The Importance of the Health Care Sector to the Chase County Economy

Countywide Report, October 2023

Prepared for the Kansas Hospital Association by
Institute for Policy & Social Research
University of Kansas

Patricia Oslund, Associate Researcher, IPSR
Thomas Becker, Assistant Researcher, IPSR
Dr. John Leatherman, Kansas State University, Retired
Dr. Donna K. Ginther, Director, IPSR

KU IPSR Institute for Policy & Social Research

KHA Kansas Hospital ASSOCIATION

Table of Contents

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 Patricia Oslund, Associate Researcher, performed calculations and provided sections of the report text. Whitney Onasch and Daria Milakhina provided editorial assistance.

This study was sponsored by the Kansas Hospital Association (KHA). The authors thank KHA for the opportunity to work on this project and for their staff's thoughtful feedback on project design, implementation and presentation.

The research is modeled on previous studies completed by Dr. John Leatherman, professor emeritus from Kansas State University. The methodology of the study was developed by Dr. Leatherman and was updated and expanded by the IPSR authors. In addition, Dr. Leatherman provided invaluable assistance with modeling concepts, data interpretation and computational approaches.

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 authors if you have questions or comments, or if you think that there are problems with the data for your county. The county level data were estimated using several sources, and some of these sources may have been inaccurate. The authors appreciate public feedback.

Contacts:

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

Patricia Oslund, Associate Researcher, IPSR
University of Kansas
poslund@ku.edu
785-864-9108

Executive Summary

The health care sector makes minimal contributions to the Chase County economy. The sector employs nearly 29 people directly and pays just over $1 million in labor income (based on 2021 data). Health care employers provide about 1.9 percent of the county's jobs and 1.4 percent of labor income.

In addition to providing direct employment and income, the health care sector creates multiplier effects as businesses purchase local goods and services, such as utilities, and employees spend their income at local businesses such as stores and restaurants. Including multiplier effects, the Chase County health care sector supports more than 30 jobs and almost $1.1 million in labor income. Nursing facilities, veterinary services and health stores are the only health care employers in the county. The table below details the contributions of individual industries within the health care sector.

In addition to jobs and income, the health care sector provides economic development effects that are less easily quantified. A quality health care sector improves the well-being of the population, and that, in turn, improves business productivity. In addition, quality health care aids in the recruitment and retention of businesses, and health care attracts and retains retirees.

Contributions of Individual Chase County Health Care Industries, 2021

Industry	Direct Employment Contribution (jobs)	Total Employment Contribution (jobs)	Direct Labor Income Contribution ($1000)	Total Labor Income Contribution ($1000)
Hospitals	0.0	0.0	0	0
Offices of Physicians	0.0	0.0	0	0
Nursing and Residential Care Facilities	20.4	21.8	878	920
Offices of Other Health Practitioners	0.0	0.0	0	0
Offices of Dentists	0.0	0.0	0	0
Health and Personal Care Stores	3.0	3.1	6	11
Medical and Diagnostic Laboratories	0.0	0.0	0	0
Outpatient Care Centers	0.0	0.0	0	0
Home Health Care Services	0.0	0.0	0	0
Residential Treatment Facilities	0.0	0.0	0	0
Veterinary Services	5.3	5.5	148	155
Other Ambulatory Health Care Services	0.0	0.0	0	0
Fitness and Recreational Sports Centers	0.0	0.0	0	0
Total	28.6	30.3	1,033	1,085

Sources: IMPLAN proprietary data and Kansas Department of Labor (see Appendix A)

Introduction

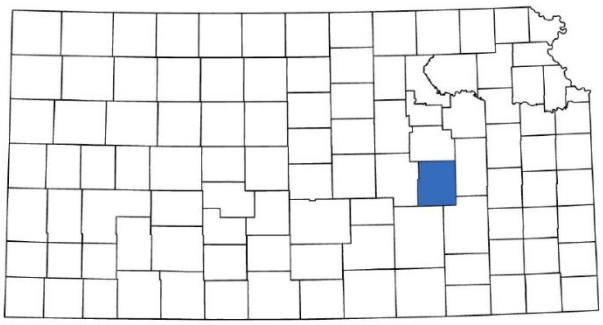
A vigorous health care system is essential not only for the health and welfare of a community's residents, but also for regional economic opportunity. Historically, health-related industries have grown faster than the economy as a whole. Given demographic trends, this growth is likely to continue. Health care industries provide jobs, income and tax revenue, with hospitals often counting among the largest employers in rural areas. Quality health care improves business productivity, aids in the recruitment and retention of businesses and attracts and retains retirees.

With these factors in mind, we examine the health care sector of individual Kansas counties. Our report is organized into three main sections:

- An overview of Chase County's population and income, focusing on factors that can affect the demand and accessibility of health care
- A detailed analysis of the Chase County economy, with a focus on individual health care industries and their contributions to jobs, income and tax revenue
- A discussion of the impact of health care on economic development, including effects on productivity, business attraction and retention, and retention and attraction of retirees.

The primary purpose of this report is to quantify the economic contributions of the health care sector in providing jobs and income. But it is important to recognize that the health care sector plays a role in a county's future stability and potential growth. Furthermore, the health care sector makes significant contributions to the physical and mental well-being of county residents.

Overview of Chase County



Located in Central Kansas, Chase County is classified non-metro in the 2020 Census. With a decreasing population of 2,583, it is the 91st largest county in Kansas by population out of 105 counties. Its county seat and most populous city is Cottonwood Falls.

Residents of Chase County are older, earn less income but are more likely to have health insurance compared to average Kansans. The median age of residents in the county is 44.3 years (based on five years of data), while the median age of Kansans is 37 (Table 1). In the same period, 23.8 percent of the county population is 65 years or older, compared to 15.8 percent statewide.

The agricultural sector is the largest industry group in terms of employment countywide, followed by services other than health (Figure 1). Based on five years of data, the median household income for county residents is $49,453, substantially less (23.4 percent) than the statewide median income level. In 2020, 9.8 percent of Chase County's population under 65 was uninsured, compared with 10.3 percent of all Kansans in that age group.

The Kansas Hospital Association has no community hospitals listed in the county. According to the Kansas Department of Health and Environment, the county had no active physicians as of 2021, while Kansas has on average 374 people per physician.

Table 1: Chase County Demographic and Economic Characteristics

Characteristic	County	Kansas
Population, 2021	2,583	2,932,099
Population, 2000	3,030	2,688,824
Percent growth (+) or decline (-) 2000-2021	-14.8%	+9.1%
Population rank (largest to smallest)	91	105 counties
Median age of population, 2017-2021	44.3	37.0
% of population over 65, 2017-2021	23.8%	15.8%
% uninsured, age 0-64, 2020	9.8%	10.3%
Median household income, 2017-2021	$49,453	$64,521
Number of community hospitals	0	
Number of other hospitals	0	
Persons per active physician, 2021	N/A	374

Sources: See Appendix A

Contributions of the Health Care Sector to the Chase County Economy

This section of the report defines the health care sector and quantifies its role in the Chase County economy. Economic contributions of the sector include not only the direct jobs and income generated, but also **multiplier effects** that occur when businesses in the health care sector purchase goods and services, and when employees spend their income within the county on goods and services.

Definition 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 includes 13 industries as developed by Professor John Leatherman, formerly with the Office of Local Government at Kansas State University, in consultation with the Kansas Hospital Association. Table 2 shows the key industries included within the broad definition of the health care sector. Health care industries include establishments owned and operated by government entities, such as a Veteran's Administration hospital or a sports facility owned by a city. Note that not every county in the state has employment in every individual health care industry.

Employees are counted in whatever industry setting they report to every week. For example, physicians that work exclusively in hospitals (hospitalists) are counted in the hospitals industry, whereas physicians that provide care in outpatient clinics are counted in the offices of physicians industry. The same goes for counting the nurses, laboratory workers, and everyone else who works in a particular health care setting.

Throughout our report, we use the definition of health care industries in Table 2 below to summarize employment and income in the county health care sector. Telehealth providers and traveling clinicians could serve patients in more than one county. We calculate the economic impact of these services based on the location of the health care employers, not the patients.

Table 2: Key Health Care Industry Definitions

Health Care Industry	Businesses and Establishments Included
Hospitals	Medical and surgical hospitals, psychiatric hospitals and other specialty hospitals
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 Facilities	Skilled nursing facilities, assisted living facilities, hospices, continuing care communities and similar residential facilities
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	Pharmacists/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 the elderly and 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 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

Composition of the Chase County economy

The health care sector comprises a minimal portion of the Chase County economy (Table 3, Figures 1 and 2). The sector employs 28.6 people (in 2021) and pays $1.033 million in wages and benefits. However, the health care sector provides a much smaller share of jobs (1.9 percent versus 10.6 percent) and a smaller share of income (1.4 percent share versus 12.4 percent) when compared with Kansas as a whole.

Agriculture and services (other than health) are the largest economic sectors in the county, which combined provides 38.3 percent of jobs and 36 percent of labor income. Health care is the tenth largest sector in the county.

Table 3. Structure of the Chase County Economy, 2021

Sector	Employment	Labor Income ($1000)	Output ($1000)
Agriculture	303.2	17,638	121,630
Mining and Extraction	204.4	11,987	118,244
Construction	80.3	3,850	11,409
Manufacturing	158.3	9,584	54,754
Transportation, Utilities and Warehousing	46.7	4,926	12,163
Information, Communications and Publishing	1.0	9	275
Finance, Insurance and Real Estate	80.6	1,553	24,937
Wholesale and Retail Trade	126.1	3,225	20,600
Services (other than health)	280.6	8,288	24,565
Health Care Services	28.6	1,033	1,730
Government	212.0	9,984	12,742
Total	1,521.6	72,077	403,050

Health Care Services as % Total			
Kansas	10.6%	12.4%	6.8%
County	1.9%	1.4%	0.4%

Sources: IMPLAN proprietary data and Kansas Department of Labor (see Appendix A)

Note: Labor income includes employee benefits.

Figure 1: Jobs by Sector, Chase County, 2021

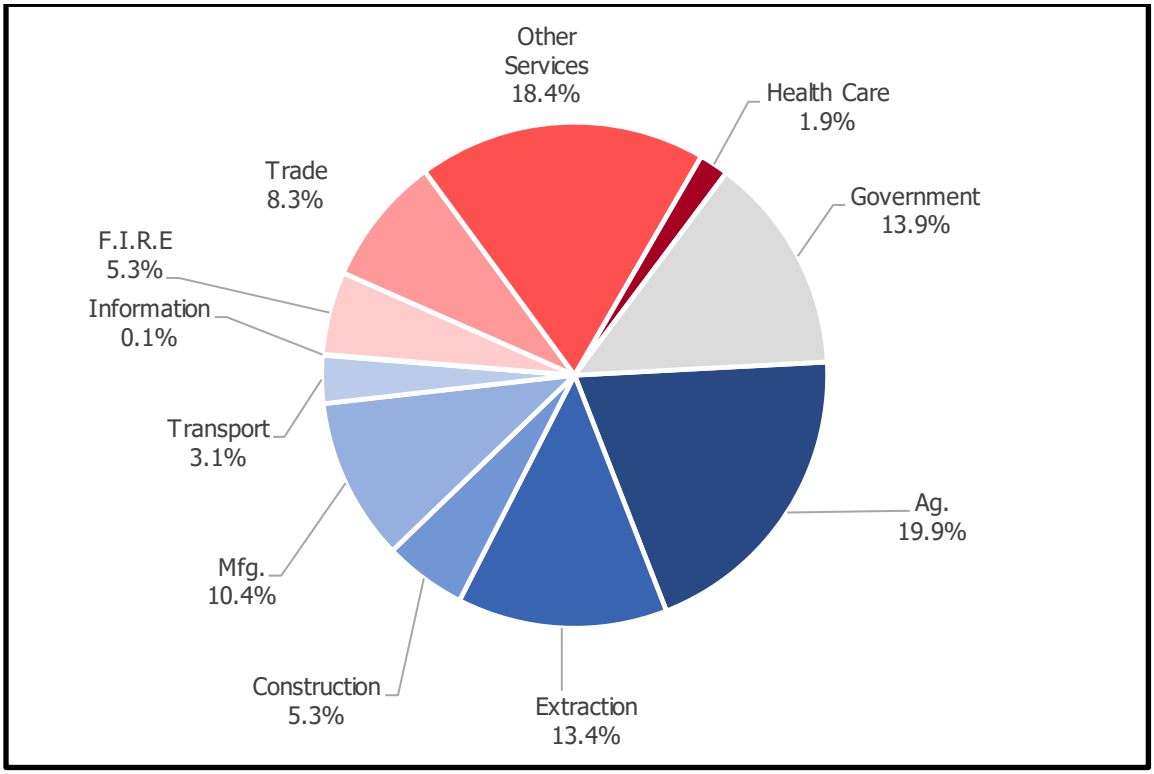
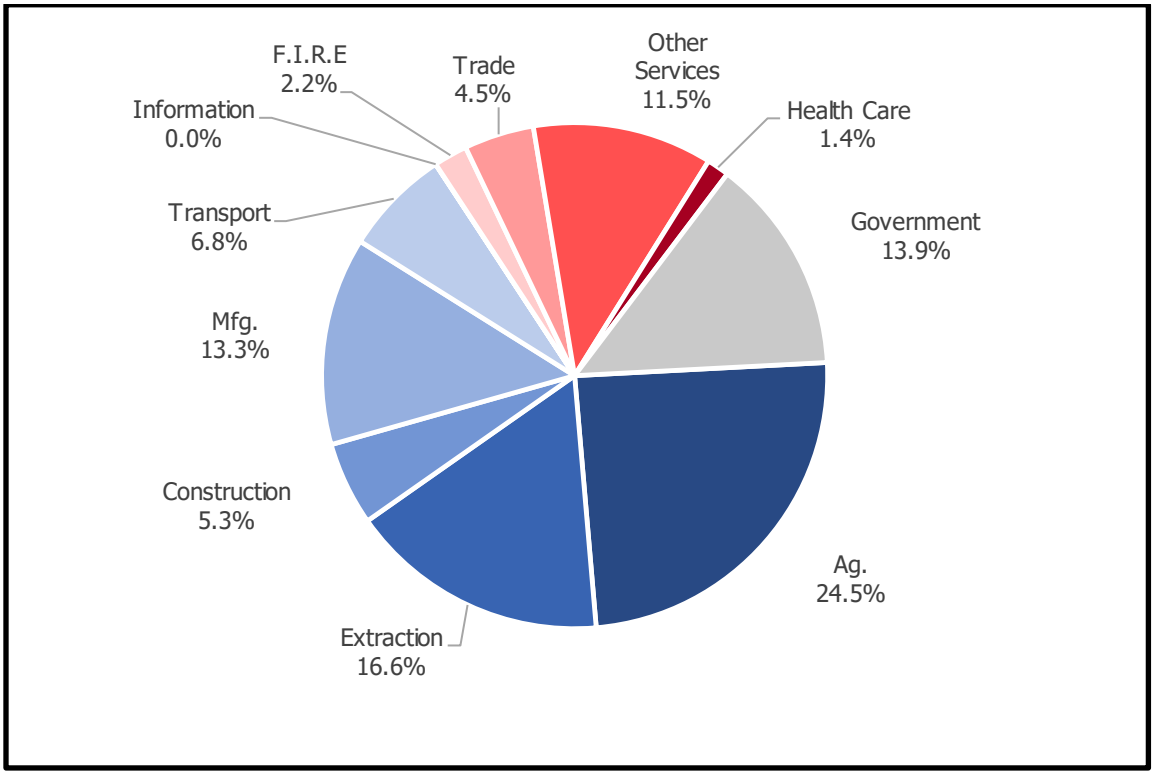


Figure 2: Labor Income by Sector, Chase County, 2021



Individual health care industries

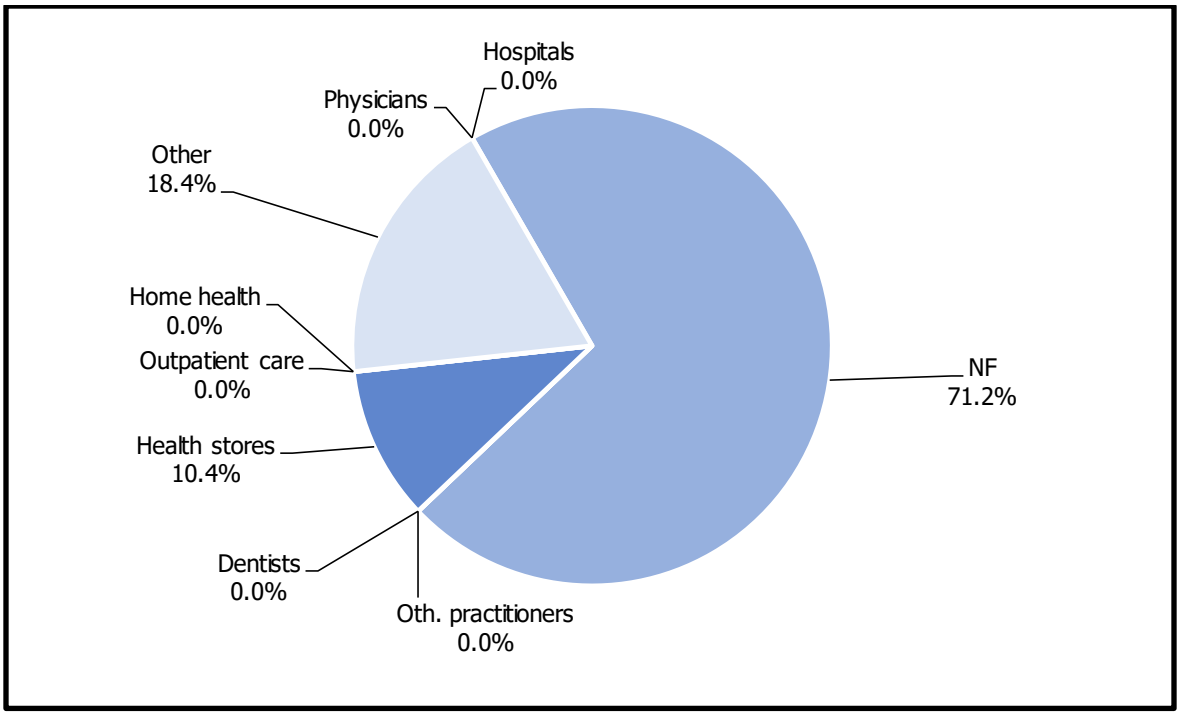
The Chase County economy includes employment and income in only 3 out of 13 individual health care industries: nursing facilities, veterinary services and health stores (Table 4 and Figure 3). Labor income per employee, including benefits, ranges by health care industry, from a high of $43,089 for nursing facilities to a low of $2,098 at health stores. Overall, income in health care industries averages $36,092 per year.

Table 4: Individual Chase County Health Care Industries, 2021

Industry	Employment	Labor Income ($1000)	Labor Income per Employee ($)
Hospitals	0.0	0	0
Offices of Physicians	0.0	0	0
Nursing and Residential Care Facilities	20.4	878	43,089
Offices of Other Health Practitioners	0.0	0	0
Offices of Dentists	0.0	0	0
Health and Personal Care Stores	3.0	6	2,098
Medical and Diagnostic Laboratories	0.0	0	0
Outpatient Care Centers	0.0	0	0
Home Health Care Services	0.0	0	0
Residential Treatment Facilities	0.0	0	0
Veterinary Services	5.3	148	28,175
Other Ambulatory Health Care Services	0.0	0	0
Fitness and Recreational Sports Centers	0.0	0	0
Total	28.6	1,033	36,092

Sources: IMPLAN proprietary data and Kansas Department of Labor (see Appendix A)

Figure 3: Employment in Health Care Industries in Chase County, 2021



Connections between the health care sector and other industries in the county

In the previous section, we analyzed the **direct effects** of the health care sector on a county's economy—that is, we calculated the employment and income generated directly within the health care sector. But the health care sector also triggers additional spillover effects of two types:

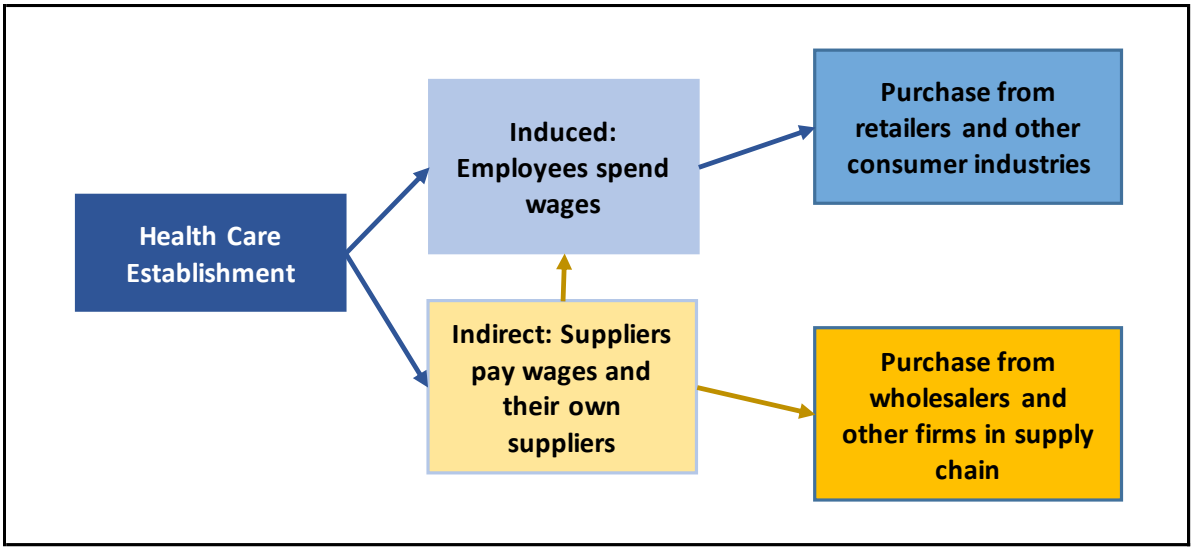
- **Indirect effects** work through the supply chain channel. Suppose, for example, a dental office contracts with a software developer in the county to organize and maintain its appointment records. The software firm uses the receipts from the dental office to pay its own employees. Hence the health 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 to purchase food, pay rent, attend entertainment events and to pay electric bills. All these downstream industries benefit from interactions with health care employees.

Collectively, indirect and induced effects create the **secondary effects** of the health care sector. Figure 4 illustrates 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 job and income creation, spending and re-spending due to the interactions among firms, industries, households and governments.

The cumulative result these feedback loops is known as the **multiplier effect**. As an example, an employment multiplier of 1.4 for the health care sector means that every direct job in the sector, an additional 0.4 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 4: Secondary Effects of the Health Care Sector on Suppliers and Consumer Industries



This report makes use of two different types of multipliers, depending on the effects under consideration (see Tables 5 and 6). In the economics literature, the two approaches are known as **contribution analysis** and **impact analysis**, each with its own multiplier. The multipliers have different uses: if we want to look at the economic impact of one health care industry in **current** county economy, we use a contribution multiplier. This answers the question "what is…" If we want to measure the economic impact of **hypothetically** expanding or contracting the health care industry on other economic sectors, we use the impact multiplier. Here we answer the question "what if…"

For example, current employees of a hospital may use their wages to pay veterinarians, who in turn pay their own employees. The veterinary employees have already been tabulated as part of the direct employment and income in Tables 5 and 6, so it would

be double counting to include them as secondary effects as well. This would be a case for using a contribution multiplier versus an impact multiplier to get an accurate picture of the economic impact.

On the other hand, suppose that we want to estimate the **potential** effect of adding 20 new hospital employees. Now, in our example, the demand for veterinary care would increase in the county due to the spending of hospital employees. To measure this effect on the health care sector, we would include all feedbacks, because veterinarians can expand their businesses to accommodate the new employees and their pets. Here, we would use the impact multiplier.

As a rule of thumb, economists use contribution multipliers when they discuss the magnitude of feedbacks between current health care industries and the broader county economy. They use impact multipliers when they discuss the possible effects of expanding or contracting one of the health care industries. Both types of multipliers generally range between 1.0 and 2.2, depending on the industry and county. Contribution multipliers always are slightly smaller than impact multipliers because they exclude interactions among health care industries. Both types of multipliers are included in Tables 5 and 6.

Tables 5 and 6 show direct effects, total effects (direct plus secondary) and multipliers for all Chase County health care industries. Using contribution analysis, we estimate that the county's 28.6 health care jobs (direct employment contribution, Table 5) and $1.033 million in direct labor income (Table 6) support an additional 1.7 jobs and $52,000 in added 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.

Focusing specifically on the Chase County nursing facilities industry, we find the 20.4 current jobs sustain 1.4 additional jobs outside of health care (employment contribution multiplier = 1.07 in Table 5). The formula is:

Direct Employment Contribution * Employment Contribution Multiplier = Total Jobs
Total Jobs – Direct Employment Contribution = Net Additional Jobs[1]

Note that the nursing facilities industry has the largest employment contribution multiplier of all health care industries in the county. That implies employees in nursing facilities have the greatest impact on "producing" more outside jobs. The multiplier is large because nursing facilities pay higher wages and because nursing facilities use

[1] All multipliers in the report tables have been rounded to two decimal places. This may cause a slight discrepancy between the numbers in the report and the calculations in the formula.

substantial goods and services from the community, such as utilities and business services.

Similarly, the $878,000 in nursing facilities wages and benefits produce another $42,000 in income within the county (income contribution multiplier = 1.05 in Table 6). The formula is:

Direct Labor Income * Income Contribution Multiplier = Total Income
Total Income – Direct Labor Income = Net Additional Income

The multiplier effect magnifies the benefits of expanding employment and wages in an industry, but it also compounds the consequences of closures or reduced staffing in industries such as nursing facilities, as the effects of reduced income and reduced demand for business inputs ripple throughout the county.

Table 5: Contributions of the Health Care Sector to Chase County Employment, 2021

Industry	Direct Employment Contribution	Total Employment Contribution	Employment Contribution Multiplier excl. Health Care Feedbacks	Employment Impact Multiplier incl. Health Care Feedbacks
Hospitals	0.0	0.0	0.00	0.00
Offices of Physicians	0.0	0.0	0.00	0.00
Nursing and Residential Care Facilities	20.4	21.8	1.07	1.07
Offices of Other Health Practitioners	0.0	0.0	0.00	0.00
Offices of Dentists	0.0	0.0	0.00	0.00
Health and Personal Care Stores	3.0	3.1	1.04	1.04
Medical and Diagnostic Laboratories	0.0	0.0	0.00	0.00
Outpatient Care Centers	0.0	0.0	0.00	0.00
Home Health Care Services	0.0	0.0	0.00	0.00
Residential Treatment Facilities	0.0	0.0	0.00	0.00
Veterinary Services	5.3	5.5	1.04	1.04
Other Ambulatory Health Care Services	0.0	0.0	0.00	0.00
Fitness and Recreational Sports Centers	0.0	0.0	0.00	0.00
Total	28.6	30.3	1.06	

Sources: IMPLAN proprietary data and Kansas Department of Labor (see Appendix A)

Table 6: Contributions of the Health Care Sector to Chase County Labor Income, 2021

Industry	Direct Labor Income Contribution ($1000)	Total Labor Income Contribution ($1000)	Income Contribution Multiplier excl. Health Care Feedbacks	Income Impact Multiplier incl. Health Care Feedbacks
Hospitals	0	0	0.00	0.00
Offices of Physicians	0	0	0.00	0.00
Nursing and Residential Care Facilities	878	920	1.05	1.05
Offices of Other Health Practitioners	0	0	0.00	0.00
Offices of Dentists	0	0	0.00	0.00
Health and Personal Care Stores	6	11	1.77	1.78
Medical and Diagnostic Laboratories	0	0	0.00	0.00
Outpatient Care Centers	0	0	0.00	0.00
Home Health Care Services	0	0	0.00	0.00
Residential Treatment Facilities	0	0	0.00	0.00
Veterinary Services	148	155	1.04	1.05
Other Ambulatory Health Care Services	0	0	0.00	0.00
Fitness and Recreational Sports Centers	0	0	0.00	0.00
Total	1,033	1,085	1.05	

Sources: IMPLAN proprietary data and Kansas Department of Labor (see Appendix A)

Note: Labor income includes employee benefits.

The effect of the health care sector on local sales tax collections

Counties and cities throughout Kansas have the option of imposing local sales taxes. Hence when consumers spend money in their local communities, they generate sales tax revenues for county and city government, supporting county and city services such as road maintenance, fire and police protection, sanitation and general administration. Table 7 shows estimates of the retail sales and sales tax revenue that the health care sector produces in Chase County. Our estimates are conservative because they do not consider the impact of any taxable local purchases made by the health services businesses themselves.

Data from the Kansas Department of Revenue (KDOR) provide the foundation for our estimates. KDOR reports taxable retail sales by county, county-level local sales tax collections, and city-level tax collections. We calculate the ratio of retail sales to county-wide personal income, to create what is known as a **retail sales capture ratio**. Chase County's ratio is 25.68 percent. The labor income of health employees is part of overall personal income, so roughly 25.68 percent of health care worker's income is spent on taxable goods and services in the county. We estimate a local sales tax rate by adding together county and city receipts and then dividing it by retail sales. Note that the state and local sales tax bases were approximately the same in 2021, our target year. The

average local sales tax rate for Chase County is 1.59 percent. Our final calculation is based on the formula below:

$$\text{Estimated Sales Tax} = \text{Total Labor Income} * \text{Retail Capture Ratio} * \text{Local Rate}$$[2]

We estimate that local sales taxes due to the health care sector sum to $4,400 annually (Table 7).

Table 7: Impact of the Health Care Sector on Local Sales Tax Revenue, 2021

Ratio of Taxable Sales to County Personal Income		25.68%	
Ratio of Local Sales Tax Revenue to Retail Sales		1.59%	
Industry	Total Labor Income (Health Care) ($1000)	Retail Sales from Labor Income ($1000)	Local Sales Tax Revenue ($1000)
Hospitals	0	0	0.0
Offices of Physicians	0	0	0.0
Nursing and Residential Care Facilities	920	236	3.8
Offices of Other Health Practitioners	0	0	0.0
Offices of Dentists	0	0	0.0
Health and Personal Care Stores	11	3	0.0
Medical and Diagnostic Laboratories	0	0	0.0
Outpatient Care Centers	0	0	0.0
Home Health Care Services	0	0	0.0
Residential Treatment Facilities	0	0	0.0
Veterinary Services	155	40	0.6
Other Ambulatory Health Care Services	0	0	0.0
Fitness and Recreational Sports Centers	0	0	0.0
Total	1,085	279	4.4

Sources: Labor income based on proprietary income from IMPLAN and on data from Kansas Department of Labor. Sales tax data from Kansas Department of Revenue. Personal income from US Bureau of Economic Analysis. See Appendix A.

[2] The capture ratio and the sales tax rate have been rounded to two decimal places. This may cause a small discrepancy between the numbers in the table and the results of the formula in the text.

Economic contributions summary

In summary, the health care sector in Chase County generates minimal employment and income for local residents as well as tax revenue for local governments. Health care businesses provide nearly 29 jobs and just over $1 million in labor income. When the multiplier effect is included, the contributions rise to more than 30 jobs and almost $1.1 million in labor income. The health care sector supports over $4,400 in local sales tax revenue.

The health care sector in the county may be constrained by the county's low level of income relative to the state, but not by lack of health insurance when compared to residents across the state. Access to health care services is limited by the lack of physicians practicing in the county, as well as most of the other health care industries.

The Effects of Health Care on Economic Development

So far, this report has focused on the effects of the health care sector on wages, income and taxes. 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. One additional effect is the health care sector's role in improving worker productivity. Secondly, these effects attract and retain employees as well as businesses. And third, they stimulate in-migration and retention of retirees.

A substantial body of research supports the proposition 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). Diseases such as asthma, cardiovascular disease and depression lead to missed workdays, and also impact productivity through "presenteeism," that is, when employees are operating at less than full capacity throughout their workday (Isham, Mair and Jackson 2021).

Chronic health conditions also can 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 experienced a 22.9 percent loss in workplace productivity (Mazanec et al. 2011). 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 (Committee on Caregiving for Older Adults). 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.

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 (Mandich and Dorfman 2017). Similarly, rural counties that have suffered hospital closure see lower employment and wage growth rates than rural counties that have no closures (Edmiston 2019), 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 Business Climate Ranking (2022). Furthermore, quality-of-life is rated among the top 10 location factors, tied with business incentives offered by states, cities and counties. 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." Health care, in turn, comprises an important part of what analysts consider quality of life factors (US News & World Report, 2021). Millennial and Gen Z employees rank health care, including access to mental health services, as the top employer-offered benefits (Mearian 2022). Strong health care systems support the efforts 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 in magnitude to the effects of other amenities, such as educational and recreational institutions (Oehmke et al. 2007). 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 (Dorfman and Mandich 2016).

In summary, the health care sector provides economic benefits beyond those considered in traditional contribution and impact 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 as well as drawing and retaining retirees. Because of these effects, a robust health care sector should be considered an important contributor to economic development.

Chase County Summary

The health care sector in Chase County provides minimal jobs and income to the community. The health care sector in the county is composed of 3 out of 13 health care industries, each with unique impacts on the local economy. The industries include nursing facilities, veterinary services and health stores.

The health care sector provides about 29 jobs (1.9 percent of all jobs in the county) and just over $1 million in labor income (1.4 percent of all income earned in the county). The agriculture, services (other than health) and government sectors are the largest employers in the county. Health care is the tenth largest employer, out of 11 sectors. Within the health care sector, income averages just over $36,000 per year.

There are secondary effects of the health care sector. These are the ripple effects of having health care providers working and living locally in the county. These employees will need services from other economic sectors: restaurants, gas stations and the like. Using a contribution factor, we calculate that the nursing facilities industry in Chase County, with its 20.4 current jobs, supports 1.4 additional jobs outside of health care. Similarly, the $878,00 in nursing facilities employee income produces another $42,000 in income from additional jobs within the county. Naturally as the number of jobs increases, so does the total income and sales tax revenue in the county.

In addition to providing jobs and income, the health care sector can provide substantial economic development benefits. A quality health care sector improves the well-being of the population, and that, in turn, improves business productivity. In addition, quality health care aids in the retention and attraction of businesses and retirees.

Appendix A: Data Sources and Methods

This appendix discusses: a) what data contributed to each data table in the report and b) how the data in the report were combined to form the tables. The data used in this project come from several sources and refer to calendar year 2021 unless otherwise noted. A list of data citations follows at the end of this appendix. The numbers in brackets indicate the tables for which the data citations were used.

If you have questions about the data or methods used to create any of the tables, please email Pat Oslund (poslund@ku.edu) for more information.

Table 1: County Demographic and Economic Characteristics. This table is a compendium of data from the U.S. Census Bureau and other sources. The Kansas Department of Health and Environment contributed data on active physicians by county, as published in IPSR's Kansas Statistical Abstract. The Kansas Hospital Association served as the primary source of hospitals by county, supplemented by data from the American Hospital Association.

Table 3: Structure of the County Economy. This table relies on the two main datasets used for this report: the IMPLAN Model proprietary county-level dataset as well as a special data extract from the Kansas Department of Labor.

The IMPLAN dataset covers all industries in a county including government. Employment numbers in the dataset include both wage and salary workers, and people who are self-employed. Labor income includes wages and salaries, self-employment income, and benefits. For small areas such as counties, data on employment and income is not always reported by state and federal agencies. IMPLAN estimates employment and income based on the best available data, but sometimes these estimates do not appear realistic (see Table 4 discussion). Note that we moved employment and income for hospitals owned by federal, state or local governments out of the IMPLAN government sector and into health care services. For all economic sectors except health care, IMPLAN provided our major source of data for employment and income.

The Kansas Department of Labor (KDOL) provided us with a special extract of county-level employment and wage data. We used the KDOL dataset primarily for health care industries. For these industries, we aggregated the included employment and wage data to match the IMPLAN definition of industries, added self-employment information from IMPLAN and added an estimate of benefits. We then applied appropriate statistical measures to keep detailed employer data confidential.

Table 4: Individual County Health Care Industries. Data for individual health care industries incorporate both IMPLAN and KDOL data. As mentioned above, data from KDOL was combined with IMPLAN and then fuzzed in order to protect confidentiality. In

some cases, the IMPLAN estimates of self-employment were unrealistic. For example, we found a small county with about 40 self-employed people working in physicians' offices, each earning about $2,000 per year. In cases with unrealistic data, we looked at IMPLAN data from the previous year and almost always found that the previous estimate was zero. We also verified that no wage and salary employees appeared in the KDOL data. Finally, we reset the estimates to zero.

Another data problem we encountered was that for two counties that actually have a hospital, both IMPLAN and KDOL showed zero employees. In one case we used data from a previous year. In another case we used estimates of employment that appeared on the hospital's web site.

Tables 5 and 6: Contributions of the Health Care Sector. These tables show direct and total employment and income. In general, we used a formula: Total Effects = Direct Effects * Multiplier. Multipliers were provided by the IMPLAN model, and are specific to the industry, the county, and the type of effect (employment or income).

Table 7: Impact of the Health Care Sector on Local Sales Tax Revenue. This table makes use of the ratio of local sales tax revenue to county personal income. Local sales tax revenue was provided by the Kansas Department of Revenue. It includes both county and city levies. County-level personal income comes from the U.S. Bureau of Economic Analysis.

Data citations

American Hospital Association. AHA Hospital Lookup. https://www.aha.org/aha-hospital-lookup [1]

IMPLAN Model. 2022. 2021 data and models for Kansas and Kansas counties. https://www.IMPLAN.com [3, 4, 5, 6, 7]

Kansas Department of Labor. Special labor market extract for 2021. [3, 4, 5, 6, 7]

Kansas Department of Revenue. State Sales Tax Collections by County-2021. https://www.ksrevenue.gov/prsalesreports.html#state [7]

Kansas Department of Revenue. State Use Tax Collections by County-2021. https://www.ksrevenue.gov/prsalesreports.html#usecoll [7]

Kansas Department of Revenue. City/County Local Sales Tax Distributions Calendar Year – 2021. https://www.ksrevenue.gov/prsalesreports.html#annlocalsales [7]

Kansas Department of Revenue. CY 2021 City/County Use Tax Distribution by Month. https://www.ksrevenue.gov/prsalesreports.html#localuse [7]

Kansas Hospital Association, Hospital-Specific Data. 2022. "KHA STAT." Updated 4/20/2022. https://www.kha-net.org/DataProductsandServices/STAT/ [1]

KU Institute for Policy & Social Research (IPSR). 2022. *Kansas Statistical Abstract Enhanced Online Edition*. September 5, 2022. "Persons per Physician in Kansas, by County, 2021." https://ipsr.ku.edu/ksdata/ksah/vital/doctors.pdf [1]

U.S. Bureau of Economic Analysis. Regional GDP & Personal Income, Personal Income and Employment by County and Metropolitan Area, Table CAINC1. https://www.bea.gov/itable/regional-gdp-and-personal-income [7]

U.S. Census Bureau, 2000 Census. https://data.census.gov/table?q=United+States&g=010XX00US_040XX00US20,20$0500000&y=2000&d=DEC+Summary+File+1&tid=DECENNIALSF12000.P001 [1]

U.S. Census Bureau, American Community Survey (ACS). 2017-2021 American Community Survey. https://www.census.gov/acs/www/data/data-tables-and-tools/subject-tables/ [1]

U.S. Census Bureau, Population Estimates. 2021 Population Estimates. https://www.census.gov/programs-surveys/popest/data/tables.html [1]

U.S. Census Bureau, Small Area Health Insurance Estimates (SAHIE). 2020 Small Area Health Insurance Estimates. https://www.census.gov/data-tools/demo/sahie/#/?map_yearSelector=2020&tableYears=2021,2020 [1]

U.S. Department of Agriculture. 2020. "2013 Rural-Urban Continuum Codes." Updated 12/10/2020. https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/ [1]

References

Avery, Susan. 2007. "What is Quality of Life?" *Area Development*. Dec/Jan 2007. https://www.areadevelopment.com/laboreducation/dec06/qualityoflife.shtml.

Christensen, Marit. 2017. "Healthy Individuals in Healthy Organizations: The Happy Productive Worker Hypothesis." 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

Clouse, Candi. 2019. "How IMPLAN Works." IMPLAN. Last modified April 26, 2022. https://support.implan.com/hc/en-us/articles/360038285254-How-IMPLAN-Works

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

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

Edmiston, Kelly. 2019. "Rural Hospital Closures and Growth in Employment and Wages." July 2019. Kansas City, MO: Kansas City Federal Reserve. https://www.researchgate.net/publication/335192551_Rural_Hospital_Closures_and_Growth_in_Employment_and_Wages

Isham, Amy, Simon Mair, and Tim Jackson. 2021. "Worker wellbeing and productivity in advanced economies: Re-examining the link." *Ecological Economics* 184. https://doi.org/10.1016/j.ecolecon.2021.106989

Maerian, 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

Mandich, Anne and Jeffrey Dorfman. 2017. "The Wage and Job Impacts of Hospitals on Local Labor Markets." *Economic Development Quarterly* 31 no. 2(April): 139-148. https://journals.sagepub.com/doi/abs/10.1177/0891242417691609

Mazanec, Susan, Barbara Daly, Sara Douglas and Amy Lipson. 2011. "Work productivity and health of informal caregivers of persons with advanced cancer." *Research in Nursing & Health* 34: 483-495.

Oehmke, James F., Satoshi Tsukamoto and Lori A. Post. 2007. "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(April): 1-12. https://doi.org/10.22004/ag.econ.10155

Site Selection. 2022. "Virginia Claims Top State Business Climate for 2022" [Press Release]. https://siteselection.com/press/releases/221101.html

U.S. Department of Agriculture. 2020. "2013 Rural-Urban Continuum Codes." Updated 12/10/2020. https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/.

U.S. News & World Report. 2021. "Best States 2021." https://www.usnews.com/media/best-states/overall-rankings-2021.pdf