



# The Contribution of Health Care to Flathead County's Economy

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## Summary

Health care is Flathead County's largest industry. Flathead County's health care industry employs nearly 6,300 people. This represents 16 percent of total employment. Flathead County's health care sector also pays more than \$313,000,000 in total wages. This represents 21 percent of total wages.

Table 1 breaks the health care sector into its four sub-components: ambulatory health care, hospitals, nursing and residential care facilities, and social assistance. Ambulatory health care (e.g., doctor's offices) comprises about one-third of Flathead County's health care sector. Hospitals comprise 41 percent of employment and 53% of total wages. Nursing and residential facilities comprise 17 percent of employment and 10 percent of total wages. Social assistance comprises the remainder.

**Table ES1. Components of Flathead County's private-sector health care industry, 2015**

	Employment	% of industry total	Wages	% of industry total
<b>Ambulatory health care</b>	2020	33%	\$105,000,000	34%
<b>Hospitals</b>	2546	41%	\$163,000,000	53%
<b>Nursing and residential care facilities</b>	1087	17%	\$31,000,000	10%
<b>Social Assistance</b>	561	9%	\$11,000,000	4%

How does health care contribute to Flathead County's economy? While size matters, looking only at the jobs and incomes tied to the health care sector fails to capture the full contribution of health care to the regional economy.

Health care is essential. It is essential for healthy people, and it is essential for healthy economies. In this report, we describe the different ways that health care contributes to Flathead County's economy, and we provide some numbers that help describe the magnitude of its contribution.

Highlights of this report include:

- **Flathead County's health care sector is necessary.** Health care produces health, and health is very valuable. People want to live and live well. They recognize that access to health care is an important part of enjoying a healthy life. As such, without its health care sector many people and businesses would

move away from (or never move to) Flathead County. Some people would remain in Flathead County but travel elsewhere for care, draining potentially hundreds of millions of dollars from Flathead County's economy. Losing people, firms, or health care spending would harm Flathead County's economy. It would reduce economic activity (i.e., the number of jobs and amount of income) in Flathead County, and it would reduce Flathead County's capacity to grow.

- **Flathead County's health care sector directly or indirectly accounts for over 30% of the county's economy.** Quantifying the effects of the loss of health care is tricky. Because economists have not seen what happens when a large community loses health care, our ability to describe the full effects of health care is limited. However, we can use existing models to provide an imperfect answer to the question, "how much would total employment, income, and output fall if Flathead County lost all of its health care jobs and all of its health care payroll?" If no one could purchase health care in Flathead County, the direct and ripple effects of this loss would shrink Flathead County's economy by more than 30 percent. It would reduce total employment in the Flathead County by approximately 13,000 jobs, reduce total personal income by approximately \$1 billion, and reduce regional GDP by approximately \$1.1 billion. These estimates understate the true impact of health care on economic activity in Flathead County by a large amount. As noted above, it does not account for the fact that many people and businesses would not locate in region that did not offer health care.
- **Flathead County's health care sector is efficient.** Life expectancy at age 40 is 2-4 years longer in Flathead County than the U.S. overall. This ranks Flathead County in the top 5% of areas in the U.S.. Flathead County's health care facilities receive high quality ratings from the federal government. Health care spending per person in Flathead County is thousands of dollars less than in other parts of the country. Thus, Flathead County residents enjoy great health outcomes, high quality facilities, but lower than average health care spending. This indicates that Flathead County's health care system generates great value relative to other parts of the country.
- **Health care is one of Flathead County's fastest growing industries.** Since 1990, health care employment grew 180 percent, from 2,200 to 6,300. This is proportional to what we would expect given the overall growth of health care in the U.S. and Flathead County's 60 percent population growth over this period. However, an important change for Flathead County's economy accompanied this growth. A disproportionate share of this growth represents the expansion of specialty services. This has two important effects on Flathead County's economy. First, it makes the area more attractive to people and firms. Second, it means that fewer residents have to travel to receive care and the money they would have spent someplace else remains in Flathead County.
- **Health care is expected to continue to grow.** Bureau of Labor Statistics projects that health care employment in the U.S. will grow by 21 percent



between 2014 and 2024. This exceeds the projected growth rate for every other industry. A 21 percent increase in health care employment would mean 1,300 additional health care jobs in Flathead County by 2024. Of course, Flathead County's health care growth has exceeded the U.S. rate in recent decades. If Flathead County continues to grow its population at a relatively fast rate (and a more robust health care sector may contribute to this), Flathead County's health care employment will likely rise by much more than this estimate.

## By the Numbers

**6,300**

Number of workers in Flathead County's health care industry, 16 percent of the county's total employment.

**41**

Percent of Flathead County's health care workers who work at hospitals.

**\$313,000,000**

Total payroll paid to Flathead County's health care workers, 21 percent of total payroll.

**13,000**

Total number of jobs directly or indirectly attributable to health care in Flathead County, over 30% of total employment.

**\$1,000,000,000**

Total personal income directly or indirectly attributable to health care in Flathead County.

**\$147,000,000**

Spending on new doctors offices, hospital facilities, nursing home facilities, etc. in Flathead County between 2012-2018

**4,025**

Number of health care jobs added since 1990 in Flathead County. A 180% increase and nearly 50% more new jobs than next highest industry.

**1,300**

Number of additional health care jobs added by 2024 if Flathead County grows at the nationally forecast rate (it will almost certainly exceed this).

**20**

Percent of patients who come from outside of Flathead County for care.

**2-4**

Additional years of life expectancy at age 40 enjoyed by Flathead County residents. This ranks 42<sup>nd</sup> among the 1600 counties with data.

**\$600+ million**

Annual value to Flathead County residents from gains in life expectancy and work-life attributable to health care

**\$2500**

How much less Medicare spends per beneficiary in Flathead County than the US avg.



## I. Introduction

Health care is a large and growing industry. Nationally, Americans spend more than one out of every six dollars on health care.<sup>1</sup> It is the largest industry in the country (measured by employment at the 2-digit NAICS level<sup>2</sup>), employing more than 20 million people (14.5 percent of the total).<sup>3</sup> Its employment has grown 84 percent since 1990, and economists expect it to continue to grow. The Bureau of Labor Statistics projects that health care employment will grow by 21 percent between 2014 and 2024.<sup>4</sup> This is the fastest projected growth rate for any industry.

Flathead County's health care sector is not different. In fact, health care in Flathead County constitutes a larger share of total employment, and it has grown faster over the past several decades. Flathead County's health care industry employs nearly 6,300 people (15.9 percent of total) and pays more than \$313,000,000 in wages (20.8 percent of total).<sup>5</sup> Since 1990, total health care employment in Flathead County grew by 180 percent, and total wages grew by 341 percent (adjusted for inflation). And health care in Flathead County is continuing to grow. Recently, Kalispell Regional Healthcare averages 300-400 job openings.

Clearly health care contributes to Flathead County's economy as it employs many people. Yet looking only at the jobs and incomes tied to the health care sector fails to adequately capture how health care contributes to the regional economy.

This report explores the contribution of health care to Flathead County's economy. Specifically, we investigate how health care contributes by addressing eight questions:

- (1) What is health care?
- (2) What is health care in Flathead County?
- (3) How does one evaluate the contribution of an industry to a regional economy?
- (4) How valuable is health care?
- (5) Is Flathead County's health care sector efficient?
  - a. How healthy are the residents of Flathead County?
  - b. How well does its health care system perform?
  - c. How much does health care cost in Flathead County relative to other parts of the U.S.?
- (6) If Flathead County's health care sector disappeared, what would happen to Flathead County's economy?
- (7) How large is the traded component of Flathead County's health care sector?
- (8) What does the future hold for health care in Flathead County?

Each section of this report provides an answer to one of these questions.

## II. What is health care?

This report describes the contribution of health care to Flathead County's economy. Before we can describe how health care contributes, we need to define health care.

Health care is what you imagine. It is all the places people go when they need someone to help improve or manage their health. It includes doctors' offices and hospitals and assisted living facilities.

Government data-keepers organize industry data using NAICS codes. The most inclusive NAICS code for health care is "62 – Health Care and Social Assistance". We use this definition instead of sub-industry data because it is available across time and place for most places. Confidentiality restrictions often prevent the disclosure of sub-industry data in places without many firms.<sup>6</sup>

## III. What is health care in Flathead County?

Health care is the largest industry in Flathead County. In 2015, Flathead County's health care sector employed almost 6,300 people, and it paid approximately \$313 million in wages.<sup>7</sup> The health care sector accounted for 16 percent of Flathead County's employment and 21 percent of wages. The next largest industry is retail trade, which represents 15 percent of total employment and only 11 percent of total wages.

**Table 1: Flathead County's largest industries**

NAICS Code	Industry	Employment	Wages	% of Total Emp.	% of Total Wages
<b>10</b>	Total, all industries	39394	1,508,541,608		
<b>62</b>	Health care and social assistance	6256	313,770,606	15.9%	20.8%
<b>44-45</b>	Retail trade	5919	167,498,631	15.0%	11.1%
<b>72</b>	Accommodation and food services	5540	97,473,586	14.1%	6.5%
<b>61</b>	Education	2855	110,360,639	7.2%	7.3%
<b>23</b>	Construction	2786	120,582,684	7.1%	8.0%
<b>31-33</b>	Manufacturing	2669	140,333,828	6.8%	9.3%
<b>56</b>	Administrative support and waste management	2198	60,786,104	5.6%	4.0%
<b>52</b>	Finance and insurance	1862	111,904,007	4.7%	7.4%

Source: BBER analysis of data from the Quarterly Census of Employment at Wages

Table 2 breaks the health care sector into its four sub-components: ambulatory health care, hospitals, nursing and residential care facilities, and social assistance. Ambulatory health care (e.g., doctor's offices) comprises about one-third of Flathead County's health care sector. Hospitals comprise 41 percent of employment and 53% of total wages. Nursing and residential facilities comprise 17 percent of employment and 10 percent of total wages. Social assistance comprises the remainder.

**Table 2. Components of Flathead County's private-sector health care industry, 2015**

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Source: BBER analysis of data from the Quarterly Census of Employment at Wages

Health care has also been one of Flathead County's fastest growing industries. Since 1990, health care employment grew 180 percent, from 2,200 to 6,300. Over the same period, total inflation-adjusted wages paid to health care workers increased by 340 percent, from \$71 million to almost \$313 million.

The fact that wages grew faster than employment means that the average wage in the health care sector also grew rapidly. This reflects the changing composition of health care employment more than changes to the wages of particular health care workers. That is, the growth in average wages stems from disproportionately fast growth in high wage jobs. This suggests that Flathead County's health care market has reached a size where it can support more specialty services. This has important implications for Flathead County's economy that we discuss later in this report.

Much of Flathead County's relatively fast health care growth reflects Flathead County's relatively fast population growth. Between 1990 and 2015, Flathead County's population grew by 59%. On average, places that experienced similar population growth experienced a 190% increase in health care employment and a 291% increase in total health care wages. Thus, the change in health care employment is roughly inline with other places that experienced similar population growth. However, wage growth in Flathead County has exceeded the rate of growth that occurred in other rapidly growing regions. Again, this is what would be expected if the health care sector added more specialty services.

Thus, Flathead County's health care sector is large and growing. So what does this mean? Certainly, one should pay attention to any industry that employs one out of every six workers and pays one out of every five dollars of wages. However, health care is the largest industry in close to two-thirds of places. Size alone does not capture how any industry contributes to the regional economy. A large health care sector could indicate that the local health care system is inefficient. To understand the full contribution of health care to the regional economy, we must look at more than size. We must understand how the economy would be different if the health care system was smaller, less efficient, or if it disappeared.

## **IV. How does one evaluate the contribution of an industry to a regional economy?**

To measure an industry's contribution to a regional economy, economists want to assess how the economy would differ if the industry disappeared (or changed in some other significant way).

Economists divide the regional economy into two main parts: the traded sector and the local sector. The traded sector (or tradable sector) includes establishments that primarily sell to customers elsewhere. It includes things like factories, software companies, or corporate headquarters. The local sector (or non-traded sector) includes establishments that primarily sell to local customers. It includes things like schools, grocery stores, homebuilders, and local government. A healthy regional economy requires both parts to operate well.

The different sectors contribute to the regional economy in different ways. Traded sector industries contribute primarily by bringing in money from outside the community. Local sector industries contribute primarily by keeping money, people, and businesses inside the community.

### **A. The Contribution of the Traded Sector**

A healthy traded sector contributes to the regional economy in two main ways.<sup>8</sup> First, job growth in the traded sector generates job growth throughout the region. Economists find that, on average, each traded sector job supports 1.6 jobs elsewhere in the local economy. Second, economists argue that wage growth in the traded sector leads to wage growth throughout the region. Much of the difference in wages (and prices) across regions stem from differences in the productivity of the traded sector.

In the traded sector, size and productivity are what matter. People do not particularly care what their traded sector produces.<sup>9</sup> Local residents are not dependent on its output. That is, if a region loses part of its traded sector, local consumers are not affected much. For instance, if a region had auto factories and the factories shut down, people living in the region could still buy a car. They would just buy a car made someplace else. The region, though, would lose a number of jobs.

Thus, from an economic perspective, residents mostly want a large, productive traded sector that supports jobs throughout the economy.

## **B. The Contribution of the Local Sector**

The contribution of the local sector to the regional economy is more complicated. One finds local sector industries (almost) everywhere. It is hard to fathom economies without various parts of the local sector. Market forces ensure that any place with sufficient size has each of the main parts of the local sector.

To begin to understand the contribution of the local sector, consider how the economy would differ if a part of it disappeared. When a traded sector industry disappears, the economy loses jobs and incomes, but the choices available to local consumers are not directly affected. If a local sector industry disappears, the set of choices available to local consumers changes. A good or service is no longer available locally. For instance, if all grocery stores in a region shut down, local residents could not make a quick trip to the grocery store.

To understand the effects of this loss, one needs to understand how consumers will respond to the lost local sector entity. Consumers have three choices. First, they can accept that certain goods and services are not available locally and find other things to do with their money. Second, they can travel and purchase the lost goods or services in some other community. Third, they can move someplace else.

How consumers respond determines how the loss of a part of the local sector affects the economy. For instance, if consumers do not value the lost goods or services, the consequences of the loss will be small. The money that used to flow into the lost industry would return to local residents or businesses. Consumers would find something else to buy. The value to consumers of the new items would be less than the value of the old items. As such, consumers would lose something. However, the effect of the loss on economic activity – jobs and incomes – is ambiguous. It could increase, decrease, or remain the same. If people simply redirect their spending to a different local industry, economic activity would not change much. In this instance, one would likely conclude that the lost industry contributed little to the local economy.

If the lost good or service is sufficiently valuable, people or businesses may choose to travel to obtain the lost goods or services. In this case the lost sector becomes traded, and the impact on economic activity mirrors that of the traded sector. Like the loss of a factory, the loss of the industry causes money to leave the community. As a result, local economic activity shrinks and jobs and incomes disappear. Consumers also suffer losses because they must pay the cost of travel and/or they may consume less of the lost good or service than they would like.

If people or businesses choose to move to obtain the lost goods or services, the consequences for the local economy are far worse. Rather than losing some fraction of the money spent at the lost industry, the region is losing all the money spent by

the people or firms who view its presence as necessary. This would reduce jobs, incomes, and output throughout the region by a large amount.

More important, the loss of people and businesses mean the loss of economic capacity. Losing capacity – particularly skilled, creative workers – diminishes the region’s growth prospects.

Ultimately, the local sector helps the regional economy by contributing to an attractive quality of life and a reasonable cost of living. It also helps create a robust and resilient business climate. A robust and resilient business climate is important. Traded sector industries will wax and wane. The local sector helps smooth the transition between old dying sectors and new growing ones.<sup>10</sup>

Thus, residents care about the local sector because they are its customers. A healthy local sector contributes to the regional economy by making sure that local residents can obtain the goods and services they desire. People do not want to live in places that lack good schools, extensive shopping, ample entertainment, functioning infrastructure, and affordable housing. Businesses that cannot access workers, professional services, or transportation networks struggle to compete.

Beyond its existence, the efficiency of the local sector is also important. People want an efficient local sector because the money to support it comes out of local pockets. A large, but inefficient local sector is a drain on the local economy. It increases the cost-of-living or the cost-of-business and reduces the attractiveness and competitiveness of the region.

While some argue that the traded sector is more important than the local sector (or vice versa), neither sector is superior to the other. A region needs both sectors to function. That is, each part is necessary but not sufficient to generate local economic health.

Economists usually place health care in the local sector. Most places in the United States offer health care, and most consumers purchase health care from local providers. However, in some places, a significant proportion of health care consumers come from outside the area. In these places, health care includes a traded component. Flathead County is one of these places. Thus, to understand the contribution of health care to Flathead County’s economy, we need to examine its contributions as both a local sector and a traded sector entity.

## **V. How valuable is health care?**

The reason health care exists in Flathead County is because people who live in Flathead County want care. This is the local component of health care. To assess the contribution of health care to Flathead County’s local sector, we want to assess the value it creates and its efficiency.

The first contribution that Flathead County's health care sector makes to Flathead County's economy is providing valuable health care. It is impossible to describe the contribution of health care to Flathead County's economy without discussing the value that consumers place on the care they receive.

Because health care is semi-ubiquitous, people tend to take its contributions for granted. They should not. Health care improves health. This is the primary way health care contributes to regional economies. Health is important. Health helps boost local economic capacity. Health is valuable. We cannot live without it.

People want to live, and not just live, but live well. We want to run, jump, see, hear, taste, smell, and feel. We want to experience. Health is necessary for a high quality life. As such, people value health, a lot.

The value of health (and thus the importance of health care) extends beyond the individual. Your health affects others. If you are unhealthy, your friends and family suffer. If you are unhealthy, you are less productive at work and your employer (and the rest of the economy) suffers.

Assigning a value to health is difficult. While people claim that life is priceless, economists have developed estimates for it. Technically, economists estimate the value of a statistical life (VSL). Economists recognize that your life is likely priceless to you. Instead of estimating the value people place on their own lives, economists investigate how much people are willing to pay to reduce their chance of dying. If people are willing to pay \$700 to reduce their chances of dying by 1 in 10,000, then a life is worth \$7 million.<sup>11</sup> Researchers commonly find VSLs that range between \$6 million and \$9 million.<sup>12</sup>

To help put these values in perspective, consider the following. Since 1970, life expectancy at age 50 for men increased from 21.8 years to 29.5 years. Thus, a 50-year-old today expects to live 7.7 years longer than a 50-year-old in 1970. Imagine that God came to you on your 50th birthday and offered you a choice. You could have the normal life expectancy for a 50 year old (29.5 years), or you could trade it for the life expectancy of a 50-year-old in 1970 and a suitcase full of cash. How much money would need to be in the suitcase to get you to choose the shorter life? On average, economists find that God would need to pay more than \$500,000 to get people to accept the shorter life.<sup>13</sup>

One paper estimates that the gains in longevity achieved between 1970 and 2000 contributed more than \$4 trillion per year to the U.S. economy.<sup>14</sup> That amount is equal to over one-quarter of U.S. GDP. Applying this increase to Flathead County, life expectancy gains over this period contributed over \$1 billion of value each year to Flathead County's economy.<sup>15</sup> These estimates underestimate the value of mortality reductions in the current economy. They do not include the two-year increase in life expectancy achieved since 2000.



To further illustrate the enormous value of health. The same paper argues that the value of a 1 percent reduction in cancer mortality exceeds \$500 billion, and a cure for cancer is worth more than \$50 trillion.<sup>16</sup>

Health care contributes not just by extending people's lives. It also generates value by improving the quality of people's lives. Economists estimate that people value one year of good health at approximately \$100,000.<sup>17</sup>

While individuals value longer life and better health, the value of one's health extends to other parts of the economy. Healthy people are productive people. When people live longer, avoid disability, come to work, and actually work while at work, the capacity of the economy grows. Flathead County's employers may lose 448,000 work-days each year to absenteeism (workers not coming to work because their sick) and presenteeism (workers coming to work while sick, but not getting work done).<sup>18</sup> That's the equivalent of 1,865 worker-years (or 5% of Flathead County's total employment).<sup>19</sup>

The value of productivity gains (or losses) due to health is large. When fewer people die young, the economy gains workers. One study found that the reduction in mortality between 1970 and 2000 added \$1.9 trillion to the capacity of the labor force.<sup>20</sup> When fewer people are disabled or sick, the capacity of the labor force also grows. Chronic health conditions cost the economy more than \$1 trillion each year in lost worker time.<sup>21</sup> Applying this value proportionally to Flathead County, suggests that these chronic conditions cost Flathead County \$250 million per year in lost worker time.

In sum, people want health care because health is valuable, and health care contributes to health. While health outcomes reflect a mix of genetic, behavioral, and environmental factors, economists argue that up to 50 percent of gains in life expectancy since 1950 stem from improvements to health care.<sup>22</sup> Applying this fraction to the values calculated above and allocating them proportionally to Flathead County suggests that health care generates more than \$500 million per year by extending lives. It contributes more than \$125 million per year in additional work-life capacity. Such values indicate that regardless of any other effects on the economy, health care contributes a substantial amount to Flathead County's economy simply by keeping people healthy.

## **VI. Is Flathead County's health care sector efficient?**

Health care's contribution to the local sector is not limited to whether it exists. Efficiency matters. Regions with health care systems that produce more health at lower costs are better off. Better health is good for all the reasons described in the previous section. Lower cost means residents have more money in their pockets and firms have more flexibility when constructing compensation packages and when setting prices.

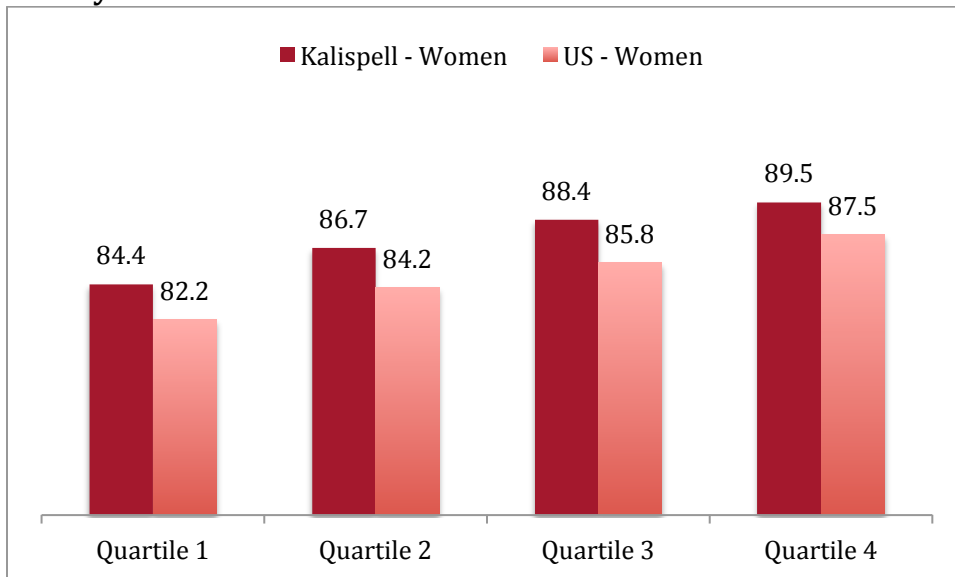
To assess the efficiency of Flathead County’s health care system, we look at three things: health outcomes, hospital performance, and health care spending. If Flathead County’s residents have good health outcomes, if its hospitals rate well, and if spending is low (relative to the outcomes obtained), we can conclude that Flathead County’s health care system further contributes to the local economy by operating efficiently.

### A. How healthy are the residents of Flathead County?

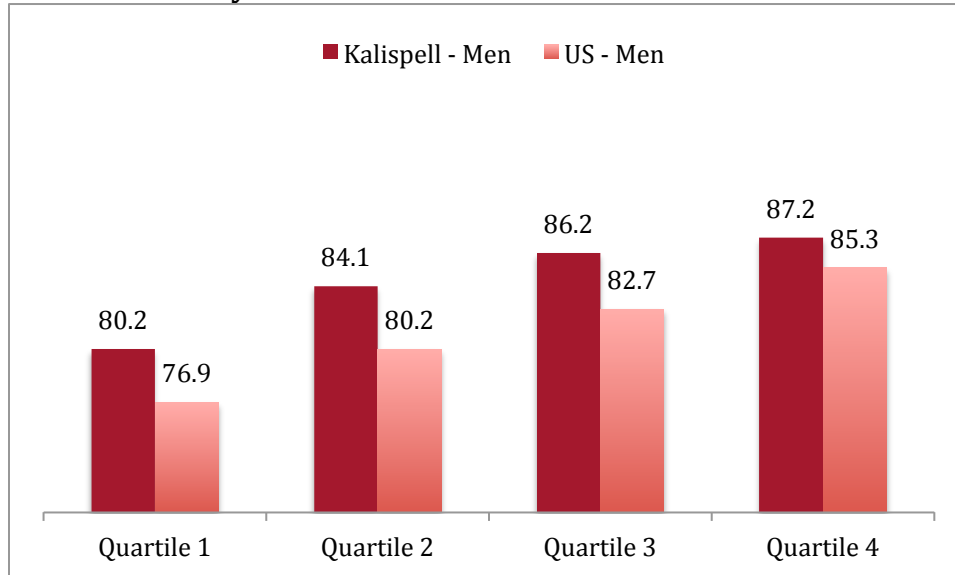
Summarizing the health of a community is difficult. Health has many facets. Given the complexity, how does one create a digestible summary of community health? In this report, we simplify our description of Flathead County’s health by focusing on a handful of broad health indicators.<sup>23</sup> These indicators provide a high level view of health in Flathead County, but they lack nuance. As such, we may miss some areas where Flathead County may perform better or worse than expected.<sup>24</sup>

First, life expectancy at age 40 in Flathead County is outstanding. Figure 1 shows life expectancy at age 40 for men and women by income quartile for Flathead County and the nation. For both men and women, across all income groups, Flathead County residents enjoy substantially higher (2-4 years) life expectancy than the average in these data. Among the nearly 1600 counties with sufficient population to be listed in this data source, Flathead County ranks in the top 2.7 percent (i.e., it ranks in the top 45).

**Figure 1: Life expectancy at age 40 by gender and income quartile, Flathead County vs. US**



**Figure 1 (cont.): Life expectancy at age 40 by gender and income quartile, Flathead County vs. US**



Source: Chetty et al (2016); The Health Inequality Project

Flathead County also performs well on other measures of health status and health behavior (Table 3). For instance, in Flathead County, 12 percent of people report being in fair or poor health. This is below the Montana average (14%) and ranks in the top 20 percent of all U.S. counties.<sup>25</sup> In Flathead County, 22 percent of people are obese. This is below the Montana average and ranks in the top 4 percent of counties. Flathead County also ranks highly on measures like low birth weight babies, physical activity, and preventable hospitalizations.

While Flathead County does not rate as high on every metric, it generally rates very well and is certainly one of the healthier places in the U.S.

**Table 3: Flathead County’s performance on selected health indicators**

	Flathead County	Montana	Flathead County’ rank among all US counties
<b>Percent in fair or poor health</b>	12%	14%	80 <sup>th</sup> percentile
<b>Percent obese</b>	22%	25%	96 <sup>th</sup> percentile
<b>Percent low birth weight babies</b>	6%	7%	80 <sup>th</sup> percentile
<b>Percent inactive</b>	18%	22%	94 <sup>th</sup> percentile
<b>Preventable hospitalizations</b>	33%	44%	94 <sup>th</sup> percentile

Source: BBER analysis of County Health Rankings data

## **B. How well does Flathead County's health care system perform?**

Another part of health care efficiency is health system performance. When people seek care, they want to have a good experience, they want to get better, and they do not want care to cause them harm. We do not have good data on performance for all providers, but Medicare.gov's "Hospital Compare" tool compiles data on nearly 100 measures of hospital performance.<sup>26</sup> As such, we can assess the performance of Flathead County's hospitals.

Based on the metrics available, Flathead County's hospitals perform well. More than 80 percent of patients at Flathead County's hospitals would recommend the hospital. More than 75 percent of patients rate the hospitals as 9 or 10 (out of 10).

Across a wide variety of metrics that encompass timely and effective care, complications, readmissions, etc., Flathead County's hospitals generally rate at or above national average.

## **C. How expensive is care in Flathead County?**

The final part of regional health care efficiency is cost. Patients want better outcomes for a lower price. They want a good deal.

While the complexity of the health care payment system makes it difficult to say exactly who benefits when health care gets cheaper, it is clear that regions that offer cheaper care enjoy some advantages.

Health care spending varies across regions. Spending in the highest cost regions can be two to three times spending in the lowest cost regions.<sup>27</sup>

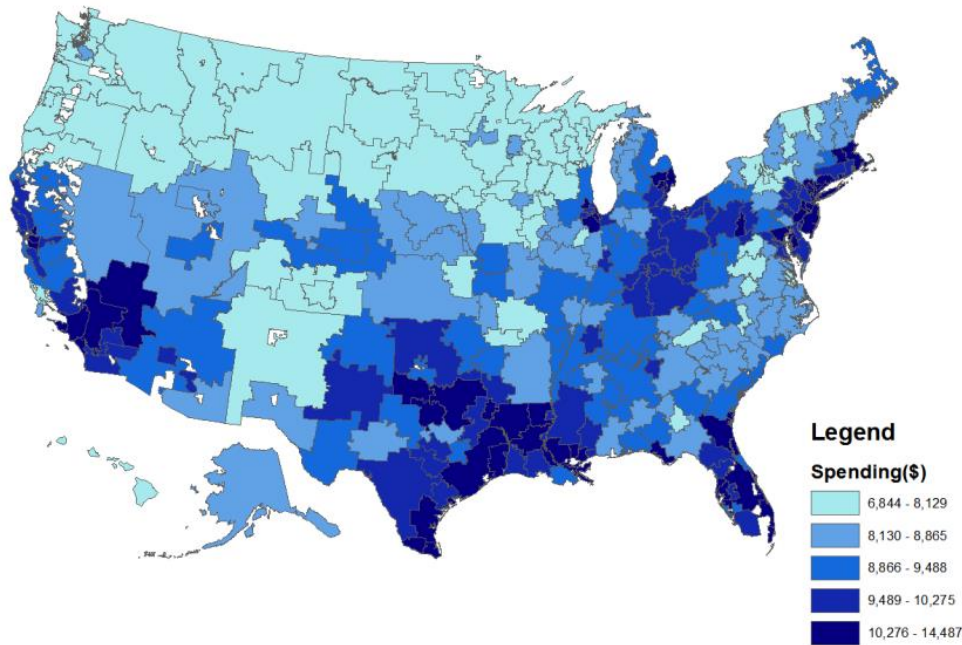
Given that local residents provide much of the health care sector's revenues, regions that offer cheaper care allow residents to keep more money in their pockets. Lower health care costs also may allow firms greater flexibility in how they compensate their workers or how they price their products.

Figure 2 presents one of the most famous descriptions of geographic variation in health care spending. This figure, based on data produced by the Dartmouth Atlas of Health Care, shows spending per Medicare beneficiary by hospital referral region.<sup>28</sup> This figure shows that Flathead County is a low-spending area. Medicare spent \$7,143 per beneficiary in the Kalispell Hospital Service Area in 2012. This ranks in the bottom 10 percent of the nation. In contrast, Medicare spent nearly double this amount in places like McAllen, TX and Miami, Florida.

The figure includes adjustments for price differences and demographics. These adjustments mean that one can interpret the differences across regions as differences in health care use. Patients in the high spending areas (the dark blue areas) receive more care than patients in the low spending areas (the light blue

areas). For instance, Medicare beneficiaries in Flathead County spend an average of 4.4 days in the hospital during their last six months of life.<sup>29</sup> This is half of the national average and a third of the highest areas. Similarly, over the last six months of life, Medicare spends more than \$20,519 per beneficiary in the highest spending areas.<sup>30</sup> Yet, Medicare spends less than \$8,500 per beneficiary during the last six months of life in Flathead County.

**Figure 2: Medicare care spending per beneficiary, 2011**

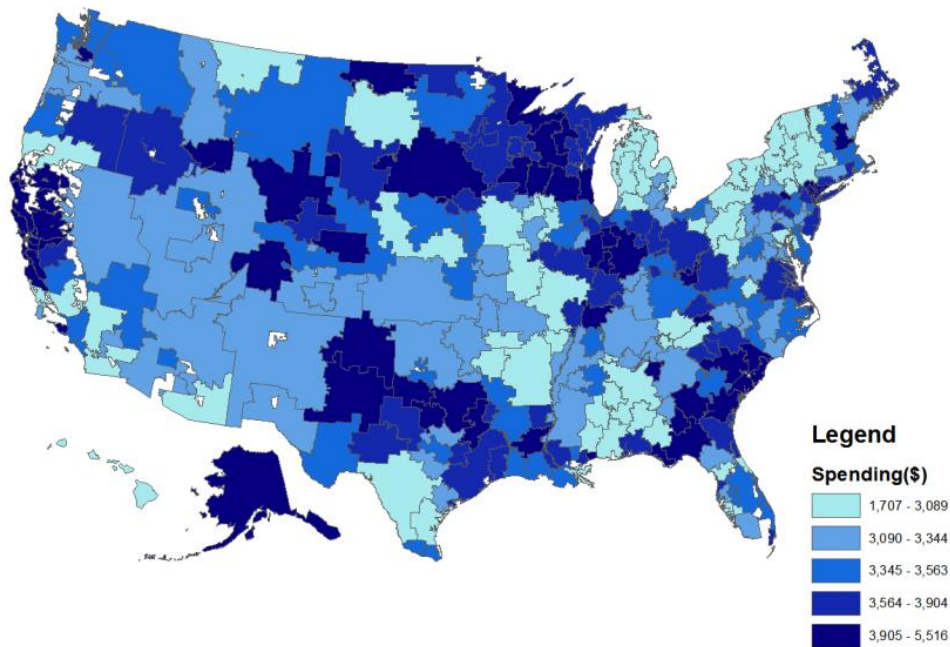


Source: Cooper et al (2015)

Recent research indicates that, within regions, the correlation between Medicare spending and private spending is weak.<sup>31</sup> That is, some regions with high Medicare spending may have low private sector spending and vice versa.

Figure 3 presents a different look at the geographic variation in spending.<sup>32</sup> This figure presents spending among a sample of commercially insured people by hospital referral region. Again, the figure shows wide variation in spending. Regions in the top category spend roughly twice as much as regions in the bottom category. This figure also indicates that health care spending in Flathead County is low. Flathead County falls in the second lowest category. However, we note two caveats. First, Flathead County is subsumed in the larger Missoula hospital referral region, and spending may vary within even this relatively small region. Second, the set of insurers who provided the data for this analysis do not include Montana's dominant insurer, Blue Cross Blue Shield.

**Figure 3: HCCI private insurer spending per beneficiary, 2011**



Source: Cooper et al (2015)

Collectively, the evidence suggests that Flathead County's health care sector is efficient. Flathead County's residents are healthy. Flathead County's hospitals are at or above average on most metrics. Flathead County's patients appear to receive less unnecessary care, and the cost of care in Flathead County is below average.

## **VII. If Flathead County's health care sector disappeared, what would happen to Flathead County's economy?**

Health care has large effects on Flathead County's level of economic activity. If Flathead County lacked a local health care sector, its residents would not simply forego care. The value of health care is large enough that its residents would still consume close to the same amount of care. This means that Flathead County's residents would either travel or move to obtain care.

If Flathead County's residents travel to get care, then most of the money that residents currently spend on health care would transfer to other areas. The economic activity supported by health care would transfer with it. As noted above, Flathead County's health care sector employs nearly 6,300 people and pays more than \$313 million in wages. Without a health care sector, this employment and these wages would disappear. All the jobs and incomes in other parts of the economy supported by health care would disappear as well.



Economists refer to the jobs and incomes in other parts of the economy tied to health care as indirect and induced impacts. Table 4 describes the gross impacts of Flathead County’s health care sector as measured by REMI (a standard software package used to conduct economic impact analysis). This analysis suggests that 12,995 jobs, \$1 Billion in personal income, and \$1.1 Billion in GDP are directly or indirectly related to health care spending. This means that every job in the health care sector support approximately one job elsewhere in Flathead County.

**Table 4: Gross economic impacts of Flathead County’s health care sector**

	<b>GDP (\$Millions)</b>	<b>Employment</b>	<b>Labor income (\$Millions)</b>
<b>Total</b>	1,076	12,995	1,039

In addition, if people leave Flathead County to obtain care, health care providers will not invest in new health care facilities. While the numbers above include the maintenance and repair of existing facilities, they do not fully account for the economic activity related to the construction of new facilities.

Between 2012 and 2018, Flathead County’s health care providers will have invested \$147 million in the creation of nearly 595,000 square feet of new health care facilities. This amounts to roughly \$25 million per year in new facilities.

Recent building levels in Flathead are above average. On average, Americans spend \$140 per person on health care construction. Depending on how one defines the region’s population, we would expect spending of approximately \$13-16 million per year; however, this level is not surprising given Flathead County’s recent (and projected) rapid population growth.

Every million dollars spent on the construction of new health care facilities generates slightly more than \$1,260,000 in GDP for Flathead County’s economy. It total, \$25 million spent on health care construction is associated with approximately 423 jobs, \$31 million in personal income, and \$32 million in output for Flathead County’s economy.

Combining these construction estimates with those above, nearly 13,400 of Flathead County’s 39,400 jobs can be directly or indirectly traced back to its health care sector. Similarly, approximately one-third of total employment can be directly or indirectly traced back to Flathead County’s health care sector. Removing health care would have massive impact on Flathead County’s economy.

These estimates, though, underestimate the impact of health care on Flathead County’s economy. It assumes that the primary impact of the loss of its health care sector is the loss of spending on health care. However, it is likely that many, though not all, of Flathead County’s residents would move away if health care disappeared in their community. For many people, access to health care is a prerequisite for living in a community. One study found that 84 percent of a rural population



indicated that living near a hospital was important or very important.<sup>33</sup> Research finds that people who live near developed health care systems experience better health outcomes.<sup>34</sup> People understand this, and this shapes where they consider living.

**Table 5: Recent and expected construction projects**

Project	Completed	SF	\$ millions
<b>FVCC Nursing &amp; Health Sciences Bldg</b>	2013	32,000	\$5.7
<b>Glacier Eye Clinic</b>	2014	17,058	\$3.6
<b>Imm. Lutheran: Memory Care</b>	2017	31,751	\$8.2
<b>Imm. Lutheran: Retreat Expansion</b>	2017	21,925	\$4.0
<b>Imm. Lutheran: Terrace Expansion</b>	2012	15,036	\$5.6
<b>Imm. Lutheran: The Retreat</b>	2012	18,120	\$4.8
<b>KRMC: Central Plant</b>	2018	8,361	\$3.0
<b>KRMC: Emergency Room</b>	2017	37,516	\$14.0
<b>KRMC: Gastrointestinal Clinic</b>	2018	30,000	\$12.0
<b>KRMC: Oncology Center</b>	2015	4,230	\$2.1
<b>KRMC: Pediatrics Center</b>	2018	182,813	\$37.8
<b>KRMC: Surgical Tower</b>	2013	130,446	\$34.0
<b>NW Family Medicine</b>	2017	8,250	\$1.8
<b>Oral Surgery Center (Dr. Weber)</b>	2016	7,800	\$1.5
<b>Rising Sun Assisted Living</b>	2013	20,000	\$3.5
<b>The Rock</b>	2015	29,000	\$5.4
<b>Total</b>		<b>594,306</b>	<b>\$147.0</b>

When CNNMoney listed Kalispell as one of the 25 Best Places to Retire in 2012, it highlighted the fact that “Health care is superb; Kalispell Regional Medical Center ranks among the top hospitals in the nation.” Health care is one of the essential things that people look for when considering a place to live.

If people or businesses will not locate in a place without health care, then the impact of health care on Flathead County’s economy may be many times larger than the estimates described in Table 3. It is easy to imagine that losing health care would turn Kalispell into small town over the long -run. Thus the true economic impact of health care is substantially larger than the values reported in Table 3.

Unfortunately, estimating the full value of health care is difficult. Because the market generates supply where sufficient demand exists, economists do not have data to compare economies with health care to similar economies without health care. Thus, we cannot describe precisely how Flathead County’s economy would differ without its health care system. However, sufficient evidence exists to support the conclusion that losing its health care sector would weaken the economy.

## VIII. How large is the traded component of Flathead County's health care sector?

In most communities, the vast majority of patients come from within the local community. In some communities, however, residents from outside the community provide a large share of health care revenue. When serving patients from outside the area, health care providers export health services. When they do this, health care becomes more like a factory, part of the traded sector. It brings in money from outside the community that circulates throughout the local economy, creating jobs and incomes for others.

Flathead County is the hub of Northwestern Montana. Its health care providers serve more than just the residents of Flathead County. Inpatient and outpatient data from Flathead County hospitals indicate that slightly more than 20% of patients and spending come from residents who reside in zipcodes outside of Flathead County.

How much does the traded component of health care contribute to economic activity (aka jobs and incomes) in Flathead County? This is difficult to calculate precisely, but we do have the tools to estimate the basic order of magnitude.

To calculate the contribution of the traded component of health care, we want to imagine what the economy would be like if people from outside the area did not travel to Flathead County for care and if people from Flathead County left to seek some forms of care elsewhere. While we have some data about how much money flows into Flathead County from outside of Flathead County, we do not have such data for every health care provider. As such, we cannot estimate the size of the traded component directly.

Instead, to estimate the traded component's contribution, we ask a different question: "How much larger is Flathead County's health care industry than we might expect given Flathead County's characteristics?" The extent to which employment deviates from expectation provides a crude measure of the impact of the traded component of health care on employment or payroll.

Total employment in health care is strongly related to population. Cities with larger populations have larger health care employment. On average, if you double the size of a city, you nearly double the size of its health care sector. Population explains over 90 percent of the variation in total health care employment across metro areas.

Thus, comparing health care employment in Flathead County to employment in similar sized counties provides a simple way to estimate Flathead County's "excess" health care employment.

Relative to other areas its size, Flathead County has approximately 800 "extra" health care workers and approximately \$65 million in "extra" wages. Thus, relative to the average county its size, Flathead County has 15% more health care

employment and 26% more health care payroll. Given that approximately 20% of health care spending comes from outside Flathead County, these values seem reasonable.

These estimates suggest that the traded component of Flathead County's health care sector directly accounts for 2% of Flathead County's employment and 4% of its wages. To help put this in perspective, the traded component of Flathead County's health care sector is roughly one-third the size of Flathead County's manufacturing sector.

These numbers still underestimate the contribution of the traded component of health care. Unlike a factory where the output gets delivered to customers, "exporting" health care (usually) entails the customer traveling to Flathead County. When patients travel to Flathead County they spend money elsewhere in the community. They buy gas. They eat at restaurants. They (or their family members) may stay at a hotel. They may combine a trip for treatment with shopping. Without extensive surveys of out-of-town patients, we cannot say how large these additional effects are. However, it seems quite plausible that such effects add jobs and income to Flathead County's economy.

The discussion thus far misses an important aspect of the "traded" component of health care. While Flathead County's economy enjoys increased activity when people come from outside of the county to receive health care, its economy also enjoys increased activity when residents who might otherwise leave to receive care stay and receive care locally. Economists refer to this process as import substitution, and it reflects an important part of how health care contributes to Flathead County's economy.

In past years, more residents of Flathead County had to leave to obtain certain types of care. Flathead County's population was not large enough to support various health care services, so people had to travel elsewhere to obtain them. This drained some money (and related economic activity) from the region.

However, over the past several decades as Flathead County's population has grown, its population (and the population in surrounding areas) has reached the scale required to support more specialty services. This has two important effects. First, when people get care locally, money that would otherwise have left the area remains in the region supporting jobs and incomes throughout the economy. Second, a more robust health care sector may positively affect whether people choose to move to or remain in Flathead County.

## IX. What does the future hold for health care in Flathead County?

Most forecasters expect health care to grow into the future. For instance, the Bureau of Labor Statistics projects that health care employment will grow by 21 percent between 2014 and 2024.<sup>35</sup> This projected growth rate exceeds the projection for every other industry. It is also 20 percent faster than health care grew between 2002 and 2012. Of the 21 industries expected to grow the most through 2022, six are in the health care industry, including the top three.

A 21 percent increase in health care employment would mean 1,300 additional health care jobs in Flathead County by 2024. Of course this likely understates the likely growth in Flathead County's health care employment over this period – potentially by a substantially amount. Over the past several decades, health care has grown much faster in Flathead County than in the U.S. overall. Flathead County's faster growth reflects faster than average population growth compounded by the fact that its population has crossed various thresholds necessary to support higher-level specialty care. If these trends continue, Flathead County's health care growth will continue to outpace the U.S. For instance, if Flathead County's health care sector grows at the same rate its grown at over the past 25 years, it will add approximately 2,500 jobs by 2024.

Forecasting a precise value for the growth in Flathead County's health sector is difficult. All forecasts contain a large margin of error. The path of health care spending and employment reflects the confluence of many factors. Changes to any one factor ripple through the system. As such, it is better to focus on the logic that underlies the forecast, and not its precise numbers.

To forecast health care growth, one needs to forecast population growth, health care utilization per person, and health care prices. Forecasting population growth depends on figuring out the natural rate of increase as well as net migration.

### Utilization

Utilization describes how much care each person receives. Utilization rates change when patients change, when policy changes, and when medical science changes. To forecast utilization, economists consider a series of questions:

- Is the population going to be less healthy and require more care per person (i.e., will it become older or will it become more obese)?
- Is a greater share of the population going to have health insurance?
- What new technologies will become available, and how will new technology affect total utilization?

- Will health care delivery become more efficient (e.g., will better coordinated care lead to fewer errors, better outcomes, and a better understanding of how best to care for patients)?

Prices reflect the cost of delivering care and the extent of market power. Prices change when the cost of care changes or when the relative market power of providers change. When considering the likelihood of price changes, economists ask:

- How much expensive new technology will be adopted?
- How will the cost of skilled workers, etc. change?
- How much market power will exist and how might it be exercised?

Some of these questions are easier to answer than others. For instance, we know that the population will age with the baby boomers over the next several years and that will increase health care utilization. A few years ago, only 13 percent of Montana's population was over age 65, a few years from now 24 percent of Montana's population will be over age 65. Given that older people consume more health care than younger people, health care utilization will increase. We also know that the Affordable Care Act increased the share of people with health insurance and this increase is expected to (over the long run) drive an increase in health care utilization. Combined, aging and expanded insurance coverage will likely boost health care in Flathead County by a sizeable amount.

However, there may be some factors that work against health care and may limit its growth. For instance, the health care sector is currently attempting a number of initiatives designed to improve health care efficiency (i.e., generate more health at lower cost). If successful, these initiatives may reduce health care use and health care spending. It is also possible that new medical technologies will reduce the need for certain types of health care (although it is also possible the new technologies will increase demand for care).

Forecasts tend to assume recent trends will continue with adjustments for the things we know will change. Many (and perhaps most) of the determinants of health spending, though, remain unknown, so any forecast will have a large margin of error.

The main forces that shape the forecast for the U.S. apply in Flathead County. Thus, health care in Flathead County should grow along with the U.S. health care sector. There are, however, two factors which may affect the growth of Flathead County's health care over the short- and long-run – population growth and a greater propensity to travel for certain types of specialty care.

## **Population Growth**

The key driver of Flathead County's faster than average health care growth is population growth. Since 1990, Flathead County has experienced very fast population growth – ranking in the top 10 percent of areas. As population grows, the health care system grows along with it. A larger population requires the health care system to expand its existing capacity to continue to provide the same level of service. However, a larger population also means that the health care sector can expand and provide new services. Certain types of health care require a certain population base to be feasible, and as Flathead County passes certain thresholds it has and will continue to develop new capacity.

While Flathead County's population growth slowed around the Great Recession, in recent years it has returned to levels that were common in the early 2000s. Flathead County offers access to an amazing and highly desirable set of natural amenities. These natural amenities combined with its local consumer amenities, including its health care sector, make Flathead County a desirable place to live. Assuming that the other factors that affect individual's location choices (e.g., jobs and cost of living) do not shift in ways to offset Flathead County's quality of life advantage, Flathead County's population should continue to experience relatively rapid population growth. Population growth should, in turn, continue to fuel rapid health care growth.

### **Travel for care**

In the traditional model of health care growth, as Flathead County's population grows, it will expand its health care offerings. An expanded range of services will lead to fewer people from Flathead County leaving to obtain care and will lead more people living near Flathead County to choose Flathead County over some further destination. This has already occurred in Flathead County and will likely to continue to occur.

However, among the many changes currently occurring in health care is experimentation with encouraging people to travel greater distances for care.<sup>36</sup> For instance, some insurance companies have begun to encourage patients to fly far from home to receive care. This trend is driven by research finds that greater specialization can improve health care outcomes and reduce costs. Thus, insurance companies and patients have incentives to seek out the highest quality, lowest cost provider – for at least some specialty services. If the cost savings, quality improvement is sufficient to justify the cost of travel, more patients may begin to travel far away for care.

This trend has two potential implications for Flathead County. First, if a sufficient number Flathead County residents choose to travel elsewhere for care, it will limit or slow how much health care in Flathead County grows with its population. Second, it creates an opportunity for Flathead County to attempt to become a destination care provider (and boost the amount of its health care that is traded). To become a destination care provider, Flathead County will have to offer

high quality care at a low price. It may be able to do this. It may be possible to use its high quality of life to attract skilled providers and patients to support more traded-sector health care.

## **X. Conclusion**

Health care is a large and important industry in Flathead County. It employs lots of people and supports lots of other jobs throughout Flathead County's economy. However, the jobs and incomes directly or indirectly supported by the health care sector comprise only a small portion of the health care sector's overall contribution to the regional economy.

Health care also contributes to the local economy by attracting people and firms. Health care is a necessary industry. People want to be healthy, and they want to live reasonably close to health care services that help keep them healthy. Without a robust health care sector, Flathead County would be a less desirable place to live and work.

Health care also contributes to the local economy by producing care efficiently. Residents also want their health care sector to be efficient. That is, they want to obtain good health care outcomes at the lowest possible cost. Flathead County's health care sector appears to be very efficient. Flathead County residents have good health outcomes, highly regarded health care providers, but spend less per person on health care than most other places in the U.S.. Relative to people in other places, this means that residents and firms have more money to support other local economic activity.

Finally, health care in Flathead County is likely to continue growing. As the sector grows, its contribution will grow. A more robust health care sector means the fewer residents need to travel elsewhere for care. This keeps more money in the local economy (supporting more jobs and incomes throughout the region) and it makes the region a more desirable place to live.



## Endnotes

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<sup>1</sup> Specifically, health care consumed 17.5 percent of GDP in 2014. Centers for Medicare and Medicaid Services, National Health Expenditures 2014 Highlights.

<sup>2</sup> Throughout this report, we use 2-digit NAICS codes as the primary unit of analysis. When we refer to industries, we refer to 2-digit industries.

<sup>3</sup> These data come from the Quarterly Census of Employment and Wages (QCEW) area annual average file for the whole U.S.

<sup>4</sup> Table 4 of Bureau of Labor Statistics, Employment Projections  
<http://www.bls.gov/news.release/ecopro.t04.htm>

<sup>5</sup> BBER analysis of annual average QCEW data.

<sup>6</sup> For instance, because the hospital sector in Flathead County includes only 2 firms, employment and payroll for Flathead County's hospital sector is not always publicly available.

<sup>7</sup> We report the data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages. These data include "covered employment," i.e., people who work at jobs with unemployment insurance coverage. Other data sources (e.g., the Census Bureau's County Business Pattern or the Bureau of Economic Analysis' Regional Accounts data) provide slightly different values.

<sup>8</sup> This description includes only a high level summary of the traded sector's contribution. For a more detailed discussion, see, Ward, B. et al (2012) "The Traded Sector in Portland's Regional Economy."

<sup>9</sup> People may take some pride in their region's output, and they may prefer industries that do not create negative spillovers (like pollution); however, for the most part, what the traded sector produces is less important than how big and productive it is.

<sup>10</sup> Economist Wilbur Thompson commented over 50-years ago, "... [A]ll products wax and wane, and so the long-range viability of any area must rest ultimately on its capacity to invent and/or innovate or otherwise acquire new export bases. The economic base of the larger metropolitan area is, then, the creativity of its universities and research parks, the sophistication of its engineering firms and financial institutions, the persuasiveness of its public relations and advertising agencies, the flexibility of its transportation networks and utility systems, and all the other dimensions of infrastructure that facilitate the quick and orderly transfer from old dying bases to new growing ones."

<sup>11</sup> Imagine, 10,000 people in a basketball stadium, and we know that two of them will die at random. Someone comes in and asks each person what they would pay to ensure that only 1 person would die. If people would on average pay \$700 to reduce their risk of dying by 1 in 10,000, then collectively the 10,000 would pay \$7 million to keep one person alive. In this case, economists say that the value of a statistical life is \$7 million.

<sup>12</sup> Aldy, J. E., & Smyth, S. J. (2014). Heterogeneity in the Value of Life. *Resources for the Future Discussion Paper*, (14-13); Aldy, J. E., & Viscusi, W. K. (2008). Adjusting the value of a statistical life for age and cohort effects. *The Review of Economics and Statistics*, 90(3), 573-581; U.S. Environmental Protection Agency (2014) *Guidelines for Preparing Economic Analyses*. EPA 240-R-10-001

<sup>13</sup> This value is adapted from Murphy and Topel (2003). They estimated that the value of longevity increases between 1970 and 2000 for 50 year-olds was \$350,000 in 2000. We adjusted this value to \$2014 and scaled it up slightly to reflect the addition gains in life expectancy since 2000. Murphy, K. M., & Topel, R. H. (2003). Diminishing returns?: The costs and benefits of improving health. *Perspectives in biology and medicine*, 46(3), S108-S128.

<sup>14</sup> This is the value reported in Murphy and Topel (2005) adjusted for inflation. Murphy, K. M., & Topel, R. H. (2005). *The value of health and longevity* (No. w11405). National Bureau of Economic Research.

<sup>15</sup> This is the Murphy and Topel (2005) estimate adjusted for inflation and scaled in proportion to Flathead County's share of the US.

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<sup>16</sup> Murphy and Topel (2005)

<sup>17</sup> Frakt, A. (2014) "How much would you pay for a quality-adjusted life year?"

<http://theincidentaleconomist.com/wordpress/how-much-would-you-pay-for-a-quality-adjusted-life-year/>

<sup>18</sup> This calculation assumes that, on average, each worker misses approximately 11 days of work due to absenteeism or presenteeism. This is based on the estimates from Mitchell, R. J., & Bates, P. (2011). Measuring health-related productivity loss. *Population health management*, 14(2), 93-98. Other studies, though, report different magnitudes for the number of days lost to absenteeism and presenteeism, e.g., Davis, K., Collins, S. R., Doty, M. M., Ho, A., & Holmgren, A. L. (2005). Health and Productivity Among US Workers, Goetzel, R. Z., Long, S. R., Ozminkowski, R. J., Hawkins, K., Wang, S., & Lynch, W. (2004). Health, absence, disability, and presenteeism cost estimates of certain physical and mental health conditions affecting US employers. *Journal of Occupational and Environmental Medicine*, 46(4), 398-412.

<sup>19</sup> This calculation assumes a work-year includes 240 days.

<sup>20</sup> Bhattacharya, J., & Lakdawalla, D. N. (2006, January). The labor market value of health improvements. In *Forum for Health Economics & Policy* (Vol. 9, No. 2).

<sup>21</sup> DeVol, R., Bedroussian, A., Charuworn, A., Chatterjee, A., Kim, I., Kim, S., & Klowden, K. (2007). An unhealthy America: The economic burden of chronic disease. *Santa Monica, CA: Milken Institute*. Other studies use different assumptions and find different values (e.g., Davis et al (2005) estimate the losses of \$328 billion (\$2014) in 2004).

<sup>22</sup> Cutler, D. M., Rosen, A. B., & Vijan, S. (2006). The value of medical spending in the United States, 1960–2000. *New England Journal of Medicine*, 355(9), 920-927.

<sup>23</sup> Additional data on Flathead County's health can be obtained from [countyhealthrankings.org](http://countyhealthrankings.org), [healthindicators.gov](http://healthindicators.gov).

<sup>24</sup> We note that many of these measures come from surveys, and, as such, they have a margin of error. The margin of error for a place the size of Flathead County can be high. This limits how much we conclude about how Flathead County's health, but the data are still useful.

<sup>25</sup> Depending on the indicator, the number of counties ranges 2,741 and 2,936.

<sup>26</sup> <http://www.medicare.gov/hospitalcompare/search.html>

<sup>27</sup> Institute of Medicine of the National Academies (2013) *Variation in Health Care Spending: Target Decision Making Not Geography*. Washington D.C.: The National Academies Press.

<sup>28</sup> <http://www.dartmouthatlas.org/data/topic/topic.aspx?cat=21>

<sup>29</sup> Dartmouth Atlas

<sup>30</sup> Dartmouth Atlas

<sup>31</sup> Chernew, M. E., Sabik, L. M., Chandra, A., Gibson, T. B., & Newhouse, J. P. (2010). Geographic correlation between large-firm commercial spending and Medicare spending. *The American journal of managed care*, 16(2), 131; Cooper, Z., Craig, S. V., Gaynor, M., & Van Reenen, J. (2015). *The price ain't right? Hospital prices and health spending on the privately insured* (No. w21815). National Bureau of Economic Research.

<sup>32</sup> Marder, W. D., Carls, G. S., Ehrlich, E. M. I. L. Y., & Fabius, R. (2011). Geographic variation in spending and utilization among the commercially insured. *Thomson Reuters White Paper*.

<sup>33</sup> Sørensen, J. F. (2008). The potential migration effect of rural hospital closures: A Danish case study. *Scandinavian journal of public health*, 36(5), 460-466

<sup>34</sup> E.g., [http://ruralhealth.stanford.edu/health-pros/factsheets/downloads/rural\\_fact\\_sheet\\_5.pdf](http://ruralhealth.stanford.edu/health-pros/factsheets/downloads/rural_fact_sheet_5.pdf)

Jones, C. A. (2010). *Health status and health care access of farm and rural populations* (No. 57). DIANE Publishing, Chan, L., Hart, L. G., & Goodman, D. C. (2006). Geographic access to health care for rural Medicare beneficiaries. *The Journal of Rural Health*, 22(2), 140-146.

<sup>35</sup> Bureau of Labor Statistics, Employment Projections; Such forecasts are consistent with various forecasts for health care spending growth. While health care spending growth has slowed in recent years, economists still expect health care to grow faster than the economy. As a result, health care

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spending as a share of GDP will continue to rise. Forecasts suggest that the health care spending will rise from 17.9 percent of GDP to 23 percent by 2032.

<sup>36</sup> Gawande, Atul “Overkill: An avalanche of unnecessary medical care is harming patients physically and financially. What can we do about it?” *The New Yorker* May 11, 2015.