The Importance of the Health Care Sector to the Kansas Economy

Kansas Hospital Association
University of Kansas
Institute for Policy & Social Research

Statewide Report
February 2025

Dr. Donna K. Ginther, Director, IPSR
Pat Oslund, Associate Researcher, IPSR
Thomas Becker, Assistant Researcher, IPSR

KHA
Kansas Hospital
ASSOCIATION

Acknowledgments

This study was performed by the Institute for Policy & Social Research (IPSR) at the University of Kansas. Dr. Donna Ginther, Distinguished Professor of Economics and Director, IPSR, directed the work. Thomas Becker, Assistant Researcher and Pat Oslund, Associate Researcher, performed calculations and provided sections of the report text. The design and format of this report is largely based on the 2023 report produced by Mad Marshall.

This is an update of the original 2023 study, as part of an ongoing project sponsored by the Kansas Hospital Association. The authors thank KHA for the opportunity to work on this project. The research is modeled on previous studies completed by Professor John Leatherman, now retired from Kansas State University. The original methodology and structure of the study was developed by him and was updated and expanded by the IPSR authors.

Any conclusions or opinions expressed in this study remain those of the authors and do not necessarily reflect the views of the Kansas Hospital Association. Please feel free to contact the following researchers if you have questions or comments:

Dr. Donna Ginther, Director
IPSR
University of Kansas
dginther@ku.edu

Thomas Becker, Assistant Researcher
IPSR
University of Kansas
thomasbecker@ku.edu
785-864-9108

Executive Summary

The health care sector in Kansas provides substantial contributions to the state's economy. Health care employees in Kansas number around 214,000 (2023), or 10.7 percent of all Kansas workers. Furthermore, health care industries in Kansas provide $16.7 billion in direct payroll, 12.8 percent of the state total. Not only does health care generate direct jobs and employee income—it also supports additional businesses across many industries through supply chain linkages and employee spending on household goods and services. These secondary feedbacks are known as multiplier effects, and account for the difference between direct and total employment and income (table below). **The Kansas health care sector contributes around 325,000 jobs and almost $23 billion in labor income to the Kansas economy**, including direct effects and multiplier effects. This labor income, when spent, generates over $700 million in sales tax revenue. On average, **every 100 jobs in health care industries supports an additional 52 jobs in other Kansas industries**. Similarly, each $1000 in health care wages sustains an additional $364 in wages for other industries. The table on the following page summarizes the contributions of health care and its component industries to the current Kansas economic system.

Hospitals comprise the largest industry within the health care sector, with direct employment of almost 74,000 Kansans and direct labor income of almost $7 billion. The hospital sector also has large multiplier effects. **Every 100 hospital jobs supports an additional 73 jobs in non-health care sectors. And every $1000 in current hospital wages and salaries sustains an additional $450 in income** for employees of grocery stores, restaurants, gas and electric utilities, and other industries used by hospitals and their employees. As will be discussed later in this report, multiplier effects are even higher when we consider changes in hospital activity rather than contributions of current levels.

A vigorous health care system both supports the well-being of community residents and enhances economic opportunity. **Health-related sectors are some of the fastest growing in the economy.** Given demographic trends, this growth is likely to continue. Furthermore, evidence shows that **quality health care improves business productivity, aids in the recruitment and retention of businesses, and attracts and retains retirees.**

Contributions of the Health Care Sector to the Kansas Economy, 2023

Sector	Direct Employment	Employment Multiplier excl. Health Care Feedbacks	Total Employment	Employment Multiplier incl. Health Care Feedbacks
Hospitals	73,778	1.7335	127,893	1.9074
Offices of Physicians	27,619	1.6518	45,622	1.8415
Nursing and Residential Care	31,926	1.3758	43,925	1.4398
Offices of Other Health Practitioners	11,724	1.2810	15,019	1.3561
Offices of Dentists	10,176	1.2980	13,209	1.3870
Health and Personal Care Stores	14,085	1.3208	18,605	1.3858
Medical and Diagnostic Laboratories	5,601	1.4173	7,938	1.5254
Outpatient Care Centers	10,499	1.5850	16,641	1.7154
Home Health Care Services	8,736	1.2333	10,774	1.2997
Residential Treatment Facilities	5,308	1.2990	6,896	1.3622
Veterinary Services	5,601	1.2339	6,911	1.2986
Other Ambulatory Health Care Services	2,430	1.4645	3,559	1.5896
Fitness and Recreational Sports Centers	6,497	1.2090	7,855	1.2378
Total	213,982	1.5181	324,846	

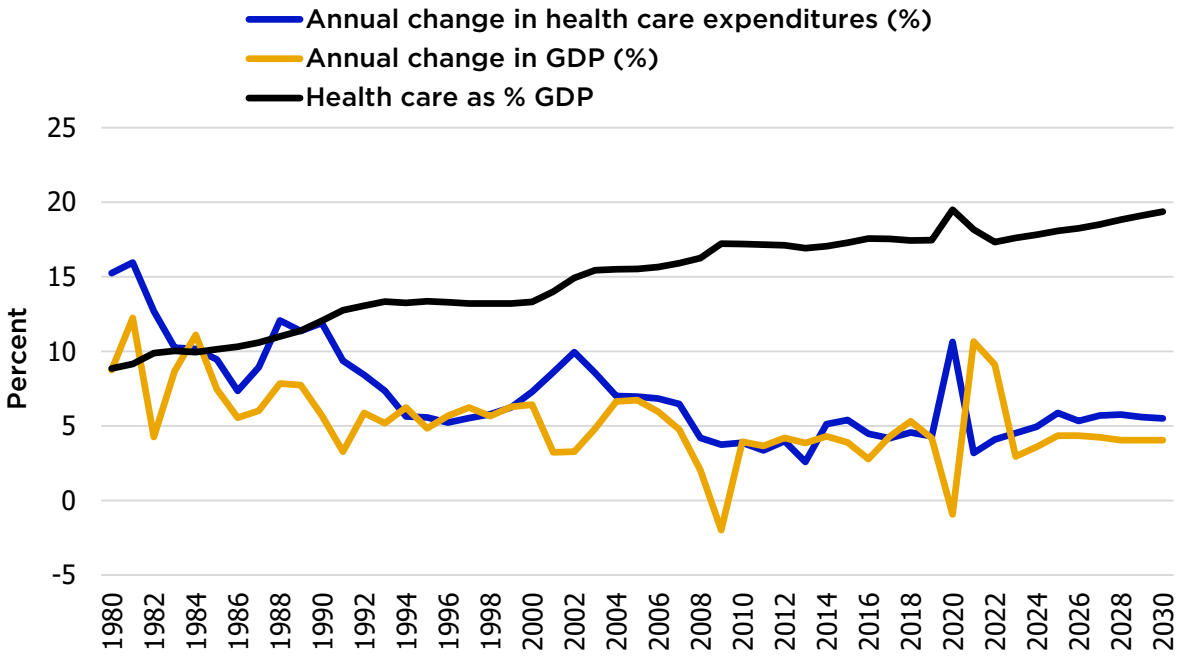
Introduction

The most important roles of the health care sector are to keep people well and to improve their quality of life, but the role of health care in economic development is often overlooked. This report focuses on the role that health care plays in nourishing and sustaining the Kansas economy and the businesses, public organizations and employees that operate within it.

Growth of the Health Care Sector

Health care is a growing sector, both in the nation as a whole and in Kansas. To quantify this growth trend, we look at data series from the US Centers for Medicare & Medicaid Services (CMS) and from the US Bureau of Economic Analysis (BEA). Figure 1 and Table 1 show annual data on the level of health care spending relative to gross domestic product (GDP). Historically, the annual change in expenditures has generally been greater than the annual change in GDP, especially prior to 2010. As a consequence, health care as a share of GDP rose rapidly from 1980 to 2010. During the most recent decade,

Figure 1. National Health Care Expenditures: Growth Trends and % GDP, Actual 1980-2021, Projected 2022-2030



Sources: Centers for Medicare & Medicaid Services and US Bureau of Economic Analysis.[1] Note: GDP is a broad measure of a country's or state's income.

this trend began to level out. It has now started to rise again, and this increase is projected to continue. During the first pandemic year, 2020, GDP fell but health expenditures rose substantially. Health care currently accounts for almost 18 percent of GDP nationally.

Total health care spending data are available at the national level only, but a more limited series, personal health care expenditures, is available for both the US and for states. This data series includes only expenditures for direct patient care and excludes items such as research. The growth of Kansas personal health care expenditures mirrors the US, with health care comprising an

Table 1. Health Care Expenditures, Growth, and % GDP: Historical (1980-2022) and Projected

Year	Total US Health Ex-pend. ($bil.)	Annual Change Total Expend. (%)	US GDP ($bil.)	Annual Change GDP (%)	Total US Health Expend. as % GDP	Personal Health Care Expend. as % GDP (US)	Personal Health Care Expend. as % GDP (KS)
1980	253	15.25	2,857	8.75	8.86	7.50	8.04
1990	719	11.91	5,963	5.70	12.05	10.26	10.91
2000	1,366	7.29	10,251	6.44	13.33	11.28	12.74
2010	2,590	3.89	15,049	3.94	17.21	14.49	14.99
2011	2,677	3.36	15,600	3.66	17.16	14.45	14.78
2012	2,783	3.99	16,254	4.19	17.12	14.43	15.00
2013	2,856	2.60	16,881	3.86	16.92	14.24	14.49
2014	3,002	5.11	17,608	4.31	17.05	14.35	14.26
2015	3,164	5.40	18,295	3.90	17.29	14.61	14.40
2016	3,305	4.47	18,805	2.79	17.58	14.86	14.32
2017	3,444	4.19	19,612	4.29	17.56	14.79	14.26
2018	3,601	4.57	20,657	5.33	17.43	14.61	14.16
2019	3,756	4.31	21,521	4.19	17.45	14.74	14.42
2020	4,156	10.65	21,323	-0.92	19.49	15.83	15.77
2021	4,289	3.20	23,594	10.65	18.18	15.09	
2022	4,465	4.09	25,744	9.11	17.34	14.39	
2025	5,185	5.87	28,654	4.35	18.10		
2030	6,804	5.51	35,114	4.05	19.38		

Sources: Centers for Medicare & Medicaid Services and US Bureau of Economic Analysis.[2] Calculations by the authors. See Appendix B for discussion of data methods.
Note: In current dollars, not adjusted for inflation.

increasing percentage of GDP, especially from 1980 through 2010 (see Table 1). Unfortunately, personal health care expenditures data are only available at the state level through 2020.

The growing importance of the health care sector is also reflected in employment data. Table 2 tracks health care employment, which is available for both the nation and for states. Thirty years ago, about 9 percent of US private sector employees and about 10 percent of those in Kansas worked in health care industries. By 2010, the health care employment share had risen to about 12 percent in both areas. During the last decade, health care employment has hovered around that level. In 2020, employment in health care actually fell as workers left the industry and as some sectors, such as dentistry, limited appointments. Overall employment in Kansas and the nation, however, fell even faster. Health care employment expanded in 2023 in the US and in Kansas. Unlike the nation as a whole, Kansas health care employement remains below its 2019 level.

Table 2. US and Kansas Health Care Employment Trends

Year	US Health Care Employment (thousands)	% Total US Employment	KS Health Care Employment (thousands)	% Total KS Employment
1990	9,779.0	9.0	107.9	10.1
2000	12,261.1	9.4	133.0	10.1
2010	15,361.6	12.0	157.2	12.1
2011	15,606.5	12.1	160.4	12.3
2012	15,854.5	12.0	162.4	12.3
2013	16,068.4	12.0	161.0	12.0
2014	16,263.7	11.9	161.8	11.9
2015	16,607.1	11.9	162.8	11.9
2016	17,003.4	12.0	162.7	11.9
2017	17,322.0	12.0	166.5	12.1
2018	17,618.7	12.1	169.6	12.3
2019	17,935.3	12.1	172.1	12.4
2020	17,464.8	12.6	168.7	12.7
2021	17,661.6	12.3	167.9	12.4
2022	17,918.8	11.9	170.1	12.2
2023	18,653.5	12.2	174.8	12.3

Source: Quarterly Census of Employment and Wages.[3]
Note: Includes public and private sector wage and salary employment. Does not include self-employed.

Health Care Plays a Vital Role in Consumer Spending in the United States

In examining the economic impact of the health care sector, it is worth noting that health care spending makes up a greater share of GDP in the United States than in other comparable economies. According to the OECD, the United States ranked first among member countries in 2022 with health expenditures representing almost 17 percent of GDP, while Switzerland came in second at 12 percent.[4] Similarly, spending per capita was highest in the United States, with around $13,400 in health spending per person that year, followed by $9,700 in Switzerland (converted from Swiss Francs using OECD annual purchasing power parity estimates at current prices).

The impact of this spending differential on population-level health metrics is less clear. Although greater health care spending as a share of GDP correlates with better health outcomes in OECD countries in general,[5] health care spending in the United States has not consistently resulted in better health outcomes at the national level. While the US performs better on some measures of care quality, such as mortality rates within 30 days of hospitalization and rates of post operative sepsis,[6] both male and female life expectancy at birth in the United States is lower than the OECD-wide average, and infant mortality is higher.[7]

There are several possible reasons for the disproportionately high spending on health care in the United States. Most obviously, the United States is a wealthy country in terms of per capita income, and household consumption in general is correspondingly higher than other OECD countries.[8] In other words, individuals who spend more in general tend to spend more on health care. Even considering the relationship between household consumption and health care spending, however, American per capita health expenditures are unexpectedly high given patterns in other member states.[9]

Differences in the health care marketplace also seem to play a role in disproportionate spending. In a recent study conducted by the Commonwealth Fund, researchers found that higher administrative costs, associated with both insurers and providers, made up the largest share of “excess” spending on health care in the US when compared to other countries.[10] Other expenditures also drive higher spending in the United States

than abroad. The authors found that higher drug prices, comparably high wages for physicians and nurses, and greater spending on machinery and equipment were also significant contributing factors.[11]

Whether or not the spending differential is problematic for American households, these findings illustrate the significance of the health care sector to the United States economy. As our approach to economic impact analysis highlights, expenditures on health care result in a corresponding increase in household income, sales of other goods and services, and tax revenue. The high wages of physicians and nurses in the US are a key part of the outsized economic impact of the healthcare sector, especially at the local level. Similarly, investments in medical machinery and equipment, as well as spending on prescription drugs, represent indirect effects of health care services. Administrative spending also corresponds to greater incomes for administrators, which further magnifies the impact of health care in national and local economies.

Significant Economic Contributions of the Health Care Sector in Kansas

The effects of the health care sector spread broadly over the entire Kansas economy, through job and income creation, tax generation, and enhancement of the Kansas quality of life. Specific channels of influence include:

- **Creating direct jobs and income within the health care sector when health care establishments hire staff;**
- **Creating secondary jobs and income when suppliers to health care industries hire their own employees and when employees purchase goods and services such as groceries in the community;**
- **Creating direct tax revenue when health care establishments pay income taxes on profits and property taxes on buildings and land;**
- **Creating secondary taxes when employees pay income taxes, pay sales taxes on their purchases and pay property taxes on residences and vehicles;**
- **Improving employee productivity, making it easier for Kansas firms to compete in national and international marketplaces;**
- **Making businesses more likely to choose Kansas as a location for investment;**
- **Improving the attractiveness of Kansas as a retirement location for current and new residents.**

This report focuses on the first four financial roles of the health care sector. Appendix A reviews the literature on additional roles of health care in improving the business climate and the quality of life in the state.

Share of the Kansas Economy Comprising Health Care Industries

This report uses a definition of health care that is more inclusive than most definitions used in national studies. The definition was developed by Dr. John Leatherman in consultation with the Kansas Hospital Association. Table 3 shows the key industries included within the broad definition of the health care sector in Kansas. The industries include establishments that are owned and operated by government entities, such as a Veteran's Administration hospital or a municipally-owned sports center.

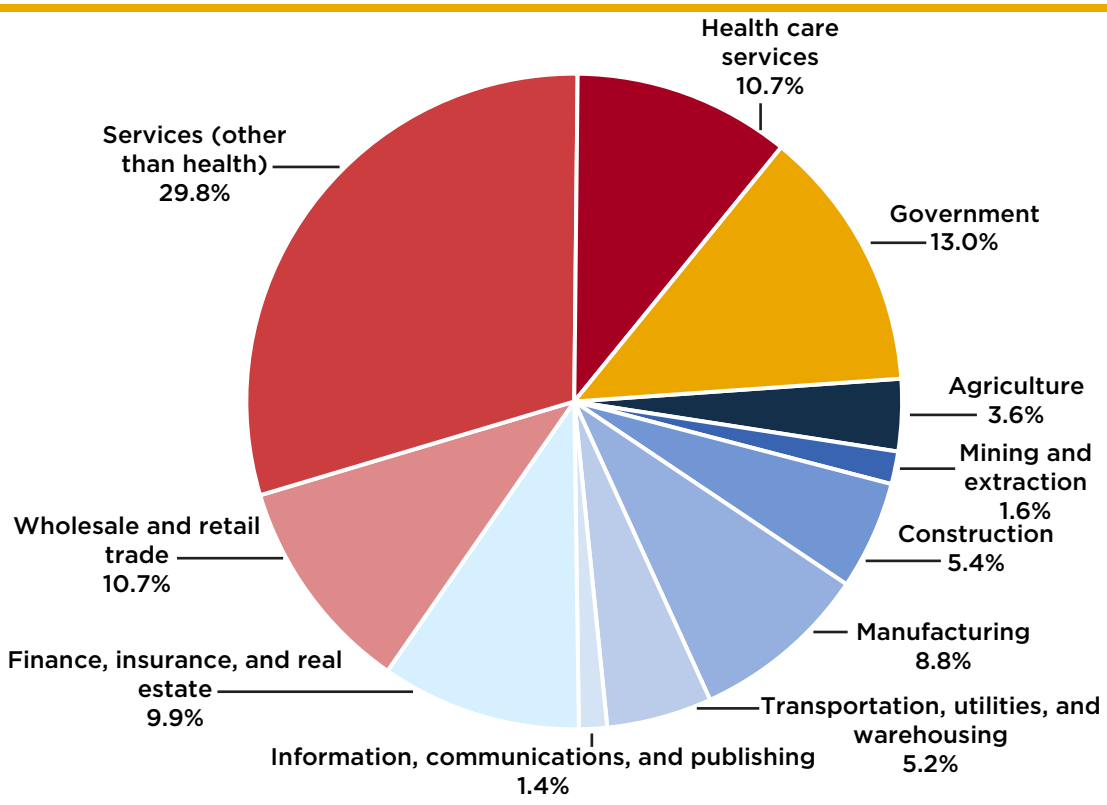
Table 3. Key Health Care Industry Definitions

Health Care Industry	Businesses and Establishments Included
Hospitals	Medical and surgical hospitals, psychiatric hospitals, and other specialty hospitals. Includes hospitals owned and operated by government entities.
Offices of Physicians	Offices of health practitioners with M.D. or D.O. degrees, primarily engaged in the independent practice of general or specialized medicine.
Nursing and Residential Care	Skilled nursing facilities, assisted living facilities, hospices, continuing care communities and similar residential facilities. Includes facilities owned and operated by government entities.
Offices of Other Health Practitioners	Optometrists, mental health professionals, audiologists, chiropractors and other practitioners without M.D. or D.O. degrees.
Offices of Dentists	Family dentists, dental surgeons, periodontists, orthodontists and other dental practitioners with doctorate level degrees.
Health and Personal Care Stores	Pharmacies, optical goods stores, medical goods and equipment stores, vitamin and nutritional supplement stores, wheelchair and other mobility equipment stores and similar establishments.
Medical and Diagnostic Laboratories	Testing laboratories, breast and other diagnostic imaging centers, ultrasound imaging centers, radiological laboratory services and similar establishments.
Outpatient Care Centers	Fertility clinics, family planning centers, non-residential drug addiction and substance abuse treatment centers, non-residential mental health treatment centers, free-standing emergency medicine and urgent care centers and similar facilities.
Home Health Care Services	In-home hospice services, visiting nurses, home care of elderly and home health care agencies.
Residential Treatment Facilities	Residential facilities providing intellectual disability, mental health, substance abuse or other support services.
Veterinary Services	Veterinary hospitals, small animal veterinary services, livestock veterinary services and veterinary testing services.
Other Ambulatory Health Care Services	Blood banks, organ banks, air and ground ambulance services, employee drug testing services and smoking cessation programs.
Fitness and Recreational Sports Centers	Gyms and other physical fitness facilities, skating rinks, swimming pools, tennis courts, recreational sports facilities and youth athletic facilities.

Health care industries comprise a significant portion of the Kansas economy, as shown in Figure 2 and Table 4. More than one out of ten employed Kansans work in health care industries, a greater share than those working in manufacturing and almost as great a share as those working in the wholesale and retail trade sectors combined. Health care employees take home almost 13 percent of the labor income in the state, a number greater than the employment share because many health care employees earn above-average wages.

Other measures of "economic share" include output and total income. Output, or total sales of a sector, includes the value of intermediate products or inputs that go into the sector. For example, manufacturing output includes the value of crude petroleum that goes into gasoline and the value of steel that goes into automobiles. So, the output measure includes some double-counting. This is part of why certain sectors have higher output per employee than health care. Total income includes not just labor income, but also returns on capital such as profits and depreciation allowances. Because the health care sector includes a large number of public and not-for-profit organizations such as hospitals, total income is similar to labor income in that sector. Capital income,

Figure 2. Health Care Employment as a Share of the Kansas Economy, 2023



especially of large corporations, often leaves the state to be distributed to shareholders nationwide. Note that "total income" approximates the health care sector's contribution to the state's GDP, while labor income approximates the contribution to households within the state.

Table 4. Structure of the Kansas Economy, 2023

Sector	Total Employment	Total Output ($mil.)	Labor Income ($mil.)	Income, All Sources ($mil.)
Agriculture	71,028	23,247.9	1,668.2	7,916.3
Mining and extraction	32,152	13,354.0	1,327.4	1,264.8
Construction	107,075	19,167.9	7,014.3	9,995.8
Manufacturing	175,529	112,776.4	15,906.7	31,618.6
Transportation, utilities, and warehousing	103,749	22,709.8	7,239.0	12,706.0
Information, communications, and publishing	27,636	19,653.6	6,450.2	11,465.4
Finance, insurance, and real estate	197,244	58,392.4	8,953.0	32,508.0
Wholesale and retail trade	214,544	40,872.9	12,178.5	25,444.7
Services (other than health)	594,931	84,507.0	35,385.4	53,039.6
Health care services	213,982	32,119.0	16,675.7	20,216.6
Government	260,029	22,372.8	17,942.7	22,101.5
Total	**1,997,900**	**449,173.7**	**130,741.0**	**228,277.3**
Healthcare as Share of Kansas Economy	10.7%	7.2%	12.8%	8.9%

Sources (Figure 2 and Table 4): Census of Employment and Wages.[12] Calculations by IPSR. See Appendix B for discussion of data methods.

Individual Health Care Industries

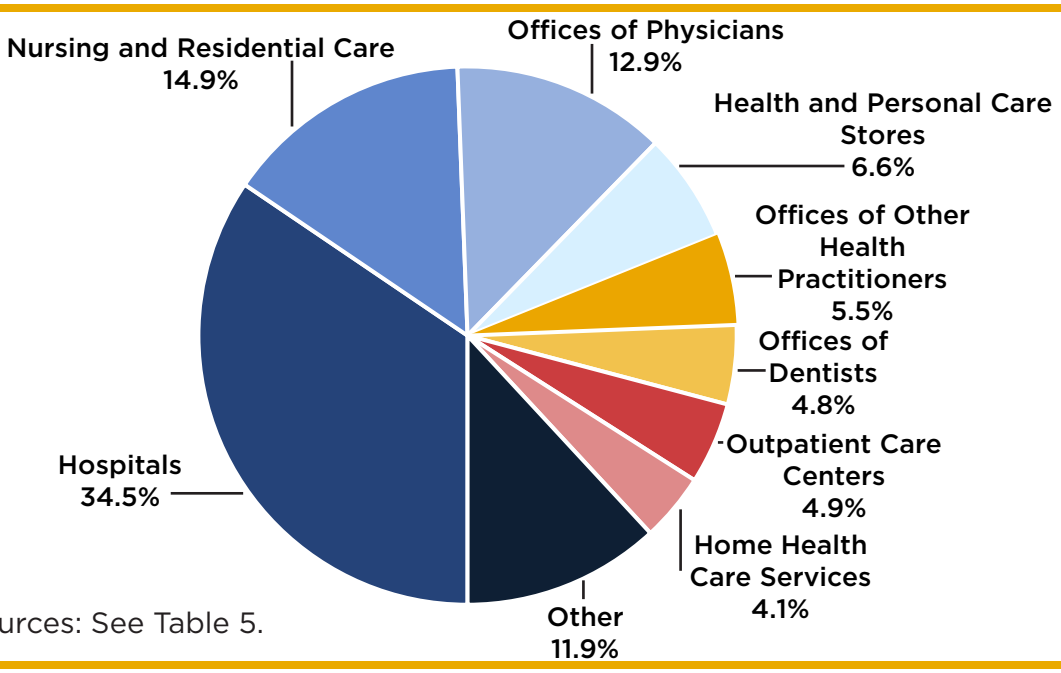
Our report emphasizes employment and labor income, the measures most relevant to the majority of the state's residents. Hospitals, nursing facilities, and physicians lead the health care industries in terms of employment and labor income (Table 5 and Figure 3). Hospitals alone employ nearly 74,000 Kansans and pay out more than $6.6 billion in wages and benefits. Hospitals directly employ approximately 34.5 percent of total health care employees, followed by nursing facilities (14.9 percent) and offices of physicians (12.9 percent). Overall, health care industries employ about 214,000 people and provide $20.2 billion in income.

Table 5. Contributions of Kansas Health Care Industries to Employment, Output and Income, 2023

Industry	Total Employment	Total Output ($mil.)	Labor Income ($mil.)	Income, All Sources ($mil.)	Labor Income per Employee
Hospitals	73,778	14,789.3	6,624.6	8,093.3	89,791
Offices of Physicians	27,619	5,062.2	3,679.8	3,518.3	133,234
Nursing and Residential Care	31,926	2,918.4	1,496.5	1,729.1	46,873
Offices of Other Health Practitioners	11,724	1,315.1	737.4	1,063.4	62,898
Offices of Dentists	10,176	1,396.1	770.7	1,157.4	75,736
Health and Personal Care Stores	14,085	1,791.2	717.6	1,395.9	50,945
Medical and Diagnostic Laboratories	5,601	1,000.6	487.2	770.6	86,993
Outpatient Care Centers	10,499	1,478.9	752.9	888.8	71,713
Home Health Care Services	8,736	660.1	490.7	516.1	56,174
Residential Treatment Facilities	5,308	446.5	267.7	306.3	50,424
Veterinary Services	5,601	606.8	291.2	411.4	51,996
Other Ambulatory Health Care Services	2,430	321.8	234.4	203.5	96,450
Fitness and Recreational Sports Centers	6,497	331.9	124.9	162.5	19,220
Total or Average	**213,982**	**32,119.0**	**16,675.7**	**20,216.6**	**77,930**

Sources: IMPLAN model data; US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[13] Calculations by IPSR. See Appendix B for discussion of data methods.

Figure 3. Composition of the Kansas Health Care Sector, Employment Shares, 2023



Sources: See Table 5.

Labor income per employee, including benefits, ranges widely by health care industry, from a high of more than $133,000 for physicians' offices to a low of about $19,000 for fitness and sports centers. Hospitals not only are the largest health industry in the state—they are also one of the best paying, with average wages and benefits nearing $90,000.

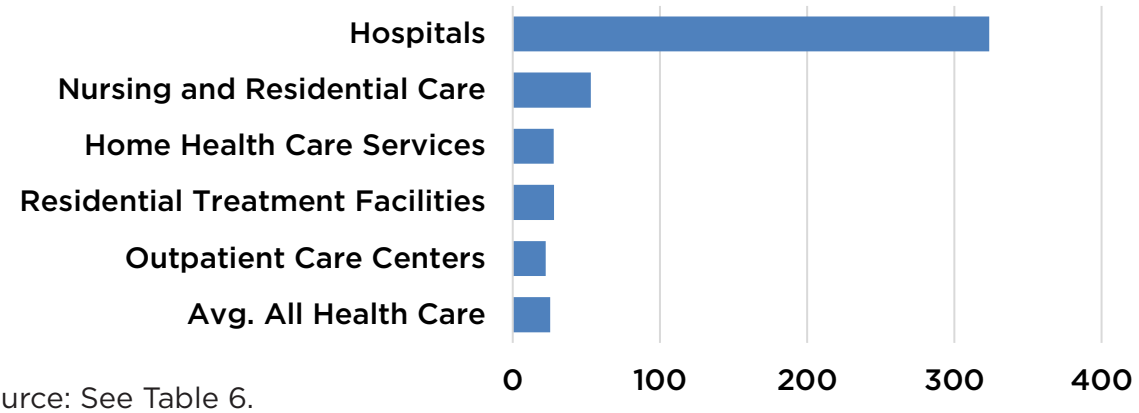
Health care establishments vary widely by size (Table 6 and Figure 4). Data from the US Bureau of Labor statistics records the number of establishments and total employment for businesses that are required to submit unemployment insurance taxes (this excludes self-employed people, who otherwise are included in the tables in this report). Note that the data are recorded by business location, so a business that operates two separate facilities in Kansas counts as two establishments. In 2023, more than 7,700 health care establishments operated in the state (again, excluding the self-employed). Hospitals on average employed over 320 people each, making them a major employer wherever they are located. Hospitals are likely to be larger in urban than in rural areas, but nonetheless the loss of a hospital in a rural area would be a major blow to employment. Similarly, nursing facilities (average employment of about 50) can be considered a major employer in a rural community.

Table 6. Number of Establishments and Establishment Size, 2023

Industry	Number of Establishments	Employees per Establishment
Hospitals	228	324
Offices of Physicians	1417	12
Nursing and Residential Care	581	53
Offices of Other Health Practitioners	1732	6
Offices of Dentists	924	10
Health and Personal Care Stores	822	10
Medical and Diagnostic Laboratories	252	19
Outpatient Care Centers	408	22
Home Health Care Services	283	28
Residential Treatment Facilities	185	28
Veterinary Services	446	11
Other Ambulatory Health Care Services	165	12
Fitness and Recreational Sports Centers	319	20
Total/Average	7762	25

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[14] .
Note that this dataset sometimes classes physicians practices associated with hospitals as separate hospital estlablishments, thus inflating the number of hospitals. Does not include self employed.

Figure 4. Number of Employees per Health Care Establishment, 2023



Source: See Table 6.

Repercussions of the Health Care Sector on Other Industries in the State of Kansas

Up to this point, we have analyzed the "direct" effects of the health care sector on the state's economy—that is, we have summed up the employment and income generated within the health care sector. But the sector also triggers additional effects of two types:

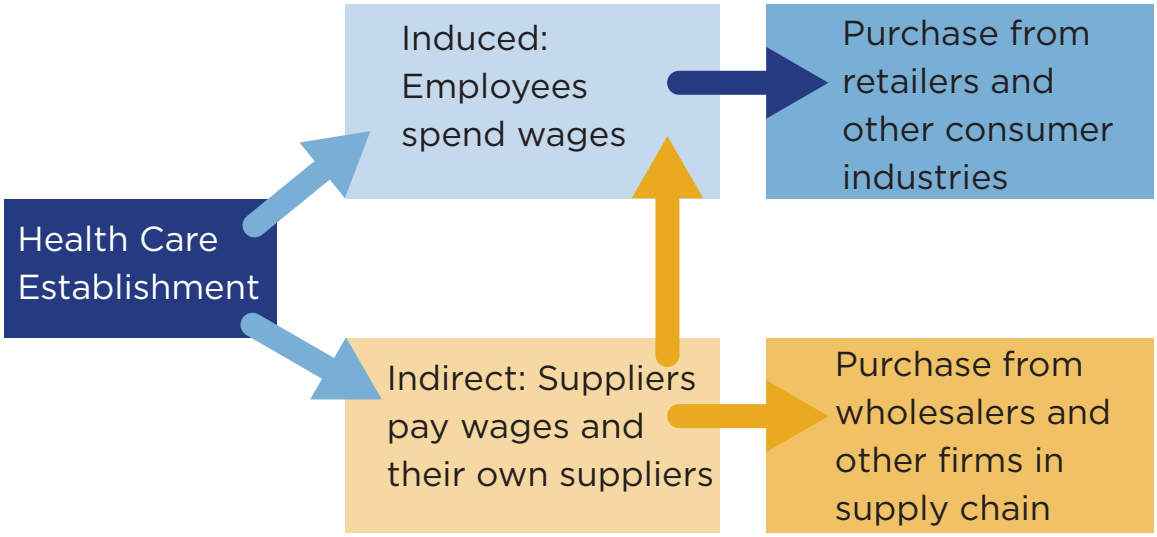
- **Indirect effects work through the supply chain channel. Suppose, for example, that a dental office contracts with a Kansas software developer to organize and maintain its appointment records. The software firm uses the receipts from the dental office to pay its own employees. Hence the health care sector supports part of the employment in the software industry.**

- **Induced effects work through the employer payroll channel. For example, when the dental office pays its office administrator, the income of that administrator will be used in many ways: for instance, to purchase food, pay rent, attend entertainment events and to pay electric bills. All of these downstream industries benefit from interactions with health care employees.**

Collectively, indirect and induced effects comprise the "secondary" effects of the health care sector. Figure 5 shows the first layer of secondary feedbacks due to health care. Note that after employees make purchases from retailers, those retailers in turn pay employees and make additional supply purchases. Similarly, the suppliers initially impacted in turn pay wages and purchase their own supplies. The direct effect of the health care sector initiates iterative rounds of income creation, spending, and re-spending due to the interactions between firms, industries, households and governments. The cumulative effect of these feedback loops is known as the multiplier effect. As an example, an employment multiplier of 1.5 for the health care sector means that for every direct job in the sector, an average of 0.5 additional jobs are supported elsewhere in the economy.

Multipliers vary by industry, by the size of the economic region under consideration, and by the industrial diversity of the regional economy. Large and diversified economies typically show higher multipliers.

Figure 5. Connections among the Health Care Sector, Consumer Industries, and Suppliers



This report makes use of two different types of multipliers, depending on the effects under consideration (see Tables 7 and 8). In the literature, the two approaches are known as **contribution analysis** and **impact analysis**. As explained by Henderson and Evans,[15] contribution analysis estimates the relative importance of a group of industries to an existing economy, while impact analysis estimates the effect of changes in an industry on that economy.

Discussions of the overall effects of the health care sector rely on contribution analysis. The associated multipliers exclude feedbacks between a given single health care sector and other health care industries in the state because the direct totals for other health care industries already include these health care feedbacks. For example, suppose that hospital employees use their wages to pay veterinarians, who in turn pay their own employees. The veterinary employees already have been tabulated in the direct employment and income columns, so it would be double counting to count them as secondary effects as well. Figure 6 shows potential feedbacks for contribution analysis.

As mentioned above, discussions of the effects of changes in a single industry, or a single establishment within an industry, generally use impact analysis. The associated multipliers include health care feedbacks. The results from single sector multipliers should not be summed across industries because of

Figure 6. Interactions Included in Contribution Analysis

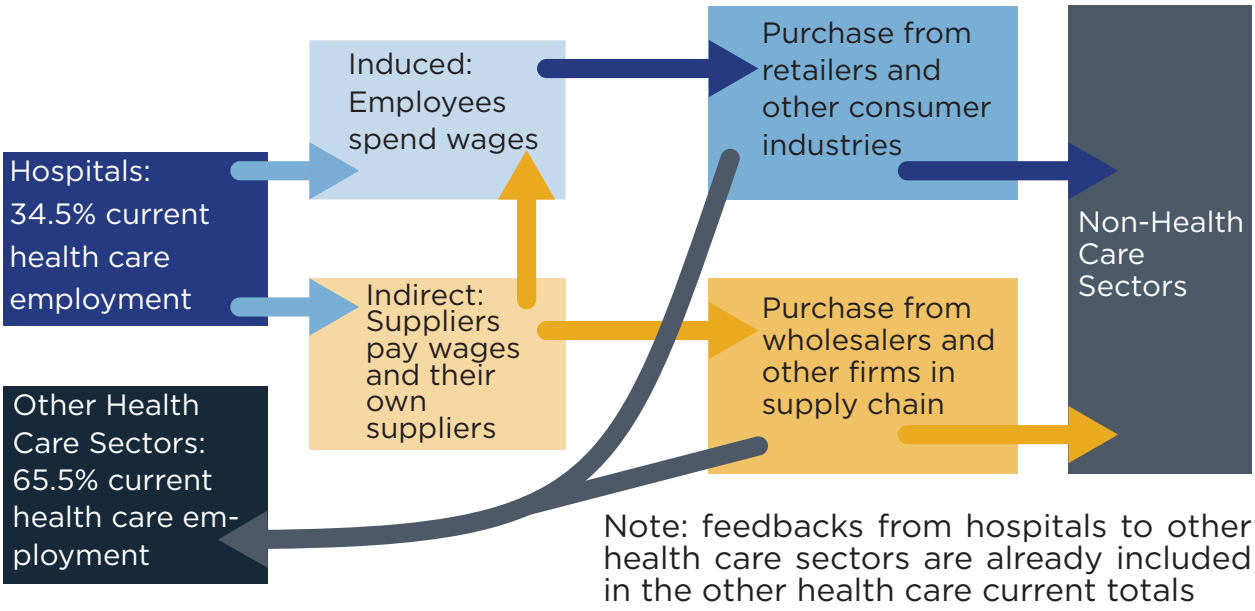
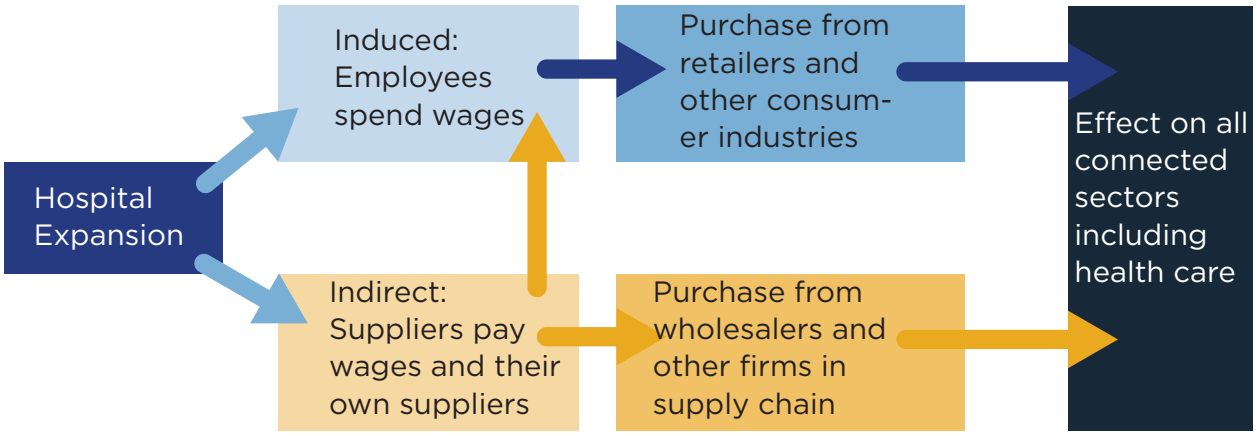


Figure 7. Interactions Included in Impact Analysis



the aforementioned double counting problem. The difference between the two types of multipliers depends on the exclusion or inclusion of feedbacks between industries within the health care sector.

Specialized software products have been developed to estimate the multiplier effects, both for individual industries and for sectors comprising several industries. One of the most widely used of these products is the IMPLAN model.[16] IMPLAN not only estimates multiplier effects: it also estimates

employment, output, and income by industry, even for small and mid-sized counties. Publicly available data for such counties is often suppressed to avoid disclosure of private firm-level information. Rather than leave "by-industry" data blank, IMPLAN uses multiple data sources to fill in the picture. The IMPLAN dataset is not perfect, but it is often all that is available. Appendix B discusses our data sources, our use of the IMPLAN model, and the differences between contribution and impact analysis in more detail.

Tables 7 and 8 show direct effects, multipliers, and total effects (direct plus secondary) for Kansas health care industries. Using contribution analysis, we estimate that the 214,000 direct health care jobs in Kansas support roughly

Table 7. Contributions of Kansas Health Care Industries to Employment, 2023

Industry	Direct Employment	Employment Multiplier excl. Health Care Feedbacks	Total Employment	Employment Multiplier inc Health Care Feedbacks
Hospitals	73,778	1.7335	127,893	1.9074
Offices of Physicians	27,619	1.6518	45,622	1.8415
Nursing and Residential Care	31,926	1.3758	43,925	1.4398
Offices of Other Health Practitioners	11,724	1.2810	15,019	1.3561
Offices of Dentists	10,176	1.2980	13,209	1.3870
Health and Personal Care Stores	14,085	1.3208	18,605	1.3858
Medical and Diagnostic Laboratories	5,601	1.4173	7,938	1.5254
"Outpatient Care Centers"	10,499	1.5850	16,641	1.7154
Home Health Care Services	8,736	1.2333	10,774	1.2997
Residential Treatment Facilities	5,308	1.2990	6,896	1.3622
Veterinary Services	5,601	1.2339	6,911	1.2986
Other Ambulatory Health Care Services	2,430	1.4645	3,559	1.5896
Fitness and Recreational Sports Centers	6,497	1.2090	7,855	1.2378
Total	213,982	1.5181	324,846	

Sources: IMPLAN model data; US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[17] Calculations by the authors.

110,000 additional jobs and around $6 billion in additional income. The additional jobs and income arise in industries such as business services, retail trade, wholesaling, restaurants, and rentals that are connected to health care through supply chain and consumer expenditure linkages. The 74,000 current hospital jobs in Kansas sustain approximately 54,000 additional jobs outside of health care (employment multiplier = 1.73). The more than $6.6 billion dollars in hospital wages, salaries, and benefits currently support about $3 billion in additional earnings across the state outside health care industries (income multiplier = 1.45).

If a single health care industry were to expand--for example, if a hospital were to add 100 jobs--we can use economic impact analysis to estimate job creation both inside and outside of health care. Continuing the example, the 100 added hospital jobs would add an additional 91 jobs in other businesses

Table 8. Contribution of Kansas Health Care Industries to Labor Income, 2023

Sector	Direct Labor Income ($mil.)	Labor Income Multiplier excl. Health Care Feedbacks	Total Labor Income ($mil.)	Labor Income Multiplier incl. Health Care Feedbacks
Hospitals	6,624.6	1.4497	9,603.8	1.5886
Offices of Physicians	3,679.8	1.2775	4,701.1	1.3797
Nursing and Residential Care	1,496.5	1.4176	2,121.4	1.5143
Offices of Other Health Practitioners	737.4	1.2352	910.9	1.3197
Offices of Dentists	770.7	1.2172	938.1	1.3005
Health and Personal Care Stores	717.6	1.3274	952.5	1.4177
Medical and Diagnostic Laboratories	487.2	1.2855	626.3	1.3734
Outpatient Care Centers	752.9	1.4304	1,077.0	1.5626
Home Health Care Services	490.7	1.2226	600.0	1.3063
Residential Treatment Facilities	267.7	1.3076	350.0	1.3962
Veterinary Services	291.2	1.2557	365.7	1.3438
Other Ambulatory Health Care Services	234.4	1.2853	301.3	1.3775
Fitness and Recreational Sports Centers	124.9	1.5561	194.3	1.6620
Total	16,675.7	1.3638	22,742.4	

Sources: IMPLAN model data; US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[18] Calculations by the authors.

(health care and non-heath care). Similarly, the addition of $1000 in hospital wages would create $589 in other industries (health care and non -heath care).

Estimated Effects of the Health Care Sector on Tax Revenue

The health care sector not only sustains employment and income in the Kansas economy—it also supports federal, state, and local government activities through the generation of tax revenue. This report uses up-to-date information from the Kansas Department of Revenue (KDOR) to estimate the effect of income in the health care sector on sales and use tax collections (Table 9).

In addition, the report uses results from the IMPLAN model to estimate the overall impact on federal, state, and local taxes. We point out that the IMPLAN data sets used to model taxes are often a few years out-of-date and may lack details about taxation by industry. In addition, the IMPLAN data sets do not specifically account for tax exemptions that may apply to "not for profit" health care facilities. Tax results other than sales tax should be considered as "ball park" numbers (Table 10).

Estimation of Sales and Use Taxes. Kansas has a long history of sales and use tax collections. Taxes on retail sales began in 1937, while a use tax (for out-of-state purchases brought into Kansas) began in 1945.[19] Sales and use taxes are now employed by the state, by most counties, and by over 300 Kansas cities.[20] Both the base and the rates for sales and use taxes have changed over time. Historically, groceries have been taxable items, but their taxation started to phase out starting in 2023. As of 2023, the state imposed a tax of 6.5 percent on non-food items and 4 percent on food. Food remained fully taxable at the local level. As of 2025, the state-level tax on food falls to zero.

Using data from the Kansas Department of Revenue, we calculated the state sales/use tax base. We estimated a weighted average rate by combining data on food sales and on non-food items. We also estimated the ratio of the

sales tax base to Kansas personal income—36.02 percent (Table 9). Our key assumption is that the sales tax base is tied closely to income. That means that, on average, we expect that an increase in income of $1000 will result in taxable sales of about $360.

In order to estimate the amount of sales tax revenue generated by various health care industries, we made use of the previously calculated labor income by industry. We then made use of the following formulas:

1) Taxable Sales Ratio x Total Labor Income = Estimated Taxable Sales

2) Estimated Taxable Sales x Rate = Sales or Use Tax Revenue

Overall, the income associated with the health care sector generates about $518 million in state sales/use taxes and $183 million in local sales/use taxes for counties, cities, and special districts.

Table 9. Contributions of the Health Care Sector to State and Local Sales Taxes

Ratio of Taxable Sales to Income:	36.02%
State Sales/Use Tax Rate, Non-food	6.50%
State Sales/Use Tax Rate, Food	4.00%
Average State Sales and Use Tax	6.22%
Average Local Sales/Use Tax Rate	2.34%

Sources: Kansas Department of Revenue and US Bureau of Economic Analysis.[21] Calculations by IPSR.

Table 10. Contributions of Health Care Sector Income to State and Local Sales Taxes

Industry	Total Labor Income ($mil.)	Estimated Taxable Sales ($mil.)	Total Sales/ Use Tax ($mil.)	State Sales/Use Tax ($mil.)	Local Sales/Use Tax ($mil.)
Hospitals	9,603.8	3,459.2	296.3	215.3	80.9
Offices of Physicians	4,701.1	1,693.3	145.0	105.4	39.6
Nursing and Residential Care	2,121.4	764.1	65.4	47.6	17.9
Offices of Other Health Practitioners	910.9	328.1	28.1	20.4	7.7
Offices of Dentists	938.1	337.9	28.9	21.0	7.9
Health and Personal Care Stores	952.5	343.1	29.4	21.4	8.0
Medical and Diagnostic Laboratories	626.3	225.6	19.3	14.0	5.3
Outpatient Care Centers	1,077.0	387.9	33.2	24.1	9.1
Home Health Care Services	600.0	216.1	18.5	13.5	5.1
Residential Treatment Facilities	350.0	126.1	10.8	7.8	2.9
Veterinary Services	365.7	131.7	11.3	8.2	3.1
Other Ambulatory Health Care Services	301.3	108.5	9.3	6.8	2.5
Fitness and Recreational Sports Centers	194.3	70.0	6.0	4.4	1.6
Total	22,742.4	8,191.7	701.5	509.9	191.7

Source: IMPLAN model, Kansas Department of Revenue, and US Bureau of Economic Analysis. Calculations by IPSR.[22]

Estimation of Other Federal, State and Local Taxes. Estimates from the IMPLAN model indicate that the health care sector in Kansas generates about $5 billion in federal tax revenue and $2 billion in state and local tax revenue (Table 11). To put this in perspective, The Kansas Legislative Research Department estimates that Kansas collected a total of about $19.5 billion in combined state and local revenue in 2022. Thus the health care sector contributed about 10.3 percent of tax revenue in Kansas—directly through the businesses and organizations that comprise the sector and secondarily through supply chain links and rounds of consumer spending.

Table 11. Overall Contributions of the Health Care Sector to Tax Revenue, 2023

Tax Type	Paid to... Federal Govt. ($ mil.)	State and Local Govt. ($ mil.)
Social Insurance Tax	2,836.3	0.0
Income Tax-Corporate	325.4	142.9
Income Tax-Personal	1,751.9	484.8
Licenses and Fees	0.0	46.8
Property Tax	0.0	613.2
Sales Tax	0.0	701.5
Other Business Taxes	53.4	49.7
Total	4,967.1	2,039.1

Sources: Estimates from IMPLAN model.[23] Sales tax revenue from calculations in Table 9.

Summary and Conclusions

This report documents the relative importance of the health care sector to the Kansas economy. The contributions are substantial, with health care **directly providing about 214,000 jobs and $16.7 billion in labor income**. The reach of the health care sector goes beyond these direct effects. Through supply chain links and employee expenditure links, the sector **supports an additional 111,000 jobs and $6 billion in income**. The sector also supports about 9.5 percent of state and local tax revenue.

A vigorous health care system both supports the well-being of community residents and enhances economic opportunity. **Health-related sectors are growing**, and growth is expected to continue, as shown in national projections. Furthermore, evidence shows that **quality health care improves business productivity, aids in the recruitment and retention of businesses, and attracts and retains retirees.**

Health care industries provide opportunities and challenges for communities. Hospitals and nursing facilities tend be large, with hospitals averaging over 320 employees each and nursing facilities averaging over 50. The retention of even a smaller than average sized hospital or nursing facility in a rural community **creates economic ripples that expand beyond the health care sector, sustaining local grocery stores, eating places, and retailers, and providing tax support for public infrastructure** such as schools and parks. Similarly the closing of such a facility can have cascading negative effects. A challenge is finding a revenue stream sufficient to maintain facilities in rural areas.

Appendix A: Additional Effects of Health Care on Economic Development

This study focuses on estimating the effects of wages and other expenditures made by the health care sector using the IMPLAN input-output model. However, the health care industry has numerous effects on regional economic development and labor force sustainability that go beyond the scope of a traditional economic contribution or impact analysis. These additional effects include the health care sector's role in improving worker productivity, attracting and retaining employees and businesses, and stimulating in-migration and retention of retirees.

A substantial body of research supports the belief that healthy, fulfilled employees are more productive at work, less prone to absenteeism, and less likely to lose their jobs. This is known as the "happy-productive worker hypothesis," as described by Christensen (2017).[24] Diseases such as asthma, cardiovascular disease and depression lead to missed work days, and also impact productivity through "presenteeism," that is, when employees are operating at less than full capacity throughout their work day.[25]

Chronic health conditions can also impact the productivity of a patient's informal caregivers, who deal with fatigue and competing time commitments. One study found that friends and relatives who care for people with advanced cancer outside of a professional health care setting see a 22.9 percent loss in workplace productivity.[26] This study was limited to caregivers who are currently employed, but further studies suggest that a large portion of informal caregivers quit their jobs entirely to focus on providing care.[27] This impact shows the benefits of health care access in a community, which not only lessens the responsibilities placed on informal caregivers, but also helps prevent chronic conditions in the first place.

Recent literature has focused also on the economic impacts specifically of mental illness, modeling workforce productivity concerns such as "presenteeism," absenteeism and lost caregiver productivity, as well as a host of other societal costs such as burden on criminal justice and social services, suicide mortality, and missed primary education. Greenberg et al. (2021) found that the collective costs of major depressive disorders and comorbid conditions in adults in 2018 was around $400 billion in 2024 dollars.[28] The authors attributed 61 percent of this figure to workplace costs. The 2018 estimate was also a 38% increase from 2010, largely because of an increase in

incidence of major depressive disorder, particularly among those in their prime working years.

Besides supporting a healthy and productive workforce, the health care industry fosters sustainable economic growth through the attraction and retention of businesses and the working-age population, especially in rural areas. This effect is visible in county level wage and employment data, as counties with a hospital see higher employment and wage levels in non-health care industries than similar counties with no hospital.[29] Similarly, rural counties that have suffered hospital closure see lower employment and wage growth rates than rural counties that have no closures,[30] suggesting that access to local health care keeps and attracts non-health care businesses and employees, creating local jobs and raising local wages in all industries.

Access to a quality workforce is the number one factor influencing a business's decision of where to locate or expand, according to Site Selection's 2022 Business Climate Ranking. Furthermore, quality-of-life is rated among the top 10 location factors, tied with business incentives offered by states, cities and counties.[31] Workforce and quality of life issues go hand-in-hand. Avery (2007) comments that "a general rule of thumb is that the greater the number of professionals who will be transferred or recruited from elsewhere, the more important quality of life factors will be."[32] Health care, in turn, comprises an important part of what analysts consider quality of life factors.[33] Millennial and Gen Z employees rank health care, including access to mental health services, as the most sought-after employer-offered benefits.[34] Strong health care systems support the effort of businesses to attract and retain a skilled and motivated workforce.

The health care sector similarly plays a role in attracting and retaining retirees, who contribute to economic development through local spending and tax revenue. One study examining rural counties in Michigan found that presence of health care facilities and number of health care workers had a positive effect on net migration (those who move in minus those who leave) within the 70+ age group. This effect was found to be similar to in magnitude to the effects of other amenities, such as educational and recreational institutions.[35] A broader study across urban and rural counties throughout the United States found that increases in hospital beds, number of doctors, and total health expenditures were all positively associated with increased in-migration in the 60-74 and 75+ years of age groups.[36]

In summary, the health care sector provides various economic benefits beyond those considered in traditional input-output modeling. Health care access improves the productivity of the labor force, by treating and preventing conditions that would otherwise impact an individual's work productivity and by reducing the amount of informal care required from non-health workers. Health care access plays a role helping grow a community's working age population, attracting and retaining businesses, and drawing and retaining retirees. Because of these effects, a robust health care sector should be considered an important contributor to economic development.

Appendix B: Data and Methods

The calculations in this report rely on several datasets and use a variety of methods to combine these datasets. This appendix details our data and approaches.

Data

For our description of the historical growth of the health care sector, we use data from the Centers for Medicare & Medicaid Services, as documented in the main report. National data on health care expenditures include expenditures by or on behalf of individual patients, insurance administration costs, public health expenditures, health research and investment in buildings and equipment. CMS publishes the national health expenditures dataset without any breakdown by state. However, a more narrow series, personal health care expenditures, is available by state of health care recipient and by state of health care provider. The personal health expenditures series can be used to compare trends across states, or to compare Kansas with the nation as a whole.

The core of our analysis relies on two main data sources as detailed below.

1. Quarterly Census of Employment and Wages from the US Bureau of Labor Statistics. QCEW uses administrative data from employers who pay unemployment insurance taxes. Most but not all firms come under the unemployment insurance system. Exceptions include ministerial employees of religious organizations, members of the military, and self-employed individuals. QCEW protects individual firms through disclosure rules that require data to be left blank when there are only a few firms in an industry in a given geographic area, or when one firm creates more

than 80 percent of the employment in an industry in an area. Fortunately, disclosure is not a serious problem for Kansas state-level health care industries.

QCEW summarizes data by ownership of employer establishments. Categories include private employers, the Federal Government, state governments, and local governments. Many federal employment series use QCEW private sector employment as a base, summarizing other ownership categories into government. The data that we present in this report also includes health care establishments with government ownership, for example, a county-owned hospital. Currently, all public sector employment data in Kansas is disclosed in the QCEW.

2. IMPLAN Model Data. The IMPLAN model contains within it data on output, employment, labor income, other income sources, and government spending for states and counties. IMPLAN data are provided on a subscription basis. Some key characteristics of the data include:

a. The data on employment includes both private sector employees and the self –employed.

b. IMPLAN's government employment is not broken out in much detail, but as noted above, we have adjusted the data using QCEW, which shows publicly owned establishments by industry.

c. IMPLAN wage and salary data include estimates of benefits.

d. Data are estimated for all of the states and counties, even small counties. Most federal datasets include a substantial amount of data suppression for small areas to protect privacy. IMPLAN estimates these "missing" data by combining numerous federal data sources.[37]

e. IMPLAN data are more accurate for large areas than for small. For example, estimates for the state of Kansas will be better than estimates for Wabaunsee County.

Modeling

The IMPLAN model is an input-output model, and as such, it has built-in estimates of the connections between all industries and institutions within a region. The model is structured so that the user can trace through connections between the output of an initial industry, the industries that are used as inputs, and the industries on which households spend the income generated by the initial industry. The effect of an initial industry spills out into the community through supplier and consumer linkages.

IMPLAN analyzes four types of effects:

1. Direct effects, which are based on the actual output, employment, wages and other characteristics of the industry or group of industries being analyzed;

2. Indirect effects, which work though supply chain channels;

3. Induced effects, which work through consumer spending channels;

4. Total effects, which are the sum of direct, indirect, and induced effects.

IMPLAN and other input-output systems define a multiplier as the ratio of total effects to direct effects. A jobs multiplier of 2 means that each job in the initial industry creates another job though indirect and induced effects.

As previously mentioned, this report makes use of two different types of multipliers, depending on the effects under consideration. In the literature, the two approaches are known as **contribution analysis** and **impact analysis**. As explained by Henderson and Evans,[38] contribution analysis estimates the relative importance of a group of industries to an existing economy, while impact analysis estimates the effect of changes in an industry on that economy.

Contribution analysis is used to avoid double counting when multiple smaller industries comprise a "sector." For example, suppose we want to estimate the contribution of hospitals to the health care sector in the current Kansas economy. We want to exclude the feedback between hospitals and physicians' offices, because all of the employment of physician's offices is already counted in the listing of direct effects of health care industries.

If, on the other hand, we want to look at the effects of a potential expansion of a hospital in Kansas, we use impact analysis and include the hospital-physicians feedback. We are no longer looking at the current economy—we are looking at a future economy where physicians' offices can expand in sync with the hospital expansion.

In general, multipliers for contribution analysis are smaller than those for impact analysis because contribution analysis excludes some feedbacks.

Endnotes

1. Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group, Table 1: National Health Expenditures; Aggregate and Per Capita Amounts, Annual Percent Change and Percent Distribution: Calendar Years 1960-2023, https://www.cms.gov/files/zip/nhe-tables.zip Accessed 01/24/2025. Note that the original source of GDP is US Bureau of Economic Analysis, but GDP data is included in the cited table.

2. Centers for Medicare & Medicaid Services, National Health Expenditure Accounts Historical Tables. https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nationalhealthaccountshistorical. Accessed 01/24/2025.

Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group, Table 1: National Health Expenditures and Selected Economic Indicators, Levels and Annual Percent Change: Calendar Years 2013-2032. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected. Accessed 01/24/2025.

Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group, Table 15: Total Personal Health Care as a Percent of Gross Domestic Product by State. https://www.cms.gov/data-research/statistics-trends-and-reports/national-health-expenditure-data/state-provider Accessed 01/24/2025.

US Bureau of Economic Analysis, Annual Gross Domestic Product by State, https://www.bea.gov/itable/regional-gdp-and-personal-income Accessed 01/24/2025.

3. US Bureau of Labor Statistics. Quarterly Census of Employment and Wages. QCEW NAICS-Based Data Files (1990-2023). https://www.bls.gov/cew/downloadable-data-files.htm. Accessed 01/24/2025.

4. The Organization for Economic Co-operation and Development, OECD.stat, Health Expenditure and Financing, https://data-explorer.oecd.org/vis?fs[0]=Topic%2C1%7CHealth%23HEA%23%7CHealth%20expenditure%20and%20financing%23HEA_EXP%23&pg=0&fc=Topic&bp=true&snb=5&vw=tb&df[ds]=dsDisseminateFinalDMZ&df[id]=DSD_SHA%40DF_SHA&df[ag]=OECD.ELS.HD&df[vs]=1.0&dq=.A.EXP_HEALTH.PT_B1GQ._T.._T.._T...&pd=2015%2C&to[TIME_PERIOD]=false&ly[cl]=TIME_PERIOD&ly[rw]=REF_AREA. Accessed 1/16/20234.

5. The Organization for Economic Co-operation and Development. 2022. "Understanding differences in health expenditure between the United States and OECD countries." September 2022. https://www.oecd.org/en/publications/understanding-differences-in-health-expenditure-between-the-united-states-and-oecd-countries_6f24c128-en.html Accessed 01/24/2025.

6. See endnote 5.

7. Wager, Emma and Cynthia Cox. 2024. "International Comparison of Health Systems" in Health Policy 101. Kaiser Family Foundation. https://www.kff.

org/health-policy-101-international-comparison-of-health-systems/?entry=table-of-contents-introduction Accessed 01/24/2025.

8. Karaman, Sevilay, Duygu Ürek, Ipek Bilgin Demir, Özgür Uğurluoğlu and Oğuz Işık. 2020. "The Impact of Healthcare Spending on Health Outcomes: New Evidence from OECD Countries." Journal of Clinical Practice and Research 42(2): 218-222. https://doi.org/10.14744/etd.2020.80393

9. See endnote 8.

10. Ani Turner, George Miller, and Elise Lowry. 2023. High U.S. Health Care Spending: Where Is It All Going? Commonwealth Fund, October 4, 2023. https://doi.org/10.26099/r6j5-6e66

11. See endnote 10.

12. IMPLAN (www.implan.com) is a subscription service that includes national, state, and county level data along with software for estimating impacts on and contributions to employment, labor income, output, and taxes. We used the 2023 IMPLAN release, the most recent release at the time of this report. IMPLAN's employment measures include self-employed workers. IMPLAN's labor income measure includes benefits. IMPLAN provides estimates of data that is suppressed in federal datasets because of confidentiality.

To adjust employment totals for hospitals and other establishments owned by units of government, we used US Bureau of Labor Statistics. Quarterly Census of Employment and Wages, Employment and Wages, QCEW Data Files, Single Annual Files, https://www.bls.gov/cew/downloadable-data-files.html

13. See endnote 12.

14. See endnote 3.

15. J. E. Henderson and G. K. Evans, Single and Multiple Industry Economic Contribution Analysis Using IMPLAN, Forest and Wildlife Research Center, Research Bulletin FO468, Mississippi State University, 2017. https://www.fwrc.msstate.edu/pubs/implan_2017.pdf Accessed 01/24/2025.

16. https://implan.com/ Accessed 01/24/2025.

17. See endnote 12.

18. See endnote 12.

19. Kansas Legislative Research Department. Kansas Tax Facts: Sixth Edition. November, 1993. p 9.

https://www.kslegresearch.org/KLRD-web/Publications/TaxFacts/1993TaxFacts6thEd.pdf Accessed 01/24/2025.

20. Kansas Department of Revenue. City/County Local Sales Tax Distributions Calendar Year – 2023. https://www.ksrevenue.gov/prsalesreports.html#annlocalsales Accessed 01/24/2025.

21. Kansas Department of Revenue, State Sales Tax Collections by County -

Jan-Dec, 2023.

Kansas Department of Revenue, State Use Tax Collections by County - Jan-Dec, 2023.

Kansas Department of Revenue, CY 2023 City/County Use Tax Distribution by Month, https://www.ksrevenue.gov/pdf/CY23LocUseTaxDist.xlsx

Kansas Department of Revenue, City/County Local Sales Tax Distributions Calendar Year - 2023, https://www.ksrevenue.gov/pdf/loytd2023.xlsx

U.S. Bureau of Economic Analysis, "SAINC1 State annual personal income summary: personal income, population, per capita personal income," https://apps-bea.gov/itable

All accessed 01/24/2025.

22. IMPLAN model. https://implan.com/. Also see endnote 21.

23. See endnote 22.

24. Christensen, Marit. "Healthy Individuals in Healthy Organizations: The Happy Productive Worker Hypothesis." 2017. in The Positive Side of Occupational Health Psychology, edited by Marit Christensen, Per Øystein Saksvik and Maria Karanika-Murray, 155-169, Springer, Cham. https://doi.org/10.1007/978-3-319-66781-2_13

25. Isham, Amy, Simon Mair, and Tim Jackson. "Worker Wellbeing and Productivity in Advanced Economies: Re-Examining the Link," Ecological Economics 184, 2021. https://doi.org/10.1016/j.ecolecon.2021.106989

26. Mazanec, Susan, Barbara Daly, Sara Douglas, and Amy Lipson. 2011. "Work productivity and health of informal caregivers of persons with advanced cancer." Res Nurs Health. 2011 Dec;34(6):483-95. doi: 10.1002/nur.20461. Epub 2011 Sep 23. PMID: 21953274; PMCID: PMC4381346.

27. Committee on Family Caregiving for Older Adults, "Economic Impact of Family Caregiving." In Families Caring for an Aging America, edited by Richard Schulz and Jill Eden, 123-158, Washington (DC): National Academies Press (US) 2016. https://www.ncbi.nlm.nih.gov/books/NBK396402/ Accessed 01/24/2025.

28. Greenberg, Paul, Andree-Anne Fournier, Tammy Sisitsky, Mark Simes, Richard Berman, Sarah H. Koenigsberg and Ronald C. Kessler. 2021. "The Economic Burden of Adults with Major Depressive Disorder in the United States (2010 and 2018)." Pharmacoeconomics 39 no. 6: 653-665. Note that the authors estimate was 326.2 billion in 2020 dollars. Converted to 2024 dollars using the CPI-all urban consumers.

29. Mandich, Anne and Jeffrey Dorfman, "The Wage and Job Impacts of Hospitals on Local Labor Markets." Economic Development Quarterly 31, no. 2, 2017. https://journals.sagepub.com/doi/abs/10.1177/0891242417691609

30. Edmiston, Kelly, Rural Hospital Closures and Growth in Employment and Wages, Kansas City, MO: Kansas City Federal Reserve, 2019. https://www.re-

searchgate.net/publication/335192551_Rural_Hospital_Closures_and_Growth_in_Employment_and_Wages Accessed 01/24/2025.

31. The 2022 Business Climate Ranking, Site Selection, November, 2022. p. 117.

https://siteselection.com/digitalEdition/2022/nov/#page=1 Accessed 01/24/2025.

32. Avery, Susan. "What is Quality of Life," Workforce Development, Dec/Jan 2007. https://www.areadevelopment.com/laboreducation/dec06/qualityoflife.shtml. Accessed 01/24/2025.

33. US News & World Report, Best States 2021. https://www.usnews.com/media/best-states/overall-rankings-2021.pdf Accessed 01/24/2025.

34. Mearian, Lucas. "What Gen Z and Millennials Want from Employers", Computerworld, May 23, 2022. https://www.computerworld.com/article/3661170/what-gen-z-and-millennials-want-from-employers.html Accessed 01/24/2025.

35. Oehmke, James, Satoshi Tsukamoto, and Lori Post, "Can Health Care Services Attract Retirees and Contribute to the Economic Sustainability of Rural Places?" Northeastern Agricultural and Resource Economics Association Agricultural and Resource Economics Review, 36 no. 1, 1-12, 2007. https://doi.org/10.22004/ag.econ.10155

36. Dorfman, Jeffrey and Anne Mandich, Senior Migration: Spatial Considerations of Amenity and Health Access Drivers," Journal of Regional Science 56 no. 1(August): 96-133, 2016. https://doi.org/10.1111/jors.12209

37. IMPLAN, IMPLAN Data: Overview & Sources, Undated. https://implan.com/wp-content/uploads/IMPLAN-Data-Overview-and-Sources.pdf Accessed 01/24/2025.

38. See endnote 15.