The Importance of the Health Care Sector to the Kansas Economy

Kansas Hospital Association

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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:

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Executive Summary

The health care sector in Kansas provides substantial contributions to the state's economy. Not only does it 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. **The Kansas health care sector contributes over 300,000 jobs and almost $20 billion in labor income to the Kansas economy**, including direct effects and multiplier effects. This labor income, when spent, generates over $600 million in sales tax revenue. On average, **every 100 jobs in health care industries support an additional 50 jobs in other Kansas industries**. Similarly, each $1000 in health care wages sustains an additional $365 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 over 72,000 Kansans and direct labor income of over $6 billion. The hospital sector also has large multiplier effects. Every 100 hospital jobs support an additional 73 jobs in non-health care sectors. And **every $1000 in current hospital wages and salaries sustains an additional $483 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 is essential not only for the health and welfare of community residents, but also to enhance 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, 2021

Industry	Direct Employment Contribution	Total Employment Contribution	Employment Multiplier excl. Health Care Feedbacks	Employment Multiplier incl. Health Care Feedbacks	Contribution to Sales/Use Tax ($mil)
Hospitals	72,348	125,452	6,051.1	8,976.2	276.6
Offices of Physicians	26,046	42,099	3,221.7	4,050.3	124.8
Nursing and Residential Care	30,878	40,250	1,303.9	1,757.4	54.2
Offices of Other Health Practitioners	9,989	12,475	591.3	714.8	22.0
Offices of Dentists	9,808	12,949	706.9	871.2	26.8
Health and Personal Care Stores	11,316	15,103	545.2	740.3	22.8
Medical and Diagnostic Laboratories	5,270	7,325	456.5	568.2	17.5
Outpatient Care Centers	8,833	12,905	574.9	765.8	23.6
Home Health Care Services	8,700	10,952	453.6	567.0	17.5
Residential Treatment Facilities	5,427	6,893	243.5	316.3	9.7
Veterinary Services	3,790	4,475	169.7	206.3	6.4
Other Ambulatory Health Care	2,178	3,041	166.9	212.9	6.6
Fitness and Recreational Sports	5,454	6,635	115.0	176.3	5.4
Total	200,038	300,555	14,600.1	19,922.8	613.9

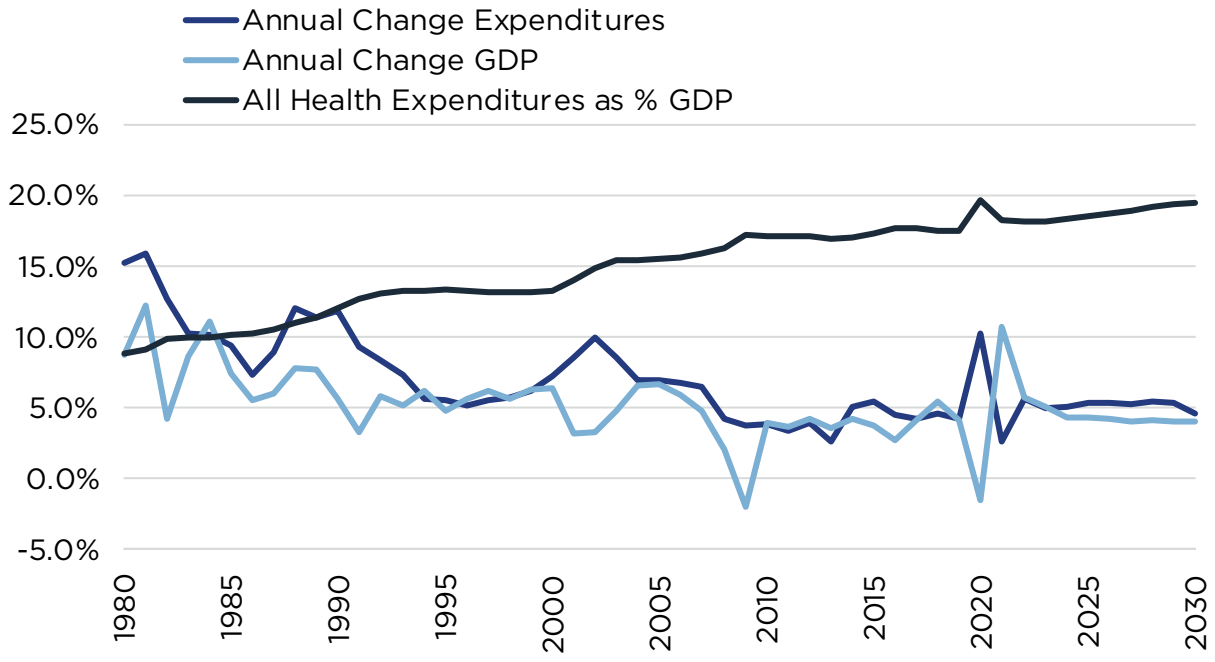
Introduction

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 who 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 Labor Statistics (BLS). 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 generally has 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]

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 over 18 percent of GDP. The total health care spending data are available at the national level only, but a more limited series, personal health care expenditures, is available for 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 increasing percentage of GDP, especially from 1980 through 2010.

Table 1. Health Care Expenditures, Growth, and % GDP: Historical and Projected

Year	Total US Health Expend. ($bil.)	US GDP ($bil.)	Annual Change Total Expend. (%)	Annual Change GDP (%)	Total US Expend. as % GDP	Personal Health Care Expend. as % GDP (US)	Personal Health Care Expend. as % GDP (KS)
1980	253.2	2,857.3	15.2	8.8	8.9	7.9	8.0
1990	718.7	5,963.1	11.9	5.7	12.1	10.8	10.9
2000	1,366.0	10,251.0	7.3	6.4	13.3	11.3	12.7
2010	2,589.6	15,049.0	3.9	3.9	17.2	14.5	15.0
2011	2,676.5	15,599.7	3.4	3.7	17.2	14.5	14.8
2012	2,783.3	16,254.0	4.0	4.2	17.1	14.4	15.0
2013	2,856.6	16,843.2	2.6	3.6	17.0	14.3	14.5
2014	3,002.6	17,550.7	5.1	4.2	17.1	14.4	14.3
2015	3,165.4	18,206.0	5.4	3.7	17.4	14.7	14.4
2016	3,307.4	18,695.1	4.5	2.7	17.7	15.0	14.3
2017	3,446.5	19,477.3	4.2	4.2	17.7	14.9	14.3
2018	3,604.4	20,533.1	4.6	5.4	17.6	14.7	14.2
2019	3,757.4	21,381.0	4.2	4.1	17.6	14.9	14.4
2020	4,144.1	21,060.5	10.3	-1.5	19.7	16.1	15.8
2021	4,255.1	23,315.1	2.7	10.7	18.3		
2025	5,231.0	28,224.7	5.4	4.4	18.5		
2030	6,751.5	34,521.8	4.7	4.0	19.6		

Sources: Centers for Medicare & Medicaid Services and US Bureau of Economic Analysis. [2]
Note: GDP is a broad measure of a county's or state's income.

The growing importance of the health care sector also is reflected in employment data. Table 2 tracks private sector 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 13 percent in both areas. During the last decade, health care employment has hovered in the 13 percent range. In the first pandemic year, 2020, employment in health care actually fell as workers left the industry and as some sectors such as dentistry limited appointments, but overall employment in the nation and the state fell even faster. Health care employment expanded in 2021 in the US but continued to fall in Kansas, where it remains below its 2019 level.

Table 2. US and Kansas Health Care Employment Trends, Private Sector Employees

Year	US Private Sector Health Care Employment (thous.)	% US Total Private Sector Employment	KS Private Sector Health Care Employment (thous.)	% KS Total Private Sector Employment
1990	8,244.5	9.07	86.4	10.03
2000	10,805.2	9.82	112.8	10.41
2010	13,728.1	12.93	137.3	13.11
2011	13,972.5	12.92	140.6	13.29
2012	14,220.7	12.85	142.5	13.25
2013	14,430.4	12.78	141.3	12.92
2014	14,632.7	12.66	142.3	12.78
2015	14,948.8	12.64	143.3	12.74
2016	15,308.0	12.70	142.7	12.64
2017	15,602.7	12.75	142.9	12.65
2018	15,884.4	12.75	145.0	12.72
2019	16,172.0	12.80	147.4	12.85
2020	15,700.6	13.31	145.7	13.36
2021	15,908.5	12.96	145.0	13.01

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[3]

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 Comprised of 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

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, home health care agencies.
Residential Treatment Facilities	Residential intellectual disability, mental health, substance abuse and other facilities.
Veterinary Services	Veterinary hospitals, small animal veterinary services, livestock veterinary services, veterinary testing services.
Other Ambulatory Health Care Services	Blood banks, organ banks, air and ground ambulance services, employee drug testing services, smoking cessation programs.
Fitness and Recreational Sports Centers	Gyms and other physical fitness facilities, skating rinks, swimming pools, tennis courts, recreational sports facilities, youth athletic facilities.

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.

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 over 12 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

Figure 2. Health Care Employment as a Share of the Kansas Economy, 2021

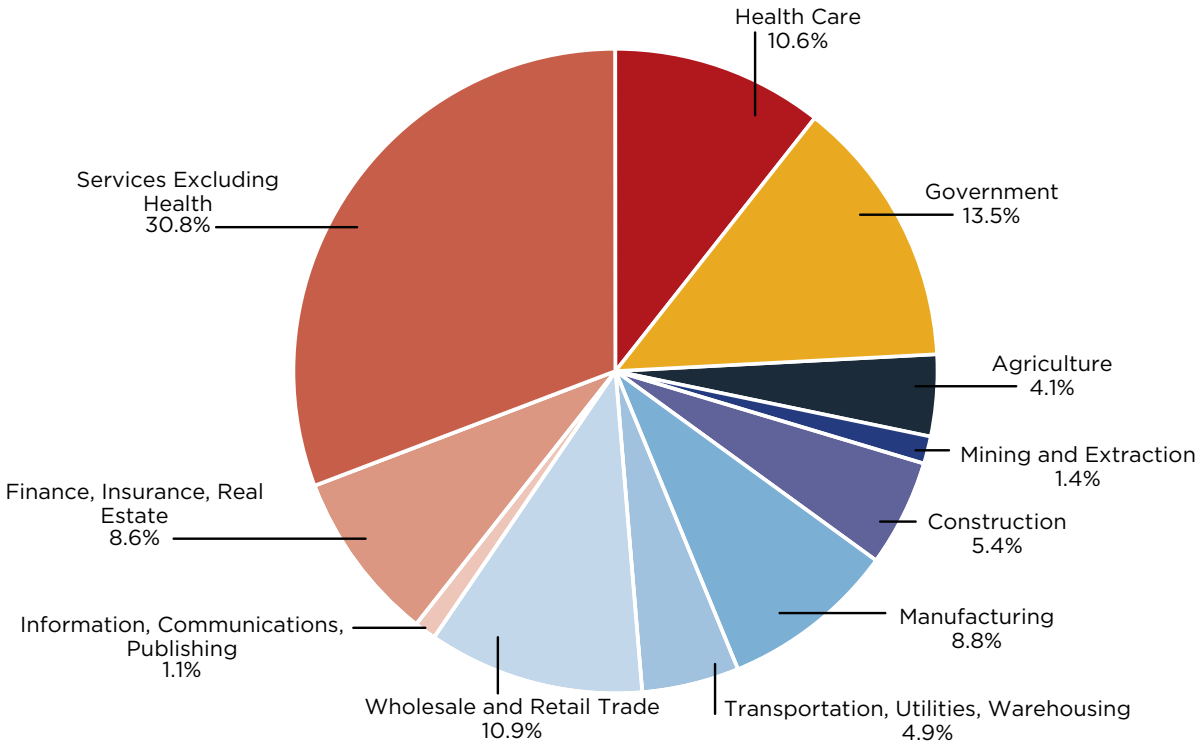


Table 4. Structure of the Kansas Economy, 2021

Sector	Total Employment	Total Output ($mil.)	Labor Income ($mil.)	Income, All Sources ($mil.)
Agriculture	76,968	23,111.8	3,809.9	6,690.6
Mining and Extraction	25,822	10,647.0	1,086.9	1,131.6
Construction	100,913	16,481.3	6,317.2	8,185.4
Manufacturing	165,398	92,277.0	13,621.1	25,588.8
Transportation, Utilities, Warehousing	91,915	21,690.2	6,457.2	9,745.9
Wholesale and Retail Trade	204,133	38,351.9	10,877.9	17,459.6
Information, Communications, Publishing	20,685	16,096.6	2,034.4	7,177.2
Finance, Insurance, Real Estate	161,492	55,489.7	8,523.6	26,324.9
Services (other than health)	578,896	72,250.3	33,883.1	43,272.6
Health Care	200,038	26,896.5	14,600.1	16,662.3
Government	254,749	20,627.8	16,559.5	20,864.3
Total	1,881,009	393,920.0	117,770.9	183,103.1
Health Care as Share of Kansas Economy	10.6%	6.8%	12.4%	9.1%

Sources (Figure 2 and Table 4): IMPLAN model data; US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[4] Calculations by the authors. See Appendix B for discussion of data methods.

some double-counting. Total income includes not just labor income, but also returns on capital such as profits and depreciation allowances. Capital income, 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. Our report emphasizes employment and labor income, the measures most relevant to the majority of the state's residents.

Individual Health Care Industries

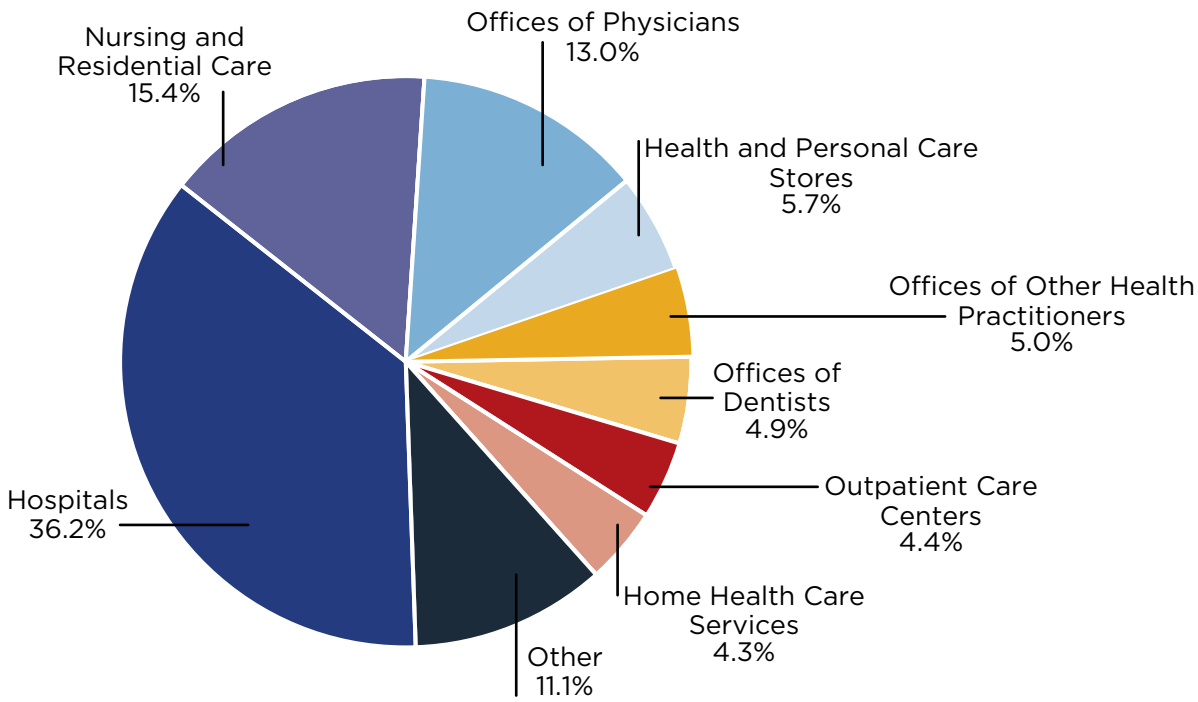
Hospitals, nursing facilities, and physicians lead the health care industries in terms of employment and labor income (Table 5 and Figure 3). Hospitals alone employ over 72,000 Kansans and pay out more than $6 billion in wages and benefits. Hospitals directly employ approximately 36.2 percent of total health care employees, followed by nursing facilities (15.4 percent) and offices of physicians (13.0 percent). Overall, health care industries employ about 200,000 people and provide $14.6 billion in income.

Table 5. Contributions of Kansas Health Care Industries to Employment, Output, and Income, 2021

Industry	Total Direct Employment	Total Output ($mil.)	Direct Labor Income ($mil.)	Income, All Sources ($mil.)	Labor Income per Employee
Hospitals	72,348	13,327.4	6,051.1	6,975.1	83,638
Offices of Physicians	26,046	4,329.5	3,221.7	3,216.7	123,689
Nursing and Residential Care	30,878	2,339.1	1,303.9	1,481.0	42,227
Offices of Other Health Practitioners	9,989	1,109.7	591.3	971.5	59,196
Offices of Dentists	9,808	1,069.3	706.9	838.3	72,069
Health and Personal Care Stores	11,316	1,062.6	545.2	622.7	48,177
Medical and Diagnostic Laboratories	5,270	907.5	456.5	779.1	86,613
Outpatient Care Centers	8,833	900.9	574.9	559.1	65,085
Home Health Care Services	8,700	594.1	453.6	452.7	52,138
Residential Treatment Facilities	5,427	379.6	243.5	243.6	44,868
Veterinary Services	3,790	298.7	169.7	196.4	44,776
Other Ambulatory Health Care Serv.	2,178	278.5	166.9	203.6	76,631
Fitness and Recreational Sports	5,454	299.4	115.0	122.7	21,093
Total or Average	200,038	26,896.5	14,600.1	16,662.3	72,987

Sources: IMPLAN model data; US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[5] Calculations by the authors. See Appendix B for discussion of data methods.

Figure 3. Composition of the Kansas Health Care Sector, Employment Shares, 2021



Sources: See Table 5.

Labor income per employee, including benefits, ranges widely by health care industry, from a high of almost $124,000 for physicians' offices to a low of about $21,000 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 near $84,000.

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). The data are recorded by business location, so that a business that operates two separate facilities in Kansas counts as two establishments in the data. In 2021, over 7,400 health care establishments operated in the state (again, excluding the self-employed). Hospitals on average employed over 300 people each, making them a major employer wherever they are located. Hospitals are likely to be

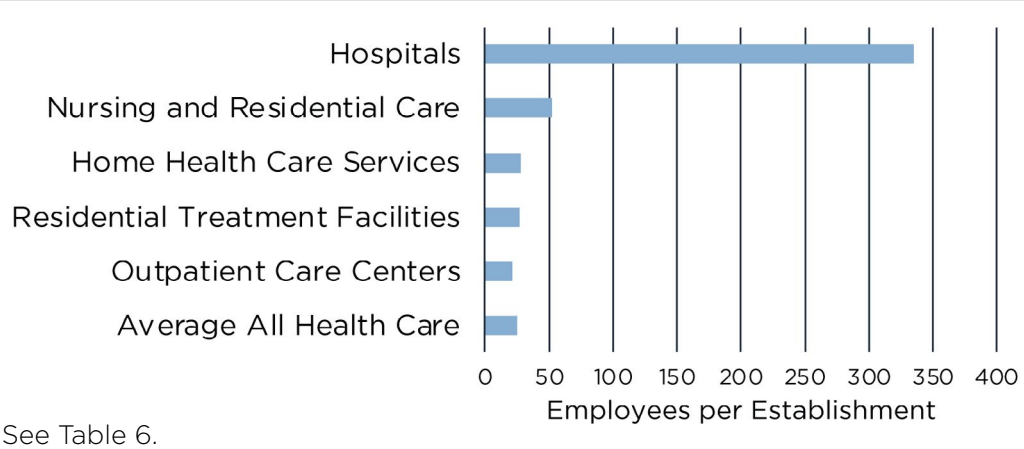
larger in urban than in rural areas, but nonetheless the loss of a hospital in a rural area will be a major blow to employment. Similarly, nursing facilities (average employment of about 50) can be considered a major employer in a rural community.

Table 6. Number of Establishments and Establishment Size, 2021

Industry	Number of Establishments incl. Branch Locations	Employees per Establishment
Hospitals	216	335
Offices of Physicians	1348	15
Nursing and Residential Care	582	52
Offices of Other Health Practitioners	1547	6
Offices of Dentists	959	9
Health and Personal Care Stores	814	10
Medical and Diagnostic Laboratories	236	19
Outpatient Care Centers	364	21
Home Health Care Services	275	28
Residential Treatment Facilities	190	27
Veterinary Services	447	10
Other Ambulatory Health Care Serv.	142	13
Fitness and Recreational Sports	311	19
Total/Average	7,431	25

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[6]

Figure 4. Number of Employees per Health Care Establishment, 2021



Source: See Table 6.

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

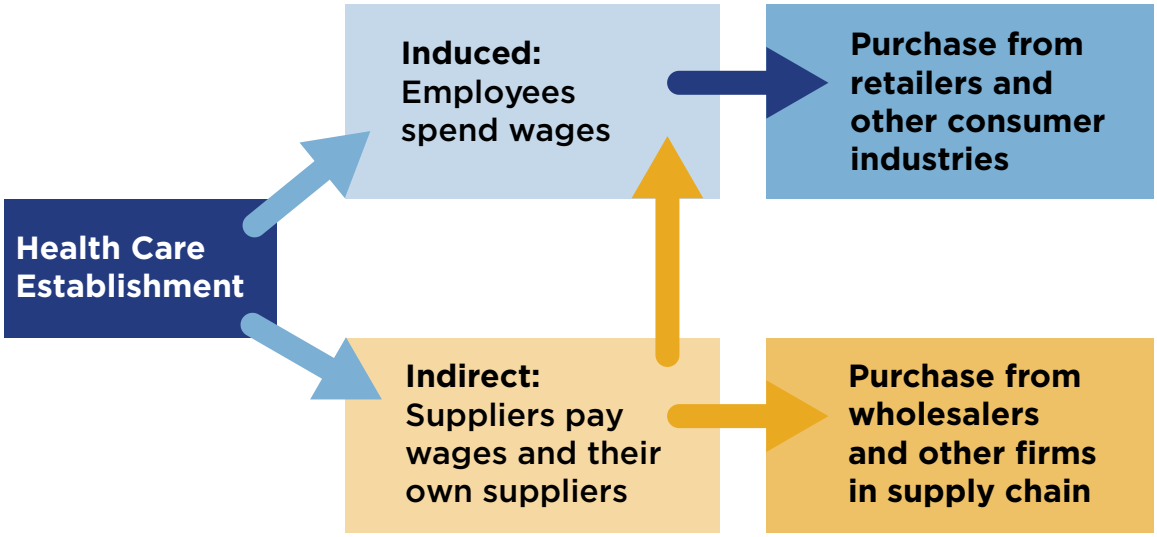
Up to this point, we have analyzed the "direct" effects of the health care sector on the state's economy—that is, we have summed up the employment and income generated within the health care sector. But the sector also triggers additional effects of two types:

- **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 every direct job in the sector, an additional 0.5 jobs are supported elsewhere in the economy. Multipliers

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



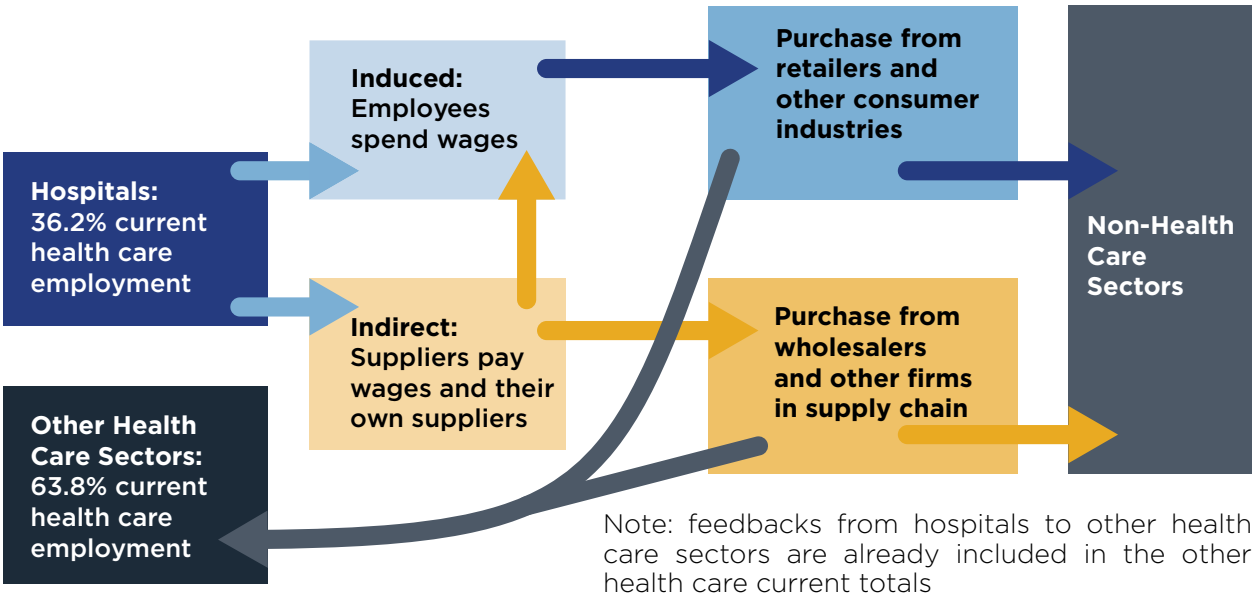
vary by industry, by the size of the economic region under consideration, and by the industrial diversity of the regional economy. Large and diversified economies typically show higher multipliers.

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,[7] 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.

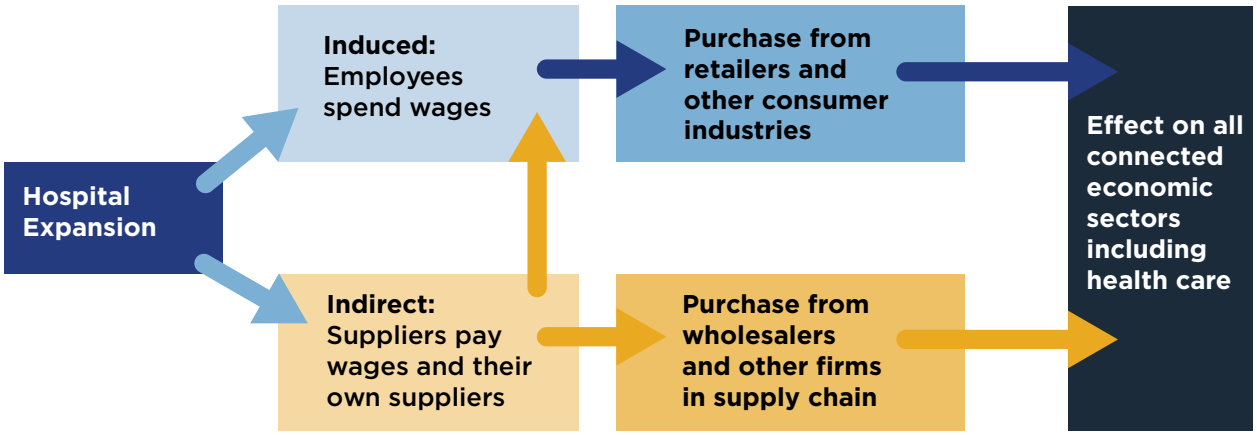
As discussed above, discussions of the effects of changes in a single industry,

Figure 6. Interactions included in contribution analysis



Note: feedbacks from hospitals to other health care sectors are already included in the other health care current totals

Figure 7. Interactions included in impact analysis



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 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 comprised of several industries. One of the most widely used of these products is the IMPLAN model. 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 often is 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. IMPLAN data are not perfect, but they are often all that are available. Appendix B discusses our data sources, our use of the IMPLAN model, and the differences

Table 7. Contributions of Kansas Health Care Industries to Employment, 2021

Sector	Direct Employment	Employment Multiplier excl. Health Care Feedbacks	Total Employment	Employment Multiplier incl. Health Care Feedbacks
Hospitals	72,348	1.7340	125,452	1.8687
Offices of Physicians	26,046	1.6163	42,099	1.7925
Nursing and Residential Care	30,878	1.3035	40,250	1.3584
Offices of Other Health Practitioners	9,989	1.2489	12,475	1.3210
Offices of Dentists	9,808	1.3202	12,949	1.4091
Health and Personal Care Stores	11,316	1.3347	15,103	1.3998
Medical and Diagnostic Laboratories	5,270	1.3899	7,325	1.5014
Outpatient Care Centers	8,833	1.4611	12,905	1.5799
Home Health Care Services	8,700	1.2589	10,952	1.3245
Residential Treatment Facilities	5,427	1.2700	6,893	1.3295
Veterinary Services	3,790	1.1808	4,475	1.2381
Other Ambulatory Health Care Services	2,178	1.3962	3,041	1.5030
Fitness and Recreational Sports Centers	5,454	1.2166	6,635	1.2500
Total	200,038	1.5025	300,555	

Sources: IMPLAN model data; US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[8] Calculations by the authors.

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 200,000 direct health care jobs in Kansas support an additional 100,000 jobs and $5.3 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 though supply chain and consumer expenditure linkages. The 72,000 current hospital jobs in Kansas sustain approximately 53,000 additional jobs outside of health care (employment multiplier = 1.73). The $6 billion dollars in hospital wages, salaries, and benefits currently support about $3 billion

Table 8. Contribution of Kansas Health Care Industries to Labor Income, 2021

Sector	Direct Labor Income ($mil.)	Labor Income Multiplier excl.. Health Care Feedbacks	Total Labor Income ($mil.)	Labor Income Multiplier incl. Health Care Feedbacks
Hospitals	6,051.1	1.4834	8,976.2	1.5863
Offices of Physicians	3,221.7	1.2572	4,050.3	1.3470
Nursing and Residential Care	1,303.9	1.3478	1,757.4	1.4378
Offices of Other Health Practitioners	591.3	1.2088	714.8	1.2909
Offices of Dentists	706.9	1.2324	871.2	1.3149
Health and Personal Care Stores	545.2	1.3579	740.3	1.4499
Medical and Diagnostic Laboratories	456.5	1.2447	568.2	1.3307
Outpatient Care Centers	574.9	1.3321	765.8	1.4591
Home Health Care Services	453.6	1.2500	567.0	1.3351
Residential Treatment Facilities	243.5	1.2989	316.3	1.3884
Veterinary Services	169.7	1.2154	206.3	1.3016
Other Ambulatory Health Care Services	166.9	1.2758	212.9	1.3697
Fitness and Recreational Sports Centers	115.0	1.5325	176.3	1.6398
Total	14,600.1	1.3646	19,922.8	

Sources: IMPLAN model data; US Bureau of Labor Statistics, Quarterly Census of Employment and Wages.[9] Calculations by the authors.

in additional earnings across the state, again outside health care industries (income multiplier = 1.48).

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 87 jobs in other businesses (health care and non -heath care). Similarly, the addition of $1000 in hospital wages would create $586 in other industries.

Table 9. Contributions of the Health Care Sector to State and Local Sales and Use Taxes, 2021

Ratio of Taxable Sales to Income:	**35.42%**
State Sales/Use Tax Rate	**6.50%**
Average Local Sales/Use	**2.20%**

Industry	Total Labor Income ($mil.)	Estimated Taxable Sales ($mil.)	State Sales/Use Tax($mil.)	Local Sales/ Use Tax ($mil.)
Hospitals	8,976.2	3,179.4	206.7	69.9
Offices of Physicians	4,050.3	1,434.6	93.2	31.6
Nursing and Residential Care	1,757.4	622.5	40.5	13.7
Offices of Other Health Practitioners	714.8	253.2	16.5	5.6
Offices of Dentists	871.2	308.6	20.1	6.8
Health and Personal Care Stores	740.3	262.2	17.0	5.8
Medical and Diagnostic Laboratories	568.2	201.2	13.1	4.4
Outpatient Care Centers	765.8	271.2	17.6	6.0
Home Health Care Services	567.0	200.8	13.1	4.4
Residential Treatment Facilities	316.3	112.0	7.3	2.5
Veterinary Services	206.3	73.1	4.7	1.6
Other Ambulatory Health Care Services	212.9	75.4	4.9	1.7
Fitness and Recreational Sports Centers	176.3	62.4	4.1	1.4
Total	19,922.8	7,056.7	458.7	155.2

Sources: IMPLAN model data; US Bureau of Labor Statistics and Quarterly Census of Employment and Wages for labor income. Calculations by the authors using US Bureau of Economic Analysis and Kansas Department of Revenue data for sales tax calculations. Average local sales tax rate provided by the Tax Foundation. [10]

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. We calculate sales tax by combining labor income estimates with data on actual taxable sales from the Kansas Department of Revenue (Table 9). We calculate other taxes using results of the IMPLAN model. We point out that the IMPLAN data used to model taxes are often a few years out-of-date, may lack details about taxation by industry, and do not take into account tax exemptions that may apply to government owned or operated health care facilities. Tax results other than sales tax should be considered as "ball park" figures (Table 10).

Estimation of Sales and Use Taxes. The Kansas Department of Revenue publishes data on taxable sales for the state and for individual counties. These data can be used to calculate a ratio of taxable sales to personal income. Our estimates include use taxes, which are a "sales-type" tax paid when a Kansas consumer purchases something from out of state, often through a vendor such as Amazon. The formulas below shows our calculations:

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 $459 million in state sales/use taxes and $155 million in local sales/use taxes for counties, cities, and special districts.

Estimation of other federal, state and local taxes. Estimates from the IMPLAN model indicate that the health care sector in Kansas generates about $3,900 million in federal tax revenue and $1,500 million in state and local government tax revenue (Table 10). To put this in perspective, the Census Bureau estimates that Kansas collected a total of about $11,800 million in combined state and local revenue in 2021.[11] Thus the health care sector contributed about 12.7 percent of tax revenue in Kansas—directly through the businesses and organizations that comprise the sector and secondarily through supply chain links and through rounds of consumer spending.

Table 10. Overall Contributions of the Health Care Sector to Tax Revenue, 2021

Tax Type	Paid to... Federal Govt. ($mil.)	State and Local Govt. ($mil.)
Social Insurance Tax	2,286.6	
Income Tax-Corporate	202.4	62.0
Income Tax-Personal	1,475.5	448.9
Licenses and Fees		34.9
Property Tax		337.0
Sales Tax		613.9
Other Business Taxes (neg. = subsidy)	-161.1	26.9
Total	3,803.4	1,523.5

Sources: Estimates from IMPLAN model. 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 over 200,000 jobs and $14.6 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 100,000 jobs and $5.3 billion in income**. The sector also supports almost 13 percent of state and local tax revenue.

A vigorous and sustainable health care system is essential not only for the health and welfare of community residents, but also to enhance 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 300 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 are 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.[12] 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.[13]

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% loss in workplace productivity.[14] 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.[15] 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.

Additionally, 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.[16] Similarly, rural counties that have suffered hospital closure see lower employment and wage growth rates than rural counties that have no

closures,[17] 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.[18] 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."[19] Health care, in turn, comprises an important part of what analysts consider quality of life factors.[20] Millennial and Gen Z employees rank health care, including access to mental health services, as the most sought-after employer-offered benefits.[21] Strong health care systems support the effort of businesses to attract and retain a skilled and motivated workforce.

The health care sector also 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.[22] 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.[23]

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 uses 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 trend 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. Very

little public sector data is suppressed at the state-level in Kansas for 2021. As of 2022, all public sector employment data in Kansas is disclosed.

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. 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.[24]

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.

This report makes use 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,[25] 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 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.

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