



Center for Business Research

Economic Impact of  
The Medical University of South Carolina

*Conducted by:*

**Center for Business Research**  
Charleston Metro Chamber of Commerce  
PO Box 975, Charleston SC 29402

**April 2016**



Driving growth. Defining tomorrow.

## **Background**

Chartered in December of 1823, the Medical University of South Carolina (MUSC) has grown from a small, private medical college with a faculty of seven physicians and 30 students into one of the nation's top academic health science centers with more than 13,000 clinicians, faculty, and staff and approximately 3,000 students.

When the institution first opened in 1824, it was the tenth medical school in the United States and the first in the Deep South. Originally a private enterprise, the state legislature was successfully petitioned in 1913 to transfer ownership of the school to the state.

Today, MUSC attracts more than \$230 million annually in research funding, making it the biggest magnet for biomedical and extramural research dollars of all institutions of higher learning in South Carolina.

The MUSC enterprise includes three main components:

- 1) **MUSC Medical Center**, with 709 beds in four inpatient facilities: Medical University Hospital, MUSC Children's Hospital, Ashley River Tower, and Institute of Psychiatry.
- 2) **MUSC Physicians**, a statewide network of more than 750 primary and specialty healthcare providers, who together with the Medical Center treat more than one million patients annually.
- 3) The **Medical University**, which has six colleges—Medicine, Dental Medicine, Graduate Studies, Health Professions, Nursing, and Pharmacy. The campus is located on more than 80 acres in the city of Charleston, but the organization is involved in activities across the state of South Carolina. The university confers degrees at the baccalaureate, masters, doctoral, and other professional levels and provides residency training for more than 500 graduate health professionals. The teaching staff is comprised of more than 1,500 full and part-time faculty.

## **Purpose**

MUSC commissioned the Center for Business Research to measure its current economic impact on the Charleston Metropolitan Area. For purposes of this study, employment and operational spending of the MUSC enterprise within the three-county Charleston Metropolitan Area were included in the analysis. Any spending or employment outside the Charleston Metropolitan Area was omitted. No student spending or visitor spending generated by the enterprise were included.

The study was conducted by the Charleston Metro Chamber of Commerce's Center for Business Research (CBR), which has served as the center for the compilation, interpretation and distribution of business and economic data for the three-county Charleston Metropolitan Area for more than 25 years.

Results are exhibited in terms of employment, income, and output (the value of goods and services produced with a given geographic region including any intermediate products purchased). These results are broken down into direct, indirect and induced impact as well as total impact.

- *Direct* refers to the actual contribution or effect in terms of jobs or payroll, for example, resulting from the entity.
- *Indirect* impact estimates changes in inter-industry (business-to-business) transactions as supplying industries respond to increased demand from the directly affected business sector(s).
- *Induced* impact estimates changes in local spending by households resulting from income changes in the directly and indirectly affected business sectors.
- *Total output or impact* is the sum of direct + indirect + induced, presenting the total effect.

For more explanation, please refer to the *Methodology* section of this report.

## Executive Summary

This study analyzes the economic impact of the three components of the Medical University of South Carolina enterprise—MUSC Medical Center, MUSC Physicians, and the University. The enterprise's presence sustains economic activity in every business sector in the Charleston Metropolitan Area, which includes Berkeley, Charleston, and Dorchester counties. First, this report will show MUSC's aggregate annual economic impact followed by the annual impacts of each of the components separately.

- MUSC's enterprise operations support a **total economic impact annually** in the Charleston Metropolitan Area of more than **\$3.8 billion**, or **nearly 12% of the Metro's \$33 billion economy**.
- MUSC directly employs more than 13,400 and supports another 14,000+ jobs in other sectors in the Charleston Metro Area for a **total employment impact of nearly 28,000**. This equates to about **1 out of every 12 jobs located in the Charleston region**.
- These 28,000 jobs add more than **\$1.8 billion in income** to the Charleston region's economy.

<u>Annual Economic Impact in the Charleston Metro Area</u>	<u>Total Employment Impact</u>	<u>Total Labor Income<sup>2</sup> Impact</u>	<u>Total Output<sup>1</sup> or Value of Economic Activity</u>
MUSC Medical Center	13,812	\$835,708,693	\$2,086,668,064
MUSC Physicians	5,263	\$463,242,369	\$849,872,171
Medical University	8,636	\$514,075,517	\$911,105,831
<b>Total Enterprise</b>	<b>27,712</b>	<b>\$1,813,026,579</b>	<b>\$3,847,646,065</b>

<u>Detail By Sector</u>	<u>Employment</u>	<u>Output<sup>1</sup></u>
Agriculture, Forestry, Fishing	21	\$1,099,865
Mining	3	\$498,398
Utilities	61	\$57,042,166
Construction	309	\$58,466,745
Manufacturing	41	\$18,846,356
Wholesale Trade	343	\$70,731,164
Retail Trade	1,608	\$120,468,407
Transportation and Warehousing	415	\$51,846,236
Information	283	\$99,620,831
Finance and Insurance	1,047	\$197,078,819
Real Estate, Rental Services, Leasing Services	1,267	\$357,894,343
Professional, Scientific and Technical Services	1,270	\$170,766,104
Management of Companies and Enterprises	81	\$18,011,499
Admin. & Support Services, Waste Mgmt. & Remediation Services	1,913	\$113,377,336
Educational Services	284	\$17,857,397
Health and Social Services	9,944	\$1,782,264,756
Arts, Entertainment and Recreation	398	\$23,601,081
Accommodations and Food Services	1,615	\$97,075,749
Other Services (excluding Government)	1,340	\$88,356,083
Government & Non-classified Sectors	5,467	\$502,742,730
<b>Total</b>	<b>27,712</b>	<b>\$3,847,646,065</b>

**MUSC Medical Center**

- The Medical Center component of the MUSC enterprise delivers a **total economic impact annually** in the Charleston Metropolitan Area of more than **\$2 billion**.
- MUSC Medical Center--which includes Medical University Hospital, MUSC Children's Hospital, Ashley River Tower, and the Institute of Psychiatry--directly employs more than 6,000 workers and supports another 7,000+ jobs in other sectors in the Charleston Metro Area for a total **employment impact of more than 13,800**.
- These 13,800 jobs add more than **\$835 million in income** to the Charleston region's economy.

*Annual Economic Impact of the MUSC Medical Center in the Charleston MSA*

<u>Impact Type</u>	<u>Employment</u>	<u>Labor Income<sup>2</sup></u>	<u>Output<sup>1</sup></u>
Direct Effect	6,400	\$515,035,223	\$1,181,132,858
Indirect Effect	3,391	\$155,181,314	\$405,308,145
Induced Effect	4,021	\$165,492,156	\$500,227,061
<b>Total Effect</b>	<b>13,812</b>	<b>\$835,708,693</b>	<b>\$2,086,668,064</b>

<u>Detail By Sector</u>	<u>Employment</u>	<u>Output<sup>1</sup></u>
Agriculture, Forestry, Fishing	10	\$523,486
Mining	1	\$214,624
Utilities	23	\$17,820,554
Construction	100	\$18,860,059
Manufacturing	23	\$10,332,705
Wholesale Trade	197	\$40,663,111
Retail Trade	728	\$54,977,241
Transportation and Warehousing	221	\$26,716,334
Information	134	\$48,221,755
Finance and Insurance	653	\$122,099,489
Real Estate, Rental Services, Leasing Services	648	\$173,673,968
Professional, Scientific and Technical Services	695	\$87,006,119
Management of Companies and Enterprises	37	\$8,235,612
Admin. & Support Services, Waste Mgmt. & Remediation Services	1,183	\$70,099,185
Educational Services	121	\$7,440,637
Health and Social Services	7,159	\$1,255,147,953
Arts, Entertainment and Recreation	188	\$11,199,951
Accommodations and Food Services	793	\$46,841,215
Other Services (excluding Government)	759	\$50,893,155
Government & Non-classified Sectors	138	\$35,700,911
<b>Total</b>	<b>13,812</b>	<b>\$2,086,668,064</b>

### **MUSC Children’s Hospital**

A part of the MUSC Medical Center system, the Children’s Hospital of South Carolina has been internationally recognized for its quality, receiving awards such as “Excellence in Patient Care” by the *Studer Group*, as well as being named a “Best Hospital for Pediatric Heart Care” by *US News & World Report*. To specifically highlight its economic significance in the Charleston region, the Children’s Hospital’s impact is summarized below separately from the rest of the Medical Center system, but readers should note it is a subset of the total Medical Center impact shown on previous pages.

In addition to the ongoing **annual economic impact of \$433 million** and support of **2,800 total jobs** each year by the Children’s Hospital (shown below), a three-year capital expenditure of \$340 million is analyzed separately on the following pages to show the additional economic boost contributed to the region during 2016-2018 as this construction occurs.

#### *Annual Economic Impact of MUSC Children’s Hospital in the Charleston MSA*

<u>Impact Type</u>	<u>Employment</u>	<u>Labor Income<sup>2</sup></u>	<u>Output<sup>1</sup></u>
Direct Effect	1,310	\$112,968,256	\$242,074,563
Indirect Effect	695	\$31,820,234	\$83,081,042
Induced Effect	868	\$35,700,532	\$107,894,139
<b>Total Effect</b>	<b>2,872</b>	<b>\$180,489,022</b>	<b>\$433,049,745</b>

<u>Detail By Sector</u>	<u>Employment</u>	<u>Output<sup>1</sup></u>
Agriculture, Forestry, Fishing	2	\$112,107
Mining	0.3	\$44,595
Utilities	4	\$3,628,509
Construction	20	\$3,754,542
Manufacturing	5	\$2,118,971
Wholesale Trade	41	\$8,545,348
Retail Trade	156	\$11,770,328
Transportation and Warehousing	47	\$5,631,041
Information	28	\$10,154,499
Finance and Insurance	137	\$25,558,932
Real Estate, Rental Services, Leasing Services	135	\$36,674,338
Professional, Scientific and Technical Services	144	\$17,978,470
Management of Companies and Enterprises	8	\$1,715,412
Admin. & Support Services, Waste Mgmt. & Remediation Services	244	\$14,490,221
Educational Services	26	\$1,614,918
Health and Social Services	1,479	\$258,786,074
Arts, Entertainment and Recreation	40	\$2,402,087
Accommodations and Food Services	168	\$9,951,493
Other Services (excluding Government)	159	\$10,601,533
Government & Non-classified Sectors	29	\$7,516,327
<b>Total</b>	<b>2,872</b>	<b>\$433,049,745</b>

### **MUSC Children’s Hospital – Non-recurring Construction**

In addition to the Children’s Hospital’s ongoing annual economic impact shown on previous pages, a three-year capital expenditure of \$340 million during 2016-2018 is analyzed separately below to show the additional economic boost the Children’s Hospital will have in the region as this construction occurs.

- 984 additional jobs supported each year on average in the region during the construction period
- An *annual* average of an additional \$52 million in income and \$171 million in additional economic activity in the Charleston Metro Area during the construction period of 2016 through 2018, for a three year total impact of more than \$512 million

#### **Three-Year Economic Impact of \$340 million in Construction by MUSC Children's Hospital in the Charleston MSA**

<b><u>Impact Type</u></b>	<b><u>Average Annual Employment</u></b>	<b><u>Labor Income during 3-Year Period<sup>2</sup></u></b>	<b><u>Output during 3-Year Period<sup>1</sup></u></b>
Direct Effect	513	\$94,022,373	\$323,993,147
Indirect Effect	220	\$31,624,564	\$94,716,988
Induced Effect	251	\$30,967,238	\$93,584,702
<b>Total Effect</b>	<b>984</b>	<b>\$156,614,175</b>	<b>\$512,294,838</b>

<b><u>Detail By Sector</u></b>	<b><u>Average Annual Employment</u></b>	<b><u>Output or Impact during 3-Year Period<sup>1</sup></u></b>
Agriculture, Forestry, Fishing	3.3	\$281,151
Mining	0.2	\$105,225
Utilities	0.9	\$2,757,773
Construction	517.3	\$326,597,897
Manufacturing	11.1	\$11,843,484
Wholesale Trade	34.5	\$21,354,770
Retail Trade	77.6	\$17,565,634
Transportation and Warehousing	30.8	\$12,698,220
Information	8.1	\$8,786,220
Finance and Insurance	24.3	\$13,484,781
Real Estate, Rental Services, Leasing Services	36.0	\$31,992,143
Professional, Scientific and Technical Services	44.5	\$17,295,988
Management of Companies and Enterprises	2.4	\$1,592,143
Admin. & Support Services, Waste Mgmt. & Remediation Services	48.2	\$8,874,763
Educational Services	7.7	\$1,410,138
Health and Social Services	44.0	\$13,457,096
Arts, Entertainment and Recreation	11.9	\$2,082,758
Accommodations and Food Services	39.8	\$7,210,213
Other Services (excluding Government)	32.8	\$6,628,260
Government & Non-classified Sectors	8.3	\$6,276,181
<b>Total</b>	<b>984</b>	<b>\$512,294,838</b>

### **MUSC Physicians**

MUSC Physicians, the physician group component of the MUSC enterprise, operates as a group practice and also serves as a resource for the education and training of the university's undergraduate and graduate medical and health-related professionals. MUSC Physicians does not receive state appropriations and operates facilities both on the MUSC campus as well as throughout the Charleston Metro Area.

- MUSC Physicians' **economic impact** annually in the Charleston Metropolitan Area is more than **\$849 million**
- MUSC Physicians directly employs approximately 2,000 and supports another 3,000+ jobs in other sectors in the Charleston Metro Area for a **total employment impact of more than 5,200**.
- These 5,200 jobs add more than **\$463 million in income** to the Charleston region's economy.
- In addition to the annually recurring impact summarized below, MUSC Physicians incurred a one-time construction expense in FY 2015 which is analyzed separately on the following page.

#### *Annual Economic Impact of MUSC Physicians in the Charleston MSA*

<u>Impact Type</u>	<u>Employment</u>	<u>Labor Income<sup>2</sup></u>	<u>Output<sup>1</sup></u>
Direct Effect	2,018	\$326,406,358	\$449,557,056
Indirect Effect	1,022	\$45,359,401	\$123,916,004
Induced Effect	2,223	\$91,476,610	\$276,399,111
<b>Total Effect</b>	<b>5,263</b>	<b>\$463,242,369</b>	<b>\$849,872,171</b>

<u>Detail By Sector</u>	<u>Employment</u>	<u>Output<sup>1</sup></u>
Agriculture, Forestry, Fishing	5	\$265,641
Mining	0	\$82,187
Utilities	7	\$6,611,800
Construction	40	\$7,563,371
Manufacturing	9	\$3,944,816
Wholesale Trade	77	\$15,872,873
Retail Trade	380	\$29,063,761
Transportation and Warehousing	94	\$11,452,624
Information	58	\$21,571,413
Finance and Insurance	220	\$42,769,888
Real Estate, Rental Services, Leasing Services	363	\$95,924,105
Professional, Scientific and Technical Services	236	\$29,900,043
Management of Companies and Enterprises	34	\$7,556,192
Admin. & Support Services, Waste Mgmt. & Remediation Services	436	\$25,783,518
Educational Services	68	\$4,150,628
Health and Social Services	2,350	\$482,701,581
Arts, Entertainment and Recreation	107	\$6,256,009
Accommodations and Food Services	436	\$26,014,194
Other Services (excluding Government)	284	\$18,190,542
Government & Non-classified Sectors	59	\$14,196,988
<b>Total</b>	<b>5,263</b>	<b>\$849,872,171</b>

**MUSC Physicians – Non-recurring Construction**

In addition to the annually recurring impact summarized on previous pages, MUSC Physicians incurred a one-time construction expense of just over \$2 million in Fiscal Year 2015, which is analyzed separately below. This impact is not included in the MUSC Physicians' *annual* economic impact and is reported separately since it is not an event that recurs annually. It also should not be interpreted as part of the MUSC enterprise's *annual* economic impact, and it is not reported as a part of the aggregate impact presented earlier in this study. Only recurring construction activity is included as part of annual economic impact results. However, it is important to report the information below to demonstrate MUSC's full economic impact in FY 2015 during this evaluation within the Charleston Metro Area.

This construction expense of \$2.3 million added another \$1.3 million in commerce to the area economy in 2015, helping to support 21 jobs and add more than \$1.1 million in income to local wallets.

*Non-recurring Construction Impact of MUSC Physicians in FY 2015 in the Charleston MSA*

<u>Impact Type</u>	<u>Employment</u>	<u>Labor Income<sup>2</sup></u>	<u>Output<sup>1</sup></u>
Direct Effect	11	\$673,015	\$2,319,153
Indirect Effect	5	\$226,370	\$677,987
Induced Effect	5	\$221,664	\$669,882
<b>Total Effect</b>	<b>21</b>	<b>\$1,121,049</b>	<b>\$3,667,022</b>

<u>Detail By Sector</u>	<u>Employment</u>	<u>Output<sup>1</sup></u>
Agriculture, Forestry, Fishing	0.1	\$2,012
Mining	0.004	\$753
Utilities	0.02	\$19,740
Construction	11.1	\$2,337,798
Manufacturing	0.2	\$84,776
Wholesale Trade	0.7	\$152,858
Retail Trade	1.7	\$125,735
Transportation and Warehousing	0.7	\$90,894
Information	0.2	\$62,892
Finance and Insurance	0.5	\$96,524
Real Estate, Rental Services, Leasing Services	0.8	\$229,001
Professional, Scientific and Technical Services	1.0	\$123,805
Management of Companies and Enterprises	0.1	\$11,397
Admin. & Support Services, Waste Mgmt. & Remediation Services	1.0	\$63,526
Educational Services	0.2	\$10,094
Health and Social Services	0.9	\$96,326
Arts, Entertainment and Recreation	0.3	\$14,908
Accommodations and Food Services	0.9	\$51,611
Other Services (excluding Government)	0.7	\$47,445
Government & Non-classified Sectors	0.2	\$44,925
<b>Total</b>	<b>21</b>	<b>\$3,667,022</b>

**Medical University of South Carolina**

- The University component of the MUSC enterprise contributes a total **economic impact annually** in the Charleston Metropolitan Area of more than **\$911 million**.
- MUSC directly employs more than 5,000 and supports another 3,000+ jobs in other sectors in the Charleston Metro Area for a **total employment impact of more than 8,600**.
- These 8,600 jobs add more than **\$514 million in income** to the Charleston region's economy.

*Annual Economic Impact of the Medical University in the Charleston MSA*

<u>Impact Type</u>	<u>Employment</u>	<u>Labor Income<sup>2</sup></u>	<u>Output<sup>1</sup></u>
Direct Effect	5,803	\$394,630,556	\$544,051,985
Indirect Effect	358	\$17,572,702	\$59,099,293
Induced Effect	2,475	\$101,872,259	\$307,954,553
<b>Total Effect</b>	<b>8,636</b>	<b>\$514,075,517</b>	<b>\$911,105,831</b>

<u>Detail By Sector</u>	<u>Employment</u>	<u>Output<sup>1</sup></u>
Agriculture, Forestry, Fishing	6	\$310,737
Mining	1	\$201,587
Utilities	31	\$32,609,812
Construction	169	\$32,043,316
Manufacturing	9	\$4,568,835
Wholesale Trade	69	\$14,195,180
Retail Trade	500	\$36,427,405
Transportation and Warehousing	100	\$13,677,278
Information	91	\$29,827,663
Finance and Insurance	173	\$32,209,442
Real Estate, Rental Services, Leasing Services	256	\$88,296,270
Professional, Scientific and Technical Services	339	\$53,859,943
Management of Companies and Enterprises	10	\$2,219,695
Admin. & Support Services, Waste Mgmt. & Remediation Services	294	\$17,494,633
Educational Services	95	\$6,266,133
Health and Social Services	436	\$44,415,222
Arts, Entertainment and Recreation	103	\$6,145,122
Accommodations and Food Services	387	\$24,220,340
Other Services (excluding Government)	297	\$19,272,386
Government & Non-classified Sectors	5,269	\$452,844,831
<b>Total</b>	<b>8,636</b>	<b>\$911,105,831</b>

## **Methodology**

To accurately measure the total economic impact of any entity or event, any “leakage” of dollars or expenditures outside the geographical area for which the impact is being measured must be taken into account. The resulting impact or “output” is the total net value of *direct* economic contribution of an entity or occurrence in a geographic location in terms of the value of goods and services produced in a given time period, plus the *indirect* and *induced* value of goods and services demanded by that region’s economy as those *direct* expenditures “turn over” in a region.

For example, Company A pays wages to its employees, who then use those wages to pay for housing, food, entertainment, auto repair services, etc. within the region. A portion of those wages spent for rent/mortgages, at grocery stores and restaurants, at entertainment venues, and at auto repair shops, in this example, then go toward paying those establishments’ employee wages as well as other company expenditures, and the dollars continue to “turn over” this way within the region’s economy until leakage occurs—i.e. the dollars are eventually spent outside the region during travel, etc. Similarly, Company A may incur other local spending besides its own payroll such as at local office supply stores, caterers, accounting firms, etc. Company A’s spending translates into more local demand (spending) as those dollars “turn over” in the local economy or are used to pay for wages and operational expenditures at other local firms. The sum of these effects prior to leakage include the *direct* spending plus the *indirect* and *induced* spending, or total output of the economic event being examined. *Indirect* impact estimates changes in inter-industry (business-to-business) transactions as supplying industries respond to increased demand from the directly affected business sector(s). *Induced* impact estimates changes in local spending by households resulting from income changes in the directly and indirectly affected business sectors.

In this case, the input-output model used takes the local direct spending by the MUSC enterprise and calculates total demand created minus that which must be imported (or supplied from outside the Metro Area)—i.e. the leakage. Impact estimates were calculated using the IMPLAN® model customized for the Charleston region. IMPLAN® is a world leader in providing economic impact data and modelling to governments, universities, and public and private sector organizations for assessing the economic impacts of project decisions in all industry sectors ([implan.com](http://implan.com)).

The study was conducted by the Charleston Metro Chamber of Commerce’s Center for Business Research (CBR), which has served as the center for the compilation, interpretation, and distribution of business and economic data for the three-county Charleston Metropolitan Area for more than 25 years. CBR staff for this project include Mary Graham (one of 32 certified community researchers in the country) and Jacki Renegar, who together have 50 years of experience in economic and community research and have conducted hundreds of economic impact analyses in the areas of manufacturing, real estate development, the military, the visitor industry, healthcare, and the transportation sector.

For more information regarding methodology, please contact the Center for Business Research, Charleston Metro Chamber of Commerce at (843) 577-2510.

### *References and Footnotes:*

<http://academicdepartments.musc.edu/administration/about/index.html>

<sup>1</sup> *Output/Impact is defined as the value of goods and services produced with a given geographic region including any intermediate products purchased. See methodology for more details. Expressed in 2015 dollars.*

<sup>2</sup> *Labor income is defined as all forms of employment income, including employee compensation (wages and benefits) and proprietor income (payments received by self-employed individuals and unincorporated business owners). Expressed in 2015 dollars.*