

**The Impact of the Local Health Care System  
on the Carson City Economy**



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**The Impact of the Local Health Care System  
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## **Introduction**

The primary purpose of this report is to document the contribution of the health sector in Carson City to the local economy. Data presented in this report reveal that the local health care sector has a substantial impact on income, employment, and sales tax revenue in Carson City – a contribution often overlooked in public policy discussions of health care costs, access to care, and community benefits. The health sector plays a critical role in local economic development by creating jobs and income for residents of Carson City through the normal operations of hospitals and other health-related enterprises. The health sector is also responsible for generating employment and income in other businesses in the community.

Utilizing the most current Nevada Department of Training, Employment and Rehabilitation and IMPLAN data available, the analysis presented in this report indicates that the health sector in Carson City employed 3,688 individuals in 2007. When the employment created by other businesses as a result of the health sector is included in the analysis, the Carson City health sector directly and indirectly generated a total of 5,784 jobs in the county. Similarly, the local health sector generated \$222 million in payroll for the year 2007. When the income created by other businesses as a result of the health sector is included in the analysis, the health sector was responsible for \$298 million in payroll for health sector employees and those employed in other businesses.

As local and state policymakers consider the medical and health care priorities for Nevada, they should bear in mind the importance of hospitals and the health sector to local and regional economies. As this report demonstrates, the Carson City health sector provides much more than necessary medical care and services. The jobs, income, and economic benefits created in other businesses, as well as sales tax revenue generated by all sectors represent additional contributions to economic well-being in Carson City. Finally, the health care sector's investment in high technology, capital improvements, and new construction continues to generate additional income and employment for the county's economy.

This report – *The Economic Impact of the Local Health Care System on the Carson City Economy* – was prepared for the citizens, community leaders, and health care providers of Carson City by the Nevada Rural Health Works Program. Rural Health Works is a joint research and policy analysis program of the Nevada Office of Rural Health at the University of Nevada School of Medicine, Nevada Cooperative Extension, and the Center for Economic Development at the University of Nevada, Reno. Over the past decade, Nevada Rural Health Works Program has provided local and state leaders with the information and assistance needed to make the best possible decisions about the role of hospitals and the health sector in economic development. Research undertaken by the Nevada Rural Health Works Program includes community health care needs assessments, budget studies and feasibility assessments, community health planning, market demand studies, and economic impact analysis.

*The Economic Impact of the Local Health Care System on the Carson City Economy* is divided into three major sections. The first section briefly discusses the role of the health sector in economic development, highlighting the financial and non-financial linkages between the health sector and the rest of the local economy. The second section provides an overview of the social,

demographic, and economic context of the health sector in Carson City. The third section demonstrates the direct and indirect economic impact of the health sector on jobs and payroll in Carson City. Utilizing an economic impact model developed specifically for the health care industry, this report provides estimates of the direct economic contribution of hospitals and the health sector, as well as the indirect or secondary income and employment impacts in other businesses resulting from hospital and other health-sector economic activity. The jobs and income generated in other business are estimated with employment and income multipliers derived for Carson City and Nevada. The report also contains an appendix that summarizes the model and data used to estimate employment and income multipliers.

## **Health Care and Local Economic Development**

Over the past couple of decades, the health sector has become an important engine of economic growth in Carson City and Nevada. The health sector includes hospitals, clinics, and physician practices, as well as nursing homes, pharmacies, and other providers of medical services and products. The premise of this report is that communities and leaders need to improve their understanding of the importance of the health sector to the local economy, including the amount of jobs and payroll it provides, directly and indirectly, and its role in generating additional employment and income to the residents of Carson City. The nexus between health care services and development is typically overlooked. At least three primary areas of commonality exist. First, a strong health care system can attract and maintain business and industry growth. Second, the existence of quality health care services is a key factor in attracting and retaining retirees. Third, a strong health care system generates jobs and payroll locally and, thus, “keeps health care dollars at home.”

### Local Business and Industry Growth

Research has documented the important role of quality-of-life factors in business and industry location decisions. A key quality-of-life factor is the availability and quality of health care services. The availability of health care services is important for a couple of reasons. First, employees and management may offer strong resistance if they are asked to move into a community with substandard or inconveniently located health services. Second, any business or industry making a location decision wants to ensure that the local labor force will be productive, and a key factor in productivity is good health. Thus, investments in health care services yield dividends in the form of increased labor productivity. Finally, the rising cost of health care services is a key factor considered by business and industry in location decisions. The existence of health care services locally can lower health care costs for business and their employees and provide value-added services for firms such as occupational health.

### Health Services and Attracting Retirees

A strong and convenient health care system is important to retirees, a special group of residents whose spending and purchasing is a significant source of income for the local economy. Many areas have environments (e.g., good climate and outdoor activities) that enable them to be in a good position to attract and retain retirees. The amount of spending by retirees, including the

purchasing power associated with Social Security, Medicare, and other transfer payments, is substantial. Additionally, middle- and upper-income retirees often have substantial net worth. Several studies have indicated that the availability of quality health services, along with safety, housing, and recreation opportunities, was a key predictor of retirement location considerations. In general, like workers, retirees are more likely to choose a retirement location that has access to quality health care.

### Health Services and Job Growth

A factor important to the success of economic development is job creation. From 1970 to 2000, employment in health services in Nevada grew by 53,410 jobs and real payroll increased from approximately \$89 million to \$2.2 billion (2000 dollars). During the same period, employment in the hospital sector in Nevada grew by nearly a factor of 10 to 21,737 jobs and real payroll increased by \$732 million. Over the past thirty years, workers in the health sector and the hospital industry have experienced significant gains in real wages. From 1970 to 2000, the real wage per job in the hospital sector increased by \$13,648 or 68% to \$33,677. The same data indicate that employment in hospital and other medical services has been accompanied by the growth of disproportionately better paying jobs. In general, payroll and employment in the Nevada health care sector, including Carson City, have grown consistently over the past thirty years.

More recently, state and federal data indicate that employment and payroll growth in health services and the hospital industry has been robust. For example, from 2003 to 2007, overall hospital employment in Nevada grew by 4,500 jobs or 18%. During the same period, statewide hospital payroll grew in real terms by nearly \$500 million. In general, payroll and employment in the health care sector in both rural and urban counties of Nevada continues to grow. Moreover, the principal demographic factors driving increased demand for hospital care and other health care services – population growth and population aging – are projected to increase substantially over the next two decades.

### Summary: “Keeping Local Health Care Dollars at Home”

As the preceding suggests, the existence of a strong health care system plays a critical role in local economic development by attracting business, industry and retirees, as well as generating jobs and payroll in its own right. However, the most important economic role the health sector plays in local economic development is “keeping local health care dollars at home.” There are many sources of local health care dollars including commercial and private insurance, Medicare, Medicaid and other transfer payments, and consumer out-of-pocket payments to health care providers and businesses. If these expenditures leave the community (e.g., an individual who leaves Carson City for medical care that could be obtained locally), they represent a real loss of potential jobs and income to local residents. In other words, payments for health care services and goods outside of the local community not only affect the health services sector, the “leakage” of those dollars out of the community has repercussions for the entire local economy.

Health care employers and employees are important purchasers of goods and services supporting local business and industry. In Carson City and most other counties in Nevada, employees in the

health service sector realize higher than average wages and are an important segment in local household consumption. Hospitals and other health sector establishments are also important purchasers of local goods and services, such as laundry and waste management, essential to the provision of health care. In summary, the health sector and other businesses that comprise the local economy mutually support one another through purchases and sales. As such, the strength and vitality of the health services sector is a key component of local economic development. The following two sections document the importance of the health services sector in Carson City and highlight the economic contributions of the health sector to the local economy.

### Demographic and Economic Context of Health Care in Carson City

Tables 1 and 2 provide selected demographic and economic data for Carson City and the State of Nevada.<sup>1</sup> Table 1 highlights the population growth experienced by Carson City over the past decade, as well as projected population growth through 2018 based on estimates provided by the Nevada State Demographer’s Office. Over the next decade, the population is expected to continue to grow, but at a much slower pace than the state as a whole. Carson City possesses a larger percentage of residents over the age 65 (15.0%) than the state (11.3%).

**Table 1 – Demographic Indicators for Carson City and the State of Nevada**

| Demographic Indicator                          | Carson City     |         | State Percent |
|--|-----------------|---------|---------------|
|  | Number          | Percent |               |
| <b>Population Growth (1990-2000)</b>           | 40,950 - 53,208 | 29.9%   | 63.7%         |
| <b>Population Growth (2000-2007)</b>           | 53,208 - 57,723 | 8.5%    | 34.3%         |
| <b>Estimated Population Growth (2008-2018)</b> | 57,535 - 59,212 | 2.9%    | 25.6%         |
| <b>Population by Race (2007)</b>               |                 |         |               |
| <b>White not of Hispanic Origin</b>            | 43,960          | 76.2%   | 60.6%         |
| <b>Black not of Hispanic Origin</b>            | 394             | 0.7%    | 6.9%          |
| <b>Native American</b>                         | 1,326           | 2.3%    | 1.3%          |
| <b>Other</b>                                   | 1,395           | 2.4%    | 6.6%          |
| <b>Hispanic Origin of Any Race</b>             | 10,647          | 18.4%   | 24.5%         |
| <b>Population by Age (2007)</b>                |                 |         |               |
| <b>0-18</b>                                    | 14,621          | 25.3%   | 26.5%         |
| <b>19-64</b>                                   | 34,425          | 59.6%   | 62.2%         |
| <b>65 and over</b>                             | 8,677           | 15.0%   | 11.3%         |

<sup>1</sup> Data sources, references, and notes for each table are contained in Appendix B.

Table 2 provides an economic snapshot of Carson City and comparative data for Nevada and the United States. Carson City possesses a higher per capita income than either the state or the nation but relies more on transfer payments as a percent of total personal income as compared to the state and less as compared to the nation. Table 2 also provides information on transfer payments and public health care enrollment in Carson City and Nevada. The percent of county residents in the Medicaid program is higher than the state average (11.6% versus 9.0%). Additionally, a greater percentage of Carson City residents (17.0%) are enrolled in the Medicare program than the state as a whole (11.6%). This result is not surprising as Carson City has a higher percentage of residents over the age 65 than the state.

**Table 2 – Economic Indicators for Carson City, Nevada and the United States**

| <b>Indicator</b>                                      | <b>Carson City</b> | <b>Nevada</b> | <b>United States</b> |
|---|--------------------|---------------|----------------------|
| <b>Total Personal Income*</b>                         | \$2,286,325        | \$97,188,684  | \$10,968,393,000     |
| <b>Per Capita Income</b>                              | \$41,478           | \$38,994      | \$36,714             |
| <b>Total Earnings*</b>                                | \$1,875,117        | \$72,588,754  | \$8,432,719,000      |
| <b>Poverty Rate</b>                                   | 12.9%              | 10.6%         | 13.0%                |
| <b>Child Poverty Rate (Ages 0-17)</b>                 | 19.7%              | 14.9%         | 18.0%                |
| <b>Employment</b>                                     | 27,093             | 1,271,472     | 146,047,000          |
| <b>Unemployment</b>                                   | 1,483              | 64,380        | 7,078,000            |
| <b>Unemployment Rate</b>                              | 5.2%               | 4.8%          | 4.6%                 |
| <b>Transfer Payments*</b>                             | \$296,858          | \$10,055,258  | \$1,612,935,000      |
| <b>Medical Transfer Payments*</b>                     | \$128,694          | \$3,922,746   | \$719,561,000        |
| <b>Transfer Payments (% of Total Personal Income)</b> | 13.0%              | 10.3%         | 14.7%                |
| <b>Medicare Enrollment</b>                            | 17.0%              | 11.6%         | 14.7%                |
| <b>Medicaid Enrollment</b>                            | 11.6%              | 9.0%          | 20.0%                |

\*Thousand dollars

## **Impact of the Health Sector on the Carson City Economy**

### The Multiplier Effect

The impact of health care expenditures and health care employee expenditures are called multiplier effects. Multiplier effects are a simplified and compact way of representing these effects on the local economy. The multiplier is interpreted as the impact of a one-unit change in sales, employment, or income that results in a corresponding total impact on sales, employment, or income in the larger economy. In essence, the multiplier represents the recycling of dollars and income in a specified geographic unit, such as Carson City. This recycling creates new job opportunities and higher wages for individuals.

There are three types of multiplier effects based on the type of economic impact analysis undertaken: direct, indirect, and induced. These types are illustrated in Table 3 below. The *direct*

*multiplier effect* is based on an industry’s initial economic impact on the region’s economy. For example, if a manufacturing plant has revenue of \$5 million, then this figure becomes the direct economic impact on the community. The *indirect multiplier effect* is based on industry-to-industry transactions only. For example, the health care sector purchases local laundry, food, and other contracted services. However, the indirect multiplier effect does not include the effect of health-sector employee spending on retail and service sectors such as housing, groceries, and real estate. The *induced multiplier effect* is the response of local industries to this employee spending from both the initial direct effects as well as household purchases induced by the indirect industry-to-industry transactions. The total economic impact is defined as the direct plus indirect and induced economic impacts.

**Table 3 – Hospital and Health Care Related Economic Impact Multipliers**

| Type of Multiplier           | Direct                      | Indirect                             | Induced  |
|------------------------------|-----------------------------|--------------------------------------|--|
| <b>Employment Multiplier</b> | Health care jobs            | Health care supplier jobs            | Local retail and service jobs related to health care employee spending |
| <b>Income Multiplier</b>     | Health care employee income | Health care supplier employee income | Local retail and service income related employee spending              |

The direct, indirect, and induced multiplier effects can be classified as employment and income multipliers. An employment multiplier of 2.0 indicates that if one job is created in the health care sector, 1.0 additional jobs are created in other sectors due to business and household spending. Likewise, an income multiplier of 2.0 indicates that for every dollar of income created in the health sector, an additional dollar of income is created in other sectors due to inter-industry spending by health businesses and employees. The measurement of multiplier effects, the input-output model, and IMPLAN data utilized in this report are explained in Appendix.

The Impact of the Health Sector on Employment in Carson City

Table 4 summarizes the impact of the health sector on employment in Carson City utilizing the most current IMPLAN employment multipliers and Nevada Department of Employment, Training data for 2007. Table 4 reveals that 3,688 people were employed in the health sector in Carson City in 2007. Applying IMPLAN employment multipliers for the health sector, the total number of jobs created by the health sector was 5,784. In other words, the Carson City health sector generated an additional 2,096 jobs through induced and indirect economic activity during 2007. Table 4 also highlights the important role of physicians and nursing care within the overall health care sector.

**Table 4 – Carson City Health Care Sector Impact on County Employment, 2007**

| Health Care Sector                          | Employment Impact |            |              | Employment Multiplier | Total Employment Impact |
|---|-------------------|------------|--------------|-----------------------|-------------------------|
|   | Direct            | Indirect   | Induced      |                       |                         |
| Hospitals                                   | 1,306             | 389        | 490          | 1.67                  | 2,185                   |
| Physicians, Dentists, & Other Professionals | 1,220             | 239        | 564          | 1.66                  | 2,023                   |
| Nursing & Protective Care                   | 545               | 36         | 62           | 1.18                  | 643                     |
| Pharmacies                                  | 189               | 23         | 34           | 1.30                  | 246                     |
| Other Medical & Health Services             | 428               | 113        | 146          | 1.60                  | 687                     |
| <b>Total</b>                                | <b>3,688</b>      | <b>800</b> | <b>1,296</b> | <b>1.57</b>           | <b>5,784</b>            |

The Impact of the Health Sector on Income in Carson City

Table 5 documents the income and payroll impact of the Carson City health care sector utilizing the most current IMPLAN employment multipliers and Nevada Department of Employment, Training, and Rehabilitation data. In 2007, the total payroll created by the Carson City health care sector was \$222,037,000. Applying IMPLAN multipliers, the total payroll created by the Carson City health care sector was \$297,964,031. In other words, the Carson City County health

**Table 5 – Carson City Health Care Sector Impact on County Income, 2007**

| Health Care Sector                          | Income Impact        |                     |                     | Income Multiplier | Total Income Impact  |
|---|----------------------|---------------------|---------------------|-------------------|----------------------|
|   | Direct               | Indirect            | Induced             |                   |                      |
| Hospitals                                   | \$81,562,000         | \$13,306,677        | \$17,756,292        | 1.38              | \$112,624,969        |
| Physicians, Dentists, & Other Professionals | \$100,098,000        | \$9,170,178         | \$20,451,423        | 1.30              | \$129,719,601        |
| Nursing & Protective Care                   | \$10,788,000         | \$1,233,629         | \$2,250,053         | 1.32              | \$14,271,683         |
| Pharmacies                                  | \$5,742,000          | \$828,352           | \$1,229,753         | 1.36              | \$7,800,105          |
| Other Medical & Health Services             | \$23,847,000         | \$4,411,600         | \$5,289,074         | 1.41              | \$33,547,673         |
| <b>Total</b>                                | <b>\$222,037,000</b> | <b>\$28,950,437</b> | <b>\$46,976,594</b> | <b>1.34</b>       | <b>\$297,964,031</b> |

care sector generated an additional \$75,927,031 in payroll in other county businesses and enterprises. Table 5 provides a detailed breakdown of the direct and secondary income and payroll impacts of industries within the health care sector.

### **Conclusion: The Economic Contribution of the Health Services Sector in Carson City**

The employment and income data presented in this report document the tremendous contribution of the health care sector to the Carson City economy. The health sector in Carson City and most regions of Nevada employs a large and growing number of residents and generates a disproportionately large and growing amount of payroll for individuals employed within the health services sector. The health care sector generates additional economic benefits for Carson City residents through the creation of jobs and payroll in secondary businesses as health care enterprises purchase and consume local goods and services. Moreover, 16.9% of payroll attributed to the health care sector or \$50.3 million was spent in 2007 on retail sales in Carson City, resulting in additional tax revenue for the county government. As the population-driven demand for health care increases over the next decade, the direct and total economic impact of the Carson City health services sector on the local economy will continue to grow in magnitude and importance.

## Appendix A: Model and Data Used to Estimate Employment and Income Multipliers<sup>2</sup>

The economic impacts and secondary benefits of economic activity presented in this report are measured by multipliers using an input-output model and data from IMPLAN, a model that is widely used by economists and other academics in the United States. A computer spreadsheet that uses state IMPLAN multipliers was developed to enable community development specialists to measure the secondary benefits of the health sector on state, regional, or county economies. The complete methodology is presented in *Measuring the Economic Importance of the Health Sector on a Local Economy: A Brief Literature Review and Procedures to Measure Local Impacts* (Doeksen et al., 1997).

Input-output (I/O) analysis is designed to analyze the transactions among industries in an economy (Miernyk, 1965). These models are largely based on the work of Wassily Leontief during the 1930s. Detailed I/O analysis captures the indirect and induced interrelated circular behavior of the economy. For example, an increase in the demand for health services requires more equipment, more labor, and more supplies, which, in turn, requires more labor to produce the supplies, and so on. By simultaneously accounting for structural interaction between sectors and industries, I/O analysis gives expression to the general economic equilibrium systems. The analysis utilizes assumptions based on linear and fixed coefficients and limited substitutions among inputs and outputs. The analysis assumes that average and marginal I/O coefficients are equal. Nonetheless, the framework has been widely accepted and used by economists and policymakers. I/O analysis is useful when carefully executed and interpreted in defining the structure of a region, the interdependencies among industries, and forecasting economic outcomes. The I/O model coefficients describe the structural interdependencies of an economy. From the coefficients, various predictive devices can be computed, which can be useful in analyzing economic changes in a state, region, or county. Multipliers indicate the relationship between some observed change in the economy and the total change in economic activity created through the economy.

MicroIMPLAN is a computer program developed by the United States Forest Service to construct I/O accounts and models (Alward et al., 1989). Typically, the complexity of I/O modeling has hindered practitioners from constructing models specific to a community requesting an analysis. Too often, inappropriate multipliers have been used to estimate local economic impacts. In contrast, IMPLAN can construct a model for any state, region, county, or zip code area in the United States by using available state, region, county, or zip code data. Impact analysis can be performed once a regional I/O model is constructed.

Five different sets of multipliers are estimated by IMPLAN, corresponding to five measures of regional economic activity: (1) total industry output, (2) personal income, (3) total income, (4) value added, and (5) employment. Three types of multipliers are generated. Type I multipliers measure the impact in terms of direct and indirect effects. Direct impacts are the changes in the activities of the focus industry or firm, such as the construction of a hospital or the closing of a hospital. The focus business changes its purchases of inputs as a result of the direct impacts. This produces indirect impacts in other business sectors. However, the total impact of a

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<sup>2</sup> The explanation given in this appendix is from Doeksen's 2007 paper "Economic Tools for Rural Health Planning". Some minor modifications have been made to update information about IMPLAN.

change in the economy consists of direct, indirect, and induced changes. Both the direct and indirect impacts change the flow of dollars to the state, region, or county's households. Subsequently, the households alter their consumption. The effect of the changes in household consumption on businesses in a community is referred to as an induced effect. To measure the total impact, a Type II multiplier is used. The Type II multiplier compares direct, indirect, and induced effects with the direct effects generated by a change in final demand (the sum of direct, indirect, and induced effects divided by direct effects). The Type SAM multiplier further modifies the induced effect to include information about other institutions in the model, such as state and local government and investment.

Additional information on the data, methodology, and software requirements of I/O modeling and IMPLAN analysis can be found in guides developed by Doeksen et al., (1997), Alward et al., (1989), and the Minnesota IMPLAN Group (MIG), (2004).

## Appendix B: References and Data Sources

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### Data Sources

#### ***Table 1. Demographic Indicators for Carson City and the State of Nevada***

Note: Population by age and race are estimates using Nevada demographer percentage projections applied to 2007 demographer population estimates.

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#### ***Table 2. Economic Indicators for Carson City, Nevada and the United States***

Note: Percent of population enrolled in Medicaid for United States is for 2005 whereas for Nevada and counties it is for 2007.

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**Table 5. Carson City Health Care Sector Impact on County Income, 2007**

Minnesota IMPLAN Group, Inc. (MIG). 2008. "State of Nevada Input-Output Data for 2007."  
Stillwater MN: MIG. [www.implan.com](http://www.implan.com)