3 percentage points, as **Figure 4** illustrates.

Figure 4 – Percentage of South Carolinians with post-secondary education⁴

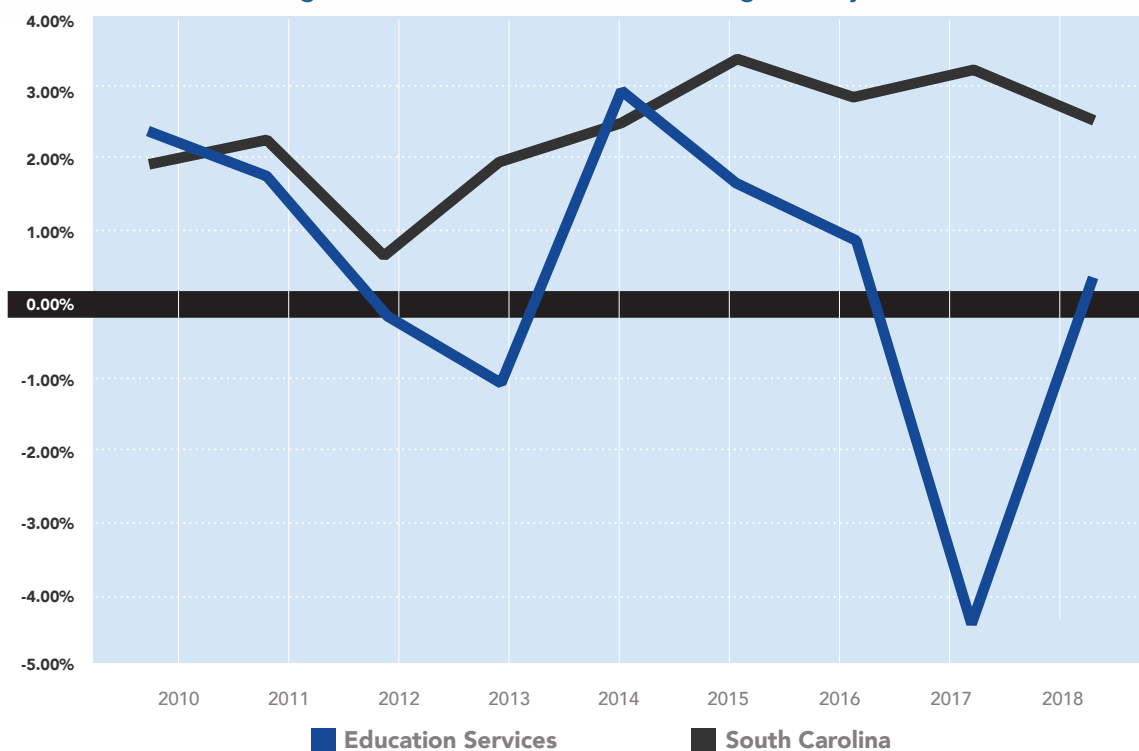


Nevertheless, despite this shortage, South Carolina has made sizable gains in educational attainment over the past decade, increasing the percentage of residents with a post-secondary education from 51.7% in 2010 to 58.7% in 2020. This has been accomplished even in an environment in which the growth rate of the education sector has consistently lagged behind that of the state as a whole. As **Figure 5** shows, this has been especially true since 2015.

⁴ Source: Georgetown Public Policy Institute Center on Education and the Workforce - and the U.S. Census Bureau



Figure 5 – South Carolina annual GDP growth by sector⁵



These trends highlight a second important contribution that MUSC makes to the state of South Carolina – namely improving educational attainment in South Carolina and helping the state meet its workforce demand through the ongoing activities across all six colleges as well as all accompanying research opportunities.

⁵ Source: U.S. Bureau of Economic Analysis

Section III

Economic impact methodology

As a comprehensive academic health sciences center and leading medical institution, MUSC employs a large workforce and supports an extensive supply chain network throughout the Charleston region and across the state of South Carolina in order to facilitate its ongoing operations. The purchases made by MUSC through various expenditures with local businesses and through wages and salaries paid to employees introduce new spending activity to the Charleston Tri-county region and to South Carolina that would not exist otherwise. As a result, the presence of MUSC provides a stable base of activity that also helps contribute to long-run economic growth.

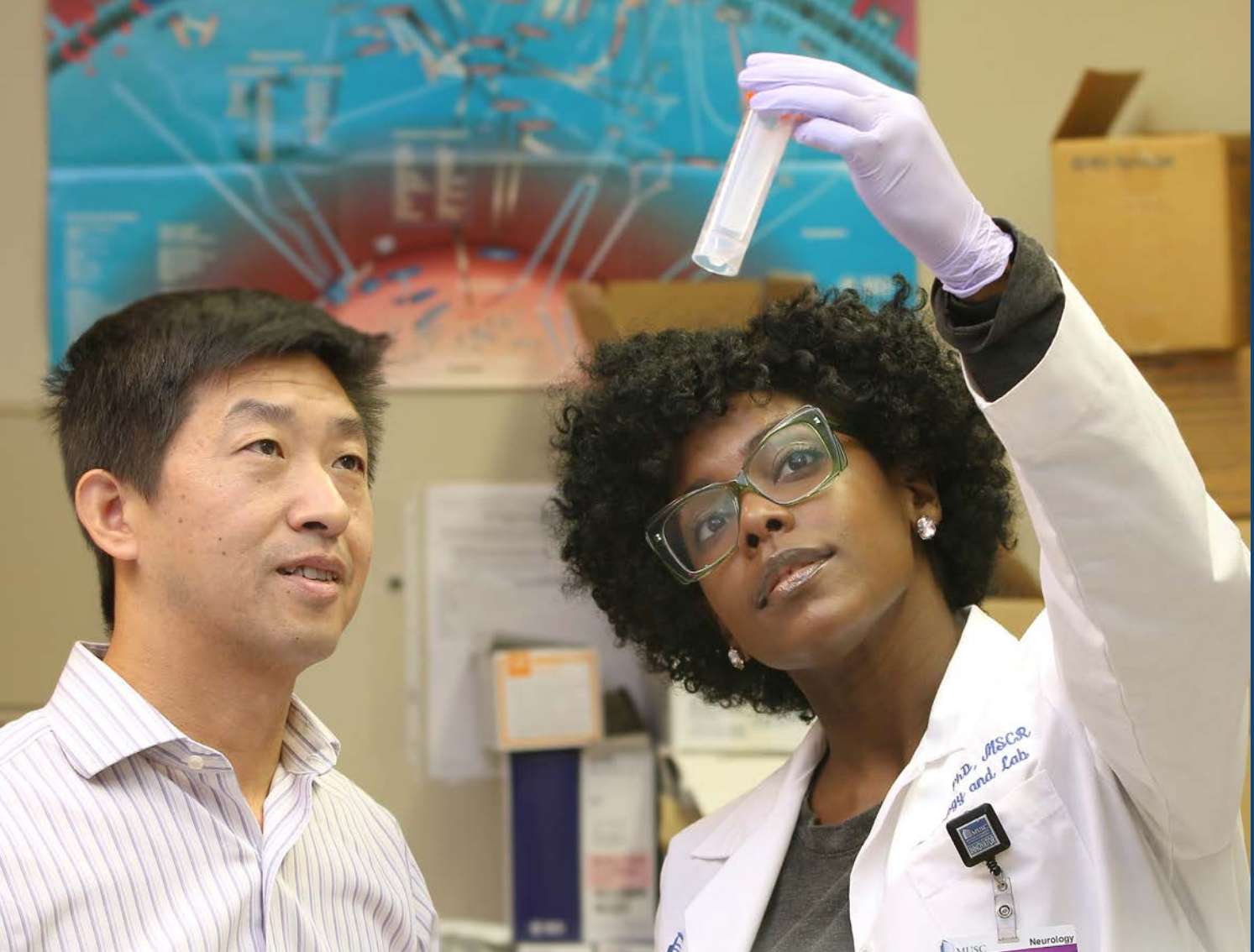
Yet these activities do not provide a complete picture of MUSC's impact on the local economy. The expenditures that occur as part of MUSC's ongoing operations represent direct economic activity within the regions in which they are made. However, these expenditures also lead to additional job creation and economic activity throughout the local area by way of the economic multiplier effect – or economic ripple effect.

Economic multiplier effects can be divided into direct, indirect and induced impacts. The direct effect represents the initial change in economic activity. This includes, for example, the initial dollars that are injected into Charleston's economy directly resulting from operational expenses on the part of MUSC. This would include any employee wages and benefits, medical devices or equipment, office supplies or other overhead and administrative costs. This spending increases demand for goods and services and leads to the creation of new jobs and higher incomes for employees and suppliers.

The indirect effect reflects all of the additional economic impacts resulting from interindustry linkages between other local businesses statewide. For example, consider the purchase of construction materials that MUSC may make for on-campus maintenance. In this situation, the construction materials vendor would, as a result of MUSC's purchase, experience an increase in demand. This would require this construction materials vendor to purchase additional raw materials to accommodate the new increase in demand and, potentially, to hire additional employees if the increase in demand were sufficiently high. The suppliers of the construction materials vendor would then experience an increase in demand and have to purchase additional inputs as well – and so on. These indirect effects ripple through the economies both locally and throughout South Carolina.

The induced effect reflects additional economic activity that results from increases in the spending of household income. For example, when the aforementioned construction materials vendor hires new workers to satisfy an increase in demand, these workers will earn incomes. They will then spend part of their new incomes locally, for example, on food, entertainment or housing. These industries will then see an increase in demand for their goods and services, which will lead to higher incomes for some of their employees, part of which will also be spent locally.





These successive rounds of indirect and induced spending do not go on forever, which is why a specific value can be calculated for each of them. In each round, money is “leaked out” for a variety of reasons. For example, firms may purchase some of their supplies from vendors located outside of Charleston. In addition, employees may save part of their incomes or spend part of them with firms located elsewhere. In order to determine the total economic impact that will result from an initial direct impact, economic multipliers are used. An economic multiplier can be used to determine the total impact – direct, indirect or induced – that results from an initial change in economic activity – the direct impact. Multipliers are different in each sector of the economy and are largely determined by the size of the local supplier network as well as the particular region being examined. In addition, economic multipliers are available to calculate not just the total impact but also the overall employment and income levels associated with the total impact.

To estimate the economic impacts in this study, this study used a detailed structural model, known as an input-output model, of South Carolina that contains specific information on economic linkages between all industries within the state. Four separate input-output models were used to estimate all listed impacts for the regions of Charleston – Berkeley, Charleston and Dorchester counties; Florence – Florence and Marion counties; Lancaster – Lancaster and Chester counties; and the state of South Carolina as a whole. This study utilized the input-output modeling software IMPLAN to calculate all estimates.

Section IV

The economic impact of MUSC on South Carolina

Although primarily concentrated within the Charleston Tri-county region, the economic impact of MUSC nevertheless extends across the Palmetto State. Moreover, in addition to its physical locations across the state, MUSC has also expanded access to care through its telehealth programs. In 2019, MUSC had 435,000 encounters across 419 telemedicine sites.

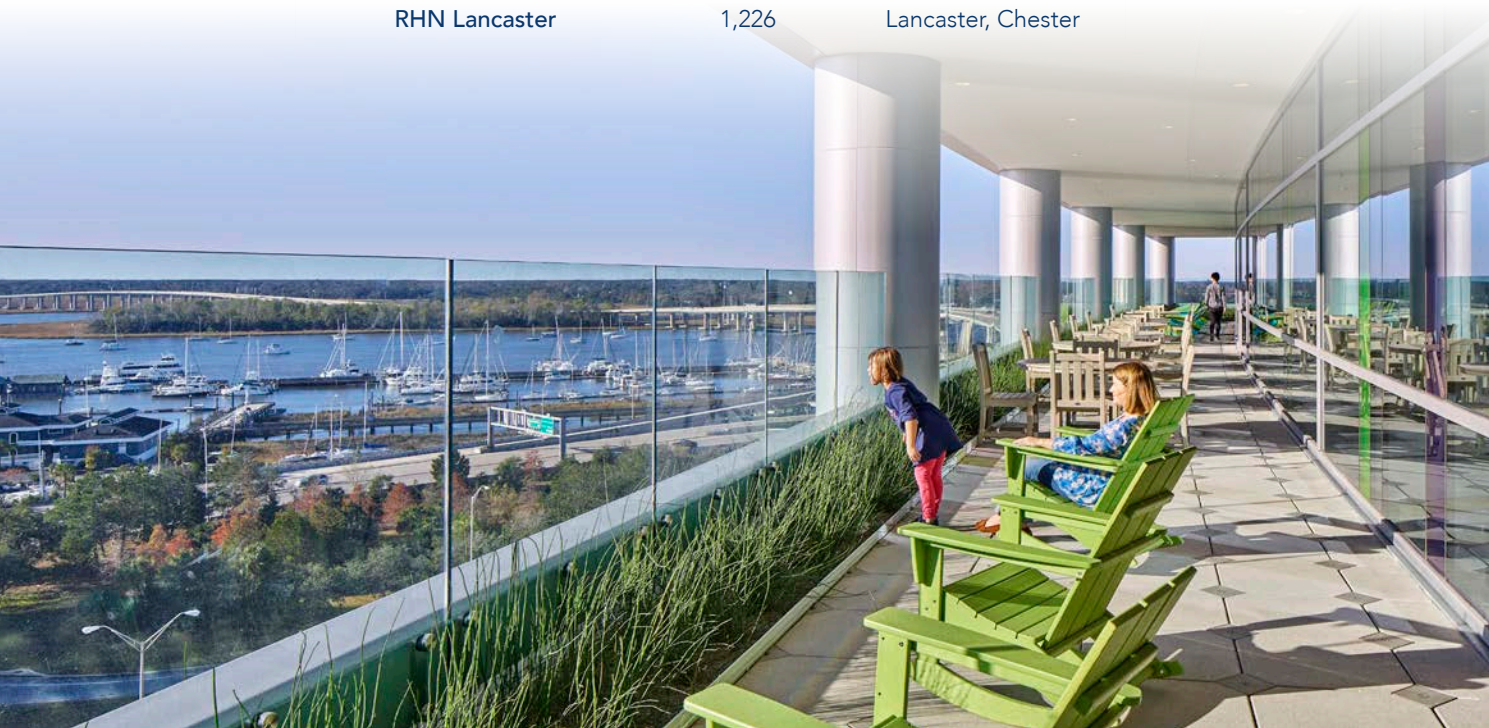
In order to complete a comprehensive assessment of MUSC’s total economic impact, for the purposes of this report, MUSC is divided into four separate segments:

- **MUSC Health – University Health Network (UHN) – Charleston**
- **The Medical University**
- **MUSC Regional Health Network (RHN) – Florence**
- **MUSC Regional Health Network (RHN) – Lancaster**

Table 2 highlights the seven counties in which the MUSC facilities associated with each segment are located.

Table 2 – Counties in which MUSC maintains a direct presence

MUSC Segment	Direct FTE Employment	South Carolina Counties
MUSC Health	9,043	Berkeley, Charleston, Dorchester
Medical University	5,210	Berkeley, Charleston, Dorchester
RHN Florence	2,307	Florence, Marion
RHN Lancaster	1,226	Lancaster, Chester





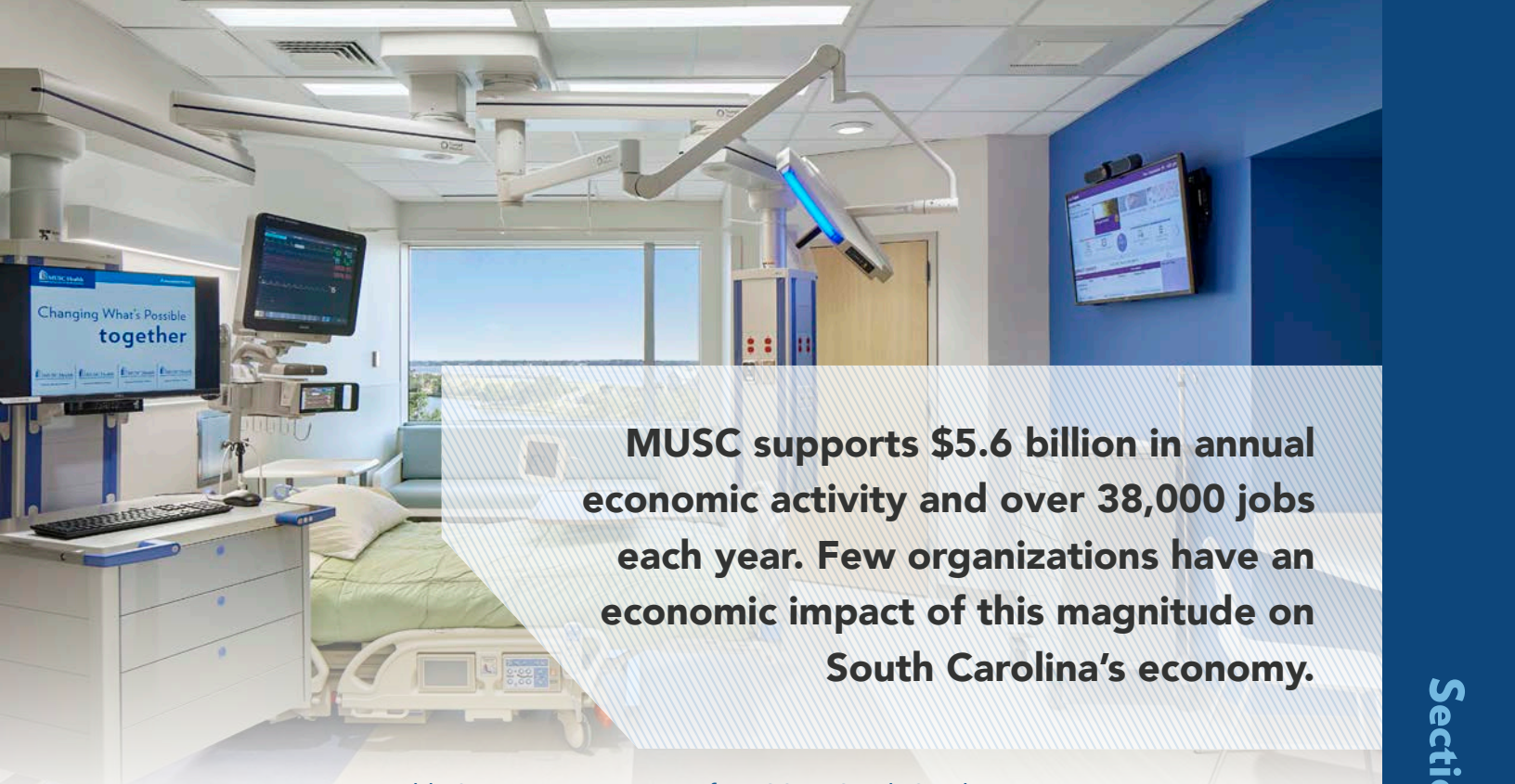
During fiscal year 2019 (FY 2019), MUSC employed a workforce of 17,786 FTEs accompanied by total nonlabor expenditures in South Carolina of \$391.4 million.⁶ These nonlabor expenditures include capital equipment purchases, professional services, construction/remodeling efforts, temporary employees and other general operating expenses. The majority of these nonlabor expenditures occur within the seven counties in which the MUSC facilities are located as denoted in **Table 2**.

The structural input-output models estimate economic impacts in terms of three specific measures: economic output, employment and labor income. Economic output is simply defined as the dollar value of the final goods and services purchased that can be attributed, directly or indirectly, to all ongoing operations associated with MUSC. It can also be thought of as an aggregate measure of total spending resulting from an initial direct expenditure. Because it includes all spending by consumers and businesses on both goods and services, it is an all-inclusive measure of the impact on total economic activity. Employment measures the impact on jobs in terms of the total number of FTE positions. Labor income represents total employee compensation, including wages, salaries and benefits.

As described above, during FY 2019, MUSC employed 17,786 FTE employees, with an accompanying \$391.4 million in nonlabor expenditures in South Carolina.⁷ These direct economic impacts also lead to indirect and induced impacts through increases in demand for goods and services in other related industries and through increases in household spending activity – all of which are estimated using economic multipliers. Each impact is reported in **Table 3**, along with the accompanying totals. These totals represent MUSC's overall impact on the state of South Carolina.

⁶ FTE refers to the number of "full-time equivalent" employees.

⁷ Each nonlabor expenditure provided by MUSC was first categorized into a specific North American Industry Classification System (NAICS) code and then incorporated into each region's input-output model where appropriate.



MUSC supports \$5.6 billion in annual economic activity and over 38,000 jobs each year. Few organizations have an economic impact of this magnitude on South Carolina's economy.

Table 3 – Economic impact of MUSC on South Carolina

	Employment	Labor Income	Economic Output
Direct Impact	17,786	\$1,263,249,289	\$2,993,043,065
Indirect Impact	10,252	\$674,211,743	\$1,337,206,454
Induced Impact	10,130	\$547,422,506	\$1,272,676,137
Total Impact	38,168	\$2,484,883,538	\$5,602,925,656

The 17,786 FTE employees that live and work in South Carolina, along with all associated nonlabor expenditures, generate approximately \$3 billion in annual economic output. This level of direct economic activity leads to indirect effects totaling approximately \$1.3 billion in economic output and 10,252 jobs. These estimates reflect the increased demand for goods and services of local suppliers resulting from in-state expenditures on the part of MUSC. The direct economic activity also leads to induced effects totaling another \$1.3 billion in economic output and 10,130 jobs. This is a reflection of economic activity in South Carolina generated across all industries that is the result of increased household spending. The combination of the direct, indirect and induced effects leads to a total economic impact of approximately \$5.6 billion, which is associated with 38,168 jobs across South Carolina.

One primary takeaway from the **Table 3** results is simply to note the sheer volume of economic activity that MUSC supports as one of the state's largest employers. Additionally, **Table 3** reveals that MUSC's total impact is associated with a statewide employment multiplier of 2.1. This implies that for every 10 jobs that are supported directly by MUSC, an additional 11 jobs are created elsewhere in South Carolina. This multiplier effect, which is normal for the health care industry, is significantly higher than that of the average industry in South Carolina.⁸ This combination of a large direct employment base accompanied by an employment multiplier above that of the average industry makes MUSC a powerful economic engine in South Carolina. MUSC supports \$5.6 billion in annual economic activity and more than 38,000 jobs each year. Few organizations have an economic impact of this magnitude on South Carolina's economy.

⁸ The average employment multiplier across all industries in South Carolina is 1.6.



Economic contributions to state tax revenue

Another major impact of MUSC comes from the increase in state tax revenue that results from the economic activity it supports. As summarized in **Table 3**, MUSC's total economic impact on the state is approximately \$5.6 billion annually.

Historically, every additional dollar that is generated in economic activity, or nominal gross state product, within South Carolina also generates 4.7 cents in new state tax revenue.⁹ By applying this figure to the economic activity MUSC generates, the tax revenue from this total volume of activity can be estimated.¹⁰ **Table 4** displays these results, which show that the annual total estimated tax revenue from MUSC is approximately \$149.6 million.

Table 4 – Annual state tax revenue derived from MUSC

Category	Dollar Value
Estimated Economic Output for South Carolina	\$5,602,925,656
Estimated Tax Revenue Generated for South Carolina	\$149,628,261

The Economic impact of MUSC on Charleston

The bulk of MUSC's \$5.6 billion economic impact on South Carolina is concentrated within the Charleston Tri-county region. As noted above, the university educates and trains nearly 4,000 students and residents and brings in more than \$284 million in research funding annually. MUSC Health – University Hospital includes a 790-bed medical center, nationally recognized children's hospital with an 82-bed neonatal intensive care unit (NICU), NCI-designated Hollings Cancer Center, Level 1 trauma center, Institute of Psychiatry and South Carolina's only transplant center. **Table 5** documents the total economic impact of MUSC, including MUSC Health and the Medical University, on the Charleston Tri-county region while **Tables 6 and 7** break down each segment separately.

⁹ The historical relationship between the South Carolina nominal gross state product and South Carolina general funds revenue, as measured and tracked by the South Carolina Board of Economic Advisors, was estimated by the Division of Research using industry-standard time-series regression techniques.

¹⁰ Economic output represents the value of industry production and is therefore not synonymous with gross state product. As such, the dollar value of all intermediate inputs was subtracted from economic output before the 4.7-cent estimate was applied to estimate total tax revenue.

Table 5 – Economic impact of the MUSC enterprise on the Charleston Tri-county region

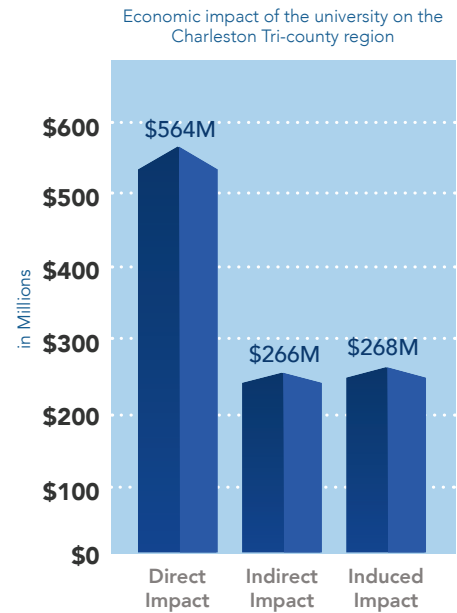
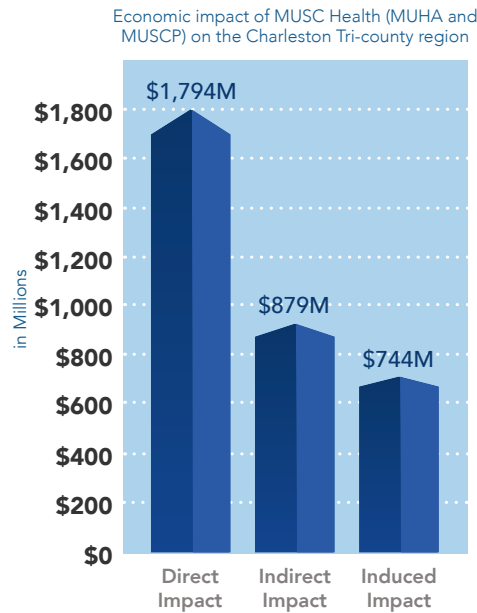
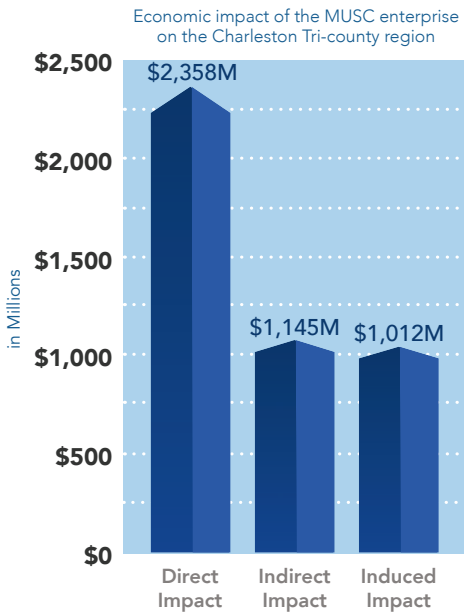
	Employment	Labor Income	Economic Output
Direct Impact	14,253	\$1,074,192,826	\$2,357,597,190
Indirect Impact	8,504	\$461,168,860	\$1,144,662,198
Induced Impact	7,825	\$345,229,702	\$1,011,769,094
Total Impact	30,582	\$1,880,591,388	\$4,514,028,482

Table 6 – Economic impact of MUSC Health (MUHA and MUSCP) on the Charleston Tri-county region

	Employment	Labor Income	Economic Output
Direct Impact	9,043	\$759,865,782	\$1,794,010,697
Indirect Impact	6,634	\$366,222,282	\$878,528,738
Induced Impact	5,756	\$253,925,566	\$744,178,430
Total Impact	21,433	\$1,380,013,630	\$3,416,717,865

Table 7 – Economic impact of the university on the Charleston Tri-county region

	Employment	Labor Income	Economic Output
Direct Impact	5,210	\$314,327,044	\$563,586,492
Indirect Impact	1,869	\$94,946,578	\$266,133,460
Induced Impact	2,070	\$91,304,136	\$267,590,663
Total Impact	9,149	\$500,577,758	\$1,097,310,615





Each year, as **Table 5** shows, MUSC generates a total economic impact of approximately \$4.5 billion within the Charleston Tri-county region. This reflects the dollar value representing all final goods and services produced in Charleston that can be attributed, directly or indirectly, to the ongoing activities of MUSC, including both MUSC Health and the Medical University. This is associated with approximately 30,582 jobs and nearly \$1.9 billion in labor income for Charleston residents.

The approximately \$2.4 billion in direct economic output leads to an additional \$2.1 billion through the economic multiplier effect. This multiplier effect is the estimated total dollar value of the increased demand for goods and services of local suppliers as well as the total increase in household spending that occurs across a variety of industries in the area. The combination of these impacts leads to a total impact of \$4.5 million on Charleston. **Table 5** also details the multiplier effects associated with all labor income and employment impacts. The \$2.1 billion in additional economic output associated with all indirect and induced effects is estimated to generate 16,329 additional jobs in Charleston, working to fill the increased demand for industry-related local suppliers and increased household spending, which also supports an additional \$806.4 million in labor income.

In a similar fashion, **Tables 6 and 7** break down the direct, indirect and induced effects of MUSC Health and the Medical University independently. Of MUSC's total impact on Charleston, approximately 76% – or roughly \$3.4 billion in annual economic output – comes about from the activities of MUSC Health.

Employment quantity and employment quality

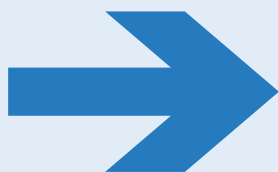
The primary means by which economists measure the strength of a local region, or state, is through its rate of employment growth and income growth. Simply put, a regional economy does well when it is producing new jobs and generating wage gains for existing jobs at a relatively rapid pace. Thus, both job quantity and job quality matter if the goal is to produce healthy, long-run economic growth.

By these measures, MUSC's economic impact on the Charleston economy cannot be overstated. The estimates documented in **Tables 5 through 7** imply that MUSC supports approximately 11% of the total employment base in Charleston and 42% of Charleston's health care industry. In addition, MUSC's expansion efforts in recent years have helped drive the strong economic growth rates that Charleston has experienced, which have been the highest growth rates among all South Carolina regions for much of the last decade. For example, MUSC's total employment impact has increased by an average of 3.3% per year between 2016 and 2019 while the Charleston economy and South Carolina as a whole have experienced 2.9% and 2.4% employment growth during this same time period, respectively.

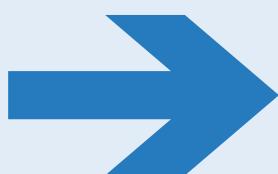


MUSC supports approximately 11 percent of the total employment base in Charleston and 42 percent of Charleston's health care industry

MUSC's contribution to employment quantity



11% of all jobs in Charleston

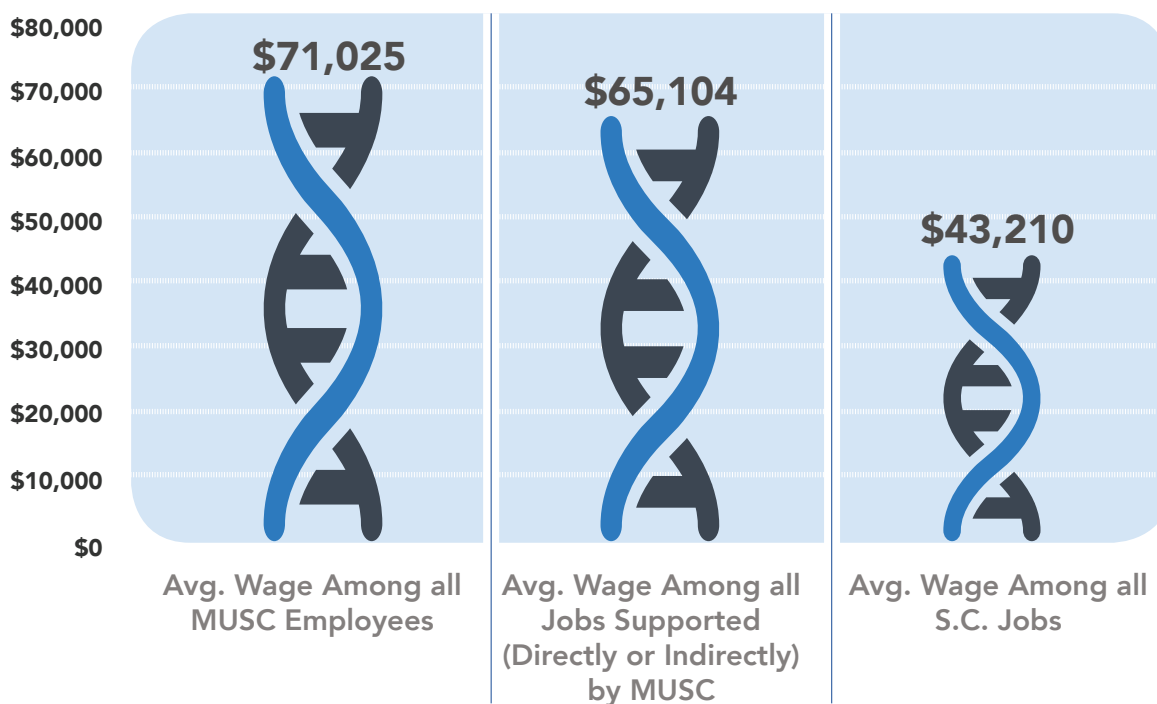


42% of all jobs in the Charleston health care industry



MUSC's contribution to high-employment quality can be observed by examining the wage levels among all jobs supported, both directly and indirectly, by MUSC throughout South Carolina. As a premier health care organization focused on education, research and patient care, a sizable majority of the employment base at MUSC encompasses highly-skilled and educated medical professionals. As such, the average annual wage of all MUSC employees greatly exceeds that of South Carolina as a whole – by approximately 64%. Put another way, MUSC creates jobs that pay workers about 64% more than that of the average job in South Carolina. Moreover, this wage premium is not just limited to the direct employees of MUSC. ***The average wage across all 38,168 jobs that are created directly and indirectly by MUSC statewide is approximately 51% higher than that of the average job in South Carolina.*** Figure 6 illustrates these wage comparisons.

Figure 6 – MUSC contributions to employment quality





The economic impact of the MUSC Regional Health Network

In 2019, MUSC finalized the purchase of four community hospitals, which significantly expanded its economic presence and impact in South Carolina. Specifically, MUSC now owns and operates a Regional Health Network (RHN), which comprises MUSC Health Florence Medical Center, MUSC Health Marion Medical Center, MUSC Health Lancaster Medical Center and the MUSC Health Chester Medical Center. As their names indicate, these four hospitals are located in their respective counties. This purchase represents the first time in MUSC's history that it has acquired external hospitals, thereby increasing the number of employees working for MUSC by nearly 25% and doubling the number of beds across the entire MUSC Health network.

This acquisition also provides a significant opportunity for MUSC to make major contributions to the more rural areas of South Carolina where these hospitals are located. Two predominant reasons account for this. First, any given physical or human capital investment in a rural region is likely to provide a disproportionately large impact to that region because of the relatively small size of its local economy. More directly, any expansion of a medical facility in a rural area of South Carolina will have a larger positive impact on that region than a similar expansion in one of the major metropolitan regions of the state. Second, there are simply more opportunities in rural areas of South Carolina to provide additional specialized services and care to the local population that did not previously exist.

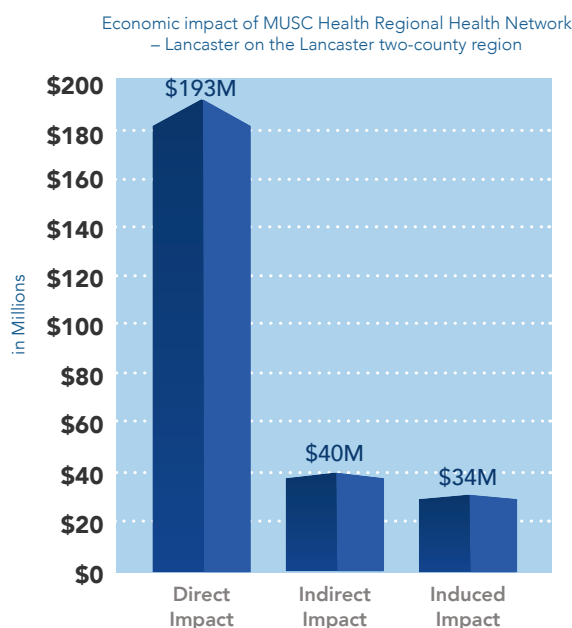
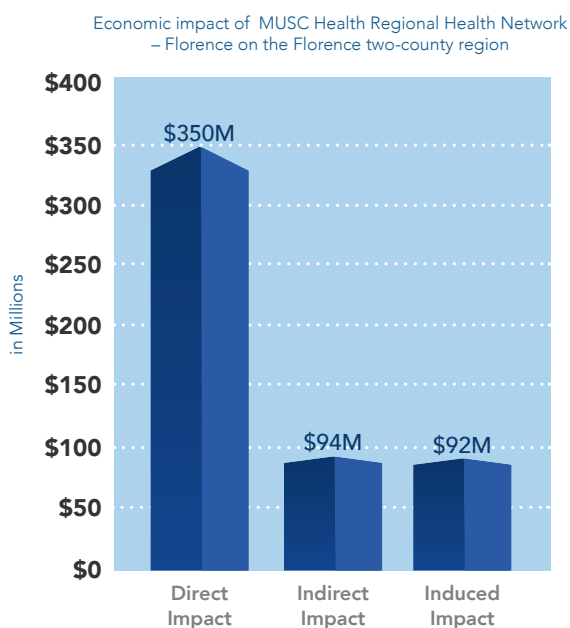
For the purposes of this report, the economic impact of this new RHN is broken down into two regions – RHN Florence and RHN Lancaster. These estimates are displayed in **Tables 8 and 9**.

Table 8 – Economic impact of MUSC Health Regional Health Network – Florence on the Florence two-county region

	Employment	Labor Income	Economic Output
Direct Impact	2,307	\$126,277,812	\$350,137,392
Indirect Impact	866	\$34,138,169	\$93,867,215
Induced Impact	797	\$28,978,034	\$92,207,579
Total Impact	3,970	\$189,394,015	\$536,212,186

Table 9 – Economic impact of MUSC Health Regional Health Network – Lancaster on the Lancaster two-county region

	Employment	Labor Income	Economic Output
Direct Impact	1,226	\$62,778,651	\$192,902,615
Indirect Impact	305	\$18,810,997	\$40,449,989
Induced Impact	270	\$10,502,536	\$34,495,869
Total Impact	1,801	\$92,092,184	\$267,848,473



RHN Florence – the MUSC Health Medical Centers in Florence and Marion counties – generates a total economic impact of approximately \$536.2 million within the two-county region each year. This is associated with approximately 3,970 jobs and nearly \$190 million in labor income for local residents. Similarly, RHN Lancaster generates a total economic impact of roughly \$267.8 million within the two-county region of Lancaster and Chester counties each year. This is associated with approximately 1,801 jobs and \$92.1 million in labor income for local residents.

Just as MUSC provides a substantial contribution to the Charleston economy, as previously outlined, so too does the RHN support the economies of Florence, Marion, Lancaster and Chester counties. More specifically, MUSC supports, directly or indirectly, approximately 6.8% of the total employment base – or about 1 in every 15 jobs – across these four counties.

Section V

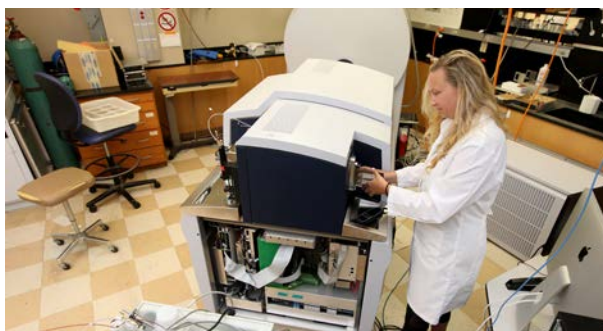
MUSC and the knowledge economy

MUSC offers a number of economic advantages to Charleston and the state of South Carolina as a whole that go well beyond traditional impact measures such as job and income creation, total economic output and state tax revenue. First, MUSC introduces a significant demand for high-wage, high-skill jobs in various health care-related fields. Much of this impact has already been documented in Section IV.

Second, MUSC is contributing to the development of the state's knowledge economy. The knowledge economy generally consists of industrial sectors that require innovation and technological development along with the commercialization of new ideas. This process – innovation and commercialization – is what leads to long-run economic growth and development. Regions with high concentrations of workers in the knowledge economy generate large volumes of human capital resources and knowledge spillover effects. In the United States, regions with a well-educated workforce and a strong innovation sector are those that are growing the fastest and have workers who are among the most productive, creative, innovative and well paid in the country.¹¹

Third, the knowledge economy is a key factor in improving a region's rate of productivity growth. Regional economies have two primary ways of boosting long-run economic growth: increasing labor force growth and increasing productivity growth. Because of current demographic trends in the United States, any attempt to boost economic growth significantly by increasing the size of the labor force will likely have minimal effects.¹² This implies that the primary strategy for increasing long-run economic growth should be boosting productivity. This, in turn, implies that growth in the knowledge economy should be at the forefront of economic development efforts.

The contributions that MUSC makes to the knowledge economy in South Carolina can be observed directly.¹³ For example, **Figure 7** illustrates that approximately 56.1% of all jobs supported, directly or indirectly, by MUSC are considered part of the knowledge economy. By contrast, this percentage is just 17.6% for South Carolina as a whole. MUSC, therefore, represents a sizable portion of the knowledge economy base both at the local and state levels.

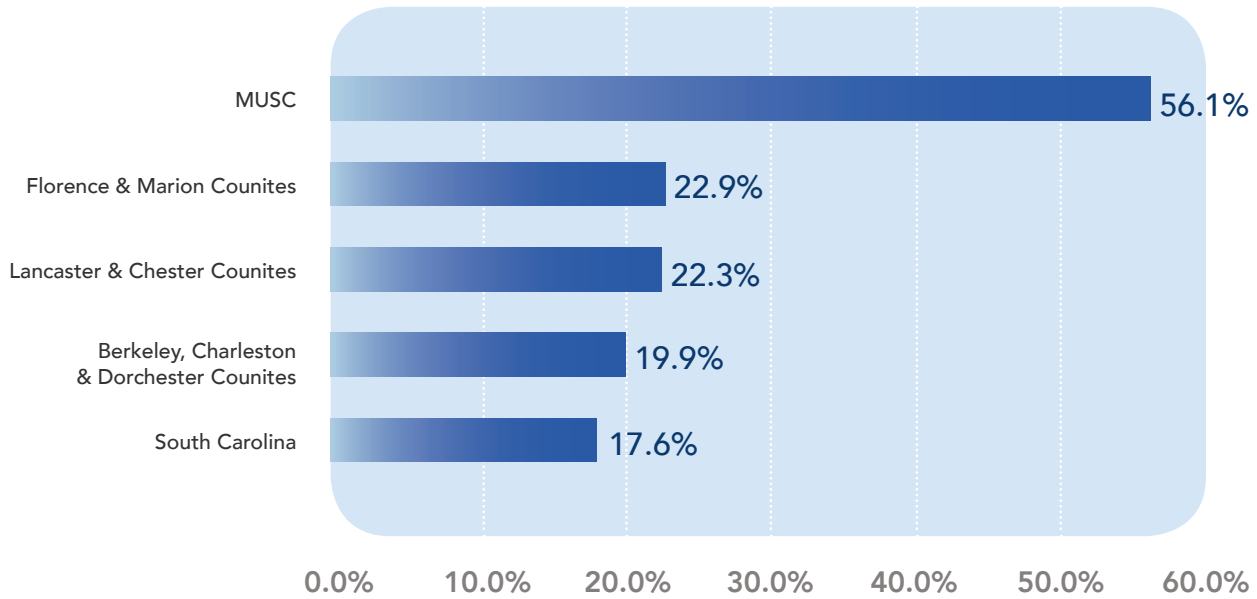


¹¹ For a full discussion on the benefits of knowledge economies in the United States, see Moretti, E., (2012). "The New Geography of Jobs." New York: Houghton Mifflin Harcourt.

¹² These demographic trends include, among other things, the aging and retiring of the baby-boom generation.

¹³ Although the knowledge economy is typically defined as a specific set of occupations, occupational data are not available for analysis at the county level. As a result, this study defines the knowledge economy by the industry-level NAICS codes 54 and 62, which approximate the occupational definitions that are normally used.

Figure 7 – Percentage of workers in the knowledge economy



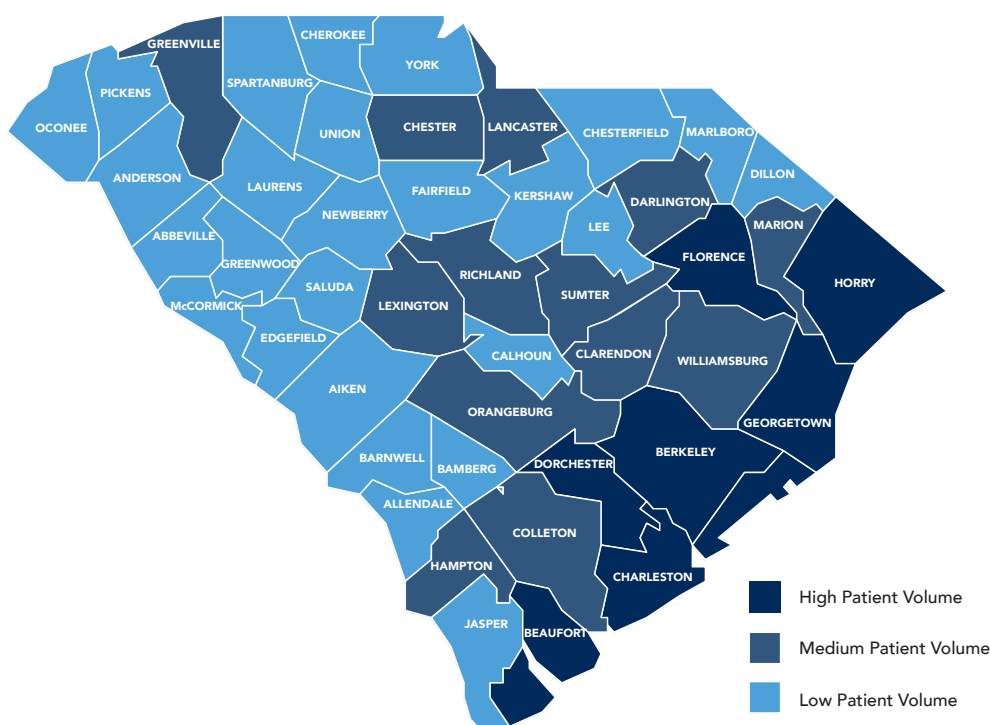
Section VI

The social impact of MUSC

In addition to the employment of local residents and spending with local business suppliers, the presence of MUSC also offers wider societal benefits for the surrounding communities. For example, MUSC plays a key role in educating future providers, supporting health care needs, driving cutting-edge innovation and research, and fostering community investment. Moreover, it is widely recognized within the economics literature that health performance and economic performance are interconnected. Since health is a fundamental component of human capital, and human capital contributes to economic growth, having a healthy workforce is essential for economic growth. The Centers for Disease Control and Prevention (CDC) estimates that the indirect costs associated with chronic health conditions and unhealthy behaviors reduce worker productivity and cost U.S. employers more than \$36 billion per year.¹⁴

Between hospital care, emergency room visits and physician office visits, MUSC serviced more than 1.7 million patient encounters during 2019. Approximately 42% of all encounters were for residents of Charleston County, while 14% of these encounters served patients from Berkeley County and 13% served patients from Dorchester County. **Figure 8** breaks down patient volume by county into high-, medium - and low-volume categories. It is also important to note that with the acquisition of the four hospitals that now comprise the RHN, this current distribution of patient encounters will likely change over the next several years. Additionally, through its 419 telehealth sites across South Carolina, MUSC had 435,000 patient encounters in 2019, allowing it to extend quality care even further.

Figure 8 – Distribution of the MUSC patient population



¹⁴ <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/workplace-health.htm>

Section VII

Conclusion

MUSC has been a major contributor to the economy of the Charleston Tri-county region, as well as to South Carolina as a whole, since its founding in 1824. Not only does MUSC provide a significant volume of economic activity for the community through its high-employment base and major local investments, it also provides critical community needs such as quality medical care, the education of future providers and life-saving research. This makes MUSC unique in that it is one of the few organizations that can improve the quality of life within the local communities of South Carolina by enhancing the health of both the local economy and the health of local citizens.

This study has found that statewide, MUSC has an annual economic impact totaling \$5.6 billion and 38,168 jobs, including its four hospitals in Lancaster, Chester, Florence and Marion counties. MUSC's total economic impact is approximately \$4.5 billion on the Charleston Tri-county region. This corresponds to roughly 30,582 jobs and \$1.9 billion in labor income that would not exist otherwise. Further, MUSC's statewide economic impact is associated with an employment multiplier of 2.1, meaning that for every 10 jobs created by MUSC, an additional 11 jobs are created elsewhere in the state.

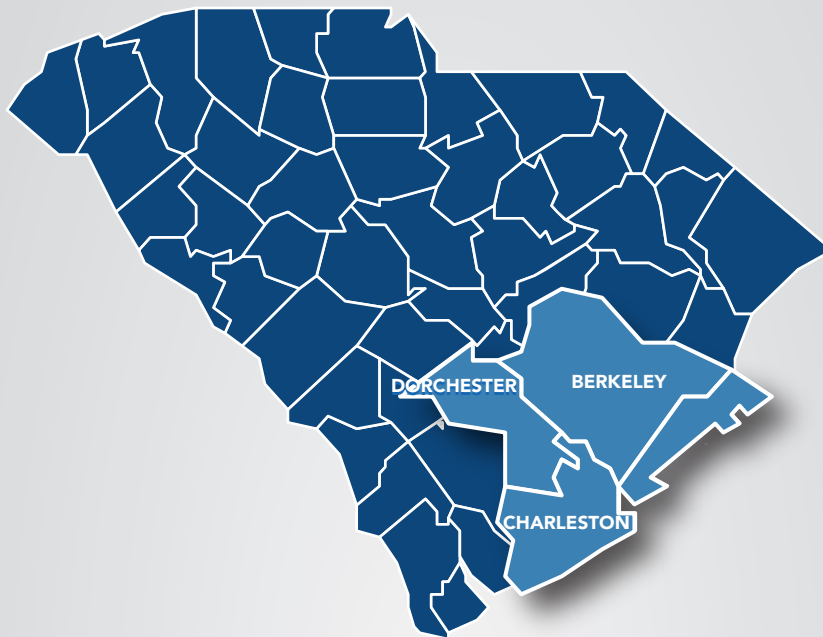
This combination of the size of MUSC and its employment multiplier effect makes it a powerful economic engine. MUSC supports approximately 11% of the total employment base in Charleston and 42% of Charleston's health care industry. This level of economic influence in a region is relatively unique. MUSC also supports high-quality jobs, with the average job associated with MUSC, either directly or indirectly, paying at an approximately 51% higher rate than the average job in South Carolina.

Finally, MUSC serviced more than 1.7 million encounters during 2019, including hospital care, emergency room visits and physician office visits. Given the link between economic growth and the overall health of the workforce, MUSC plays a crucial role in promoting a healthy, productive community.

As the demand for health care steadily rises across the United States as a result of an aging population, access to quality medical facilities will become increasingly important in the coming years. This is especially true in South Carolina where the growth in health care, as a share of the economy, outpaces the national average. In light of these trends, the importance of MUSC is clear: MUSC serves not only as a sustainable economic engine for the Charleston Tri-county region by providing a sizable number of jobs and incomes for local residents but also through broader investments in more rural areas across the state in a proactive effort to expand its ability to continue to provide the highest quality health care to all South Carolinians.



The Economic Impact of MUSC Charleston Region



Total Impact:
\$4.5 Billion

Total Employment:
30,582

Total Labor Income:
\$1.9 BILLION



74%

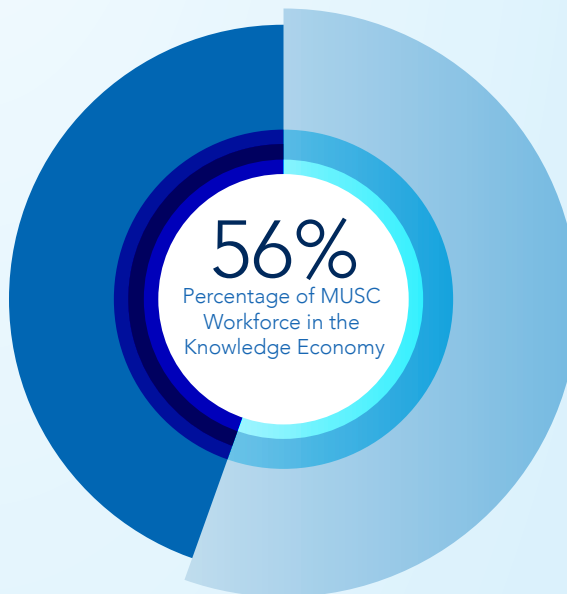
Wage Premium
Over Average
S.C. job

\$75,366

Avg. Wage Among
all MUSC Employees

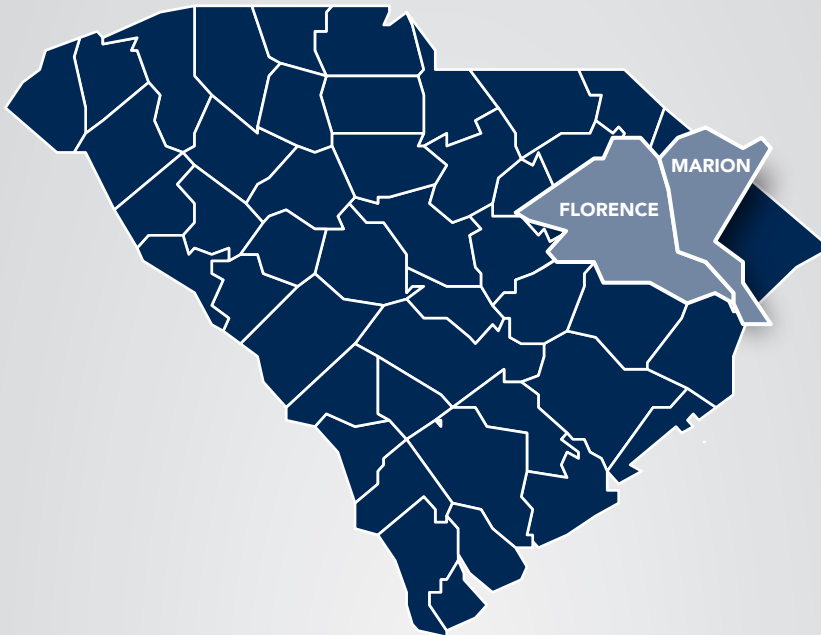
\$43,210

Avg. Wage Among
all S.C. Jobs



56%
Percentage of MUSC
Workforce in the
Knowledge Economy

The Economic Impact of MUSC Florence Region



Total Impact:

\$536.2 Million

Total Employment:
3,970

Total Labor Income:
\$189.4 MILLION



27%

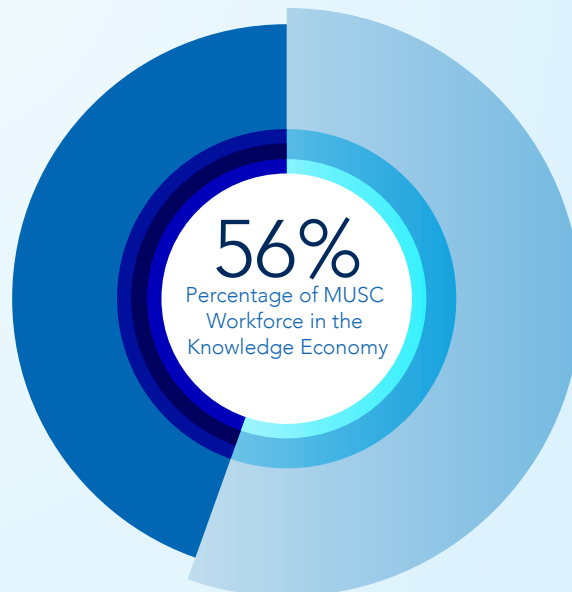
Wage Premium
Over Average
S.C. job

\$54,737

Avg. Wage Among
all MUSC Employees

\$43,210

Avg. Wage Among
all S.C. Jobs



The Economic Impact of MUSC Lancaster Region

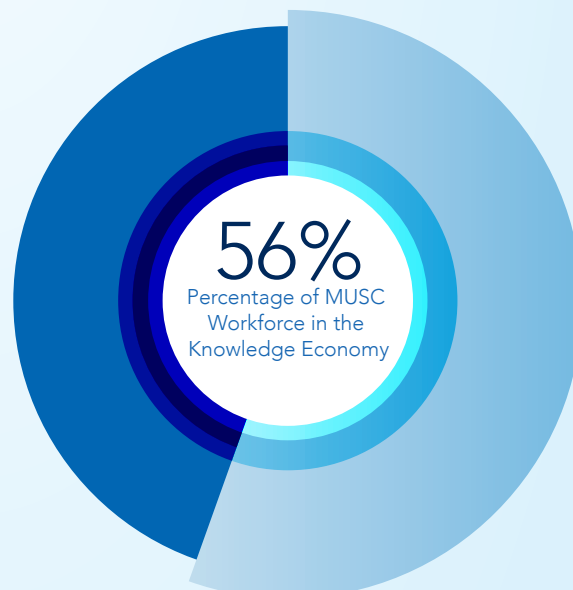
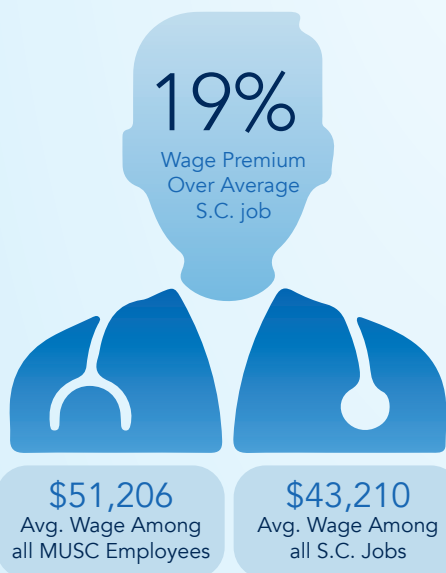


Total Impact:

\$267.8 Million

Total Employment:
1,801

Total Labor Income:
\$92.1 MILLION





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