



# Health Care Industry Nashville MSA 2023

Trends, Scope, and Impact  
on the Regional Economy

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## EXECUTIVE SUMMARY

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### Executive Summary

Health care is a growth industry that is relatively immune to economic cycles. Despite the disruptions during the pandemic years, health care industry has registered high demand for employment and technological innovation. Nashville MSA's health care sector has indicated quick recovery from the pandemic and has shown positive growth. Over the years, the health care sector has been driving the employment growth in the national economy. Considering factors as the shortage of health care workers shortage across the United States and an increasingly aging population, it is likely that this trend will continue.

Nashville provides an exceptional example of a national health care industry. More than 46 major health care companies (public and private) have chosen Nashville as their home. In addition, seven of the nation's 15 leading for-profit acute care hospitals and nursing management companies are in Nashville<sup>1</sup> (ranking based on market capitalization), controlling approximately 34 percent of the investor-owned hospitals in the United States.

The scope of the health care industry in Nashville ranges from essential service providers, such as physicians, to major hospital management companies, sizeable renal dialysis companies, health information technology services, and advanced life sciences research. This study presents two overviews of Nashville's health care industry: (1) the core health care industry, defined as ambulatory services, hospitals, and nursing and residential care facilities that provide care in the Nashville MSA\*, and (2) the health care industry cluster, which encompasses the core health care industry and other related health care industries such as health care management companies, life sciences research, and professional services firms that operate on a local, national, or international basis. Also included in this study is (3) a profile of Nashville Health Care Council (The Council or NHCC) member companies.

\* Nashville MSA includes Cannon, Cheatham, Davidson, Dickson, Macon, Maury, Robertson, Rutherford, Smith, Sumner, Trousdale, Wilson, and Williamson counties.

### ***Executive Summary: Overview of the Core Health Care Industry***

The concept of the core health care industry refers to health care services classified as such under NAICS (North American Industrial Classification System) codes: 621 (Ambulatory Services), 622 (Hospitals), and 623 (Nursing and Residential Care Facilities).

#### *Nation*

- **By 2031, the health care and social assistance sector will add 2.6 million jobs.**
- The individual and family services industry is projected to add the most jobs at 2.8 percent employment growth annually.

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<sup>1</sup> [15 Largest For-Profit Hospital Operators \(beckershospitalreview.com\)](https://www.beckershospitalreview.com)

- Nurse practitioners will be the top fastest-growing occupations, with a 46 percent growth rate.
- **A total of 19.6 percent of the gross domestic product (GDP)** is projected to be health care expenditures by 2030 with a slight increase from 18 percent projected during 2022-24.

#### Tennessee

- By 2030, health care and social assistance sector will add an estimated 80,570 new jobs in Tennessee at a 1.81 annual growth rate.
- One in every five jobs is projected to be in health care by 2030.

#### Nashville

- Health care employment in Nashville grew 8 percent during 2018 to 2022.
- One in every 12 occupations was a health care occupation in 2022.

#### *Employment, Establishment, and Wages in the Nashville MSA*

- **In 2022, over 127,700 people were employed by Nashville's core health care sector, less than 5 percent from 2019.**
- Between 2019 and 2022, hospital sectors experienced approximately 6 percent employment growth, while employment in ambulatory services and nursing care decreased 7 percent and 22 percent.
- In 2022, health care occupations account for about 9.64 percent of total occupations in Nashville MSA.
- Between 2019 and 2022, 853 **new core health care establishments** emerged in Nashville, bringing the total to 4,755, up 27 percent from 2019.
- The **average wage for health care occupations at \$92,470** is significantly higher than Nashville's average annual wage of \$57,560 in 2022.
- **Wages totaling \$10.37 billion were paid in 2022** by the core health care industry in Nashville MSA, up almost 34 percent from 2019.

#### **Executive Summary: Overview of the Nashville Health Care Industry Cluster**

The greater health care industry cluster in Nashville encompasses the core health care industry and other related health care industries such as health care management companies, life sciences research, and professional services firms that operate on a local, national, or international basis.

#### *Nashville-Based Health Care Headquarter Companies*

- **In 2022, there were 17 publicly traded health care companies headquartered in Nashville** with combined worldwide employment of more than 470,000 and revenue of more than \$89 billion.

- **In 2022**, the 46 major Nashville-based public and private investor-owned health care management companies accounted for almost **\$97 billion in revenue and over 492,000 jobs globally**.

#### *Health Care Industry Cluster Employment*

- **In 2022, the health care industry cluster directly employed 170,702 people in Nashville MSA, up 1.7 percent from 2019**, making the health care industry cluster one of the largest employers in the region.
- **Seventeen of every 100 nonfarm employees** in Nashville MSA were in health care.
- **The core health care industry represented 75 percent** of Nashville health care industry cluster employment.

#### *Employment Impact*

- In 2022, the Nashville MSA's health care industry cluster accounted for **332,305 jobs (direct, indirect, and induced), up 1.12 percent from 2019**.
- This accounts for **nearly 10 percent of Tennessee's and 29.59 percent of the Nashville MSA's nonfarm employment** in 2022.
- The Nashville health care industry cluster includes nearly **7,292 establishments, up 44 percent from 2019 to 2022**.

#### *Personal Income Impact*

- The Nashville health care industry cluster generated **\$31.29 billion (direct, indirect, and induced) in personal income** in 2022, which decreased by 4.06 percent from 2019.
- **Every \$100 of personal income generated an additional \$1.54** in the local economy.
- Nashville health care industry cluster direct personal income was \$20.25 billion in 2022.
- This corresponds to nearly **23.1 percent of the Nashville MSA's total personal income**.

#### *Business Revenue and Fiscal Impact*

- The health care industry cluster in Nashville MSA created **\$67.91 billion (direct, indirect, and induced) in business revenues in 2022, increasing 1.52 percent from 2019**.
- **Of this total, \$36.75 billion was directly** injected into the economy.
- **Every \$100 in health care cluster spending generates an additional \$1.84 in business revenues**.
- The Nashville health care industry cluster accounted for **an estimated \$2.54 billion in state and local taxes in 2022**.

#### *Health Care Industry Cluster: Peer MSA Comparison*

- Nashville ranks **second** among a group of 13 peer MSAs in terms of the **number of major health care industry cluster management companies** (both public and private), their revenues, and their employment.
- Nashville ranks **fourth in terms of business climate** and **first in relative health care competitiveness**.

#### ***Executive Summary: Overview of the Nashville Health Care Council Member Companies***

##### *The Council Member Impact on the Nashville MSA*

- **In 2022, the Council had 360 member companies, up by 13.92 percent from 2019.**
- **In 2022, the 360 Council member companies employed 96,218 health care-related workers in Nashville MSA, up 19.52 percent from 2019.**

##### *The Council Members' Global Impact*

- In 2022, the Council member companies employed **694,073** employees globally.

## I. INTRODUCTION

The health care industry has been an integral part of the global and national economy. It is relatively immune to economic cycles. A recent Bureau of Labor Statistics (BLS) news release (2022) indicates that the health care and social assistance sector is driving employment growth in the national economy by adding a projected 2.6 million jobs from 2021 to 2031. The increasing need for health care services during the pandemic and in post-pandemic years has propelled high demand for health care workers in recent years. The health care demands during the pandemic have also fueled innovation in health care technology and the health care management sector.

Amid overall growth in the health care sector throughout the United States, Nashville provides a unique example of a national health care industry hub. Eighteen major publicly traded health care companies have chosen Nashville as their home along with hundreds of privately owned health care companies. Three of the nation's five largest investor-owned hospital companies are in Nashville, controlling more than one-third of investor-owned hospitals in the United States. According to the Forbes Report (2021), Nashville health care companies either own or manages 15 percent of all hospital beds in the U.S.<sup>2</sup>

The scope of the health care industry in Nashville ranges from basic service providers such as physicians, to more advanced biomedical research, to management firms operating nationally. This study presents two views of Nashville's health care industry: (1) the core health care industry, defined as ambulatory services, hospitals, and nursing and residential care facilities, and (2) the health care industry cluster, which encompasses the core health care industry and other related health care industries, such as management companies and biomedical research entities, that operate on a regional or national basis. This approach is necessary because the presence and quality of both components profoundly affect the economic fundamentals in a region.

This study explores how Nashville has emerged as a hub for the health care industry and using a comparative analytical perspective, analyzes the trends and scope of the core health care industry in Nashville. It further provides a detailed assessment of the economic impact of the health care industry cluster on the regional economy. It compares Nashville with 12 peer Metropolitan Statistical Areas (MSAs) using selected health care-related indicators. It is a follow-up to the studies completed in 2005, 2010, 2015, 2019, and 2021. The study also presents an assessment of the member companies of the Nashville Health Care Council (the Council) and presents the results of a CEO Confidence Survey. This study is a detailed analysis of the Nashville MSA which includes Cannon, Cheatham, Davidson, Dickson, Hickman, Macon, Maury, Robertson, Rutherford, Smith, Sumner, Trousdale, Wilson, and Williamson counties.

The rest of this study is organized as follows. Chapter two presents an overview of trends in the core health care industry, comprising ambulatory services, hospitals, and nursing and residential care facilities, in the nation, Tennessee, and Nashville MSA. Chapter three briefly details the study's goals and methodology. Chapter four examines trends in the core health care industry in Nashville MSA, exploring its various aspects and growth dynamics. Chapter five presents a

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<sup>2</sup> <https://www.forbes.com/sites/billfrist/2021/04/12/nashville-is-the-health-services-capital--heres-why-this-explosively-growing-region-is-more-than-music-city-usa/?sh=7b9e145b7de8>



broader view of the health care industry and assesses the scope, size, and impact of the health care industry cluster on Nashville's economy. Chapter six compares Nashville's core health care industry with 12 of its peer MSAs. Chapter seven profiles Council member companies and presents the results of the CEO Confidence Survey. Chapter eight concludes the study. The last chapter provides survey material and technical information on various study components.

## II. OVERVIEW OF THE CORE HEALTH CARE INDUSTRY

**The concept of the core health care industry refers to health care service providers classified as such under the NAICS (North American Industrial Classification System): 621 (Ambulatory Services), 622 (Hospitals), and 623 (Nursing and Residential Care Facilities)<sup>3</sup>.**

### II.1 National Trends

Prior to Covid-19, the U.S. health care industry has been growing at an increasing speed due to the demand for health care services from the aging baby boomer generation and higher prevalence of chronic conditions among the older generation. According to Census Bureau population projections, the number of older adults will increase by 69 percent, from 56 million to nearly 95 million, between 2020 and 2060. While Covid-19 has negatively impacted some aspects of life and the economy, the health care industry is still showing upward growth. As shown in the figure below, the core health care industry grew faster than the nonfarm employment between 2004 and 2022.

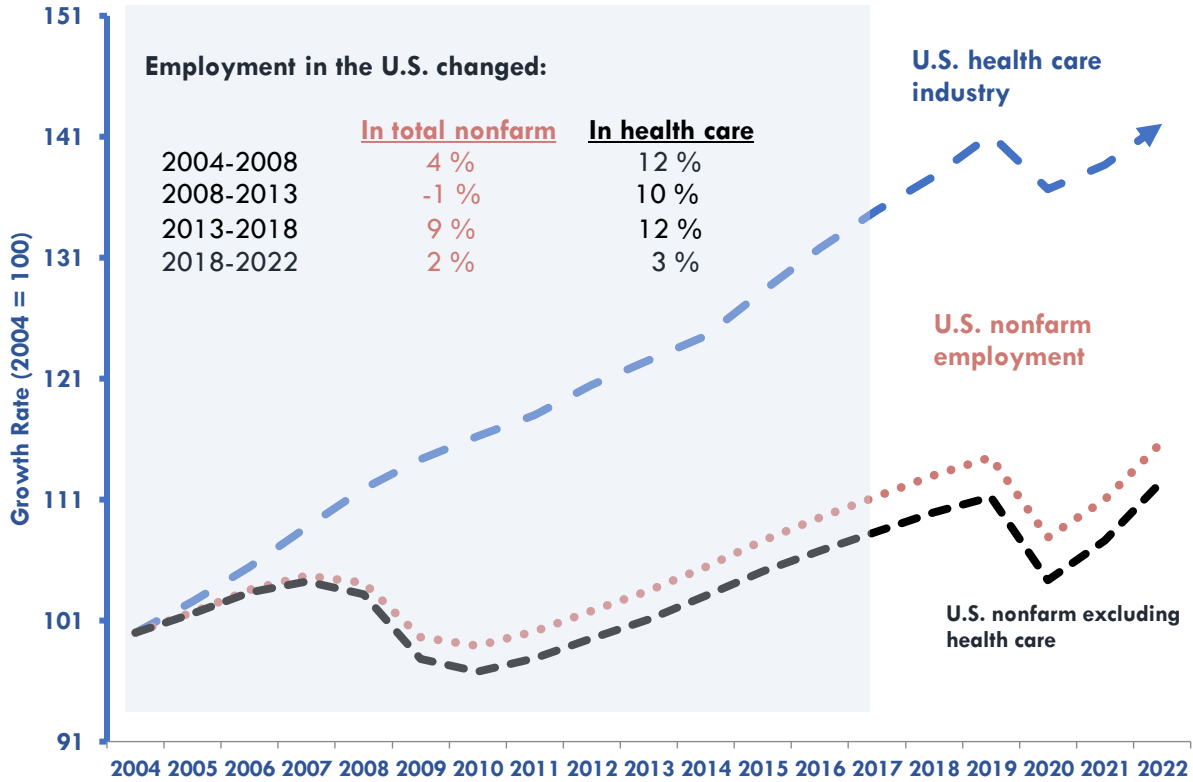
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<sup>3</sup>

For detailed analysis see the methodology section.

Figure II.1

## National Trends in Health Care Employment (2004 = 100)



Sources: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)), County Business Patterns ([www.census.gov](http://www.census.gov)), and BERC calculations

Nationally, the core health care industry employment grew nearly 12 percent between 2004 and 2008 and 2013-2018, while total nonfarm employment saw a 4 percent and 9 percent increase during those same periods. However, the total nonfarm employment increased only 2 percent from 2018 to 2022, while health care industry employment grew by 3 percent during the same years.

The growth trend in employment in the health care sector since 2004 is expected to continue through 2031, when core health care industry employment is projected to be the dominant source of employment growth with 13 percent employment growth. According to the Bureau of Labor Statistics, the health care sector is projected to add about 2.6 million jobs nationally between 2021 and 2031. Within the health care sector, the individual and family services industry is projected to add the most employment over the same period – approximately 850,000 jobs with an expected fastest annual employment growth of all health care and social assistance industries at 2.8 percent. Among the fastest-growing occupations among all industry sectors, nurse practitioners will have a 46 percent growth.

Furthermore, national health care expenditure is expected to reach \$6.8 trillion by 2030<sup>4</sup>, representing just over 18 percent of the gross domestic product (GDP) during 2022-24<sup>5</sup>. This is a slight decline from 19.7 in 2020. However, it is again projected to increase to 19.6 by 2030, with economic and health-specific changes taking place during 2025-30<sup>6</sup>.

Figure II.2

Fastest growing occupations in the U.S., 2021 and projected 2031 (number in thousands)				
Occupation	Employment		Change	
	2021	2031	Number	Percentage
Nurse practitioners	246.7	359.4	112.7	46%
Wind turbine service technicians	11.1	16.1	5	44%
Ushers, lobby attendants, and ticket takers	63.2	88.8	26	41%
Motion picture projectionists	2.0	2.8	1	40%
Cooks, restaurant	1,255.6	1,715.6	460	37%
Data scientists	113.3	153.9	41	36%
Athletes and sports competitors	15.8	21.5	6	36%
Information security analysts	163.0	219.5	57	35%
Statisticians	34.2	45.3	11	33%
Umpires, referees, and other sports officials	13.2	17.4	4	32%
Web developers	95.3	124.1	29	30%
Animal caretakers	290.7	377.6	87	30%
<b>All occupations</b>	<b>158,134.7</b>	<b>166,452.1</b>	<b>8,317.4</b>	<b>5%</b>

Sources: U.S. Dept of Labor, Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov))

Figure II.3

Top five fastest growing occupations within health care in the U.S., 2021 and projected 2031				
Occupation	Employment		Change (2021-2031)	
	2021	2031	Number	Percent
Nurse practitioners	246.7	359.4	112.7	46%
Physician assistants	139.1	177.5	38.4	28%
Physical therapist assistants	96.5	122.1	25.6	27%
Home health and personal care aides	3,636.9	4,560.9	924.0	25%
Occupational therapy assistants	43.4	54.5	11.0	25%
<b>Total Health care</b>	<b>16,254.2</b>	<b>18,303.2</b>	<b>2,049.1</b>	<b>13%</b>
<b>Total, all occupations</b>	<b>158,134.7</b>	<b>166,452.1</b>	<b>8,317.4</b>	<b>5%</b>

Source: <https://www.bls.gov/emp/tables/>

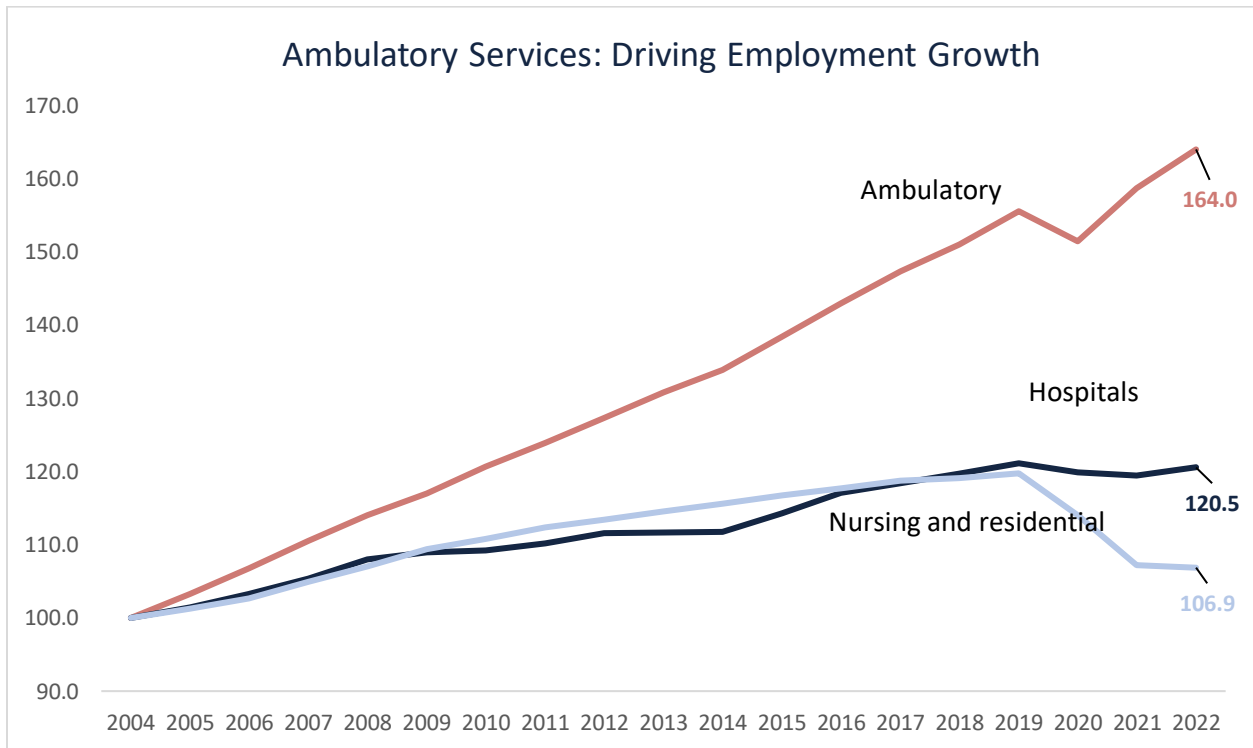
<sup>4</sup> Health expenditure projections are from the Center for Medicare and Medicaid Services ([www.cms.hhs.gov](http://www.cms.hhs.gov))

<sup>5</sup> <https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2022.00113?journalCode=hlthaff>

<sup>6</sup> Ibid.

Among national health care sectors, growth in ambulatory services was above the national health care total growth. Both nursing care facilities and hospital employment growth were lower than the overall health care growth nationally. However, the employment growth in hospitals during the period of 2018-2022 outpaced employment in ambulatory and nursing and residential care facilities during that period. The hospitals sector recorded a 9% employment growth during 2018-2022 period while employment in the ambulatory and nursing facilities recorded a 3 percent and 1 percent growth respectively for that period.

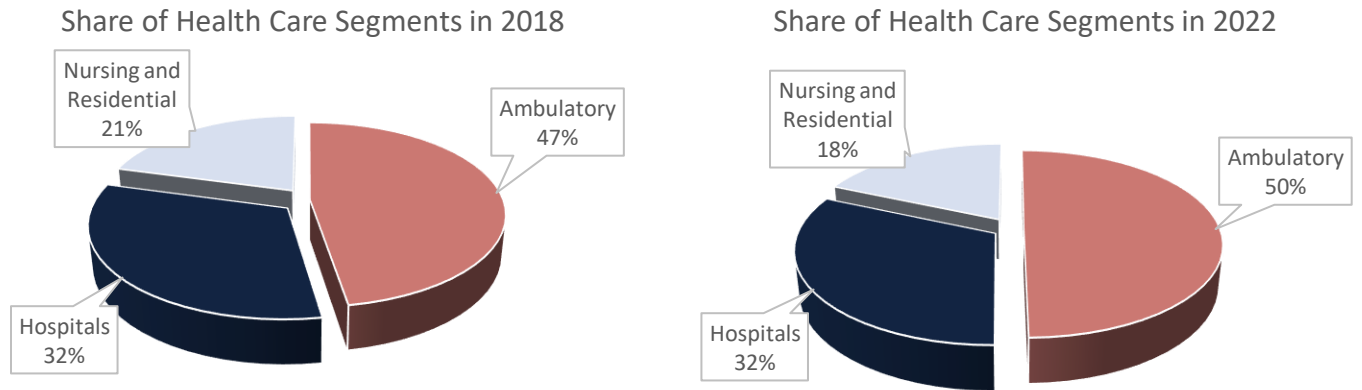
Figure II.4



Sources: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)), County Business Patterns ([www.census.gov](http://www.census.gov)) and BERC Calculations

Overall, the share of ambulatory services within the total national health care employment has increased considerably since 2004. In 2013, ambulatory services accounted for 45 percent of total health care employment, hospitals 33 percent, and nursing and residential care facilities 22 percent. In 2018, ambulatory services made up 47 percent of total health care employment, increasing by three percent to 50 percent in 2022, while the hospitals share remained the same (32 percent), and the nursing and residential care share decreased by three percent.

Figure II.5



## II.2. Trends in Tennessee

Tennessee's health care sector demonstrated significant growth between 2004 and 2008. Core health care employment grew over 12 percent while nonfarm employment increased just under three percent. This growth trend continued from 2008 to 2013 when Tennessee's health care employment recorded nine percent growth while total nonfarm employment decreased.

Between 2013 and 2018, both health care employment and nonfarm employment showed rigorous job growth. From 2013 to 2018, health care and total nonfarm employment grew by 8 percent. However, during the 2018-2022, this growth trend was disrupted notably by the pandemic leading to a nearly 2 percent growth rate in nonfarm and health care.

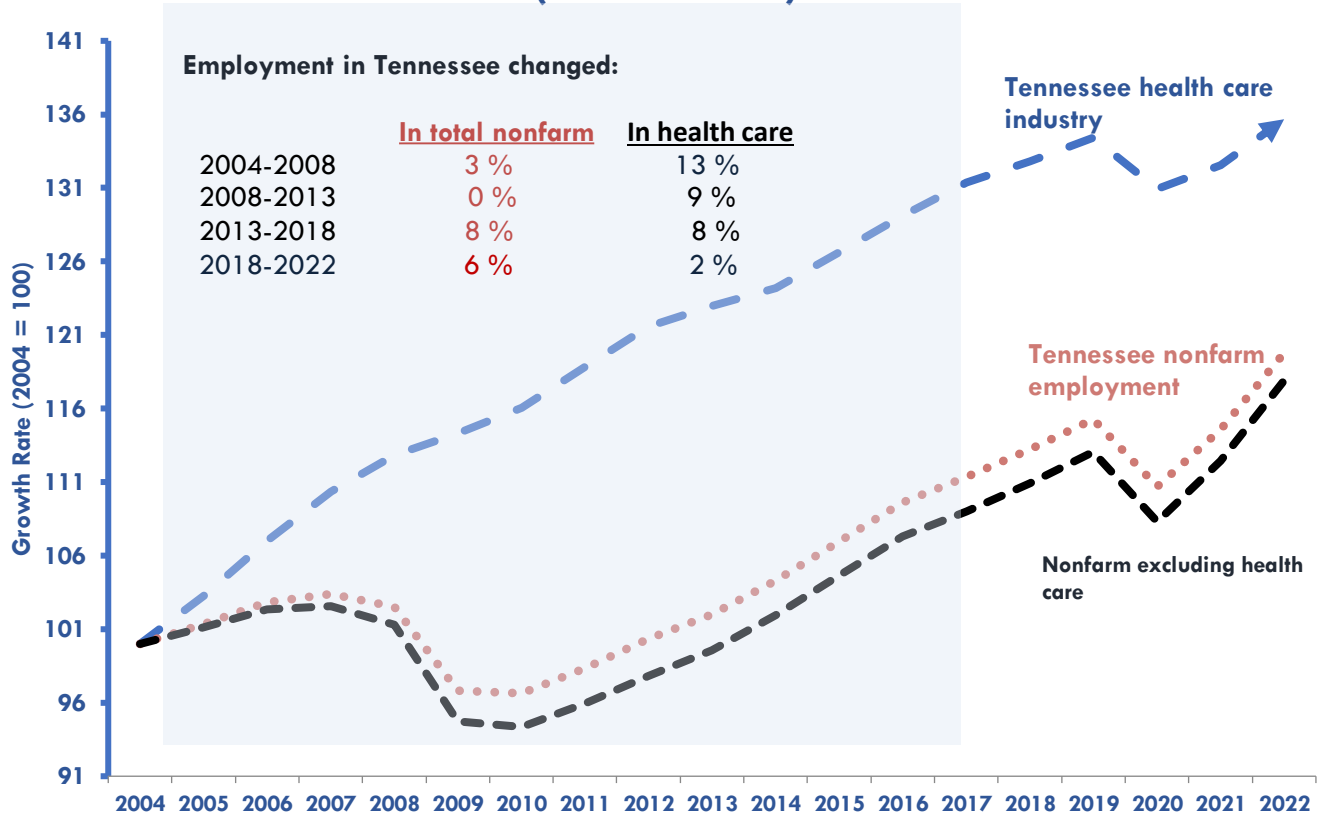
The growing share of seniors in the total population is a probable cause for the demand for health care services to continue increasing; a projected increase of 28 percent is expected between 2020 and 2040. According to Census Bureau projections, the share of the population older than 60 years in Tennessee will be over 24 percent by 2030.

Health care and social assistance occupations are projected to increase 19.7 percent during 2020-30 period, with an annual percent change of 1.81 percent. Overall health care occupations are projected to add 80,580 jobs between 2020 and 2030.

Among the fastest growing occupations in Tennessee, nurse practitioners are in the top five occupations while home health and personal care aides are also among the top 25 occupations.

Figure II.6

## Tennessee Trends in Health Care Employment (2004 = 100)



Source: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)) and BERC calculations

Figure II.7

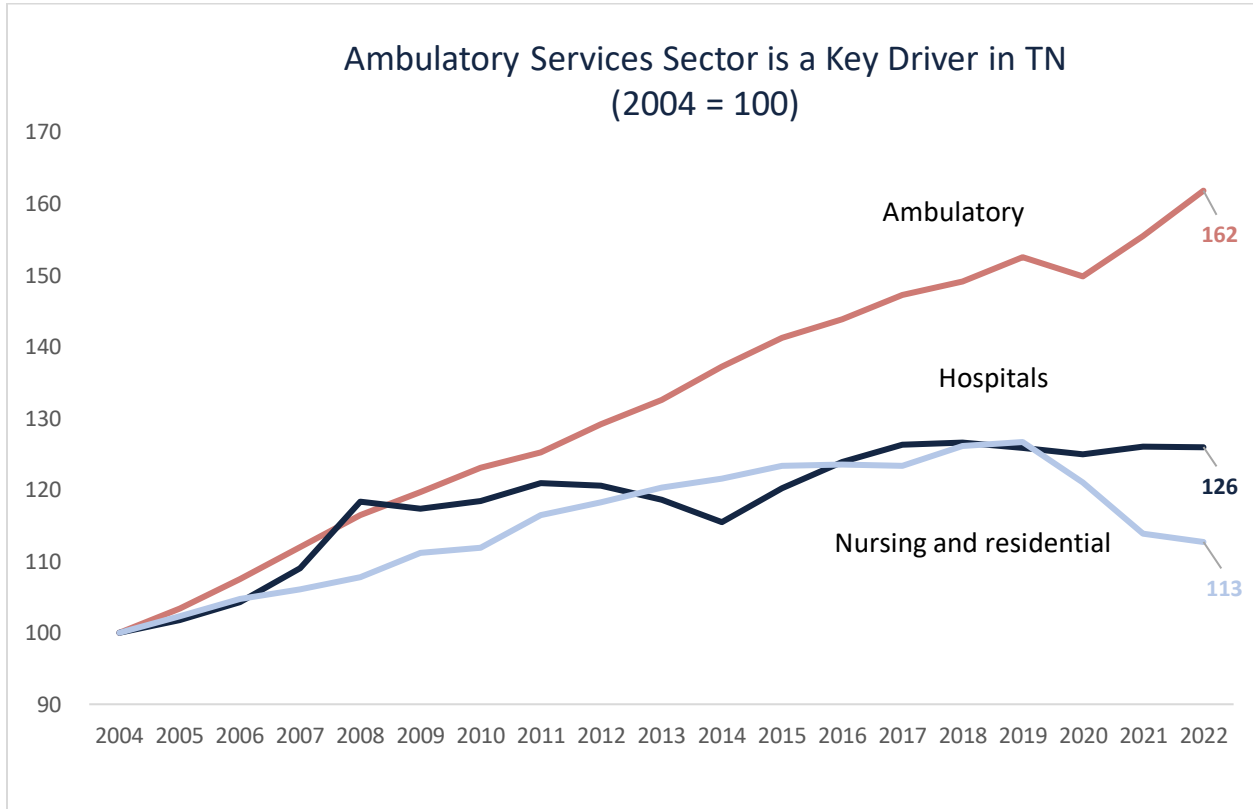
Fastest Growing Occupational Projections Tennessee (2020-2030)					
Occupations	Employment		Change		Openings Av. Annual
	2020	2030	Number	Percent	
Athletes and Sports Competitors	480	820	340	71%	120
Cooks, Restaurant	21,160	35,260	14,100	67%	5,490
Motion Picture Projectionists	140	230	90	64%	50
Nurse Practitioners	8,180	12,860	4,680	57%	1,020
Statisticians	550	850	300	55%	80
Software Developers and Software Quality Assurance Analysts and Testers	15,770	24,100	8,330	53%	2,270
Miscellaneous Entertainers and Performers, Sports & Related Workers	590	900	310	53%	100
Logisticians	3,130	4,710	1,580	51%	500
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	9,080	13,580	4,500	50%	1,590
Fitness Trainers and Aerobics Instructors	3,690	5,500	1,810	49%	890
Information Security Analysts (SOC 2018)	2,070	3,050	980	47%	280
Ushers, Lobby Attendants, and Ticket Takers	3,850	5,660	1,810	47%	1,270
Tour and Travel Guides	1,300	1,910	610	47%	310
Amusement and Recreation Attendants	4,900	7,180	2,280	47%	1,500
Actors	260	380	120	46%	50
Hotel, Motel, and Resort Desk Clerks	4,590	6,710	2,120	46%	1,140
Bartenders	6,410	9,350	2,940	46%	1,610
Baggage Porters and Bellhops	470	680	210	45%	100
Pesticide Handlers, Sprayers, and Applicators, Vegetation	160	230	70	44%	30
Chefs and Head Cooks	1,530	2,190	660	43%	300
Nursing Instructors and Teachers, Postsecondary	1,440	2,060	620	43%	220
Sound Engineering Technicians	280	400	120	43%	50
Medical and Health Services Managers	10,500	14,990	4,490	43%	1,420
Home Health and Personal Care Aides	31,470	44,740	13,270	42%	5,930
Coaches and Scouts	5,020	7,100	2,080	41%	1,040

Sources: State Occupational Projections at <https://www.projectionscentral.com>

In Tennessee, as in the U.S., the growth in health care employment was primarily driven by ambulatory services between 2004 and 2020. While hospitals and residential and nursing care services also recorded growth, it was not as rigorous as in ambulatory services. During the 2018-

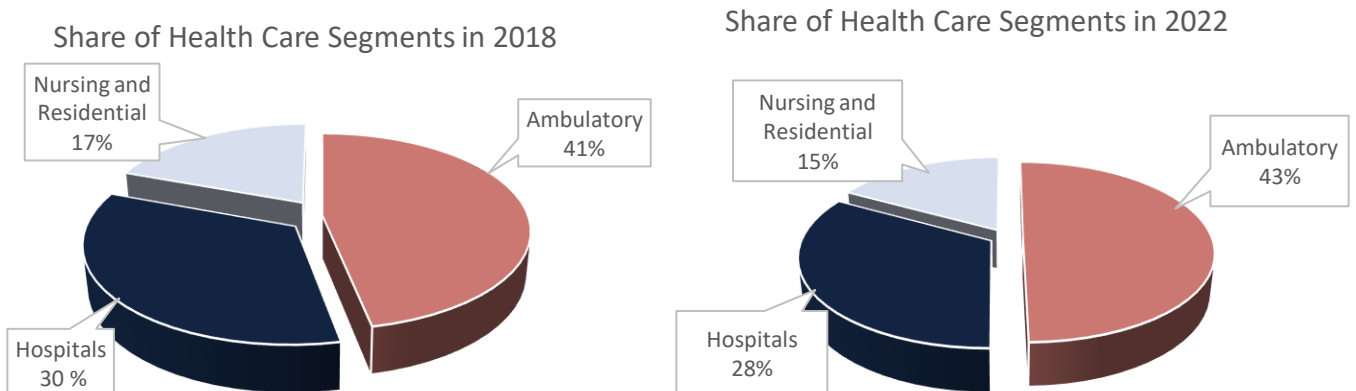
2022 period, the growth in hospitals and nursing and residential services was slower than the 2013-2018 period. While ambulatory services maintained an 8 percent growth, employment in nursing services decreased.

Figure II.8



The ambulatory services sector has grown faster than the other health care sectors. In Tennessee, the ambulatory services segment represents a larger share of the total health care sector than it does nationally. From 2018 to 2022, the nursing and residential care segment slightly decreased while ambulatory services increased by two percentage points.

Figure II.9





### II.3 Trends in the Nashville MSA

Nashville's health care employment grew faster than total nonfarm employment between 2004 and 2008. While Nashville's nonfarm employment saw a 6 percent growth rate between 2004 and 2008, Nashville's health care employment recorded a 15 percent growth rate during the same period. This growth trend continued between 2008 and 2013. During that period, Nashville's health care sector recorded a 12 percent growth rate. Between 2013 and 2018, there was a 14 percent growth rate while nonfarm employment increased to 20 percent. During the 2018-2022 period, both health care employment and nonfarm employment have slowed to 8 percent and 11 percent, respectively.

From a historical perspective, Nashville's health care sector grew 50 percent from 2004 to 2022, adding more than 50,000 jobs. The period between 2018 and 2022 was active for Nashville's health services, which added over 10,000 jobs.

In line with national and state population growth trends, the share of seniors in the adult population of Davidson County is projected to reach 14 percent in 2030, up from 12.5 percent in 2019, further increasing the demand for health care services<sup>7</sup>.

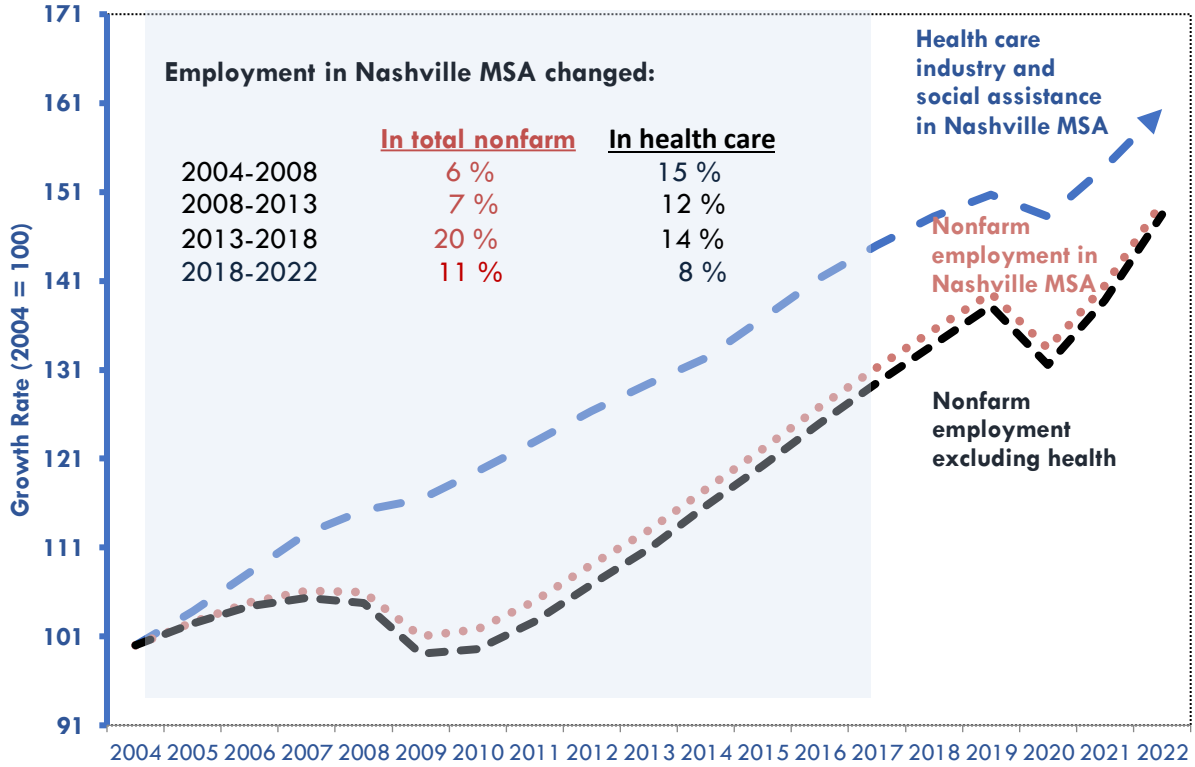
In Nashville, health care occupations represented 12 percent of total nonfarm jobs in 2022, meaning one health care worker in every eight nonfarm occupations.

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<sup>7</sup> Data is from TACIR (Tennessee Advisory Commission on Intergovernmental Relations) at [www.state.tn.us/tacir/population.htm](http://www.state.tn.us/tacir/population.htm).

Figure II.10

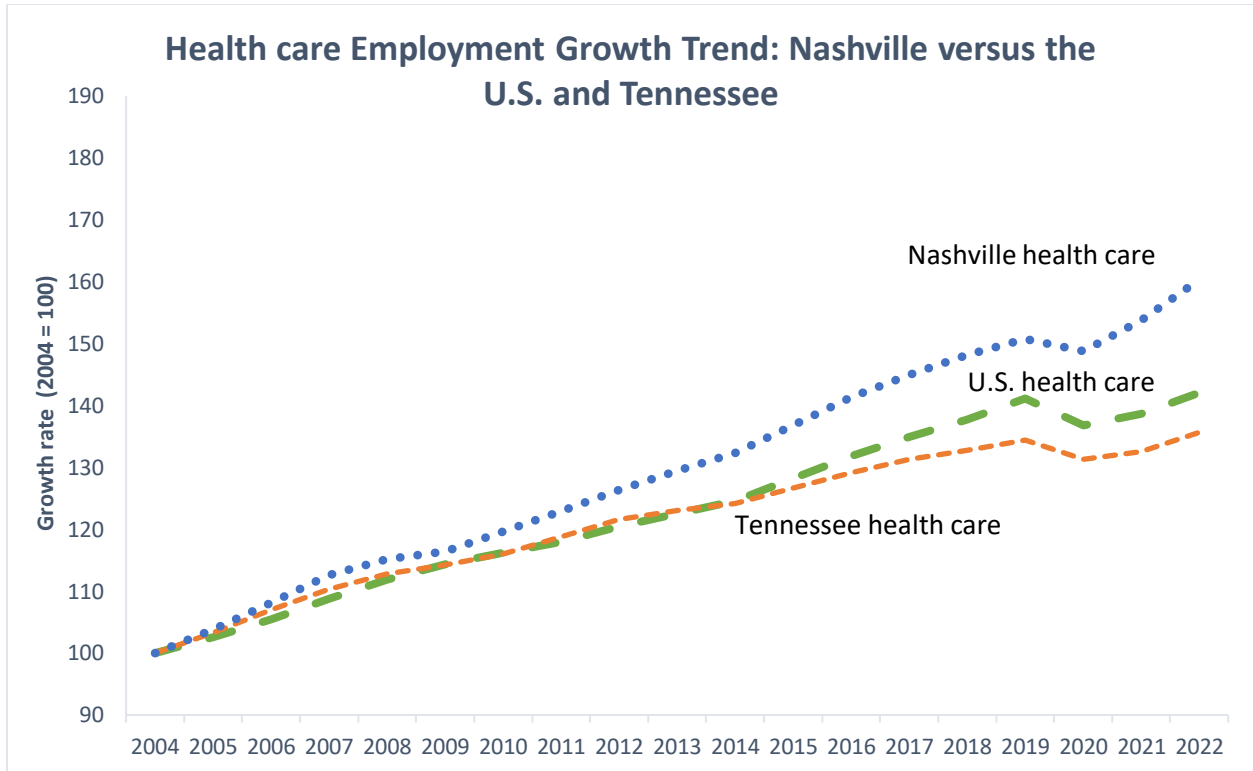
## Trends in Health Care Employment in Nashville MSA (2004 = 100)



Source: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)) and BERC calculations

**II.4 Comparative Perspective on Trends in the Core Health Care Industry** Employment growth in Nashville's core health care industry has been faster than state and national employment growth in that sector since 2004.

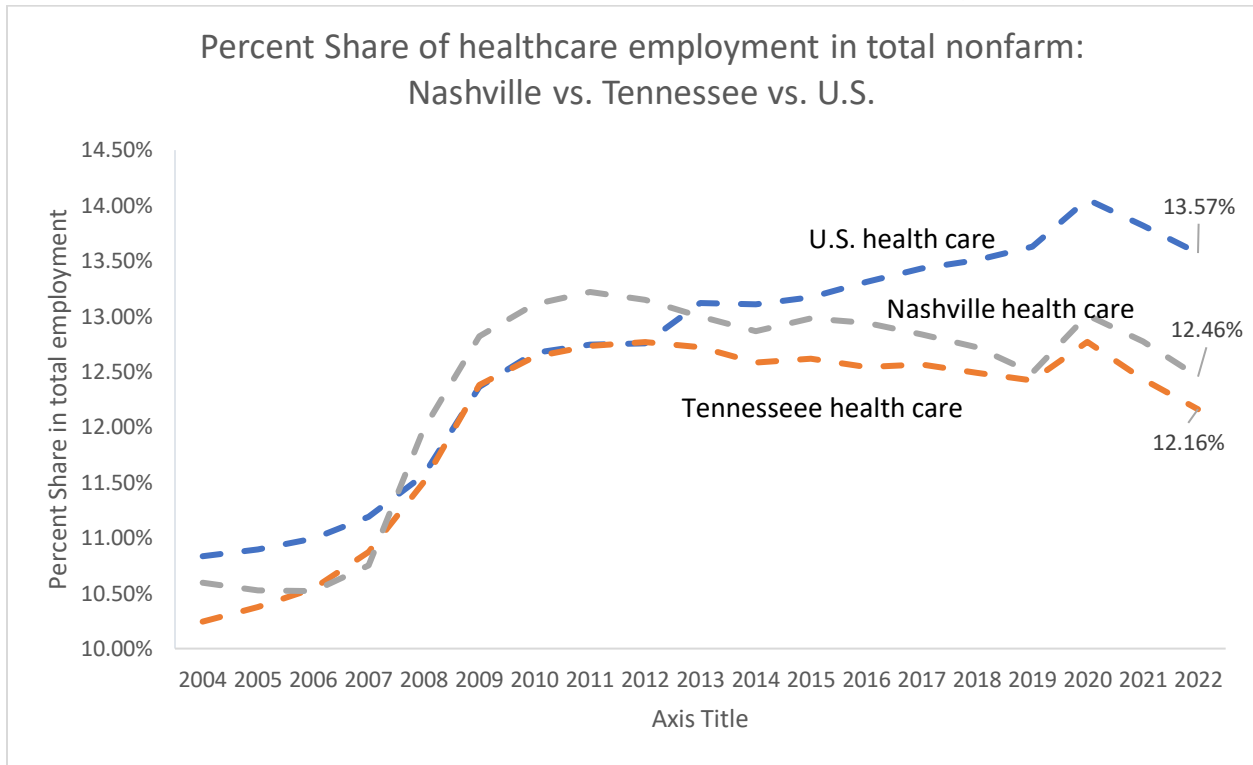
Figure II.11



Source: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)) and BERC calculations

**The core health care sector played a more prominent role in Nashville's economy than in the state and national economies** from 2007 to 2011. The following graph clearly shows that the employment share of the health care industry stabilized around 13 percent in 2011. The share of health care employment in the U.S. economy increased substantially after 2011.

Figure II.12



Source: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)) and BERC calculations

**The core health care sector played a more prominent role in Nashville's economy than in the state and national economies** from 2007 to 2011. The following graph clearly shows that the employment share of the health care industry stabilized around 13 percent in 2011. The share of health care employment in the U.S. economy increased substantially after 2011.

### III. STUDY GOALS AND METHODOLOGY

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#### III.1. Goals of the Study

The goals of this study are to address the following questions:

- What are the trends, scope, and impact of the core health care industry and health care industry cluster on the regional economy?
- What is the economic significance to the region of health care companies headquartered in Nashville?
- How does Nashville's health care industry compare with the health care industry in 12 of its peer MSAs?
- How does the Nashville MSA rank relative to its 12 peer MSAs in terms of selected health care indicators?
- What is the overall economic trend of health care services in the greater Nashville area, and how does this trend compare to the peer markets?
- What role has the Nashville Health Care Council (The Council or NHCC) played in promoting the health care industry in the greater Nashville area since 1995?

#### III.2 A Review of Selected Literature

The health care industry has been one of the core components of the economy at the global, national, and local levels. The health care industry in the U.S. is seen as an engine for economic growth. It is also a determinant of public health welfare. According to U.S. Bureau of Labor Statistics (BLS) projections, this sector is expected to create the most employment opportunities between 2021 and 2031, with a particular emphasis on health care jobs that involve caring for the elderly and those that are part of team-based health care (BLS News Release, 2022). The health care industry is expected to have a 13 percent increase in employment from 2021 to 2031, significantly higher than the average for all occupations. This growth is predicted to lead to roughly 2 million new jobs and replacement openings, from permanent workers leaving their positions, during the decade (BLS Occupational Outlook Handbook, 2022). It also reveals that the segment of the population aged 65 and over will grow in the next decade, resulting in a rise in demand for health care services and social assistance, which could necessitate a structural change in the health care industry.

The health care and social assistance sector is projected to generate the most jobs, with an estimated 2.6 million new positions by 2031. The individual and family services industry is expected to add the most employment during the projected period, with approximately 850,000 jobs and a 2.8 percent annual growth rate. Health care support occupations, including physical therapist assistants, home health and personal care aides, and occupational therapy assistants, are projected to grow the fastest, at 17.8 percent, over the same period. Home health and personal care aides are projected to experience the most significant increase in new jobs, reaching 4.6 million in 2031. As a result, this makes it the largest occupation in the economy due to the growing elderly population's pressing health care needs. (BLS News Release, 2022)

The Covid-19 and post-pandemic years have caused a significant increase in demand for health care services and the need for structural changes and technological innovations within the health care industry. This has prompted health care organizations to prioritize employment and employee support and retain talent, especially among clinical populations. According to Deloitte Global Health care Outlook (2022), despite the challenges during the pandemic, the health care industry has accelerated the implementation of innovative changes within the industry that were not previously expected until 2040 (Deloitte Global Health care Outlook, 2022). Globally, the industry has heightened the use of new technology and care, delivery models, while increasing its focus on sustainability and resiliency.

Regional economic studies also place the health care industry at the center of regional economic growth. The growth of the health care industry not only creates employment growth in the health care sector but also promotes growth in other economic sectors, such as businesses, and related service industries, generating additional tax revenues, and supplying jobs to the economy (Center for Health care Economics and Policy, 2019). Studies indicate that at the national level, physicians, with the support of clinical and administrative staff, create an aggregate of 2.3 trillion dollars in direct and indirect economic output in sales revenues. When averaged, such an economic impact makes a single physician credited to 3.3 million in direct and indirect economic output (IQVIA, 2018a)

Most regional economic studies focus on the core health care services at the center stage of the health care industry. However, health care-related infrastructure industries such as health care management, life science research, suppliers, and professional services are critical components of the health care industry cluster and contribute to the growth of the health care industry. A few studies have emphasized the inclusion of health care cluster linkages in economic impact assessment of the regional health care industry. A study on the economic impact of Indiana by BioCrossroads (2013) analyzed the key health care supplier industries to measure the extent of the overall impact. Using an input-output model, they analyzed the relationships between health care and other economic sectors. Another study on the health care industry in Lake Chelan Valley, Washington (2014) uses the health care industry cluster angle to review the current and future economic impacts of health care. These studies stress the need for incorporating health care industry clusters in examining the health care industry's economic growth.

According to the Bureau of Labor Statistics projections (2023), the health care sector is expected to grow 12.6 percent from 2021-2031. Within the health care sector, the management and health care services occupational groups are expected to grow at a more incredible speed, synergizing the business growth in other industries such as information technology, e-commerce, etc. (BLS News Release, April 2023). Nashville, as a regional hub for a health care industry cluster, has significantly contributed to the state's economy with more than 1 billion dollars in venture capital invested in the past decade. It is also home to multiple health care management and services companies. With the BLS projected growth of health care management and services companies for the decade, it will be interesting to monitor the growth of this sector in the health care industry in Nashville.

### III.3 Method and Data

Indicators for this study were collected from multiple sources. Data and figures for the Nashville MSA were more readily available than comparable figures for the peer MSAs in many cases; this is in large part due to data suppression. BERC accessed varied sources to calculate estimated comparable figures for the MSAs for the analysis. This analysis is dictated by the availability of data for health care-related indicators. As a result, throughout the present study, there may be slight variations or discrepancies between estimated figures for a particular indicator due to the estimation methods used by different employment survey sources. BERC also consulted multiple sources to construct a time-series perspective on health care indicators for Nashville and the peer MSAs. The data sources are presented in the appendix.

#### Selection of Peer MSAs

In consultation with the Nashville Health Care Council and the Nashville Area Chamber of Commerce, BERC has identified 12 peer MSAs for Nashville: Atlanta, Birmingham, Charlotte, Columbus, Dallas, Denver, Indianapolis, Jacksonville, Kansas City (MO), Louisville, Raleigh, and Richmond, all major U.S. MSAs with substantial health care-related economic activity. BERC's selection of these MSAs was also informed by the literature (for example, see Coomes and Narang, 2001).

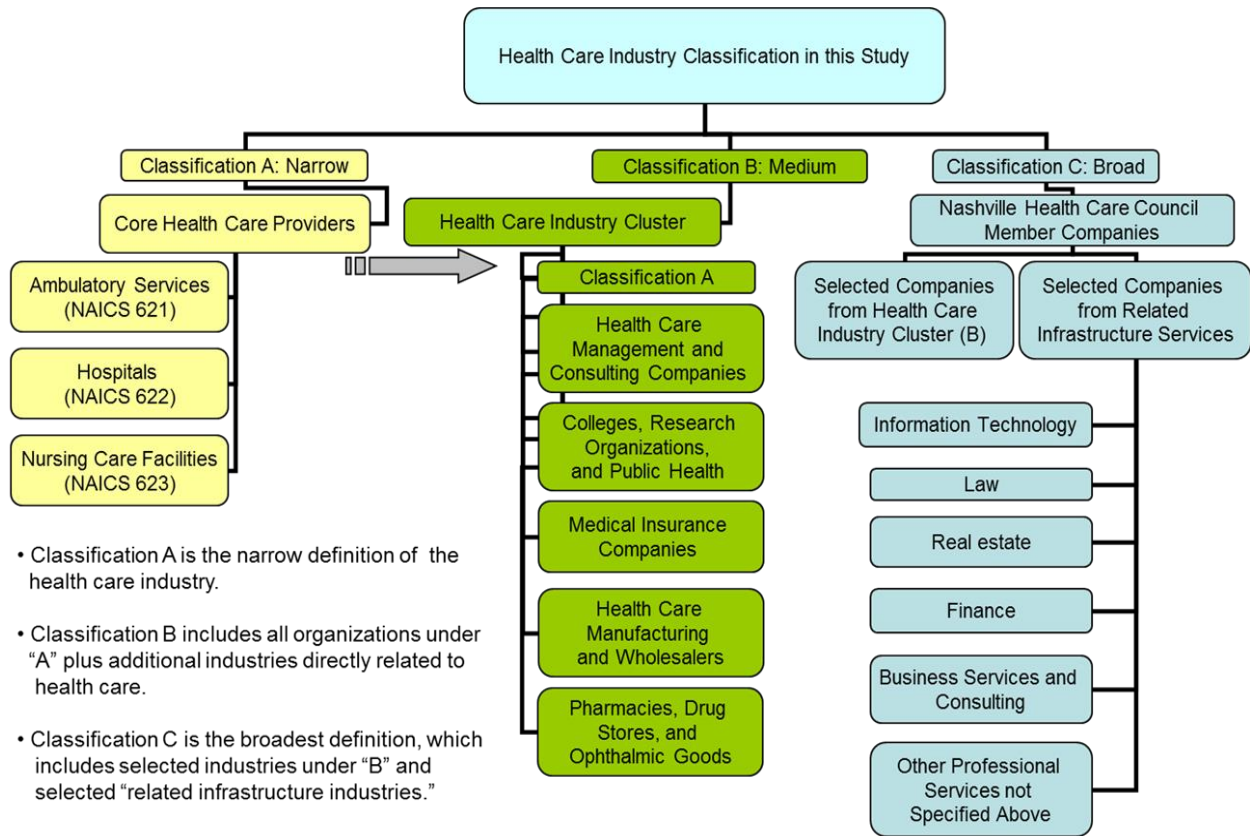
#### Survey Method

Since 1995, The Council has promoted the growth of the health care industry in Nashville. The Council has a unique member mix in that both health care and professional services (i.e., management, consulting, information technology, finance, and law) companies work together to forge strong ties to accelerate growth in the health care industry. In previous years' BERC studies of The Council, BERC employed a survey of members and analyzed results within the context of the report. Because of COVID-19 disruptions, the survey was not administered.

#### III.3.a. Definitions

Throughout this study, BERC classifies Nashville's health care industry into three distinct categories: (1) core health care industry/providers, (2) health care industry cluster, and (3) The Council member companies. The following chart indicates the relationships among these three categories of health care industry classifications. A complete industry description by NAICS code is presented in the appendix.

Figure III.1



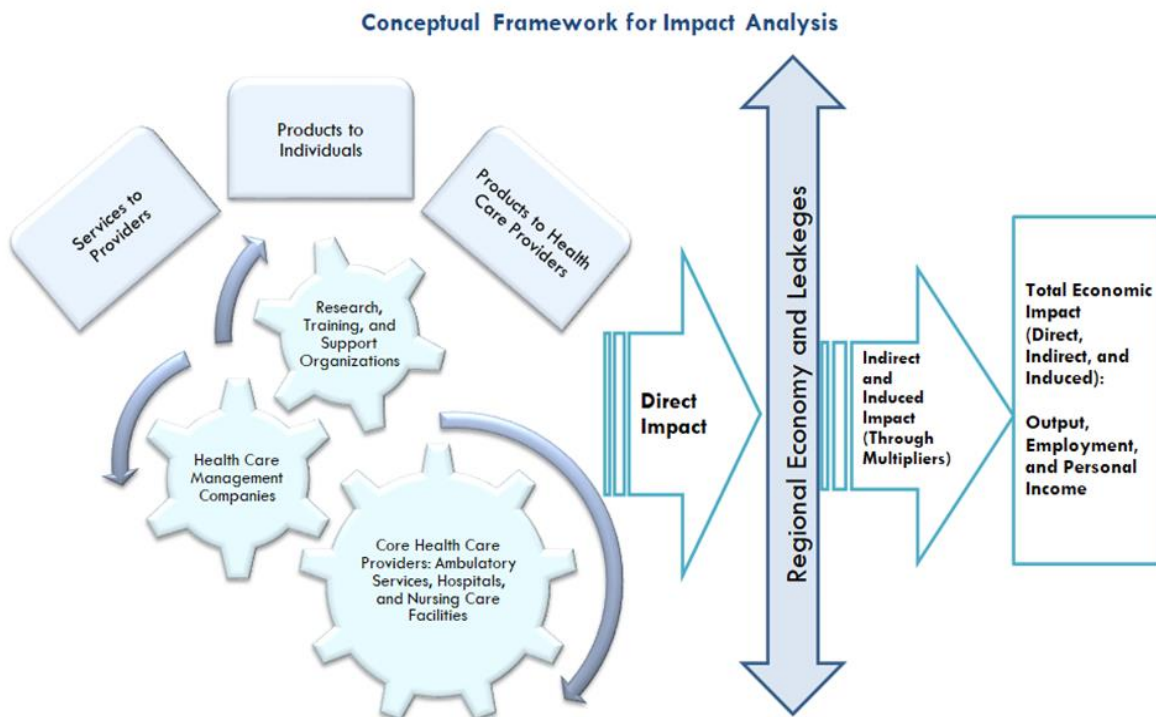
- Classification A is the narrow definition of the health care industry.
- Classification B includes all organizations under “A” plus additional industries directly related to health care.
- Classification C is the broadest definition, which includes selected industries under “B” and selected “related infrastructure industries.”



### III.3.b. Conceptual Framework for Impact Analysis

The economic impact assessment of the health care industry is based on the health care industry cluster definition provided above. This assessment aims to highlight what happens if the entire health care industry cluster is removed from the regional economy. BERC reports the direct, indirect, and induced economic impact of counterfactually removing the health care industry cluster from the economy<sup>8</sup>. The report presents three categories of impact: output, employment, and personal income. For each of these categories, BERC also reports leakages out of Nashville and the relationship between the health care industry cluster and other sectors of the economy. BERC adjusted the indirect and induced effects of the health care subsectors on each other within the health care industry cluster. BERC assumes that IMPLAN (see appendix) regional purchasing coefficients (RPCs) represent the current situation, and the differences between 100 percent local purchase and the default model RPCs determine the leakages outside of Nashville. To avoid double-counting, the core health care providers were not allowed to stimulate the health care sector and other subsectors in the cluster. The following chart shows the conceptual framework that highlights the procedure used to calculate the economic impact of the health care cluster.

Figure III.2



<sup>8</sup> See L. William Seidman Research Institute (2015), *The Economic Impact of Arizona's Hospitals on the State & Its Counties* (Arizona Hospital and Health care Association).

## IV. CORE HEALTH CARE INDUSTRY IN THE NASHVILLE MSA: ITS SCOPE AND TRENDS

### IV.1. Total Employment

Nashville's core health care sector employed just over 127,700 people in 2022, less than a 5 percent decrease from 2019. By segment, 45 percent are in hospitals, 43 percent in ambulatory services, and 12 percent in nursing care facilities. The core health care sector includes NAICS 621, 622, and 623. The share of ambulatory employment decreased by almost two percentage points between 2019 and 2022.

Figure IV.1

Core Health Care Employment in Nashville MSA (NAICS 621, 622 and 623)				
Years	Ambulatory	Hospitals	Nursing Care	Total
2008	34,000	42,300	14,000	90,300
2014	44,100	45,400	15,800	105,300
2019	59,500	54,000	19,900	133,400
2022	55,200	57,000	15,500	127,700
<b>Change (2008-2014)</b>	29.71%	7.33%	12.86%	16.61%
<b>Change (2014-2019)</b>	34.92%	18.94%	25.95%	26.69%
<b>Change (2019-2022)</b>	-7.23%	5.56%	-22.11%	-4.27%

Sources: Tennessee Department of Labor and Workforce Development and BERC Calculations

BERC used several data sources including IMPLANpro and County Business Patterns ([www.census.gov](http://www.census.gov)) to estimate employment by segment.

Each Nashville MSA core health care industry sector segment experienced some decline, except for hospitals, over both the long and short terms. From 2008 to 2014, ambulatory services grew nearly 30 percent, nursing care almost 13 percent, and hospitals almost 7 percent. From 2014 and 2019, ambulatory services experienced an approximate 35 percent increase in employment, followed by nursing care with nearly 26 percent growth, and hospitals with approximately 19 percent. From 2019 and 2022, ambulatory services experienced over 7 percent decrease in employment, followed by nursing care with a 22 percent decline, and hospitals with approximately 6 percent growth.

### Employment by Occupation

The difference between the categories of employment in the health care sector and employment in health care occupations is that the former category (sector) includes all occupations in the sector, ranging from accountant to medical doctor. The category health care occupations refers to medical professionals and allied health occupations but does not include occupations in health care education and research. Nonetheless, in 2022, health care occupations account for about

9.64 percent of total occupations in Nashville MSA. Overall, the average wage for health care occupations at \$92,470 is significantly higher than Nashville's average annual wage of \$57,560.

**Fig. 4.2 Employment by Occupational Groups**

OOH Occupation Group	Employment		Average Wage	
	Total Number	Percent Share	Average Wage (\$)	Percent Difference from Average
<b>All Occupations</b>	<b>1,036,630</b>	<b>100</b>	<b>57,560</b>	<b>0%</b>
Management Occupations	78,140	8%	128,480	123%
Business and Financial Operations Occupations	64,230	6%	72,570	26%
Computer and Mathematical Occupations	34,230	3%	88,690	54%
Architecture and Engineering Occupations	11,950	1%	85,330	48%
Life, Physical, and Social Science Occupations	6,330	1%	71,090	24%
Community and Social Service Occupations	12,710	1%	50,200	-13%
Legal Occupations	7,490	1%	109,500	90%
Educational Instruction and Library Occupations	44,160	4%	53,390	-7%
Arts, Design, Entertainment, Sports, and Media Occupations	15,400	1%	61,630	7%
<b>Healthcare Practitioners and Technical Occupations</b>	<b>70,380</b>	<b>7%</b>	<b>92,470</b>	<b>61%</b>
<b>Healthcare Support Occupations</b>	<b>29,550</b>	<b>3%</b>	<b>35,690</b>	<b>-38%</b>
Protective Service Occupations	23,510	2%	44,620	-22%
Food Preparation and Serving Related Occupations	88,500	9%	28,600	-50%
Building and Grounds Cleaning and Maintenance Occupations	25,570	2%	33,810	-41%
Personal Care and Service Occupations	18,200	2%	34,620	-40%
Sales and Related Occupations	86,680	8%	47,950	-17%
Office and Administrative Support Occupations	149,900	14%	44,600	-23%
Farming, Fishing, and Forestry Occupations	700	0%	50,270	-13%
Construction and Extraction Occupations	40,560	4%	49,790	-13%
Installation, Maintenance, and Repair Occupations	40,860	4%	52,000	-10%
Production Occupations	67,130	6%	45,050	-22%
Transportation and Material Moving Occupations	120,460	12%	41,600	-28%

Source: Bureau of Labor Statistics ([https://www.bls.gov/oes/current/oes\\_34980.htm](https://www.bls.gov/oes/current/oes_34980.htm))

## IV.2. Sectoral Diversity

The health and social assistance sector (core health care industry + social assistance) representing about 12.02 percent or 135,000 of total non-farm jobs, is the second largest in Nashville's economy (after professional and business services). This sector maintained its growth ranking from 2014-2022. Growth of over 8 percent from 2018 to 2022 indicates the sector continues as a pillar of Nashville's economy.

Figure IV.3

<b>Employment by Sector in Nashville MSA (2022)</b>			
	<b>Employment</b>		
	<b>Number (thousands)</b>	<b>Growth from 2018 (%)</b>	<b>Current Share (%)</b>
<b>Total Non-farm</b>	<b>1123.1</b>	<b>10.58%</b>	<b>100.00%</b>
<b>Mining, Logging and Construction</b>	<b>57.8</b>	<b>25.65%</b>	<b>5.15%</b>
<b>Manufacturing</b>	<b>86.1</b>	<b>2.14%</b>	<b>7.67%</b>
<b>Wholesale</b>	<b>46.5</b>	<b>11.24%</b>	<b>4.14%</b>
<b>Retail</b>	<b>103.5</b>	<b>2.88%</b>	<b>9.22%</b>
<b>Transportation and Utilities</b>	<b>71.5</b>	<b>38.57%</b>	<b>6.37%</b>
<b>Information</b>	<b>31.4</b>	<b>34.19%</b>	<b>2.80%</b>
<b>Financial Activities</b>	<b>76.1</b>	<b>11.26%</b>	<b>6.78%</b>
<b>Professional and Business Services</b>	<b>196.4</b>	<b>16.28%</b>	<b>17.49%</b>
<b>Educational Services</b>	<b>29.2</b>	<b>2.10%</b>	<b>2.60%</b>
<b>Health and Social Assistance</b>	<b>135</b>	<b>8.17%</b>	<b>12.02%</b>
<b>Leisure and Hospitality</b>	<b>122.6</b>	<b>5.24%</b>	<b>10.92%</b>
<b>Other Services</b>	<b>45.9</b>	<b>8.51%</b>	<b>4.09%</b>
<b>Government</b>	<b>121.2</b>	<b>2.28%</b>	<b>10.79%</b>

Source: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov))

In this context, it is appropriate to address the perennial question of which sector ranks first in the Nashville MSA. In evaluating the ranking, employment is only one aspect of an economic sector's contribution to the regional economy. Business revenue, value-added, personal income, and indirect business taxes are additional, often overlooked, considerations. What follows is a guide

for evaluating economic sector roles in the region's economy.<sup>9</sup>

Figure IV.4

Contributing to Nashville's Economy: How Much?

	Employment*			Business Revenue			Personal Income*			Cumulative Ranking	
	Number	Score	Rank	Total	Score	Rank	Total	Score	Rank	Average	Final
	(thousands)			(millions)			(millions)			Score	Rank
<b>Total</b>	<b>1,402.32</b>	<b>n/a</b>	<b>n/a</b>	<b>\$297,058</b>	<b>n/a</b>	<b>n/a</b>	<b>\$108,600</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
11 Ag, Forestry, Fish & Hunting	15.05	0.07	17	\$643	0.09	18	\$98	0.08	18	0.08	17
21 Mining	1.49	0.04	18	\$794	0.10	17	\$111	0.08	17	0.07	18
22-23 Utilities & Construction	89.14	0.65	8	\$18,226	0.59	7	\$8,550	0.76	3	0.67	5
31-33 Manufacturing	86.08	0.62	9	\$49,937	1.00	1	\$7,325	0.66	5	0.76	3
42 Wholesale Trade	44.30	0.23	12	\$18,608	0.60	6	\$4,959	0.42	9	0.42	12
44-45 Retail trade	113.14	0.84	3	\$13,797	0.44	9	\$5,529	0.48	7	0.58	6
48-49 Transportation & Warehousing	91.10	0.67	7	\$11,837	0.37	11	\$4,841	0.41	10	0.48	11
51 Information	30.58	0.14	14	\$15,412	0.49	8	\$3,189	0.26	13	0.30	13
52 Finance & insurance	78.67	0.55	10	\$27,429	0.85	3	\$7,940	0.71	4	0.70	4
53 Real estate & rental	66.30	0.43	11	\$28,525	0.87	2	\$3,006	0.25	14	0.51	9
54 Professional-scientific & tech services	121.49	0.88	2	\$22,835	0.74	5	\$13,384	0.97	2	0.86	2
55 Management of companies	29.65	0.13	16	\$7,605	0.24	14	\$4,735	0.40	11	0.26	14
56 Administrative & waste services	106.28	0.79	5	\$11,888	0.37	10	\$6,032	0.53	6	0.56	7
61 Educational services	30.01	0.14	15	\$2,335	0.12	16	\$1,566	0.15	16	0.14	16
<b>62 Health &amp; social services</b>	<b>144.24</b>	<b>0.96</b>	<b>1</b>	<b>\$25,027</b>	<b>0.79</b>	<b>4</b>	<b>\$16,167</b>	<b>1.00</b>	<b>1</b>	<b>0.92</b>	<b>1</b>
71 Arts- entertainment & recreation	37.41	0.18	13	\$7,521	0.24	15	\$2,490	0.21	15	0.21	15
72 Accommodation & food services	109.07	0.81	4	\$11,478	0.36	12	\$4,511	0.38	12	0.52	8
81 Other services	96.29	0.71	6	\$9,391	0.29	13	\$5,459	0.47	8	0.49	10
92 Government & non NAICS	112.05	0.83	4	\$13,772	0.44	10	\$8,709	0.77	3	0.68	5

Employment, business revenue (value of production) and value added (GDP-equivalent) figures derived from IMPLANpro 2021 data for Nashville MSA

\*Both employment and personal income include: (1) wage and salary employment and income and (2) proprietary employment and income

As the previous table demonstrates, employment is only one measure of the effect of economic activities on a region's economy. Although its ranking by employment is behind other sectors, health and social services ranks number one in the creation of economic value in the region. Overall, Professional-scientific and tech services ranks second and manufacturing, third<sup>10</sup>.

### IV.3 Establishments

Ambulatory services account for more than 90 percent of establishments (a single business location of a company) in the core health care industry. Nursing care facilities and hospitals account for about 11 percent of establishments. The following table of establishments includes only health care establishments under NAICS 621, 622, and 623.

<sup>9</sup> IMPLANpro model is created for Nashville MSA, including 13 counties.

<sup>10</sup> For detailed information about a specific sector, please see the North American Industrial Classification System (NAICS) at [www.census.gov/eos/www/naics/](http://www.census.gov/eos/www/naics/).

Figure IV.5

<b>Core Health Care Establishments in Nashville MSA (NAICS 621, 622 and 623)</b>				
<b>Years</b>	<b>Ambulatory</b>	<b>Hospitals</b>	<b>Nursing Care</b>	<b>Total</b>
<b>2008</b>	2,417	52	234	2,703
<b>2014</b>	2,804	45	280	3,129
<b>2019</b>	3,324	60	347	3,731
<b>2022</b>	4,282	84	389	4,755
<b>Change (2008-2014)</b>	16.01%	-13.46%	19.66%	15.76%
<b>Change (2014-2019)</b>	18.54%	33.33%	23.93%	19.24%
<b>Change (2019-2022)</b>	28.82%	40.00%	12.10%	27.45%

Source: Tennessee Department of Labor and Workforce Development and

Source: BERC estimates. BERC used ImplanPro, County Business Patterns (www.census.gov) and additional data sources to estimate establishments by segment.

The number of health care establishments experienced a significantly greater increase from 2019 to 2022, an increase of almost 28 percent, than from 2014 to 2019. **Between 2019 and 2022, a total of 1024 health care establishments emerged in Nashville, for a total of 4,755.**

#### IV.4 Wages

**In 2022, wages in Nashville's core health care industry total reached \$10.37 billion, with hospitals and ambulatory services accounting for more than 93 percent of those wages.**

Moreover, total wages across core health care industry sector segments increased between 2019 and 2022: ambulatory services wages increased from \$4.03 billion to \$4.74 billion; hospital wages increased from \$3.12 billion to \$4.92 billion; and nursing care facilities wages rose from \$0.60 billion to \$0.71 billion. Of the three health care industry sector segments, hospital services experienced the most significant increase in total wages, approximately 58 percent. Nursing care wages increased by over 18 percent, and ambulatory wages increased by about 18 percent.

Figure IV.6

<b>Core Health Care Wages in Nashville MSA (NAICS 621, 622 and 623) (Billion \$)</b>				
<b>Years</b>	<b>Ambulatory</b>	<b>Hospitals</b>	<b>Nursing Care</b>	<b>Total</b>
<b>2008</b>	\$1.87	\$2.45	\$0.39	\$4.71
<b>2014</b>	\$2.59	\$2.77	\$0.47	\$5.83
<b>2019</b>	\$4.03	\$3.12	\$0.60	\$7.75
<b>2022*</b>	\$4.74	\$4.92	\$0.71	\$10.37
<b>Change (2008-2014)</b>	38.50%	13.06%	20.51%	23.78%
<b>Change (2014-2019)</b>	55.60%	12.64%	27.66%	32.93%
<b>Change (2019-2022)</b>	17.62%	57.69%	18.33%	33.81%

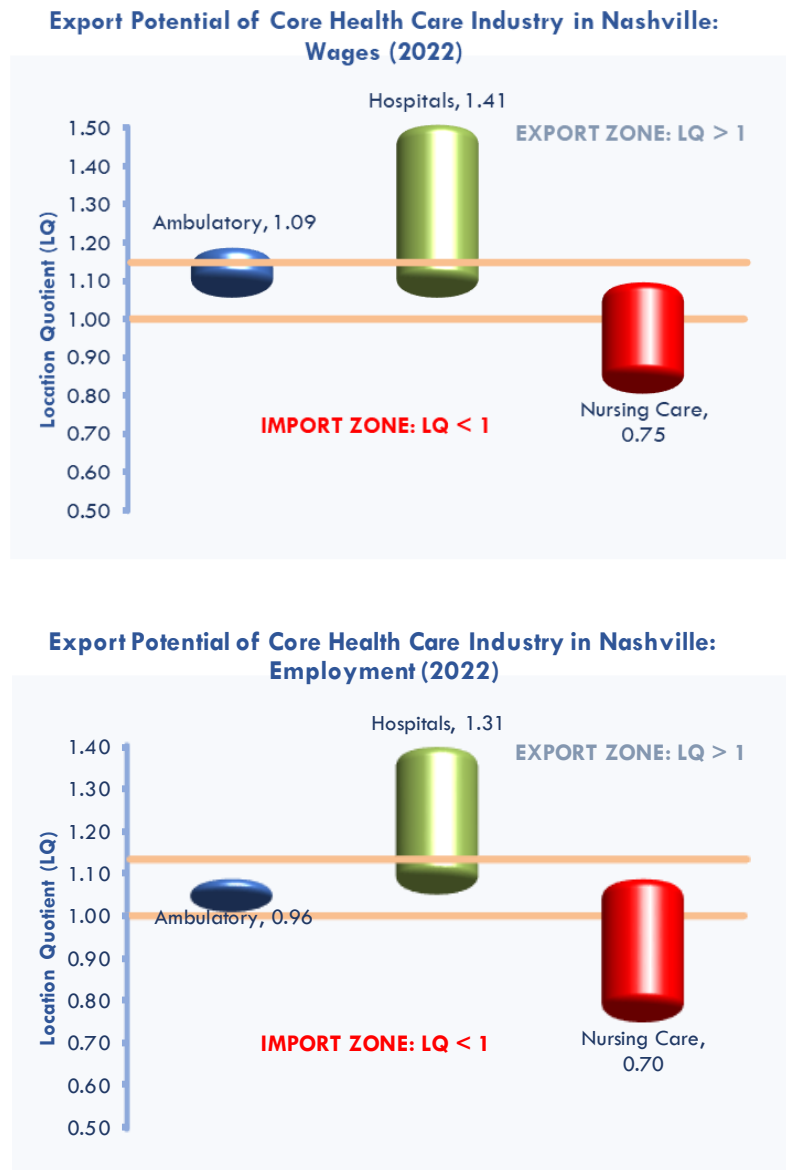
Source: Tennessee Department of Labor and Workforce Development and

Source: BERC estimates. BERC used ImplanPro, County Business Patterns (www.census.gov) and additional data sources to estimate wages by segment.

## IV.5 Export Potential of Core Health Care Industry Segments

Location quotient (L.Q.) is often used to describe the relationship between the local and national economies. If the L.Q. for the industry is larger than 1, that industry has a larger presence in the local economy than its national economic counterpart. Hospitals employ a substantially greater percentage of people in the Nashville MSA than in the U.S. Consequently, these findings suggest that supply in the region exceeds local demand for hospitals and these health care establishments serve residents outside the Nashville MSA. In the case of ambulatory services, the findings indicate the supply and demand are equal.

Figure IV.7

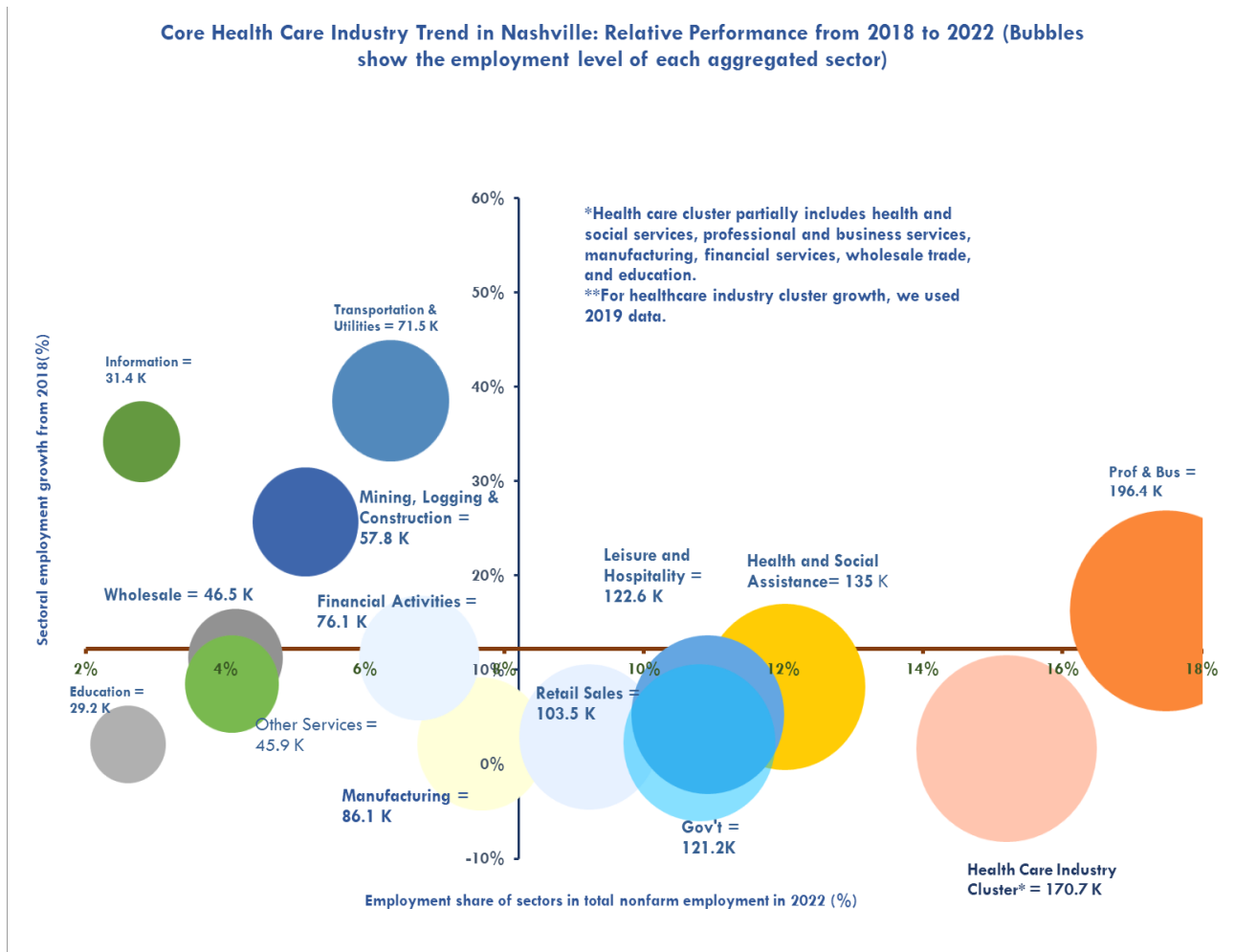


Sources: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)) and BERC calculations

## IV.6. Relative Growth Performance of Core Health Care Segments

The health care and social services sector grew faster than other sectors in the Nashville MSA (see the chart that follows). Growth in health care and social services (8.17%) was substantially lower than the average sector growth rate of 12.05 percent. However, its current (2022) share in total employment is about four percentage points above the average for all sectors. In terms of the health care industry cluster, its growth from 2018 was substantially larger than many sectors in the local economy.<sup>11</sup>

Figure IV.8



<sup>11</sup> See Chapter five for information about the health care industry cluster.



## IV.7. Core Health Care Industry and the Local Economy

### More than 32 percent of core health care spending goes to all other sectors in Nashville MSA.

Other real estate, employment services, insurance carriers (except direct life), management of companies and enterprises, and management consulting services are the top five sectors that benefit most from the business expenditures of core health care establishments in Nashville. This is illustrated in the table that follows.

Figure IV.9

Where does \$1 million core industry spending go in the local economy? (Industry-based assessment)

Sectors	Value	%
447 - Other real estate	\$114,942	11.49%
472 - Employment services	\$67,651	6.77%
444 - Insurance carriers, except direct life	\$57,628	5.76%
469 - Management of companies and enterprises	\$55,394	5.54%
462 - Management consulting services	\$32,898	3.29%
511 - All other food and drinking places	\$31,270	3.13%
445 - Insurance agencies, brokerages, and related activities	\$28,692	2.87%
449 - Owner-occupied dwellings	\$25,794	2.58%
441 - Monetary authorities and depository credit intermediation	\$23,654	2.37%
393 - Wholesale - Professional and commercial equipment and supplies	\$23,241	2.32%
456 - Accounting, tax preparation, bookkeeping, and payroll services	\$22,147	2.21%
509 - Full-service restaurants	\$20,435	2.04%
455 - Legal services	\$20,188	2.02%
487 - Medical and diagnostic laboratories	\$19,479	1.95%
397 - Wholesale - Drugs and druggists' sundries	\$14,765	1.48%
490 - Hospitals	\$13,675	1.37%
510 - Limited-service restaurants	\$12,533	1.25%
436 - Data processing, hosting, and related services	\$12,378	1.24%
442 - Other financial investment activities	\$11,860	1.19%
47 - Electric power transmission and distribution	\$10,883	1.09%
476 - Services to buildings	\$10,484	1.05%
470 - Office administrative services	\$10,183	1.02%
534 - Other local government enterprises	\$9,568	0.96%
483 - Offices of physicians	\$9,460	0.95%
473 - Business support services	\$8,825	0.88%
438 - Internet publishing and broadcasting and web search portals	\$8,777	0.88%
All other sectors	\$323,194	32.32%
<b>Total</b>	<b>\$1,000,000</b>	<b>100.00%</b>

Source: IMPLANpro Inc. and BERC's estimates.

Note: Calculations are based on assumption that all spending occurs in the local economy.

## V. NASHVILLE'S HEALTH CARE INDUSTRY CLUSTER

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To measure the economic impact of Nashville's health care industry cluster, BERC uses the counterfactual approach. This differs from the "net new concept" approach in that the counterfactual approach removes the whole health care industry cluster from the economy. It then measures the total economic impact that the subtraction generates across the remaining economy. In addition to the counterfactual approach, BERC uses employment by sector as an input when assessing the economic impact of the health care industry cluster. Finally, in the absence of detailed industry spending by zip code and vendor, BERC uses default regional purchasing coefficients to allow for outside leakage. Then BERC treats the outside leakages as the difference between the impact results with the default regional purchasing coefficients and the impact results with 100 percent local purchasing.

BERC assumes that each group of sectors in the health care industry cluster is not only closely linked to the core health care sector but that each sector also has its own independent effect on the local economy. Therefore, BERC measures the economic impact of the individual groups of sectors independent of each other and then adjusts the measure of the economic impact to take into consideration the indirect impact of the group on the core health care sector and vice versa. When the health care industry cluster is removed from the economy, BERC assumes that an economic shock to the core health care providers should not have a ripple effect on them. An adjustment for this purpose has been made to the study results.

In this study, BERC reports on the Nashville health care industry cluster's direct, indirect, and induced impacts. The direct impact refers to the current state of employment, sales, and personal income generated by the cluster in an economy. The indirect impact refers to the employment, sales, and personal income generated in the local economy by a business-to-business transaction. For example, a hospital purchases goods and services from local businesses for its operation. This hospital's spending in the local economy means additional jobs, business revenues, and personal income in other sectors. Induced impact refers to the employment, sales, and personal income generated in the local economy by employee spending. For example, a hospital employs and pays many individuals for their work at the hospital. These workers then spend their earnings in the local economy. This process generates additional jobs, business revenues, and personal income across the local economy. Finally, BERC also estimates linkages between the health care industry cluster and other sectors in the local economy.

## V.1 Employment

The Nashville health care industry cluster employs 170,702 people (2022), which corresponds to 17 of every 100 nonfarm employees in Nashville. Nashville health care industry cluster employment increased 36 percent from 2014. Among major aggregate sectors in the Nashville MSA, the health care industry cluster is second in employment, after professional and business services.

Figure V.1

Nashville Health Care Industry Cluster: Employment and Average Wage		
Major Sectors	Employment*	Average Wage
<b>Healthcare Management &amp; Consulting</b> (NAICS 551, 5412, 5415, 5416, 561, 813920)	19,258	\$109,721
<b>Healthcare Providers (NAICS 621, 622, 623)</b>	127,700	\$81,206
<b>Research, Training and Support Organizations</b>		
<i>Educational (NAICS 6112, 6113, 6115)</i>	3,051	\$82,724
<i>Research and Public Health (NAICS 54171, 92312)</i>	2,961	\$100,220
<b>Services to Providers (NAICS 524114)</b>	2,441	\$95,313
<b>Products to Healthcare Providers</b>		
<i>Manufacturing (NAICS 3391, 3254)</i>	1,759	\$73,053
<i>Wholesalers (NAICS 42345, 42346, 4242)</i>	5,843	\$107,811
<b>Products to Individuals (NAICS 456)</b>	7,578	\$45,519
<b>Total</b>	170,702	\$84,171

\*BERC estimated employment figures from Tennessee Department of Labor and Workforce Development Database

As the table above indicates, the Nashville health care industry cluster consists of several groups of sectors, with health care providers (ambulatory services, hospitals, and nursing care facilities) at the core. **The core health care industry employs 75 percent of Nashville health care industry cluster employees.** The remaining 25 percent are shared among five major industry groups; the largest is health care management and consulting with 19,258 employees.

## V.2 Establishments and Wages

The Nashville health care industry cluster, consisting of more than 7,000 establishments, accounts for \$14.37 billion in wages. From 2019 to 2022, the number of establishments increased by 44 percent, while the cluster wages increased 20.90 percent over the same period. The average wage for the Nashville Health Care Industry Cluster is around \$84,171 in 2022. This average wage is significantly higher than Nashville's average nonfarm wage of \$57,560. Nashville's health care cluster average wage increased about 18.93 percent from 2019.

Figure V.2

### Nashville Health Care Cluster Profile: Wages and Establishments (2022)

Major Sectors	Wages (Million \$)	Establishments
<b>Healthcare Management &amp; Consulting</b> (NAICS 551, 5412, 5415, 5416, 561, 813920)	\$2,113.00	504
<b>Healthcare Providers (NAICS 621, 622, 623)</b>	\$10,370.00	4,755
<b>Research, Training and Support Organizations</b>		
<i>Educational (NAICS 6112, 6113, 6115)</i>	\$252.39	48
<i>Research and Public Health (NAICS 54171, 92312)</i>	\$296.75	273
<b>Services to Providers (NAICS 524114)</b>	\$232.66	66
<b>Products to Healthcare Providers</b>		
<i>Manufacturing (NAICS 3391, 3254)</i>	\$128.50	146
<i>Wholesalers (NAICS 42345, 42346, 4242)</i>	\$629.94	684
<b>Products to Individuals (NAICS 456)*</b>	\$344.94	816
<b>Total</b>	<b>\$14,368.18</b>	<b>7,292</b>

Source: BERCS's estimates from Tennessee Department of Labor and Workforce Development Database.

\*Change in modeling due to data availability.

### V.3. Investor-Owned Health Care Management Companies (Publicly Traded)

Many studies examine the locational patterns of large corporate headquarters in the U.S. The findings suggest that the presence of large corporate headquarters provides substantial benefits to a regional economy since headquarters (1) bring high-paying jobs, (2) increase the competitive advantage of the host city, (3) promote innovative technologies through the acquisition and dissemination of information, and (4) spur growth in critical infrastructure industries, such as law, finance, and other professional and business services.<sup>12</sup>

In choosing the location of a large corporate headquarters, certain qualities of the host region are critical factors, primarily (1) a good quality of life, (2) major transportation and communication infrastructures, (3) a diverse economic base, (4) a sound financial infrastructure, (5) professional services, and (6) a highly skilled labor force.

Today Nashville is home to more than 500 health care companies that impact the health care landscape locally, nationally, and internationally. As a center of corporate headquarter activities, Nashville presents a unique combination of these qualities. According to an analysis from The Wall Street Journal and Moody's Analytics, Nashville is the second-strongest job market in the nation. Nashville's unemployment rate, labor-force participation rate, job growth, labor-force growth, and wage growth in 2021 were used to determine the ranking in comparison to about

<sup>12</sup> For a review of literature on locational patterns of company headquarters, see Thomas Klier and William Testa's (2002) "Location Trends of Large Company Headquarters during the 1990s," *Economic Perspectives* (Federal Reserve Bank of Chicago). For detailed information on the concept of cluster and competitive advantage, see Michael Porter's (2000) "Location, Competition, and Economic Development: Local Clusters in the Global Economy," *Economic Development Quarterly*, vol. 14, pp. 15-34.

300 other metro areas<sup>13</sup>. Several other rankings highlight the prominent role the Nashville MSA plays in the national economy<sup>14</sup>.

Nashville is truly *the* center for publicly traded national health care industry headquarters, with 17 major public companies calling it home. (Only publicly traded companies are included in this analysis.) **In 2022, the 17 publicly traded health care industry cluster companies headquartered in Nashville counted revenues of more than \$89 billion and employed more than 470,000 people worldwide.**<sup>15</sup>

Figure V.3

Nashville-Based Investors-Owned and Publicly Traded Health Care Management Companies			
Company Name	Corporate Employee Size	Corporate Sales Volume	Ticker Symbol
	Actual	Actual	
HCA Healthcare Inc	294000	\$60,233,000,000	HCA
Community Health Systems Inc	66000	\$12,211,000,000	CYH
Clover Health Investments Corp	656	\$3,476,687,000	CLOV
Brookdale Senior Living Inc	36000	\$2,825,379,000	BKD
Acadia Healthcare Co Inc	23000	\$2,610,399,000	ACHC
Surgery Partners Inc	12200	\$2,539,300,000	SGRY
Amedisys Inc	20000	\$2,223,199,000	AMED
National Healthcare Corp	12355	\$1,085,738,000	NHC
Healthcare Trust Of Amer Inc	583	\$932,637,000	HR
Smiledirectclub Inc	2700	\$470,743,000	SDC
National Health Investors Inc	25	\$278,194,000	NHI
Healthstream Inc	1154	\$266,826,000	HSTM
Cryoport Inc	795	\$237,277,000	CYRX
Revanche Therapeutics Inc	534	\$132,565,000	RVNC
Harrow Health Inc	217	\$88,595,000	HROW
Cumberland Pharmaceuticals Inc	85	\$42,010,000	CPIX
IMAC Holdings Inc	85	\$16,185,000	IMAC
<b>Total</b>	<b>470,389</b>	<b>\$89,669,734,000</b>	

<sup>13</sup> <https://www.wsj.com/articles/best-cities-job-market-2022-11650639572>

<sup>14</sup> Several recent rankings are available at <https://www.nashvillechamber.com/rankings>.

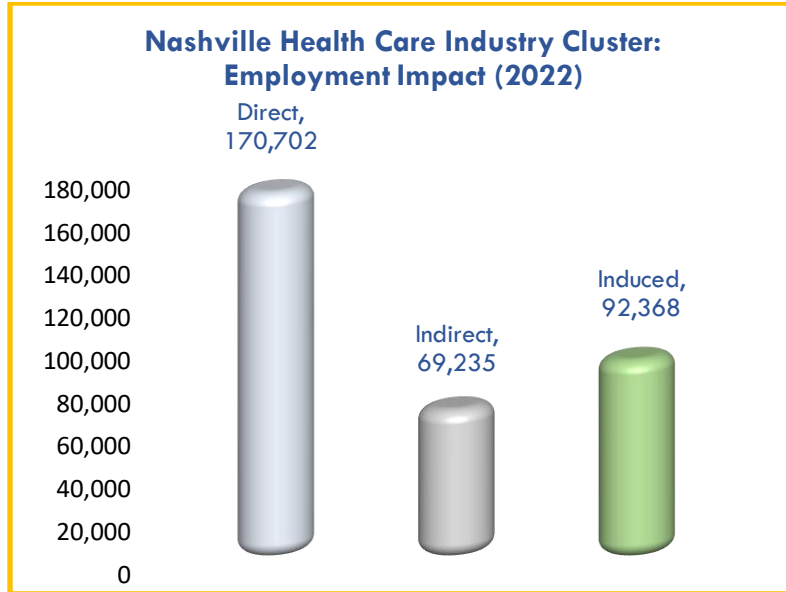
<sup>15</sup> Source: ReferenceUSA, LexisNexis Academic Universe, and company Web sites.

#### V.4. Economic Impact of the Nashville Health Care Cluster

##### V.4.a. Employment Impact

The health care industry cluster total employment impact is 332,305 which represents over 10 percent of Tennessee's and 29.59 percent of the Nashville MSA's nonfarm employment in 2022. The employment impact of Nashville's health care industry cluster increased 1.12 percent from 2019.

Figure V.4

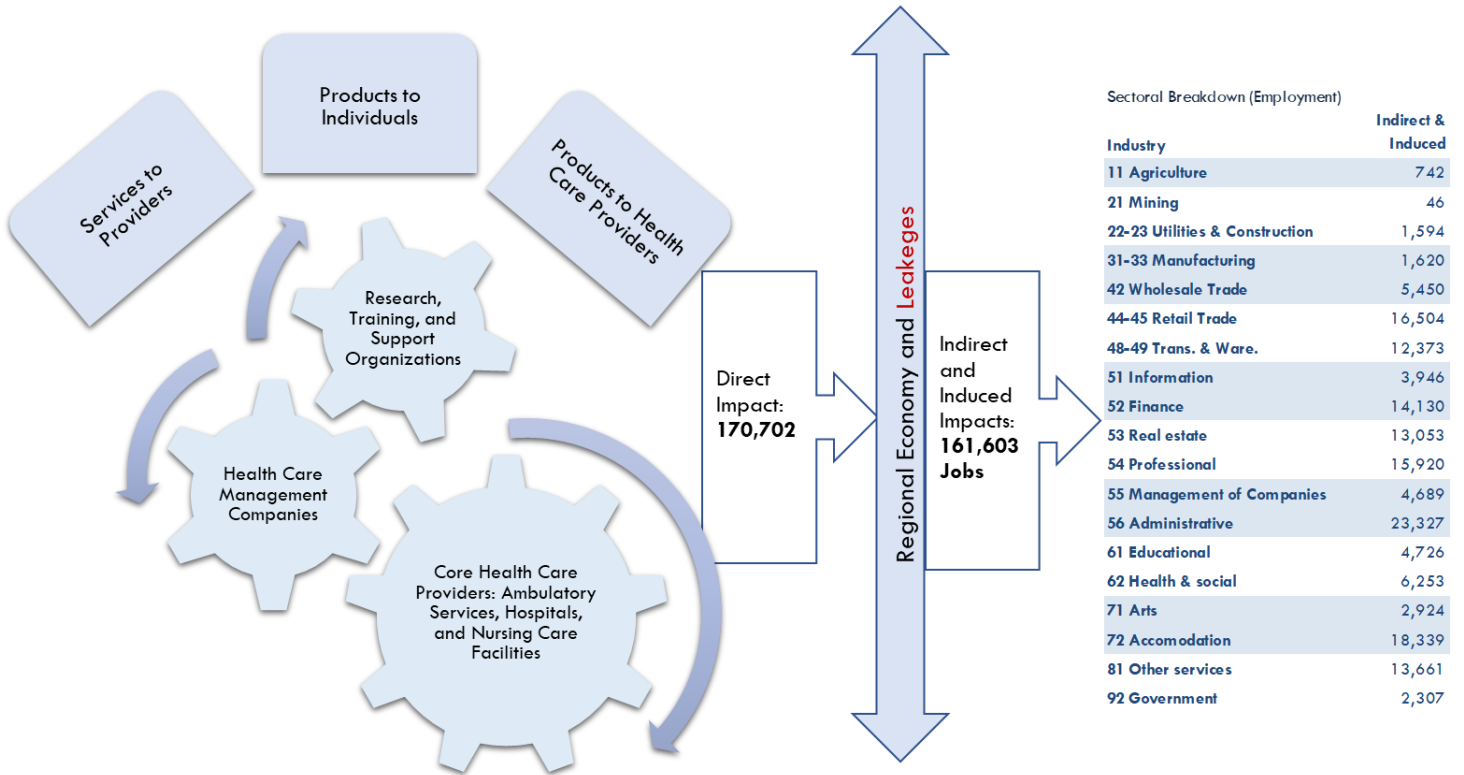


## Sectoral Impact

The largest sectors impacted by the health care industry cluster are administrative, accommodation, retail trade, and professional services, with almost 20,000 jobs each.

Figure V.5

### Employment Impact of Nashville Health Care Industry Cluster (2022)



## Industry Linkages

For every direct 1,000 jobs in the Nashville health care industry cluster, an additional 137 jobs are created in the administrative industry, 107 accommodation industry, 97 in retail trade, 93 in professional services, 83 in finance and insurance, and 80 in other services.

Figure V.6

<b>Employment Linkages Between Health Care Industry Cluster</b>		
<b>Industry</b>	<b>Indirect &amp; Induced</b>	<b>Number of jobs created per 1,000 health care industry cluster jobs</b>
<b>11 Agriculture</b>	742	4
<b>21 Mining</b>	46	0
<b>22-23 Utilities &amp; Construction</b>	1,594	9
<b>31-33 Manufacturing</b>	1,620	9
<b>42 Wholesale Trade</b>	5,450	32
<b>44-45 Retail Trade</b>	16,504	97
<b>48-49 Trans. &amp; Ware.</b>	12,373	72
<b>51 Information</b>	3,946	23
<b>52 Finance</b>	14,130	83
<b>53 Real estate</b>	13,053	76
<b>54 Professional</b>	15,920	93
<b>55 Management of Companies</b>	4,689	27
<b>56 Administrative</b>	23,327	137
<b>61 Educational</b>	4,726	28
<b>62 Health &amp; social</b>	6,253	37
<b>71 Arts</b>	2,924	17
<b>72 Accomodation</b>	18,339	107
<b>81 Other services</b>	13,661	80
<b>92 Government</b>	2,307	14

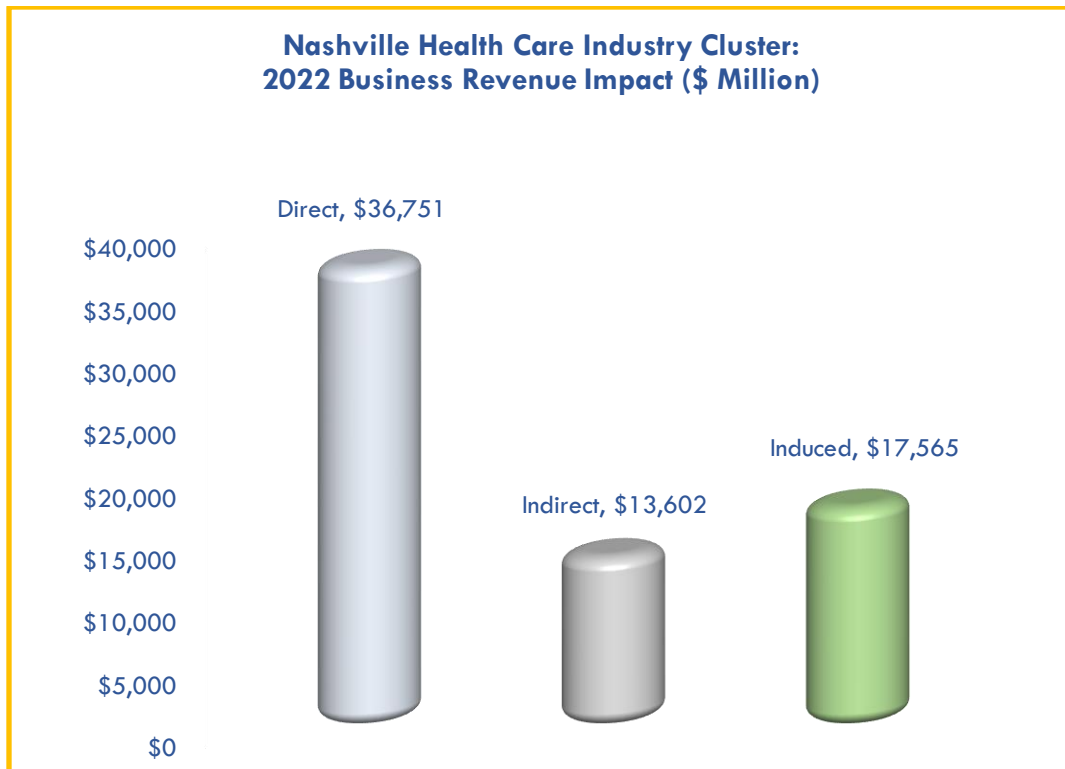
Source: BERC's estimates based on IMPLANpro, Inc impact figures.



#### V.4.b. Business Revenue Impact

The total business revenue impact of the health care industry cluster is **\$67.91 billion**, **\$36.75 billion of which is directly injected into the economy**. The business revenue impact of Nashville's health care industry cluster increased 1.52 percent from 2019. This amount is equivalent to more than eight percent of Tennessee's and 22.9 percent of Nashville's total business revenues in 2022. Every \$100 in health care cluster spending generates an additional \$1.84 in business revenues.

Figure V.7

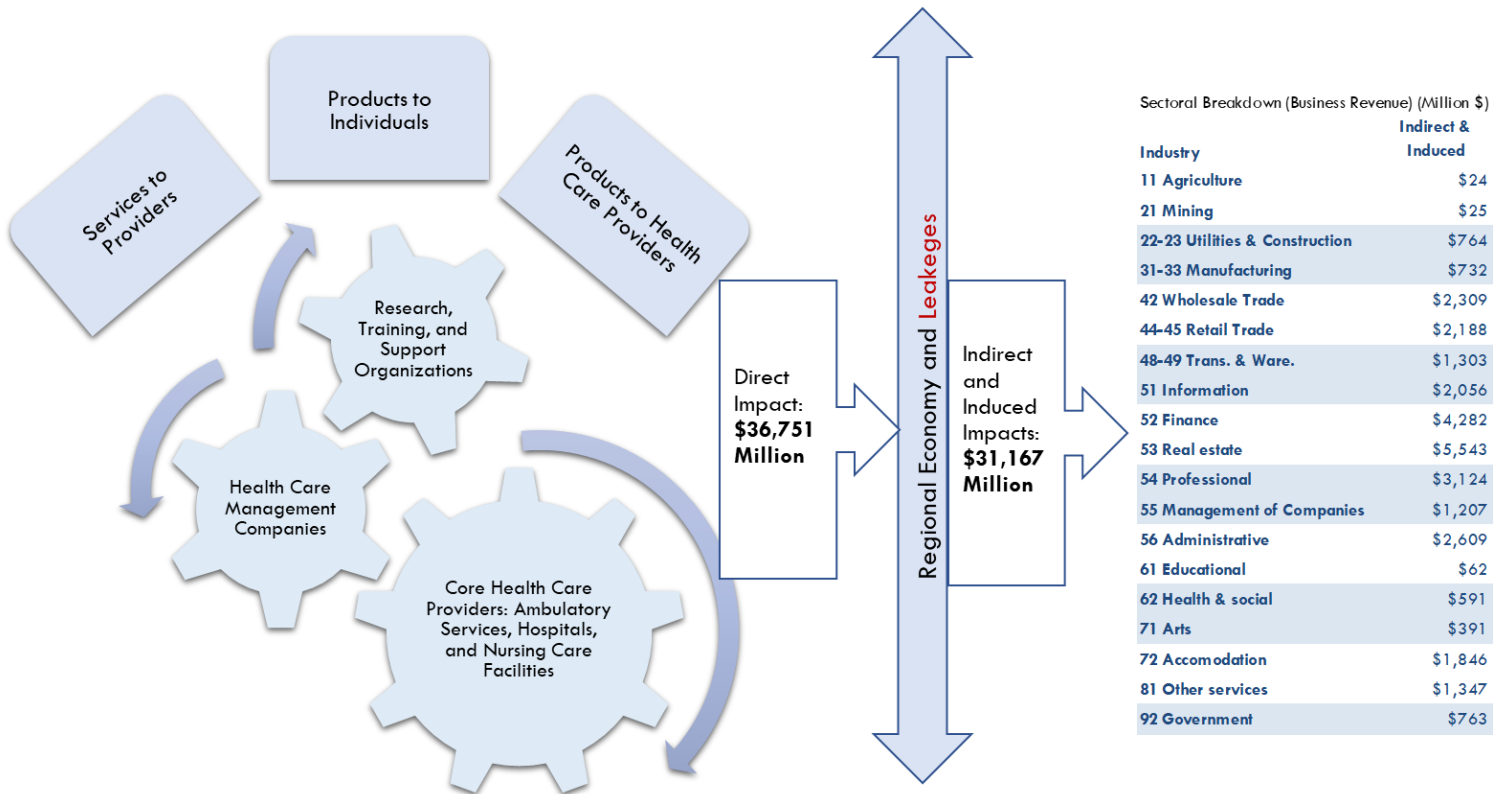


## Sectoral Impact

The real estate and financial sector in Nashville greatly benefited from the health care industry cluster, garnering almost \$10 billion in business revenues therefrom.

Figure V.8

### Business Revenue Impact of Nashville Health Care Industry Cluster (2022 Million \$)



## Industry Linkages

Every \$1,000 in business revenue generated by the health care industry cluster generates additional revenue of \$151 in real estate, \$117 in finance, \$85 in professional services, and \$71 in administrative. Other sectors seeing substantial benefits are wholesale trade (\$63), retail trade (\$60), information (\$56) and accommodation (\$50). The impact on additional sectors ranges from \$37 in other services to \$1 in agriculture.

Figure V.9

### Business Revenue Linkages Between Health Care Industry Cluster and Sectors of Nashville's Economy (Million \$)

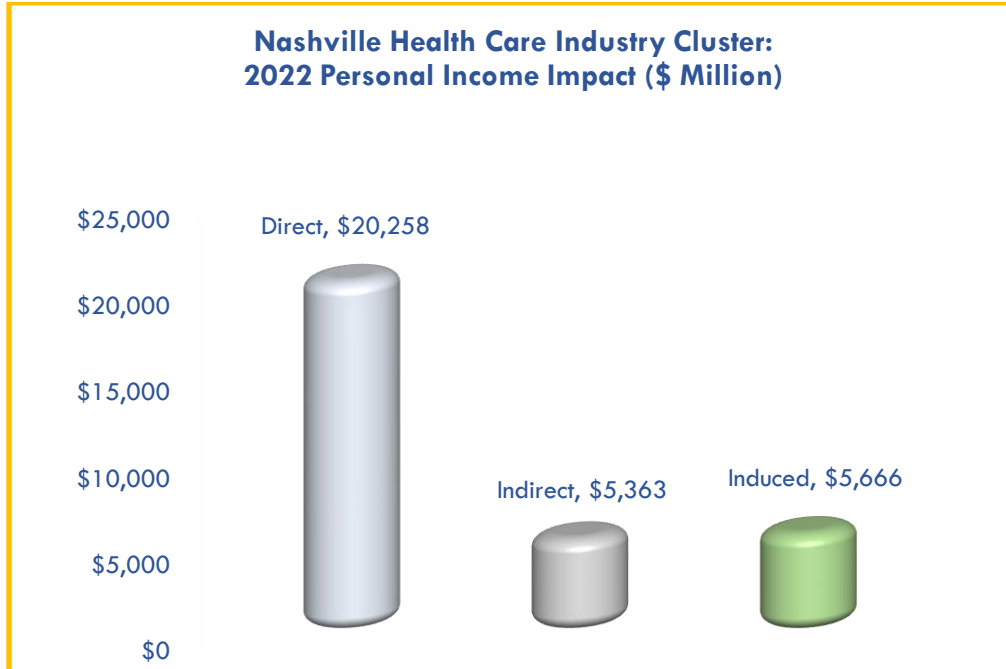
Industry	Indirect & Induced	Revenues generated per \$1,000 health care industry cluster business revenue
11 Agriculture	\$24	1
21 Mining	\$25	1
22-23 Utilities & Construction	\$764	21
31-33 Manufacturing	\$732	20
42 Wholesale Trade	\$2,309	63
44-45 Retail Trade	\$2,188	60
48-49 Trans. & Ware.	\$1,303	35
51 Information	\$2,056	56
52 Finance	\$4,282	117
53 Real estate	\$5,543	151
54 Professional	\$3,124	85
55 Management of Companies	\$1,207	33
56 Administrative	\$2,609	71
61 Educational	\$62	2
62 Health & social	\$591	16
71 Arts	\$391	11
72 Accommodation	\$1,846	50
81 Other services	\$1,347	37
92 Government	\$763	21

Source: BERC's estimates based on IMPLANpro, Inc. impact figures.

#### V.4.c. Personal Income

**The Nashville health care industry cluster generates about \$31.29 billion in personal income for the local economy.** This corresponds to 8.19 percent of Tennessee's and 23.1 percent of the Nashville MSA's total personal income in 2022. Moreover, every \$100 of personal income generates an additional \$1.54 in the local economy. The personal income impact of Nashville's health care industry cluster decreased by 4.06 percent from 2019 to 2022.

Figure V.10

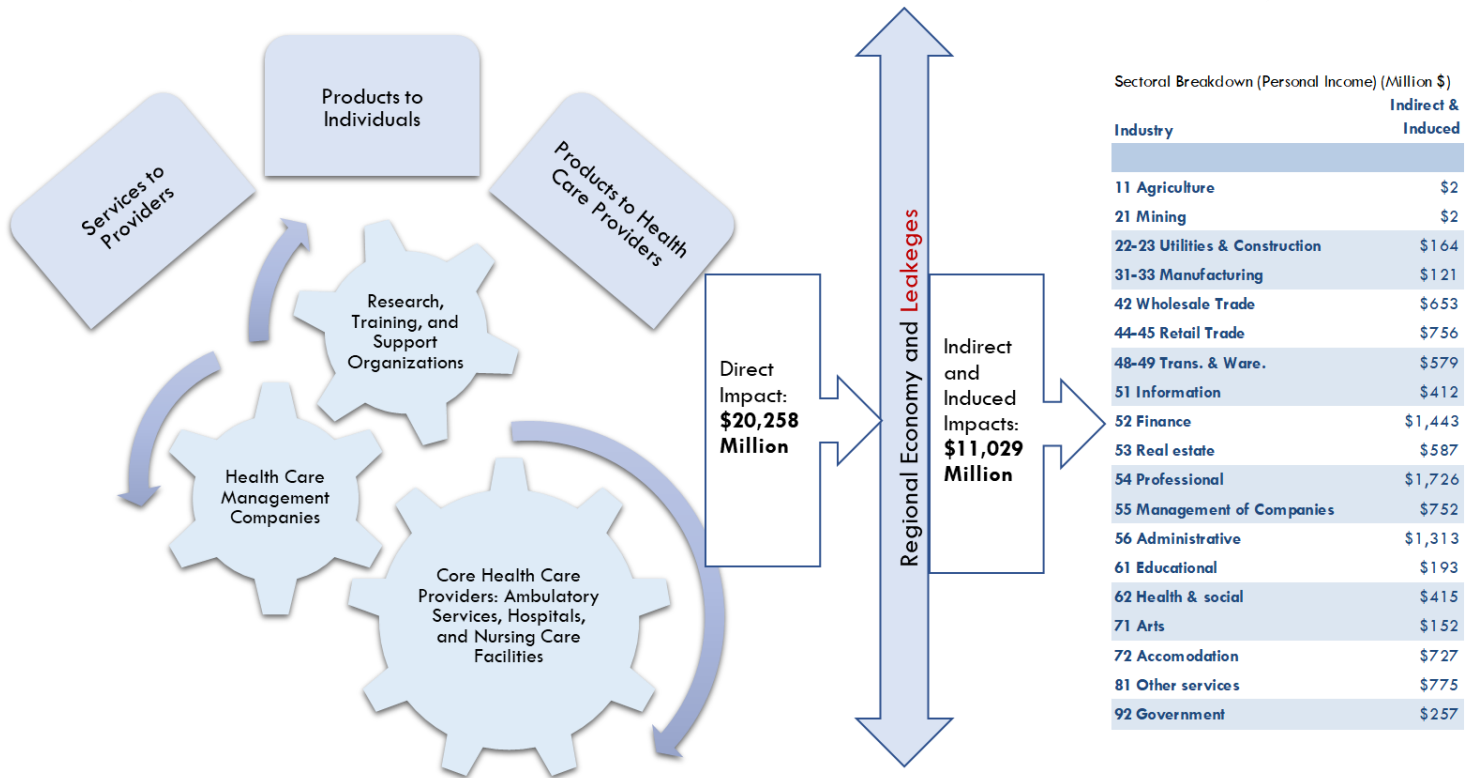


## Sectoral Impact

The largest sectoral impact is in professional services with \$1,726 million. Other notable sectors benefiting from the Nashville health care industry cluster are finance and insurance (\$1,443 million), administrative (\$1,313 million), and other services (\$775 million).

Figure V.11

### Personal Income Impact of Nashville Health Care Industry Cluster (2022 Million \$)



## Industry Linkages

Every \$1,000 in personal income earned in the health care industry cluster creates an additional \$85 in professional services, \$71 in finance, and \$65 in administrative. In addition, there are substantial impacts on other services (\$38), management of companies (\$37), and accommodation (\$36). Finally, the impact on other sectors ranges from \$10 in the educational sector to \$6 in the manufacturing sector.

Figure V.12

### Personal Income Linkages Between Health Care Industry Cluster (Million \$)

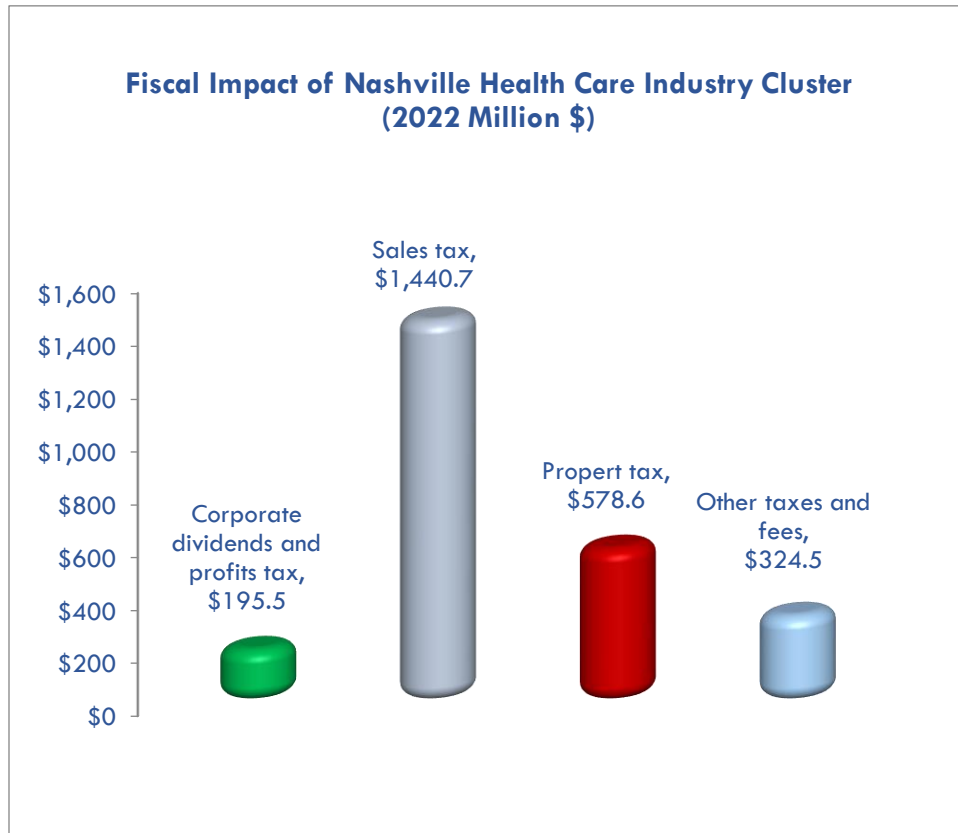
Industry	Personal income created by sector per \$1,000	
	Indirect & Induced	personal income in health care industry cluster
11 Agriculture	\$2	\$0
21 Mining	\$2	\$0
22-23 Utilities & Construction	\$164	\$8
31-33 Manufacturing	\$121	\$6
42 Wholesale Trade	\$653	\$32
44-45 Retail Trade	\$756	\$37
48-49 Trans. & Ware.	\$579	\$29
51 Information	\$412	\$20
52 Finance	\$1,443	\$71
53 Real estate	\$587	\$29
54 Professional	\$1,726	\$85
55 Management of Companies	\$752	\$37
56 Administrative	\$1,313	\$65
61 Educational	\$193	\$10
62 Health & social	\$415	\$20
71 Arts	\$152	\$8
72 Accommodation	\$727	\$36
81 Other services	\$775	\$38
92 Government	\$257	\$13

Source: BERC's estimates based on IMPLANpro, Inc. impact figures.

## V.5. Fiscal Impact of the Nashville Health Care Industry Cluster

The Nashville health care industry cluster accounts for nearly \$2.54 billion in state and local taxes. Of this amount, more than half stems from sales tax, while property tax, corporate dividends and profit taxes, and other taxes and fees make up the remainder. Compared to 2019, the fiscal impact of Nashville's health care industry cluster increased by 4.9 percent in 2022. From a comparative perspective, this figure represents over 10 percent of all taxes collected in Tennessee and nearly 32 percent of all taxes collected in the Nashville MSA in 2022.

Figure V.13



## VI. COMPARATIVE PERSPECTIVE ON NASHVILLE'S HEALTH CARE INDICATORS<sup>16</sup>

### Employment Growth and Export Potential

Indicators of health care employment suggest the Nashville MSA has a reasonable health care industry presence compared to its peer MSAs. Nashville's health care employment per capita is the second largest among the peers, with 56 employees per 1,000 people. The employment

<sup>16</sup> Chapter six acquired data from BERC Estimates, LexisNexis Academic Universe, ReferenceUSA, County Business Patterns, Bureau of Labor Statistics, and Earnest and Young/Venture Capital data to establish a comparative perspective on Nashville's health care indicators.

share of the health care sector is the sixth largest among its peers, with nearly 12 percent in 2022. Finally, in terms of health care employment growth from 2013, the Nashville MSA is showing growth and ranked third with 4.68 percent.

Figure VI.1

Comparative Perspective on Selected Health care Indicators					
	Export Potential*		Health care Employment		
	Health care (LQ 2022)	Percent Change (2019-2022)	Per Capita	Share (%)	Growth (%)
Atlanta	0.82	-4.90%	40	10.17%	1.34%
Birmingham	1.00	-13.32%	51	13.98%	-2.66%
Charlotte	0.54	-18.02%	31	7.53%	1.28%
Columbus	0.93	-15.04%	49	12.93%	-9.77%
Dallas	0.72	-18.86%	40	10.04%	-6.30%
Denver	0.65	-15.99%	44	9.03%	7.30%
Indianapolis	0.94	-16.03%	45	13.15%	-21.93%
Jacksonville	0.95	-17.78%	53	13.26%	2.69%
Kansas City	0.89	-13.25%	51	12.42%	0.51%
Louisville	0.85	-14.36%	52	11.82%	-3.83%
<b>Nashville</b>	<b>0.84</b>	<b>-18.31%</b>	<b>56</b>	<b>11.77%</b>	<b>4.68%</b>
Raleigh	0.69	-20.35%	22	9.62%	-42.81%
Richmond	0.95	-12.84%	61	13.30%	10.82%

\*A score greater than "1" indicates that the MSA is exporting health care services. A score less than "1" indicates that health care services are primarily used by residents. Source: Bureaus of Labor Statistics and BERC estimates.

Furthermore, the Nashville MSA's health care industry rank sixth in export potential among the 13 comparable MSAs. A score greater than one "1" (L.Q.> 1) suggests an MSA is exporting health care services; that is, residents from other areas are traveling to the region to use its health care services. The Nashville MSA showed a negative growth trend with a 18.31 percent decrease from 2019 to 2022.



## VI.2 Health Care Industry Cluster Headquarters and Global Impact

Nashville ranks second among the 13 MSAs in terms of the number of major health care industry cluster management companies (both public and private), their revenues, and their employment. Nashville's global impact is quite substantial, with more than 492,783 jobs and \$97.10 billion in annual business revenues generated by investor-owned health care management companies.

Figure VI.2

Comparative Perspective on Health Care Cluster Headquarters*(Public and Private)					
MSAs	Number of Cluster Headquarters*	Total Employment	Total Revenues (2022 Billion \$)**	Composite Score***	Rank
Atlanta	60	181,883	\$32.90	0.64	4
Birmingham	15	53,848	\$12.32	0.30	11
Charlotte	19	63,228	\$22.16	0.35	9
Columbus	19	80,836	\$193.49	0.56	5
Dallas	90	439,075	\$352.60	0.94	1
Denver	32	132,950	\$22.20	0.48	7
Indianapolis	30	216,919	\$253.38	0.71	3
Jacksonville	12	17,990	\$5.09	0.25	12
Kansas City	24	44,616	\$17.47	0.37	8
Louisville	10	122,650	\$103.67	0.49	6
Nashville	46	492,783	\$97.10	0.87	2
Raleigh	21	69,892	\$11.71	0.34	10
Richmond	11	8,093	\$1.10	0.23	13

Source: ReferenceUSA

\*List includes health care industry cluster companies as defined throughout this study.

\*\* To be consistent across all MSA's, employment and business revenues are directly taken from the source without making company-level adjustments.

\*\*\* Composite score includes relative rankings of each MSA with regard to (1) number of headquarter companies, (2) total revenues, and (3) total number of employees.

### VI.3. Health Care Occupations

**Nashville ranks sixth among the 13 MSAs in percent of health care occupations among all occupations.** Nashville ranks eighth among the 13 peer MSAs in health care occupations per 1,000 people **and sixth overall in health care occupations**

Figure VI.3

Health care Practitioners and Support Occupations					
MSAs	Total	Health care Occupations as a Percent of Total	Health care Occupations per Capita	Average Score	Rank
Atlanta	2,727,620	8.10%	36	0.16	12
Birmingham	500,850	12.14%	54	0.90	1
Charlotte	1,269,850	8.23%	38	0.21	11
Columbus	1,060,610	10.65%	52	0.78	4
Dallas	3,804,710	8.35%	14	0.08	13
Denver	1,551,060	8.32%	43	0.30	9
Indianapolis	1,051,250	10.68%	52	0.78	3
Jacksonville	721,380	10.08%	43	0.55	8
Kansas City	1,052,830	10.85%	52	0.79	2
Louisville	643,330	10.41%	52	0.75	5
<b>Nashville</b>	<b>1,036,630</b>	<b>9.64%</b>	<b>49</b>	<b>0.58</b>	<b>6</b>
Raleigh	672,280	8.58%	39	0.26	10
Richmond	629,790	9.85%	46	0.57	7

Note: Health care occupations per 1,000 people.

Source: Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov))

## VI.4.1 Venture Capital Flow

### VI.4.1.a. 2022 Total Venture Capital by MSA

**Nashville ranks fourth among 13 MSAs in venture capital flow in health care in 2022 while remaining sixth in terms of venture capital flow in all sectors.** Nashville ranks fifth in terms of the number of health care venture capital deals in 2022 among the 13 MSAs. In terms of venture capital per capita Nashville is ranked third. Nashville has a high concentration of health care venture capital flow as it ranked fourth among all MSAs with location quotient of **1.25**.

Figure VI.4

2022 Total Venture Capital Flow by MSA								
MSA	2022 Total Deal Value (\$mn)			2022 Number of Total Deals			Venture Capital Per Capita	Location Quotient
	All Sectors	Health Care	HC % of Total	All Sectors	Health Care	HC % of total		
Atlanta	1,960	140	7.14	201	26	12.94	0.02	0.32
Birmingham	270	40	14.81	42	7	16.67	0.04	0.70
Charlotte	930	60	6.45	<b>32</b>	<b>5</b>	15.63	0.02	0.31
Columbus	690	300	43.48	58	12	20.69	0.14	2.06
Dallas	4,130	600	14.53	189	27	14.29	0.08	0.69
Denver	4,830	1,040	21.53	280	53	18.93	0.35	1.02
Indianapolis	530	240	45.28	68	14	20.59	0.11	2.14
Jacksonville	2,340	10	0.43	22	4	18.18	0.01	0.02
Kansas	560	60	10.71	43	10	23.26	0.03	0.51
Louisville	70	20	28.57	18	6	33.33	0.02	1.35
<b>Nashville</b>	<b>1,400</b>	<b>370</b>	<b>26.43</b>	<b>70</b>	<b>23</b>	<b>32.86</b>	<b>0.18</b>	<b>1.25</b>
Raleigh	3,260	520	15.95	148	47	31.76	0.35	0.76
Richmond	260	50	19.23	26	6	23.08	0.04	0.91

Source: Earnest & Young LLP ([https://www.ey.com/en\\_us/growth/tracking-venture-capital-deployment-and-deal-trends-over-time](https://www.ey.com/en_us/growth/tracking-venture-capital-deployment-and-deal-trends-over-time)) and BERC Calculation

#### VI.4.1.b. Venture Capital Cumulative Growth (2018-2022) by MSAs

Nashville is ranked fourth among the 13 MSAs in terms of health care venture capital cumulative growth during the 2018-2022 period, with nearly 40% of the total venture capital flow. It is ranked second among the MSAs in terms of the number of health care deals among all deals with almost 30 percent of the total deals for the 2018-2022 period. Nashville has a high concentration of health care venture capital flow for the same period as well. It is ranked second among all MSAs with a location quotient of 1.79.

Figure VI.5

2018-2022 Venture Capital Cumulative Growth Flow by MSA							
MSA	2018-2022 Total Deal Value (\$mn)			2018-2022 Number of Total Deals			Location Quotient
	All Sectors	Health Care	HC % of Total	All Sectors	Health Care	HC % of total	
Atlanta	10,500	1110	10.57	1079	150	13.90	0.48
Birmingham	730	110	15.07	206	42	20.39	0.68
Charlotte	2,890	81	2.80	<b>192</b>	<b>16</b>	8.33	0.13
Columbus	3,920	1710	43.62	1285	192	14.94	1.98
Dallas	10,380	2070	19.94	954	162	16.98	0.90
Denver	18,740	4,670	24.92	1621	277	17.09	1.13
Indianapolis	2,240	500	22.32	350	51	14.57	1.01
Jacksonville	3,920	22	0.56	86	16	18.60	0.03
Kansas	1,710	270	15.79	244	48	19.67	0.72
Louisville	380	70	18.42	118	28	23.73	0.83
<b>Nashville</b>	<b>4,400</b>	<b>1740</b>	<b>39.55</b>	<b>380</b>	<b>113</b>	<b>29.74</b>	<b>1.79</b>
Raleigh	11,780	2180	18.51	708	259	36.58	0.84
Richmond	790	160	20.25	169	42	24.85	0.92

Source: Earnest & Young LLP (<https://www.ey.com>) and BERC Calculation

## VI.5 Where does the Nashville MSA stand relative to its peers?

For academic and public policy purposes, studies analyze the quality of life, business climate, infrastructure, and socioeconomic productivity across cities. While many of these studies take a comprehensive approach to indicators and coverage areas, others focus on a single issue, such as education.<sup>17</sup> The resulting rankings serve many purposes: business groups use them as marketing tools, policymakers address deficiencies in their respective regions, and individuals and businesses factor these rankings into their relocation decisions. Thus, from multiple perspectives, rankings play an important role in understanding socioeconomic dynamics across regions.

A brief review of rankings, for example, demonstrates that Nashville is at the top 10 among comparable MSAs in terms of infrastructure and human capital.<sup>18</sup> In 2022, Tennessee is ranked sixth among the top business friendly states by national business agency news<sup>19</sup>. Furthermore, Franklin, Tennessee, is ranked among the best cities for startup companies.<sup>20</sup> In keeping with this approach, the current study provides rankings of 13 comparable MSAs in health care services. The study uses two categories of ranking: health care business climate and health care infrastructure. For ranking purposes, BERC identified 11 health care business climate indicators and 9 health care infrastructure indicators.

The selection of indicators was affected by (1) availability of reliable data across peer MSAs (some data sources and indicators have changed since previous BERC studies of The Council were reported) and (2) literature on business climate and infrastructure indicators. Before ranking, each indicator was converted to a unitless relative score bounded between zero and one [0, 1]. These relative scores were then averaged across indicators for each MSA within the given category (business climate or infrastructure).

BERC's final rankings are based on two fundamental assumptions: (1) each indicator contributes equally to the final score for a given category (no weights are assigned to the indicators), and (2) each indicator's contribution to a given category is linear.

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<sup>17</sup> For a review of literature on different aspects of city rankings, see Fred Carstensen et al. (2001), *The Second MetroHartford Regional Performance Benchmark*, Connecticut Center for Economic Analysis, University of Connecticut, Storrs, CT.

<sup>18</sup> See Carstensen et al. (2001). These rankings are based on 56 comparable MSAs in the U.S.

<sup>19</sup> <https://www.cnn.com/2022/07/13/americas-top-states-for-business-2022-the-full-rankings.html>

<sup>20</sup> For a list of rankings, see Nashville Area Chamber of Commerce at [www.nashvillechamber.com](http://www.nashvillechamber.com)

## VI.5.a. Health Care Business Climate Indicators

Figure VI.6

Health Care Business Climate Indicators	Atlanta	Birmingham	Charlotte	Columbus	Dallas	Denver	Indianapolis	Jacksonville	Kansas City	Louisville	Nashville	Raleigh	Richmond
Health care employment share (% , 2022)	10.17%	13.98%	7.53%	12.93%	10.04%	9.03%	13.15%	13.26%	12.42%	11.82%	11.77%	9.62%	13.30%
Health care employment per 1,000 people (2022)	40	51	31	49	40	44	45	53	51	52	56	22	61
Health care pay (average \$, 2022)	\$60,000	\$56,750	\$60,167	\$53,681	\$55,116	\$56,225	\$57,926	\$50,768	\$58,493	\$57,519	\$58,642	\$62,309	\$58,689
Health care occupations (% , 2019)	7.65%	11.35%	8.08%	10.01%	8.55%	8.59%	10.69%	10.06%	10.25%	9.64%	9.40%	7.95%	10.14%
Health care occupations per 1,000 people (2019)	35	54	38	50	41	44	55	45	51	50	49	37	52
Total public health care cluster headquarters' employment ('000)	158.57	59.57	6.91	72.58	465.55	122.95	41.45	40.84	52.8	212.71	245.31	4.05	31.96
Total public health care cluster headquarters' revenue (billion \$)	\$20.30	\$9.22	\$2.13	\$8.62	\$74.71	\$11.34	\$9.19	\$7.42	\$18.04	\$19.19	\$16.26	\$0.59	\$13.53
Number of public health care cluster headquarters' (2019)	47	13	11	14	79	27	20	11	25	12	40	13	11
Health care export capacity (LQ, 2022)	0.82	1.00	0.54	0.93	0.72	0.65	0.94	0.95	0.89	0.85	0.84	0.69	0.95
Change in export capacity (2019-2022)	-4.90%	-13.32%	-18.02%	-15.04%	-18.86%	-15.99%	-16.03%	-17.78%	-13.25%	-14.36%	-18.31%	-20.35%	-12.84%
Health care employment growth % (2019-2022)	1.34%	-2.66%	1.28%	-9.77%	-6.30%	7.30%	-21.93%	2.69%	0.51%	-3.83%	4.68%	-42.81%	10.82%

The health care business climate in Nashville is substantially better than in the 12 other MSAs.

## VI.5.b. Health Care Infrastructure Indicator

Nashville performed better in per capita, venture capital per capita and economic diversity in comparison to other MSAs.

Figure VI.7

Health Care Infrastructure Indicators	Atlanta	Birmingham	Charlotte	Columbus	Dallas	Denver	Indianapolis	Jacksonville	Kansas City	Louisville	Nashville	Raleigh	Richmond
Hospital beds per 100,000 people (2022)	151.7	411.6	158.9	217.1	180.9	146.5	272.5	217.8	266.6	340.6	239.4	329.8	261.4
Number of teaching hospitals (2022)	13	8	5	9	15	7	9	5	6	3	5	4	3
Number of 4-year colleges (2022)	23	6	19	16	27	22	20	7	21	8	18	13	5
Per capita income (\$, 2021)	\$63,219	\$59,107	\$62,506	\$59,867	\$66,727	\$78,150	\$65,805	\$59,271	\$61,410	\$59,425	\$70,206	\$66,428	\$65,834
Physicians per 100,000 people (State level, 2021)	236.1	224.0	263.6	302.3	231.7	294.4	236.4	236.1	236.0	235.6	259.0	263.6	268.0
Unemployment rate (% , 2022)	2.9	2.4	3.4	3.4	3.0	3.0	2.8	2.8	2.6	3.5	2.7	3.1	3.0
Venture Capital per capita	0.023	0.242	0.022	0.139	0.076	0.348	0.112	0.006	0.027	0.016	0.850	1.469	0.119
Economic diversity (2022)	0.892	0.897	0.897	0.890	0.895	0.892	0.894	0.893	0.893	0.898	0.895	0.885	0.886
Change in diversity (2019-2022)	0.09%	0.04%	0.18%	0.26%	-0.25%	-0.71%	-0.07%	0.05%	0.22%	0.00%	0.19%	0.04%	0.02%

### VI.5.c. Relative Rankings

For health care business climate, the Nashville MSA ranks fourth among the 13 MSAs; Richmond ranks first, Birmingham second, and Louisville fourth. (Nashville moved from third to fourth since the 2019 study). In health care infrastructure Nashville MSA ranks first, followed by Indianapolis and Birmingham at second and third. Finally, in overall relative health care competitiveness, Nashville ranks first among the 13 MSAs; Kansas ranks second, and Columbus ranks third. There were significant shifts in ranking for many in the peer group.

Figure VI.8

2022 Relative Rankings						
MSA	Business Climate Ranking*		Infrastructure Rankings**		Overall Rankings	
	Average Score***	Relative Rank	Average Score***	Relative Rank	Average Score	Relative Rank
Atlanta	0.52	7	0.48	8	0.50	8
Birmingham	0.63	2	0.43	3	0.53	4
Charlotte	0.25	12	<b>0.55</b>	10	0.40	12
Columbus	0.50	8	0.57	9	0.54	3
Dallas	0.46	10	0.53	6	0.49	9
Denver	0.39	11	0.54	4	0.46	10
Indianapolis	0.54	6	0.50	2	0.52	6
Jacksonville	0.48	9	0.32	13	0.40	11
Kansas	0.63	3	0.44	5	0.54	2
Louisville	0.58	5	0.47	12	0.52	7
<b>Nashville</b>	<b>0.62</b>	<b>4</b>	<b>0.60</b>	<b>1</b>	<b>0.61</b>	<b>1</b>
Raleigh	0.21	13	0.55	7	0.38	13
Richmond	0.66	1	0.40	11	0.53	5

\*Based on the linear combination of standardized scores of 11 indicators presented above

\*\*Based on the linear combination of standardized scores of 9 indicators presented above

\*\*\* BERCC assumes each indicator contributes to the average score equally. Selected indicators are closely related to health care business environment and infrastructure. Data availability and timeliness were key criteria used in the data selection process.

## VII. NASHVILLE HEALTH CARE COUNCIL MEMBER COMPANIES

### VII.1. Survey Methodology

The Nashville Health Care Council’s member companies are diverse, ranging from direct health care providers, health care management, health information technology, and health care finance companies to professional service providers, such as law and architecture firms. BERC’s survey asked companies to report their health care–related employment, sales, office space, federal research money, payroll, and operating sites, both in Nashville and overall. The survey materials are provided in the appendix.

The Council member companies are more diverse than the previous two classifications presented in this report, core health care providers and health care industry cluster, in terms of the industry segment. Core health care providers constitute a narrow sector and include only companies providing direct services to individuals. The health care industry cluster includes health care providers plus companies directly linked to the core providers sector. Readers should review this study with these salient differences between the three groups in mind.

As of June 2023, the Council had 360 member companies, a 13.92 percent increase from the 2019 study. BERC conducted an online survey of the Council member companies with follow-up reminders from the Council. The survey included three parts: (A) company profile, (B) company operations, and (C) Nashville Health Care Council Impact. Of the 360 member companies, 252 are based in Nashville MSA. The remaining 108 member companies represent 25 states (including Tennessee outside the Nashville MSA) and the District of Columbia.

The survey primarily targeted 252 Nashville MSA-based member companies. A total of 128 companies accessed the survey, but only 60 responses were usable for this study purpose. This represents a response rate of 23.8 percent. BERC estimated the missing company figures using company databases (e.g., Data Axel, formerly Reference USA), individual member company websites, and other BERC sources. Through these methods of extrapolation, BERC prepared financial profiles for 192 additional member companies.

Figure VII.1

Nashville Health Care Council Survey- Member Profiles		
Location	Member	Nashville MSA-based Employment
Nashville MSA-Based Companies	252	96,218
Rest of Tennessee	12	41
Other States	96	736
Total Members	360	96,997
Growth from 2019	13.92%	20.5%
Total Survey Accessed (Nashville MSA-Based)		128
Total Survey Completed (Nashville-MSA-Based)		60
Survey Response Rate (Nashville MSA-Based Companies)		23.80%

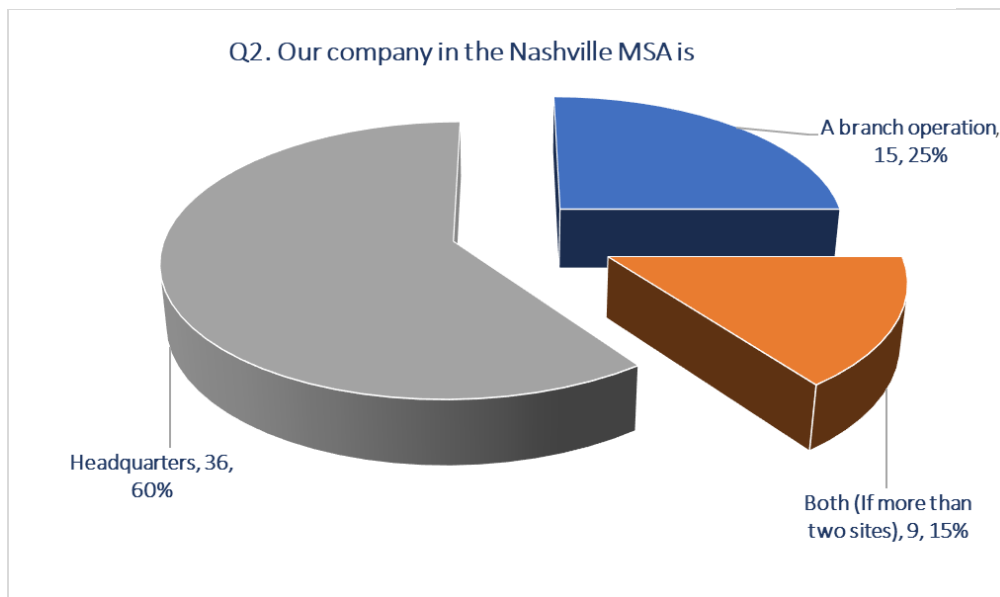


As of June 2023, The Council had 360 member companies, a 13.92 percent increase from 2019. Total health care-related local employment of the member companies is estimated at around 96,997, up 20.5 percent from 2019.

## VII.2. Council Member Companies—Profile

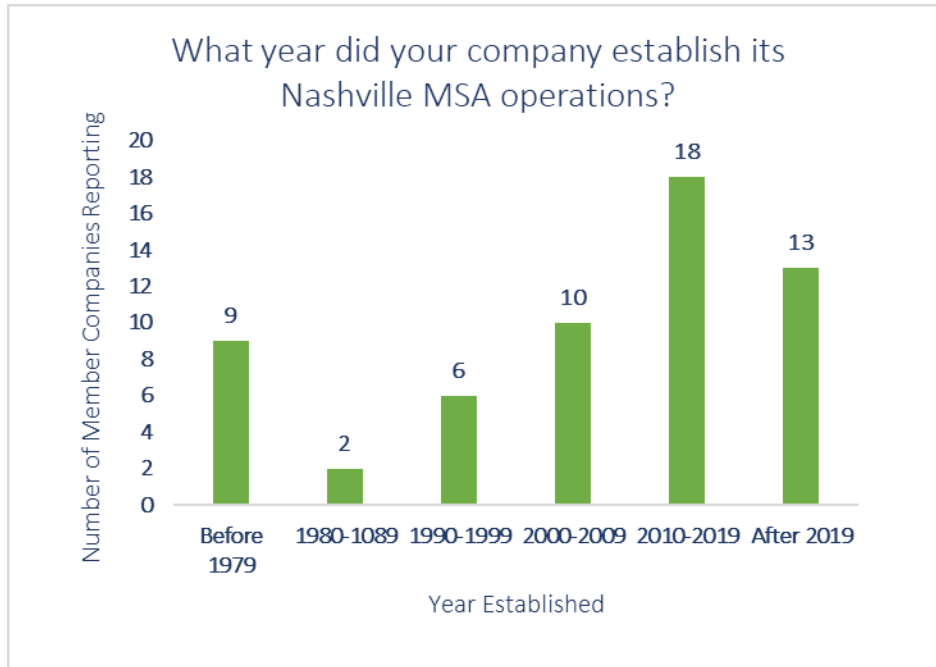
**Headquarters or branch operations.** Almost sixty percent of the companies surveyed in the Nashville MSA are headquartered (60 %), while the branch operations represent 25 percent. The remaining companies (15%) are both headquarters and branch operations.

Figure VII.2



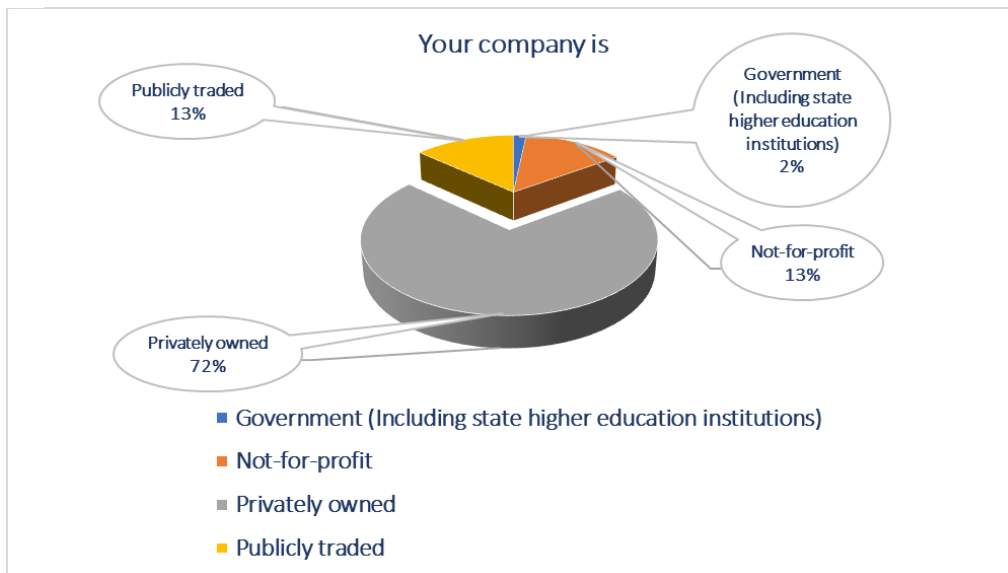
**Year Nashville operation was established.** The largest portion of responding companies (18 out of 58) was established sometime between 2010 and 2019, while a large number of companies (13) have been established since the 2019 report, suggesting the presence of strong entrepreneurial dynamics in the Nashville MSA.

Figure VII.3



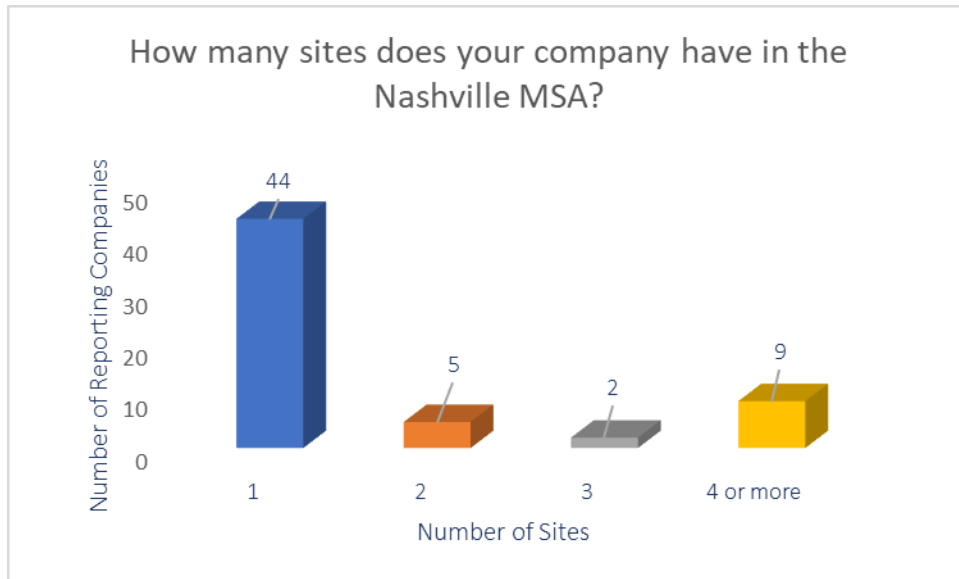
**Ownership.** A majority of the companies (72 %) are privately owned, while 13 percent of companies are publicly traded. The remaining 13 percent of companies are not-for-profit organizations, with a small portion of government institutions, including state higher education institutions (2 %).

Figure VII.4



**Sites in the Nashville MSA.** Over 73 percent of the companies (73.3%) have only one site in the Nashville MSA, while most of the remaining 27 percent of companies (15 %) have four or more sites.

Figure VII.5



**National footprint.** Based on the survey responses, the Council member companies have footprints across the 50 states. The composite intensity score, calculated using three variables (number of reporting companies, employment level, and revenues), shows that North Carolina, Virginia, Kentucky, Texas, Florida, California, Arizona, Arkansas, Alabama, and Illinois are the top ten states (after Tennessee) in which the Council member companies are heavily involved. The following tables present a detailed perspective on the extent of the Council member activities.

Figure VII.6

State	Number of Member Companies Reporting	Reported Employment	Reported Sales Volume (Million \$)	State	Number of Member Companies Reporting	Reported Employment	Reported Sales Volume (Million \$)
Alabama	7	3,139	\$1,653	Nebraska	3	96	\$27
Alaska	2	597	\$1	Nevada	5	846	\$363
Arizona	4	4,096	\$2,731	New Hampshire	2	112	\$16
Arkansas	5	3,306	\$2,495	New Jersey	4	1,852	\$303
California	11	5,045	\$558	New Mexico	4	2,210	\$1,858
Colorado	7	2,351	\$164	New York	7	1,904	\$470
Connecticut	4	662	\$80	North Carolina	9	9,229	\$5,417
Delaware	2	194	\$17	North Dakota	3	26	\$0
Florida	10	7,526	\$283	Ohio	6	5,076	\$498
Georgia	8	1,519	\$299	Oklahoma	4	1,344	\$124
Hawaii	3	37	\$9	Oregon	7	2,509	\$768
Idaho	3	321	\$22	Pennsylvania	5	4,202	\$1,860
Illinois	11	3,204	\$401	Rhode Island	4	475	\$40
Indiana	5	2,738	\$870	South Carolina	6	1,553	\$211
Iowa	4	934	\$359	South Dakota	2	5	\$1
Kansas	5	1,334	\$110	Tennessee	44	52,362	\$11,080
Kentucky	6	6,287	\$4,776	Texas	9	10,453	\$1,399
Louisiana	5	646	\$41	Utah	6	1,026	\$525
Maine	6	389	\$40	Vermont	2	55	\$8
Maryland	2	83	\$30	Virginia	8	5,321	\$3,688
Massachusetts	7	861	\$143	Washington	6	3,874	\$1,216
Michigan	5	3,872	\$1,767	West Virginia	4	1,331	\$48
Minnesota	6	433	\$33	Wisconsin	4	1,147	\$786
Mississippi	3	439	\$34	Wyoming	3	171	\$48
Missouri	6	1,650	\$88				
Montana	3	1,100	\$598				

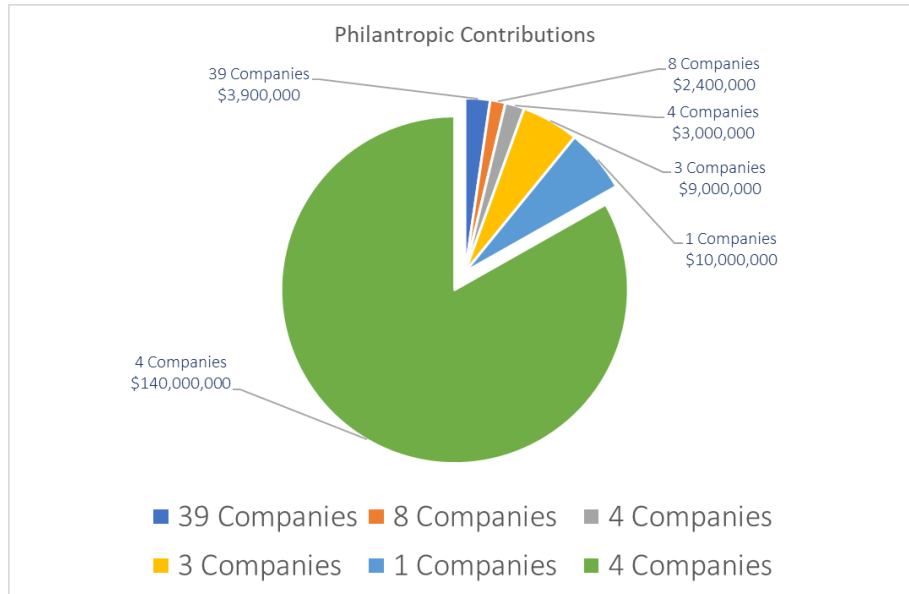
Number of responses: 60 member companies

Figure VII.7

State	Composite Presence Score (Intensity of Presence)	Ranking Based on the Intensity of Presence	State	Composite Presence Score (Intensity of Presence)	Ranking Based on the Intensity of Presence
Alabama	1.711	10	Nebraska	0.955	42
Alaska	0.918	45	Nevada	1.186	27
Arizona	1.746	8	New Hampshire	0.897	48
Arkansas	1.735	9	New Jersey	1.161	31
California	1.816	7	New Mexico	1.501	16
Colorado	1.360	21	New York	1.397	19
Connecticut	1.056	37	North Carolina	2.481	2
Delaware	0.901	46	North Dakota	0.947	44
Florida	1.832	6	Ohio	1.505	15
Georgia	1.408	18	Oklahoma	1.099	35
Hawaii	0.949	43	Oregon	1.492	17
Idaho	0.965	40	Pennsylvania	1.674	12
Illinois	1.686	11	Rhode Island	1.038	38
Indiana	1.391	20	South Carolina	1.260	24
Iowa	1.124	32	South Dakota	0.889	50
Kansas	1.161	30	Tennessee	3.000	1
Kentucky	2.144	4	Texas	2.125	5
Louisiana	1.113	34	Utah	1.296	22
Maine	1.167	29	Vermont	0.893	49
Maryland	0.898	47	Virginia	2.176	3
Massachusetts	1.278	23	Washington	1.593	14
Michigan	1.638	13	West Virginia	1.084	36
Minnesota	1.168	28	Wisconsin	1.224	26
Mississippi	0.973	39	Wyoming	0.963	41
Missouri	1.241	25			
Montana	1.120	33			
Number of responses: 60 member companies					

**Philanthropic contributions.** The combined philanthropic contributions of the responding companies surveyed total \$168,300,000. About \$140,000,000, or 83 % of this total, was contributed by four companies. The average philanthropic contribution of the Council member companies was \$2,852,542 in 2022.

Figure VII.8



**Capital expenditures.** The combined capital expenditures of the responding companies total \$1,770,000,000. As in the previous graph, four companies supplied the largest portion of this total at \$1,000,000,000 or 56.50%. The average capital expenditure of the Council member companies was \$31,052,632 in 2022.

Figure VII.9

Capital Expenditures		
Range	Value	Reporting Companies
less than \$5 million	\$220,000,000	44
\$5.1 million-\$25 million	\$75,000,000	5
\$25.1 million-\$100 million	\$125,000,000	2
\$100.1 million-\$250 million	\$350,000,000	2
\$250.1 million or more	\$1,000,000,000	4
<b>Total</b>	<b>\$1,770,000,000</b>	<b>57</b>

**VII.3. Council Members: Office Space and Sales**

**The Council member companies responding to the survey (58 of them) occupy nearly 2.7 million square feet of office space in Nashville MSA, of which 1.9 million are health care-related. Using the survey responses, the council member companies, and their health care-related employees, the total estimated health care-related office space is about 35 million square feet.** This study does not differentiate between the different types of commercial spaces the Council member companies occupy. The 35 million square feet could be in any combination of retail, office, industrial, or medical office space. As of 2022, office and industrial space in the Nashville MSA is estimated at around 250 million square feet. The Council member companies occupy about 14 percent of office and industrial space in the Nashville MSA.

*Figure VII.10*

What is the square footage of space your company occupies in the Nashville MSA? If more than 1 site, please estimate the total

Range (sqft)	# of Responses	Total Space (Sqft)	Total Health Care-Related Space (Sqft)
Less than 5000	19	95,000	59,050
5001-10,000	13	97,500	63,825
10,001-25,000	11	192,500	140,175
25,001-50,000	4	150,000	86,250
50,001-100,000	3	225,000	195,000
100,001-250,000	1	175,000	175,000
More than 250,001	7	1,750,000	1,130,000
<b>Total</b>	<b>58</b>	<b>2,685,000</b>	<b>1,849,300</b>

Based on employment numbers and total number of member companies located in the Nashville MSA area, BEREC estimates a total of 35 million square feet of healthcare-related space occupied by the Council member companies in Nashville MSA area.

According to the survey responses (26 companies), the total health care revenues of the reported companies are \$13.437 billion in Nashville MSA. Total Nashville-based health care-related revenues of the Council member companies are estimated at around \$37 billion. The total global health care-related revenues of the Council member companies are estimated at around \$120 billion.

Figure VII.11

Please estimate your company's annual gross revenues (by place of work) (26 Companies)		
Region	Revenues (billion \$)	Healthcare-related Revenues (billion \$)
Nashville MSA	\$14.931	\$13.437
United States	\$53.567	\$33.233
Total Healthcare-related employees of the Council member companies (billion \$)*		
Nashville MSA		\$37.029
Global		\$119.475

\*Based-on reviews of company websites, third-party databases, public records (SEC filings), and other confidential databases, BERC created the Council member profiles, and estimated total healthcare-related revenues for their Nashville and global operations.

### VII.3. Council Member Companies—Employment and Wages

**Council member companies employ 96,218 health care-related workers in Nashville MSA. The total Nashville-based payroll is \$9.090 billion. The average payroll per employee is \$94,475, substantially higher than the average nonfarm wage in the Nashville MSA.**

According to Bureau of Economic Analysis ([www.bea.gov](http://www.bea.gov)) figures, the average annual wage in Nashville MSA in 2022 was \$57,560. Considering this disparity, Council member companies command substantial purchasing power in the Nashville MSA, which has profound implications for the local tax base. Many Council member companies are large corporate headquarters and health care management companies that employ highly skilled individuals who are experts in their respective fields. As previously discussed, these are some of the benefits corporate headquarters bring to a region.

This survey was not designed to address the corporate citizenship of Council member companies. However, many studies highlight the role of corporate citizenship in a community. Large companies, especially in health care, traditionally make substantial contributions to local charities, civic organizations, governments, and individuals through direct cash donations, volunteer time, matching employee donations, in-kind contributions, and charity care.

A total of 27 member companies reported total global employment of 694,073 in 2022. Not all of these jobs, however, are related to health care. As the table below suggests, about 30 percent of their employees are related to health care.



**Figure VII.12**

Please estimate the current number of employees (by place of work) (27 Companies)		
Region	Number of Employees	Healthcare-related Employees
Nashville MSA	57,230	45,758
Tennessee	67,703	54,715
United States	694,073	216,947
<b>Total Healthcare-related employees of the Council member companies*</b>		
Nashville MSA		96,218
Global		546,640

\*Based-on reviews of company websites, third-party databases, public records (SEC filings), and other confidential databases, BERC created the Council member profiles, and estimated total healthcare-related jobs for their Nashville and global operations.

Taking into account health care–related share of employment, Council member companies have more than 96,000 health care–related employees in the Nashville MSA and about 550,000 globally.

**Figure VII.13**

Please estimate your company's total annualized payroll (by place of work) (28 Companies)	
Region	Healthcare-related Payroll (billion \$)
Nashville MSA	\$4.323
United States	\$21.439
<b>Total Healthcare-related employees of the Council member companies (billion \$)*</b>	
Nashville MSA	\$9.090
Global	\$52.597

\*Based-on reviews of company websites, third-party databases, public records (SEC filings), and other confidential databases, BERC created the Council member profiles, and estimated total healthcare-related payrolls for their Nashville and global operations.

Council member companies (28 companies) reported a total of \$4.323.2 billion in wages and salaries in Nashville MSA. According to BERC estimates, Council member companies had \$9.09 billion in wages and salaries related to health care in the region. The average payroll for their health care-related operations is \$94,475, about 64 percent higher than the average nonfarm wage in Nashville MSA.

## VII.5. Council Members: Diversity, Equity, and Inclusion (DEI) Initiatives

BERC surveyed the Council member companies regarding their companies' diversity, equity, and inclusion initiatives. A total of 60 CEOs from member companies responded to this section of the survey.

**Nearly seventy-five percent of the respondents cited an employee assistance plan (EAP) or alternative complaint process as one of their DEI initiatives.** In descending order, the following are the top five initiatives: general staff DEI training, leadership DEI training, specific staff members working on DEI, mentorship program, and equity scorecard. Six CEOs indicated that there is no initiative currently in place.

Figure VII.14

What Diversity, Equity, and Inclusion (DEI) initiatives currently exist within your organization? Please select all that apply.	
Diversity, Equity, and Inclusion Initiatives	Number of Responses
Employee Assistance Plan (EAP) or alternative complaint process	44
General staff DEI training	39
Leadership DEI training	37
Specific staff members working on DEI	36
Mentorship Program	26
Equity scorecard or other benchmarking and goal effort	19
Talent development partnership with schools or programs (e.g., HBCU partnerships)	16
Other Initiatives	13
<i>N/A- no initiatives currently in place</i>	<b>6</b>
<i>Actively recruit and hire diverse candidates</i>	<b>1</b>
<i>Affirmative Action program</i>	<b>1</b>
<i>Employee-led national and local DEI efforts</i>	<b>1</b>
<i>EXPAND Program</i>	<b>1</b>
<i>Five Employee Resource Groups (African Am/Women/Hispanic/Veteran/LGBTQ+)</i>	<b>1</b>
<i>Hiring required to consider DEI candidates</i>	<b>1</b>
<i>Programs focused on diverse founders</i>	<b>1</b>

**How many employees do you have in your c-suite level or above?** Fifty-eight company CEOs reported their c-suite level or above employees. These companies employ more than 1,240 c-suite-level or above employees. Fifty companies reported less than ten c-suite-level or above employees. On average, the reported companies employ 24 c-suite level or above employees. The median c-suite level or above employees for the reported companies is five.

**Of those employees in your c-suite level or above, how many are women?** BERC survey also asked about gender representation in the c-suite level or above positions. Fifty-eight CEOs reported 485 women holding positions at the c-suite level or above, representing 39.08 percent of the total reported c-suite level or above employees. On average, there are nine women in these roles across the reported companies. The median c-suite-level or above women employees is two.

How many employees do you have in your c-suite level or above? (58 Companies)	
Range	Number of Reporting Companies
0-10	50
11-20	4
21-30	2
More than 30	2
<b>Total c-suite level or above employees</b>	
	1,241
<b>Average c-suite level or above employees (reported)</b>	
	24
<b>Median c-suite level or above employees (reported)</b>	
	5
Of those employees in your c-suite level or above, how many are women?	
Total number of c-suite level or above employees	1,241
Women in total c-suite level or above employees	485
Women as percent of total c-suite level or above employees	39.08%
Average c-suite level or above women employees (reported)	9
Median c-suite level or above women employees (reported)	2

**Of those women in c-suite level or above, what diversity categories below could apply to one or more of them?** The survey responses cited “African America/Black,” “Asian,” and “other under-represented minority” as the top three diversity categories for women in positions at or above the at c-suite level.

Figure VII.16

Of those women in c-suite level or above, what diversity categories below could apply to one or more of them? Please select all that apply.	
Diversity Categories	Number of Responses
African American/Black	11
American Indian or Alaskan Native	2
Asian	6
Hispanic	2
Latinx	3
Native Hawaiian and Pacific Islander	1
LGBTQIA+	3
Other under-represented minority	7

**VII.6. Council Members: Nashville Health Care Council and Entrepreneurial Dynamics**

According to the company CEOs, Nashville Health Care Council contributes to the Nashville MSA’s entrepreneurial dynamics through more than 25 avenues/activities. The following six major activities stand out from the others:

- Networking
- Connecting players from all sides of the industry: connectivity is related to networking but is highly emphasized in the comments.
- Collaboration
- Events- all kinds of events organized by the Council.
- Training- from the fellows program to other educational activities
- Development of educational materials and resources for opportunities and challenges.

Figure VII.17

Please specify up to three ways how the Nashville Health Care Council contributed to the entrepreneurial dynamics in the Nashville MSA?	
Contributions to Entrepreneurial Dynamics	Responses
Networking	18
Connects players from all sides of the industry	11
Collaboration	10
Events	10
Training	7
Develop education and resources of the opportunities and challenges	5
Fellows program	3
Think tank	3
Visibility to other healthcare companies	3
Learning & Development content	3
Mentorship	3
Branding Nashville Positively	3
Leadership	2
Providing additional healthcare knowledge/information	2
Sharing problems and solutions from all perspectives	2
Entrepreneurial support	2
Ensure Nashville is known globally as the center of healthcare	1
Loyalty	1
Attracting investment	1
Exposure to national experts in healthcare	1
Communication	1
Hiring talent	1
Market Share	1
Measuring healthcare's economic impact on the Nashville MSA.	1
Receptivity	1
Awareness	1
Commitment	1

## VII.7. Council Members: Nashville Health Care Council and Growth of Health care Industry

The BERC survey asked the Council member company executives to describe the contributions of the Council to the growth of the health care industry in the Nashville MSA. Fifty-eight executives responded to this question. Amazingly, more than 50 distinct words were chosen to describe the Council's contribution to the growth of the health care industry, suggesting that the Council is at the forefront of all business activities associated with the growth of the health care industry. The following top 10 words stand out from the rest: collaboration, networking, leadership, education, innovation, connections, awareness, catalyst, relationship, and information.

Figure VII.18

What three words describe the contribution the Nashville Health Care Council makes to the growth of the health care industry in the Nashville MSA?			
Words	Responses	Words	Responses
Collaboration	15	Synergy	1
Network	7	Talent	1
Leadership	6	Thought leadership	1
Education	5	Vital	1
Innovation	5	Alignment	1
Connections	4	Authority	1
Awareness	3	Committed	1
Catalyst	3	Credible	1
Relationships	3	Cross-pollination	1
Information	3	Organization	1
Events	2	Proximity	1
Evolving	2	Significant	1
Impactful	2	Skillful	1
Marketing	2	Stewardship	1
Advocacy	2	Basecamp	1
Facilitator	2	Breadth	1
Inspiration	2	Content	1
Knowledge	2	Discussion	1
Opportunities	2	Diverse	1
Differentiation	2	Enhancement	1
Adaptable	1	Example	1
Cohesive	1	Fellows Program	1
Dynamic	1	Foresight	1
Entrepreneurship	1	Helping	1
Focused	1	Perspective	1
Influential	1	Promotion	1
Learning	1	Resources	1
Provider-focused	1	Respected	1
Strategic	1		

## VII.8. Council Members: Activities and Challenges

### **What was your company's health care-related investment in businesses in the Nashville MSA in 2022?**

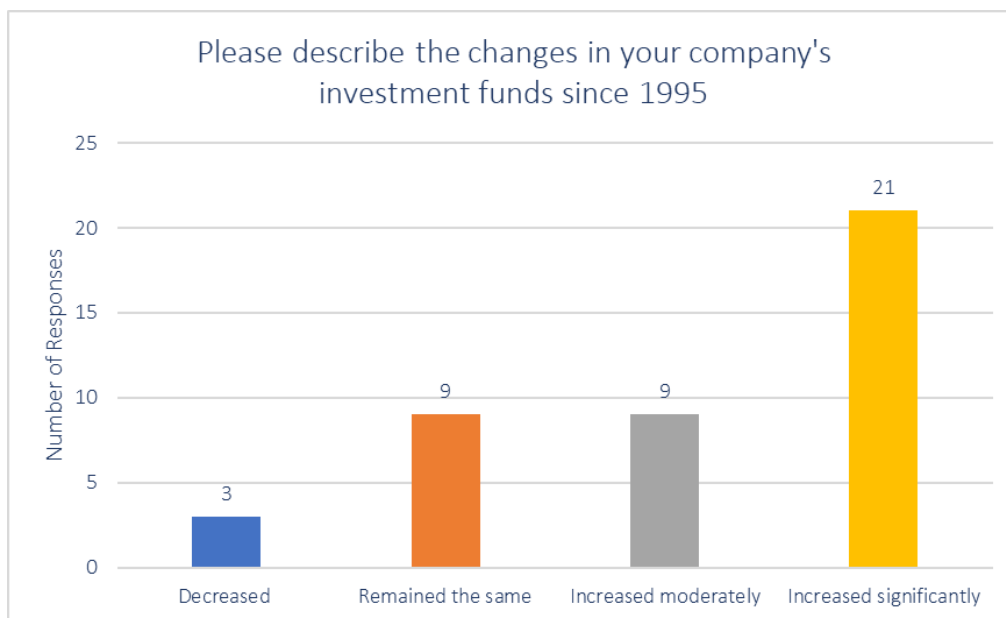
According to the BERC survey, 35 percent of the CEOs recorded no investment activities in 2022. A sizable number of companies mentioned capital investment and expansion (13 companies). Six companies experienced mergers and acquisitions.

Figure VII.19

What was your company's health care related investment in businesses in the Nashville MSA in 2022? For example, mergers and acquisitions, new start-up, expansion of current operations, etc.)	
Healthcare-Related Investment	Number of Responses
None	12
Expansion	8
Capital investment	5
Mergers and acquisitions	6
Technology upgrade	2
Fundraising	1

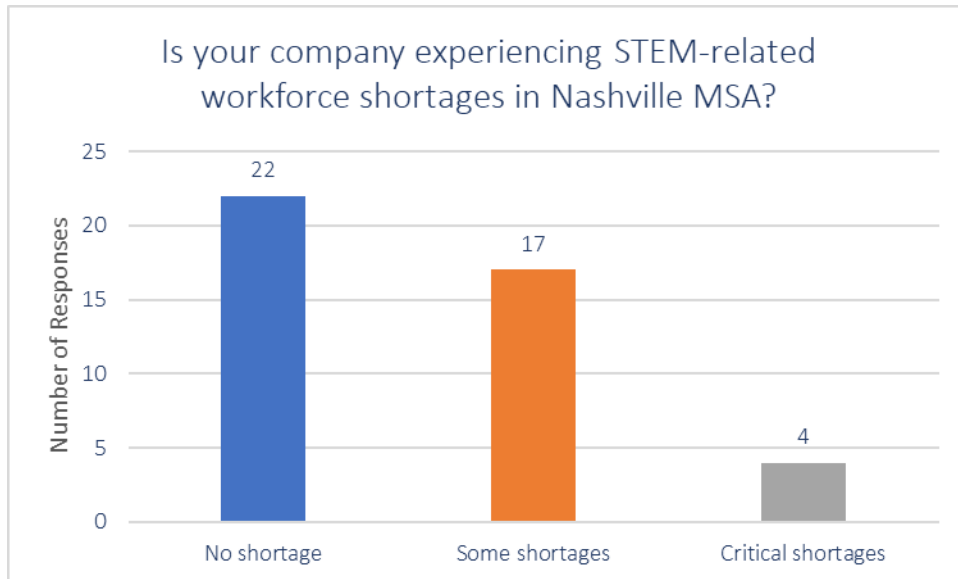
**Please describe the changes in your company's investment funds since 1995.** Nearly 50 percent of member CEOs indicated their organization's investment funds increased significantly since 1995. Only seven percent of CEOs indicated that the investment funds decreased over the years.

Figure VII.20



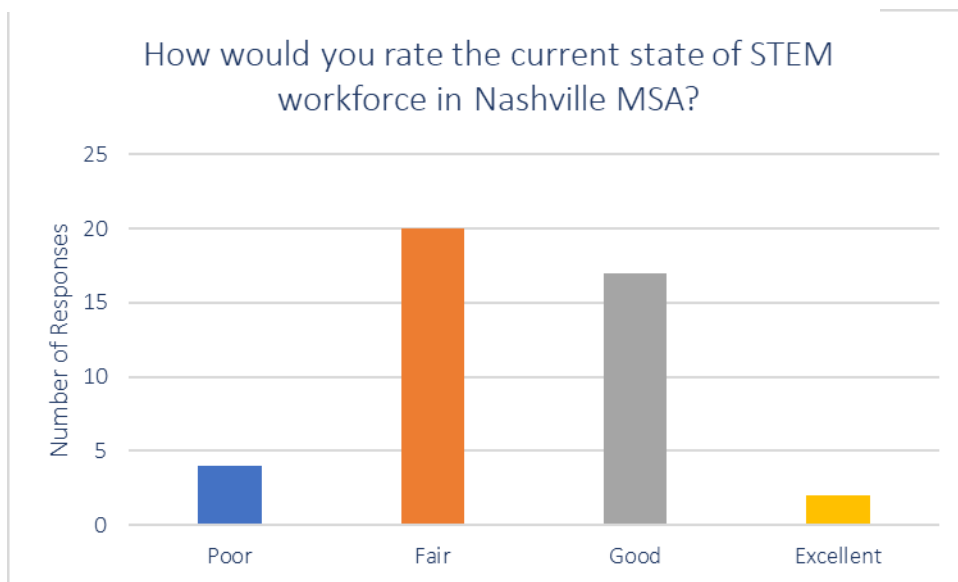
**Is your company experiencing STEM-related (Science, Technology, Engineering, and Math) workforce shortages in the Nashville MSA?** Forty-three CEOs responded to this question. A little over 50 percent of CEOs did not see a shortage in the STEM workforce in Nashville MSA. About forty (40) percent of responses acknowledged some shortages in this area.

Figure VII.21



**How would you rate the current state of the STEM workforce in Nashville MSA?** Although more than 50 percent of CEOs indicated that there are no STEM workforce shortages, about 56 percent of the survey takers graded the quality of the STEM workforce as either “Fair” or “Poor.”

Figure VII.22



**What are your company's current strategies to address the STEM-related workforce shortages in the Nashville MSA?** About 30 Council member CEOs answered this question. The best practice for many CEOs is to recruit from the competitive marketplace. The second-best practice is to invest in existing employees for skill upgrades before using other strategies.

Figure VII.23

What are your company's current strategies to address the STEM-related workforce shortages in the Nashville MSA? Please identify your top three in the order of priority.				
Strategies	Rank 1	Rank 2	Rank 3	Rank Score
Investing in existing employees for skill upgrade	7	10	6	13.98
Investing in pipeline through K-12	3		1	3.33
Outsourcing the tasks to be completed (Overseas)	1	2	1	2.33
Recruiting from the competitive marketplace	14	7	3	18.49
Using skilled internal employees to handle jobs	3	4	7	7.31
Using temporary staffing agencies	1	2	4	3.32
Outsourcing the tasks to be completed (U.S.)		3	3	2.49

**What are the hardest STEM occupations to fill in your company?** Although only 23 CEOs answered this question, we are able to highlight several occupations that are hard to fill in the Nashville MSA. The most frequently cited occupations are Engineers (especially pharma-related), data scientists, nurses, information technology positions (specifically affordable ones), and accounting occupations.



**Figure VII.24**

Please describe the three hardest STEM (Science, Technology, Engineering, and Math) occupations to fill in your company.	
Occupations	Number of Responses
Engineers (Pharma, DATA, and others)	7
Data Science/Scientist	6
Nurses	4
Information Technology	3
Accounting	2
Advanced Practice Clinicians (Physician Assistants, Nurse Practitioners, CRNAs)	2
Financial analysis	2
Software Engineer	2
Analyst	1
Cyber	1
Data Research	1
Decision Support	1
Healthcare-knowledgeable architects/technicians	1
IT positions for reasonable rates	1
Nurse Practitioner	1
Physicians	1
Senior Developer	1
In-person positions (Not Remote)	1
Medical technicians	1
Clinical revenue cycle	1
Construction observation talent	1
Database Creation and Maintenance	1
Engagement	1
Epidemiology	1
Experienced Sterile Injectable formulation scientists and analytical development scientists	1
Certified Project Manager	1
Healthcare-knowledgeable interior designers	1
Pharmaceutical QC/Analytical Development Scientists	1

**What role has the Nashville Health Care Council played in addressing the workforce needs of the health care industry cluster in the Nashville MSA?** The Council member CEOs acknowledge the work of the Council on health care workforce issues. The sentiments are mostly positive, and many CEOs applaud the Council’s effort in the areas of (1) networking events, (2) awareness, and (3) the Fellows Program to address the workforce needs of the health care industry cluster.

Several CEOs acknowledge the Council’s efforts but specify that the efforts are not bold and decisive. A few CEOs do not see any concrete steps from the Council to address the health care workforce issue.

***What role has the Nashville Health Care Council played in addressing the workforce needs of the healthcare industry cluster in Nashville MSA?***

As a source of information

Networking and Events (organizational and opportunities) (3)

Leadership education (Need more in this area)

Awareness (3)

Bringing people together to address problems

Creating a buzz and excitement

Bringing healthcare and other leaders together

Fellows program (Talent incubation) (4)

***Supportive but slow***

***Nothing concrete done***

Connecting leaders and opportunities

Locating bests and brightest

***Not sure***

***Not sure, no helps on workforce issues***

***Addressing talent issue yet to be achieved***

***Great work, but bold commitment to employees needed***

The Council makes the workforce priority, but educators should be in the mix, too

***What needs to be done to prepare Nashville's health care ecosystem for the future of health care in the United States?*** Finally, we asked the Council CEOs for their recommendations to sustain Nashville's role in the health care industry cluster in the United States. All the recommendations would benefit Nashville's position as an industry leader in the future.

Figure VII.25

**The Nashville health care industry cluster is an industry leader across the United States. To sustain its competitive advantage, what needs to be done to prepare Nashville's health care ecosystem for the future of health care in the United States? Please input up to three recommendations**

Address workforce challenges (shortages, promoting DEI, adopting innovative staffing models)(2)	More infrastructure
Attract, engage, develop, and retain the best associates	More Technology Investment
Better public transit	Understand the transformation of healthcare delivery
Bring digital therapeutics to Nashville.	Webinars & Conferences
Collaborate rather than compete in markets. (3)	Continue to bring non-Nashville healthcare experts into the FELLOWS program/and members
Connection to government and financial industries (inside and outside of Nashville)	Creation of opportunity to expand and educate future employers
Continue to be innovative with programming	Providing high quality care
Continue to brand the NHCC like the Aspen Institute.	Education surrounding emerging trends
Continued capital investment	Engagement
Deregulation - payment innovation	Exposure to minority entrepreneurs and schools
Diversity in talent and board	Implement AI (2)
Embrace digital health (2)	Integrate behavioral health care into physical care on a consistent basis
Ensure Nashville becomes a center of innovation for new technological models to deliver care	Keep Nashville as center of Healthcare Thought Leadership
Exchanging of ideas, concepts, and innovation	More investment funds
Extend topics of interest and council representation beyond tech-enabled healthcare or providers	More startup up funding based in Nashville
Focus on Development of Pharma hub	More targeted events
Heavier focus on the consumer/patient	Open to change and willing to adapt
Illustrate where leading healthcare providers are showing innovation	Become the Silicon Valley of Healthcare
Improve Diversity, Equity and Inclusion (2)	Build next generation of leaders in Healthcare
Improve health and well-being of Nashville MSA's population (2)	Challenge the market place to be more accepting of innovation and partnerships
Industry advocacy	Communication
Innovation (3)	Continued marketing of Nashville health care industry to investors, payors, and regulators
Innovations in workforce wellness (2)	Less political division
Lobbying for evolving sub-sectors (e.g., ASCs)	Maintain Low Taxes, Limited Government
Maintain US leadership position	More tools to address cost transparency and choice
More direct introductions / connections to health system executives	Position Nashville and its healthcare companies as "the mecca of healthcare."
More entrepreneurial support	Serve as a Thought Leader for Healthcare Leadership (3)
More focus on addressing the mental health of providers	

## VII.9. Council Members: COVID-19 and Business Operations

**On employment and revenue.** Covid-19 has had a mixed impact on the Council member companies. Based on the review of responses, we can divide the impact into four major categories: (1) no employment and business revenues, (2) significantly negative impact on employment and business, (3) positive impact on employment and revenues, and (4) impact of a new way of doing business and dealing with workforce issues. The table below shows 27 different impact categories. The often-cited impact categories are high attrition and decreased revenues, high clinician/staff burnout and turnover, shifts in workforce dynamics and challenges, and increasing telehealth services.

Figure VII.26

Please describe how Covid-19 has impacted your company's employment and revenue.

- (1) We have been significantly affected.
- (2) No permanent effect
- (3) Turning back office staff to remote work, creating extra effort for company culture
- (4) Revenewise beneficial
- (5) Post pandemic workforce attitude created challenges
- (6) No revenue and employment impact (5)
- (7) Higher attrition and decreased revenue (3)
- (8) Little long-term impact on employment and revenue
- (9) It affected our employment negatively
- (10) Moderate impact
- (11) Created a new culture that sustain us
- (12) Significant negative impact on revenue and employment
- (13) Has created a remote workforce that is hard to measure productivity and engagement
- (14) Revenue remained flat.
- (15) Filling clinical positions is a challenge.
- (16) High employee turnover, but revenue improved
- (17) Shift to remote work increasing talent pool. Revenue is recovering
- (18) Decreased the workforce, especially nursing.
- (19) Severe impact on emergent department volumes and revenues.
- (20) High clinician burnout and turnover (3)
- (21) Increasing telehealth services (2)
- (22) Increase demand for healthcare services
- (23) increased cost due to PPE and safety measures
- (24) Shifts in workforce dynamics (3)
- (25) Decreased revenue
- (26) Reducing the opportunity to raise funds
- (27) Increased demand and revenue (2)

**On overall business operations.** Similar to the question about the impact of Covid-19 on employment and revenues, we also asked CEOs to describe their overall experiences under Covid-19. We received mixed responses to this question, too. Out of 28 different responses, we can highlight several impacts: (1) overall business operation has continued as usual. The only impact businesses felt was indirect, through supply chain issues, cost increases, etc.; (2) Covid-19's impact has been positive as companies started utilizing new technologies and procedures; (3) Covid-19's impact on Workforce issues has created both opportunities and challenges; and (4) Covid-19 has created financial distress.

*Figure VII.27*

**Please describe how Covid-19 has impacted your company's overall business practices.**

- (1) Increased expenses, including additional labor, supply chain, capital, etc. (2)
- (2) Less travel more online meetings
- (3) Created opportunities to deliver services remotely
- (4) Required us to be flexible and nimble
- (5) Start using the technology more often
- (6) Implemented a hybrid model for employees
- (7) Relatively unscratched
- (8) Shift to hybrid work (3)
- (9) Narrowed product focus
- (10) Start implementing and using new and beneficial surgical procedures
- (11) Become more innovative in workforce issues
- (12) Affected every aspects of the business in healthcare
- (13) Our company has grown faster, allowing to penetrate new markets
- (14) Accelerating digital innovation and transformation
- (15) Had to move to a remote workforce (2)
- (16) Increased business opportunities
- (17) Shifted and remained as telehealth services (3)
- (18) Become more flexible in work styles and PTO (2)
- (19) Increased collaboration and communication
- (20) Increased focus on mental health
- (21) New regulatory environment
- (22) Increased focus on prevention and control
- (23) Created financial distresses
- (24) No impact (3)
- (25) Emphasis on emergency preparedness
- (26) Shift from chronic illness to communicable disease
- (27) Helped with scaling lessons learned
- (28) More flexibility

## VIII. CONCLUSION

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Nashville is truly the epicenter of the health care industry in the nation. Indicators used in this study demonstrate that Nashville's health care industry has a substantial impact on the MSA's economy and plays a critical role in shaping the future of the health care industry landscape across the globe. Confirming this is the presence of health care company headquarters and the flow of venture and private equity capital to the Nashville area. Overwhelmingly, the Council member companies confirm that a Nashville location is important to their business. These member companies play a vital role in the Nashville MSA economy. Additional growth opportunities are suggested in health care information technologies, population health, and global growth and economic development.

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## X. APPENDIX

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### 10.1 Data Sources

<u>Data Source Consulted</u>	<u>Web Link</u>
American Hospital Association Database	<a href="https://www.aha.org/statistics">https://www.aha.org/statistics</a>
Bureau of Economic Analysis	<a href="http://www.bea.gov">www.bea.gov</a>
Bureau of Labor Statistics	<a href="http://www.bls.gov">www.bls.gov</a>
Bureau of Labor Occupational Outlook Handbook	<a href="https://www.bls.gov/ooh/">https://www.bls.gov/ooh/</a>
Business Facilities	<a href="http://www.businessfacilities.com">www.businessfacilities.com</a>
CBRE CB Richard Ellis	<a href="http://www.cbre.com">www.cbre.com</a>
Census Bureau	<a href="http://www.census.gov">www.census.gov</a>
Earnest and Young LLP	<a href="https://www.ey.com/en_us/growth/">https://www.ey.com/en_us/growth/</a>
Expansion Management	<a href="http://www.expansionmanagement.com/">http://www.expansionmanagement.com/</a>
Nashville Health Care Council	<a href="http://www.healthcarecouncil.com">www.healthcarecouncil.com</a>
IMPLANpro, Inc.	<a href="http://www.implan.com">www.implan.com</a>
MTSU BERC survey	<a href="http://www.mtsu.edu/~Berc">www.mtsu.edu/~Berc</a>
Nashville Chamber of Commerce	<a href="http://www.nashvillechamber.com">www.nashvillechamber.com</a>
LexisNexis Academic Universe	<a href="http://www.lexisnexis.com">www.lexisnexis.com</a>
ReferenceUSA	<a href="http://www.referenceusa.com">www.referenceusa.com</a>
State Occupational Projections	<a href="http://www.projectionscentral.com">www.projectionscentral.com</a>
TACIR	<a href="http://www.state.tn.us/tacir">www.state.tn.us/tacir</a>
TN Dept. of Labor and Workforce Development	<a href="http://www.state.tn.us/labor-wfd">www.state.tn.us/labor-wfd</a>
University of Tennessee, State Data Center	<a href="https://tnsdc.utk.edu/">https://tnsdc.utk.edu/</a>
Urban Land Institute	<a href="http://www.uli.org">www.uli.org</a>

### 10.2 IMPLAN Model Information

- The impact of the health care industry cluster on the Nashville economy includes the direct employment, business sales, and income generated by the health care industry cluster and the additional or secondary impacts of all economic activity related to such employment and business sales. Secondary impacts fall into two general categories: **indirect effects** including all employment, business sales, or income generated by the interaction of local businesses with the health care industry cluster and by suppliers to local business transactions, and **induced effects**, including all spending by health care industry cluster employees in the local economy
- To quantify secondary impacts, a method called "input-output analysis" was employed using the IMPLAN Model developed by the Minnesota IMPLAN Group, Inc. IMPLAN is a predictive model based on regional accounting matrices; it simulates the inter-industry transactions occurring for any additional increase in demand in a regional economy. In this case, the increase in demand is attributed to the presence of the health care industry cluster and has been measured by jobs, business sales, and personal income. This study also employs a hybrid approach, which means that

it combines the use of a survey to gather information on direct impacts with the use of input-output analysis to calculate subsequent secondary impacts.

- **Direct Effects**
  - The direct effects of health care industry cluster employment include the total number of reported full-time employees of health care industry establishments.
  - The direct effect of income includes the total reported pre-tax staff payroll of the health care industry cluster.
  - The direct effect of business sales includes the total spending of the health care industry cluster to purchase goods and services in the local economy.
- **Indirect Effects**
  - Indirect effects include all employment, business sales, or income generated by the interaction of local businesses with the health care industry cluster and by suppliers to local business transactions.
- **Induced Effects**
  - Induced effects include all employment, business sales, or income generated by the spending of health care industry cluster employees in the local economy.

### 10.3. Health Care Industry Classifications

#### Detailed Health Care Industry Cluster Definitions

##### Core Health Care Providers

1. **Ambulatory Services (NAICS 621):** Industries that provide service directly or indirectly to ambulatory patients and do not usually provide inpatient services.
2. **Hospitals (NAICS 622):** Industries that provide medical, diagnostic, and treatment services including physician, nursing, and other health services to inpatients and the specialized accommodation services required by inpatients.
3. **Nursing Care Facilities (NAICS 623):** Industries that provide residential care combined with nursing, supervisory, or other types of care as required by the residents.

##### Health Care Management and Consulting Companies

1. **Management of Companies and Enterprises (NAICS 551):** Industries of three main types: (1) those that hold the securities of (or other equity interests in) companies and enterprises; (2) those (except government establishments) that administer, oversee, and manage other establishments of the company or enterprise but do not hold the securities of these establishments; and (3) those that both administer, oversee, and manage other establishments of the company or enterprise and hold the securities of (or other equity interests in) these establishments.
2. **Accounting, Tax Preparation, Bookkeeping, and Payroll Services (NAICS 54121):** Establishments primarily engaged in providing services such as auditing accounting records,

designing accounting systems, preparing financial statements, developing budgets, preparing tax returns, processing payrolls, bookkeeping, and billing.

**3. Computer Systems Design and Related Services (NAICS 5414):** Establishments primarily engaged in providing expertise in the field of information technologies through one or more of the following activities: (1) writing, modifying, testing, and supporting software to meet the needs of a particular customer; (2) planning and designing computer systems that integrate computer hardware, software, and communication technologies; (3) onsite management and operation of clients computer systems and/or data processing facilities; and (4) other professional and technical computer-related advice and services.

**4. Administrative and Support Services (NAICS 561):** Establishments engaged in activities that support the day-to-day operations of other organizations.

**5. Management, Scientific, and Technical Consulting Services (NAICS 5416)**

a. **Management Consulting Services (NAICS 54161):** Establishments primarily engaged in providing advice and assistance to businesses and other organizations on management issues.

b. **Other Scientific and Technical Consulting Services (NAICS 541690):** Establishments primarily engaged in providing advice and assistance to businesses and other organizations on scientific and technical issues (except environmental issues), such as biological consulting services.

**6. Professional Organizations (NAICS 813920):** Establishments primarily engaged in promoting the professional interests of their members and the profession as a whole.

#### Colleges, Research Organizations, and Public Health

**1. Junior Colleges (NAICS 6112):** Establishments primarily engaged in furnishing academic or academic and technical courses and granting associate's degrees, certificates, or diplomas below the bachelor's level.

**2. Colleges, Universities, and Professional Schools (NAICS 6113):** Establishments primarily engaged in furnishing academic courses and granting degrees at bachelor's or graduate levels.

**3. Technical and Trade Schools (NAICS 6115):** Establishments primarily engaged in offering vocational and technical training in a variety of technical subjects and trades.

**4. Scientific Research and Development Services (NAICS 5417):** Establishments engaged in conducting original investigations undertaken on a systematic basis to gain knowledge (research) and/or applying research findings or other scientific knowledge to create new or significantly improved products or processes (experimental development).

**5. Administration of Public Health Programs (NAICS 92312):** Government establishments primarily engaged in the planning, administration, and coordination of public health programs and services, including environmental health activities, mental health programs, categorical health programs, health statistics, and immunization services.

#### Medical Insurance Companies

**1. Direct Health and Medical Insurance Carriers (NAICS 524114):** Establishments primarily engaged in initially underwriting (i.e., assuming the risk and assigning premiums for) health and medical insurance policies.

#### Health Care Manufacturing and Wholesalers

1. **Optical Instrument and Lens Manufacturing (NAICS 33314):** Establishments primarily engaged in one or more of the following: (1) manufacturing optical instruments and lens, such as binoculars, microscopes (except electron or proton), telescopes, prisms, and lenses (except ophthalmic); (2) coating or polishing lenses (except ophthalmic); and (3) mounting lenses (except ophthalmic).
2. **Medical Equipment and Supplies Manufacturing (NAICS 3391):** Establishments primarily engaged in manufacturing medical equipment and supplies.
3. **Pharmaceutical and Medicine Manufacturing (NAICS 3254):** Establishments primarily engaged in one or more of the following: (1) manufacturing biological and medicinal products; (2) processing (i.e., grading, grinding, and milling) botanical drugs and herbs; (3) isolating active medicinal principals from botanical drugs and herbs; and (4) manufacturing pharmaceutical products intended for internal and external consumption in such forms as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions.
4. **Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers (NAICS 42345):** Establishments primarily engaged in the merchant wholesale distribution of professional medical equipment, instruments, and supplies (except ophthalmic equipment and instruments and goods used by ophthalmologists, optometrists, and opticians).
5. **Ophthalmic Goods Merchant Wholesalers (NAICS 42346):** Establishments primarily engaged in the merchant wholesale distribution of professional equipment, instruments, and/or goods sold, prescribed, or used by ophthalmologists, optometrists, and opticians.
6. **Drugs and Druggists' Sundries Merchant Wholesalers (NAICS 4242):** Establishments primarily engaged in the merchant wholesale distribution of biological and medical products, botanical drugs and herbs, and pharmaceutical products intended for internal and external consumption in such forms as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions.

Pharmacies, Drug Stores, and Ophthalmic Goods

1. **Health and Personal Care Retailers (NAICS 456):** This industry group comprises establishments primarily engaged in retailing health and personal care products. Drug stores and pharmacies, cosmetics, beauty supplies and perfume retailers, optical goods retailers, food (health) supplement retailers and health appliance retailers are included.

#### 10.4. Definitions and Ranking Procedure

##### Location Quotient (L.Q.)

The location quotient is the most commonly utilized method in regional economic analysis. The L.Q. is a measure of an industry's concentration in a local economy relative to the national average or any other reference unit.

$$LQ = \frac{\frac{E_{La}}{E_L}}{\frac{E_{Na}}{E_N}}$$

Where  $E_{La}$  = refers to industry "a's" employment in the local economy,  
 $E_L$  = refers to total employment in the local economy,  
 $E_{Na}$  = refers to industry "a's" employment in the national economy, and  
 $E_N$  = refers to total employment in the national economy.

## **Ranking Procedure**

Health care indicators are classified into two categories: (1) health care business climate and (2) health care infrastructure indicators.

(1) Health care business climate indicators: BEREC identified 11 indicators that reflect the overall trend in the health care sector in a given economy. The choices of these indicators are based on the review of the literature and the availability of indicators.

(2) Health care infrastructure indicators: BEREC identified 9 indicators that measure the capacity of the local economy to lay the foundation for the growth of the health care industry. In addition to direct health care-related indicators, BEREC included per capita personal income and unemployment rate in this category.

## **Standardized Procedure**

To compare these MSAs using a diverse set of indicators, BEREC converted each indicator into a unitless indicator. This procedure makes it possible to get a summary indicator for each category across MSAs. The method used to assign a relative score for each MSA for a given indicator is called cumulative normal distribution, which places each MSA for a given indicator between 0 and 1, depending on how MSA's value is related to the average standard deviation of a given series.