

The Economic Impact of Health Services on the Economy of Idaho County, Idaho



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Medical facilities have a tremendous medical and economic impact on the county in which they are located. This is especially true with health care facilities, such as hospitals and nursing homes. These facilities not only employ a number of people and have a large payroll, but they also draw into the county a large number of people from rural areas that need medical services. The overall objective of this study is to measure the economic impact of health services on the economy of Idaho County. The specific objectives of this report are to:

1. discuss national trends in health care;
2. review county demographic and economic data;
3. summarize the direct economic activities of health services in Idaho County;
4. review concepts of county economics and multipliers; and
5. illustrate the economic impact of health services on the economy of Idaho County.

No recommendations will be made in this report.

National Health Trend Data

The health care sector is an extremely fast-growing sector in the United States, and based on the current demographics, there is every reason to expect this trend to continue.

Data in **Table 1** provide selected expenditure and employment data for the United States.

Several highlights from the national data are:

- In 1970, health care services as a share of the national gross domestic product (GDP) were 7.2 percent and increased to 16.2 percent in 2007;
- Per capita health expenditures increased from \$356 in 1970 to \$7,421 in 2007;
- Employment in the health sector increased over 324.0 percent from 1970 to 2007; and
- Annual increases in employment from 2003 to 2007 ranged from 2.0 percent to 2.7 percent.

Table 1
United States Health Expenditures and Employment Data
1970-2007; Projected for 2008, 2011, 2014 and 2017

Year	Total Health Expenditures (\$Billions)	Per Capita Health Expenditures (\$)	Health as % of GDP (%)	Health Sector Employment (000)	Avg. Annual Increase in Employment (%)
1970	\$74.9	\$356	7.2%	3,052 ^a	
1980	253.4	1,100	9.1%	5,278 ^a	7.3%
1990	714.1	2,814	12.3%	7,814 ^a	4.8%
2000	1,353.2	4,789	13.8%	10,858 ^a	3.9%
2001	1,469.4	5,149	14.5%	11,188 ^a	3.0%
2002	1,602.3	5,560	15.3%	11,536 ^a	3.1%
2003	1,734.9	5,967	15.8%	11,817 ^b	N/A
2004	1,854.8	6,319	15.9%	12,055 ^b	2.0%
2005	1,980.6	6,687	15.9%	12,314 ^b	2.1%
2006	2,112.7	7,062	16.0%	12,602 ^b	2.3%
2007	2,241.2	7,421	16.2%	12,946 ^b	2.7%
Projections					
2008	2,394.3	7,868	16.6%		
2011	2,905.1	9,322	17.4%		
2014	3,523.6	11,043	18.4%		
2017	4,277.1	13,101	19.5%		

SOURCES: U.S. Department of Labor, Bureau of Labor Statistics (www.bls.gov [January 2009]); U. S. Department of Commerce, Bureau of Economic Analysis (www.bea.gov [January 2009]); U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, National Health Expenditures 1970-2007 and National Health Expenditure Projections 2007-2017 (www.cms.hhs.gov [January 2009]).

N/A - Not Available.

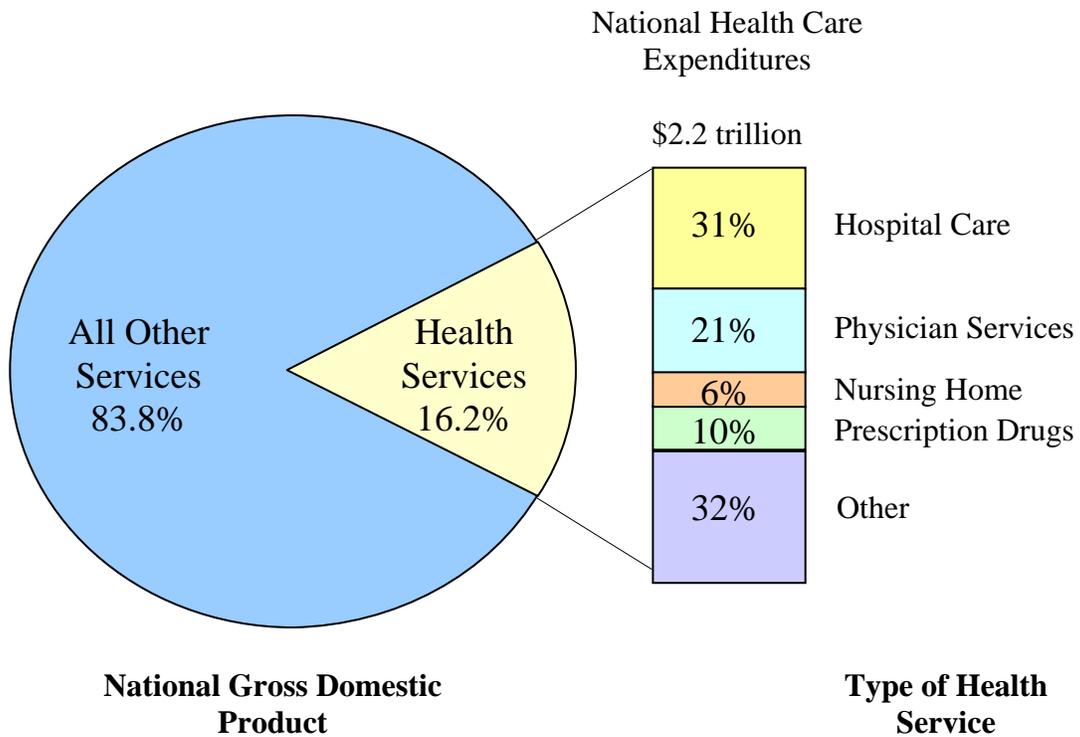
^a Based on Standard Industrial Classification (SIC) codes for health sector employment.

^b Based on North American Industry Classification System (NAICS) for health sector employment.

For the future, the U. S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, predicts that health care expenditures will account for 18.4 percent of GDP by 2014 and increase to 19.5 percent of GDP in 2017. Per capita health care expenditures are projected to increase to \$11,043 in 2014 and to \$13,101 in 2017. Total health expenditures are projected to increase to almost \$4.3 trillion in 2017.

Figure 1 illustrates 2007 health expenditures by percent of gross domestic product and by type of health service. The largest health service type was hospital care, representing 31.0 percent of the total. The next largest type of health services was physician services with 21.0 percent of the total.

**Figure 1
National Health Expenditures
as a Percent of Gross Domestic Product
and by Health Service Type, 2007**



County Demographic and Economic Data

The study is based on the medical service area that includes all of Idaho County, Idaho. Idaho County is located in the north central part of Idaho. **Table 2** shows the populations for towns and cities in Idaho County, for Idaho County, and for the state of Idaho. Grangeville city is the county seat of Idaho County and the largest population center with a population of 3,230 in 1990, which decreased by 0.1 percent to 3,228 in the 2000 census, and is estimated to have decreased an additional 4.2 percent from 2000 to 2007. The next largest population was reported in Cottonwood city with 875 in the 1990 census. The population in Cottonwood increased by 7.9 percent from 1990 to 2000 and was estimated to have increased an additional 8.4 percent

Table 2
Census Population, Population Estimates, and Percent Changes
for Idaho County Cities and Towns, Idaho County, and the State of Idaho

	Census		Estimates		<u>10 Yrs.</u>	<u>7 Yrs.</u>	<u>1 Yr.</u>
	1990	2000	2007	2008	'90-'00	'00-'07	'07-'08
Cottonwood city	875	944	1,023	NA	7.9%	8.4%	NA
Ferdinand city	135	145	143	NA	7.4%	-1.4%	NA
Grangeville city	3,230	3,228	3,091	NA	-0.1%	-4.2%	NA
Kamiah city (pt.)	3	0	1	NA	--	--	NA
Kooskia city	719	675	652	NA	-6.1%	-3.4%	NA
Riggins city	424	410	395	NA	-3.3%	-3.7%	NA
Stites city	202	226	224	NA	11.9%	-0.9%	NA
White Bird city	108	106	105	NA	-1.9%	-0.9%	NA
Balance of County	<u>8,072</u>	<u>9,777</u>	<u>9,711</u>	<u>NA</u>	<u>21.1%</u>	<u>-0.7%</u>	<u>NA</u>
Idaho County	<u>13,768</u>	<u>15,511</u>	<u>15,345</u>	<u>15,448</u>	<u>12.7%</u>	<u>-1.1%</u>	<u>0.7%</u>
State of Idaho	<u>1,006,734</u>	<u>1,293,955</u>	<u>1,496,145</u>	<u>1,523,816</u>	<u>28.5%</u>	<u>15.6%</u>	<u>1.8%</u>

SOURCE: U.S. Census Bureau; 1990 & 2000 Census Population; 2007 & 2008 Census Population Estimates (www.census.gov [March 2009]).

from 2000 to 2007. The population in the unincorporated areas of the county had a population of 8,072 in 1990 and increased to 9,777 in 2000 representing an increase of 21.1 percent. Idaho County population increased from 13,768 in 1990 to 15,511 in 2000 which represented a 12.7 percent increase. But, from 2007 to 2008 the population was estimated to have increased 0.7 percent from 15,345 to 15,448. The State of Idaho increased in population by 28.5 percent from 1990 to 2000, an additional 15.6 percent from 2000 to 2008 and is estimated to have increased by 1.8 percent from 2007 to 2008. **Figure 2** shows Idaho County in relation to the state of Idaho.

Data in **Tables 3** and **4** are from the U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis, for the year 2007 and are based on the North American Industry Classification System (NAICS). The purpose of **Tables 3** and **4** is to demonstrate the importance of health services as compared to the other industries in the economy of Idaho County and the state of Idaho. In 2007, the health care and social assistance sector (which includes hospitals) accounted for 727 full- and part-time employees or 11.0 percent of the private employment in Idaho County (**Table 3**), compared to 10.6 percent for the state of Idaho. For Idaho County, the health care and social assistance sector was the third largest sector of private employment following retail trade (#1) and construction (#2).

Personal income data are presented in **Table 4**. The health care services sector accounted for \$17.9 million or 12.3 percent of the private earnings in Idaho County which was the third largest sector of private earnings, preceded by manufacturing (#1) and retail trade (#2). For the state of Idaho, the health care services sector accounted for 11.7 percent of the private earnings and was the third largest sector in the state, preceded only by manufacturing and professional and technical services.

Figure 2.
Idaho County in relation to the State of Idaho

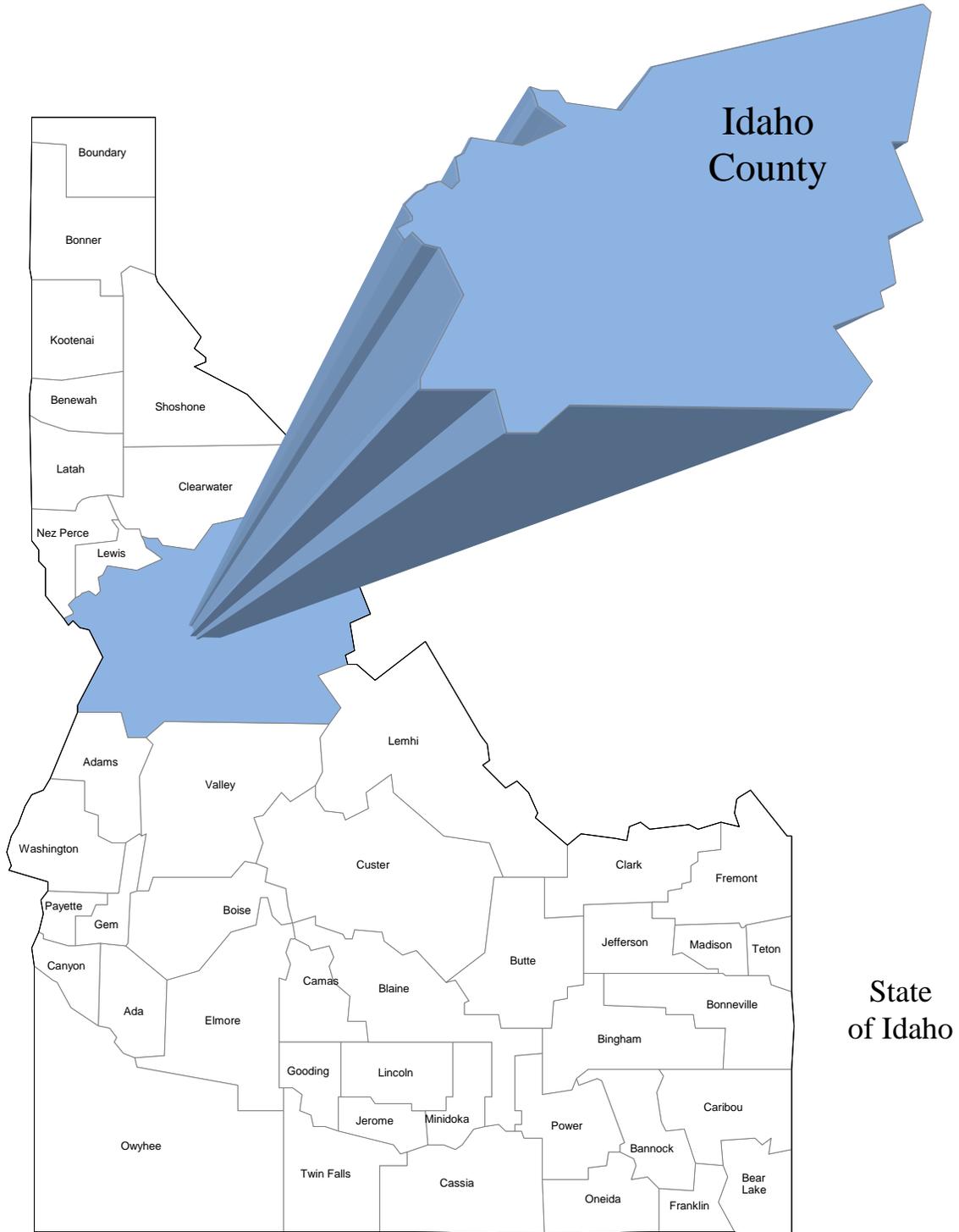


Table 3
Full- and Part-Time Employment by Type of Employment and by Major Industry
(NAICS)¹ for Idaho County and the State of Idaho, 2007

Employment Categories	Idaho County			State of Idaho	
	Number	% Total	% Private	% Total	% Private
Total FT & PT	<u>8,850</u>	<u>100.0%</u>		<u>100.0%</u>	
Wage & salary	5,075	57.3%		74.8%	
Proprietors'	<u>3,775</u>	<u>42.7%</u>		<u>25.2%</u>	
Farm proprietors'	739	8.4%		2.5%	
Nonfarm proprietors' ²	<u>3,036</u>	<u>34.3%</u>		<u>22.6%</u>	
By Industry:					
Farm	918			96.0%	
Nonfarm	<u>7,932</u>			<u>82.6%</u>	
Private	<u>6,633</u>	<u>74.9%</u>	<u>100.0%</u>	<u>86.1%</u>	<u>100.0%</u>
Forestry, fishing, related, other ³	337		5.1%		2.0%
Mining	108		1.6%		0.5%
Utilities	37		0.6%		0.3%
Construction	854		12.9%		11.0%
Manufacturing	605		9.1%		9.1%
Wholesale trade	166		2.5%		4.1%
Retail trade	967		14.6%		14.1%
Transp & wrhsng	342		5.2%		3.3%
Information	67		1.0%		1.7%
Finance & ins	266		4.0%		4.3%
RE rental & leasing	497		7.5%		6.5%
Prof & techn svcs	240		3.6%		6.9%
Mgmt of cos & enterp	0		0.0%		1.0%
Admin & waste svcs	185		2.8%		7.1%
Educational svcs	55		0.8%		1.7%
Health care/social assistance	727		11.0%		10.6%
Arts, entert, & rec	154		2.3%		2.2%
Accomm & food svcs	487		7.3%		7.6%
Other svcs, not pub admin	<u>539</u>		<u>8.1%</u>		<u>6.2%</u>
Govt & govt enterprises	<u>1,299</u>	<u>14.7%</u>		<u>13.9%</u>	

SOURCES: U.S. Department of Commerce, Bureau of Economic Analysis (www.bea.gov [May 2009]).

¹ The estimates are based on the North American Industry Classification System (NAICS).

² Excludes limited partners.

³ "Other" consists of the number of jobs held by U.S. residents employed by international organizations and foreign embassies and consulates in the U.S.

Table 4
Earnings by Place of Work and by Industry (NAICS)¹
for Idaho County and the State of Idaho, 2007

Employment Categories	Idaho County			State of Idaho	
	Income (\$1,000s)	% Total	% Private	% Total	% Private
Total earnings by place of work	<u>208,421</u>	<u>100.0%</u>		<u>100.0%</u>	
Wage & salary disbursements	140,623	67.5%		68.8%	
Proprietors' income ²	26,702	12.8%		14.6%	
Other	<u>41,096</u>	<u>19.7%</u>		<u>16.6%</u>	
Earnings by Industry					
Farm	-3,254	-1.6%		<u>3.3%</u>	
Nonfarm	<u>211,675</u>	<u>101.6%</u>		<u>96.7%</u>	
Private	<u>145,842</u>	68.9%		81.9%	100.0%
Forestry, fishing, related ³	7,999		5.5%		1.6%
Mining	4,149		2.8%		0.8%
Utilities	2,963		2.0%		1.0%
Construction	17,269		11.8%		11.2%
Manufacturing	26,489		18.2%		16.0%
Wholesale trade	4,865		3.3%		6.1%
Retail trade	18,359		12.6%		10.6%
Transp & wrhsng	11,517		7.9%		3.8%
Information	1,520		1.0%		2.0%
Finance & ins	6,867		4.7%		5.6%
RE rental & leasing	3,600		2.5%		2.0%
Prof & techn svcs	7,929		5.4%		11.8%
Mgmt of cos & enterp	0		0.0%		2.8%
Admin & waste svcs	1,041		0.7%		4.6%
Educational svcs	389		0.3%		1.0%
Health care/social assistance	17,943		12.3%		11.7%
Arts, entert, & rec	1,756		1.2%		1.1%
Accomm & food svcs	5,250		3.6%		3.3%
Other svcs, not pub admin	<u>5,937</u>		<u>4.1%</u>		<u>3.1%</u>
Govt & govt enterprises	<u>65,833</u>	<u>31.1%</u>		<u>18.1%</u>	

SOURCES: U.S. Department of Commerce, Bureau of Economic Analysis (www.bea.gov [February 2009]).

¹ The estimates are based on the North American Industry Classification System (NAICS).

² Proprietors' income includes the inventory valuation adjustment and capital consumption adjustment.

³ "Other" consists of wage and salary disbursements to U.S. residents employed by international organizations and foreign embassies and consulates in the U.S.

Table 5 compares the employment and payroll for the health services sector to the total of all other sectors for both Idaho County and the state of Idaho. From the data, health services employment increased 37.5 percent from 1998 to 2006 in Idaho County, while total county employment increased by 25.3 percent. Health services as a percent of total county employment increased from 15.5 percent in 1998 to 17.0 percent in 2006, compared to the state's health services portion of state employment increasing from 12.0 percent in 1998 to 13.2 in 2006. Health services payroll in Idaho County grew 108.2 percent from 1998 to 2006, while the total county payroll increased by 65.2 percent. Health services as a percent of total county payroll grew from 15.0 percent in 1998 to 18.9 percent in 2006, compared to the state's health services payroll as a percentage of total state payroll increasing from 12.1 percent in 1998 to 13.4 percent in 2006.

Table 5
Employment and Payroll for County Business Patterns*
Idaho County and the State of Idaho

Employment						
Based on NAICS ¹	Health Services Employment	Total County Employment	Health Services as a % of Total County Employment	Health Services as a % of Total State Employment		
1998	403	2,605	15.5%	12.0%		
1999	403	2,629	15.3%	11.8%		
2000	396	2,698	14.7%	11.8%		
2001	363	2,618	13.9%	12.1%		
2002	397	2,690	14.8%	13.1%		
2003	427	2,857	14.9%	13.1%		
2004	453	2,900	15.6%	13.6%		
2005	507	3,097	16.4%	13.3%		
2006	554	3,264	17.0%	13.2%		
% Change '98 - '06	37.5%	25.3%				
Payroll						
Based on NAICS ¹	Health Services Payroll (\$1,000s)	Total County Payroll (\$1,000s)	Health Services as a % of Total County Payroll	Health Services as a % of Total State Payroll		
1998	7,734	51,511	15.0%	12.1%		
1999	8,578	56,715	15.1%	12.3%		
2000	9,084	58,707	15.5%	11.7%		
2001	9,401	57,101	16.5%	13.0%		
2002	9,861	61,329	16.1%	13.9%		
2003	11,025	65,702	16.8%	13.9%		
2004	11,723	68,946	17.0%	14.6%		
2005	14,780	79,624	18.6%	13.9%		
2006	16,099	85,088	18.9%	13.4%		
% Change '98 - '06	108.2%	65.2%				

Source: U.S. Census Bureau, County Business Patterns; 1998-2006 data (www.census.gov [February 2009]).

¹ The Health Care and Social Assistance NAICS sector comprises establishments providing health care and social assistance for individuals. The sector includes both health care and social assistance because it is sometimes difficult to distinguish between the boundaries of these two activities. Industries in this sector are arranged on a continuum starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance. The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector shared this commonality of process, namely, labor inputs of health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry.

* Data from County Business Patterns exclude self-employed persons, employees of private households, railroad employees, agricultural production workers, and for most government employees (except for those working in wholesale liquor establishments, retail liquor stores, Federally-chartered savings institutions, Federally-chartered credit unions, and hospitals).

The Direct Economic Activities

Employment and payroll are the important direct economic activities created in Idaho County from the health services sector. The health services sector is divided into the following components:

- Hospitals
- Offices of Physicians, Dentists, and Other Health Professionals
- Home Health Services
- Nursing and Residential Care Facilities
- Pharmacies
- Other Health and Medical Services

The total health services sector in Idaho County employs 687 full- and part-time employees and has an estimated payroll including benefits of \$28.2 million (**Table 6**). The hospital component employs 369 people with an annual payroll of \$17.8 million. Two hospitals are located in Idaho County, Syringa Hospital and Clinics and St. Mary's Hospital and Clinics. Syringa Hospital and Clinics employs 149 full- and part-time employees and has a payroll with benefits of \$6.8 million. Syringa Hospital and Clinics includes a 16-bed critical access hospital, emergency medical services, physical therapy, home health, and a rural health clinic system based in Grangeville with two full-time family practice physicians, one full-time OB/GYN, and three full-time mid-level practitioners. St. Mary's Hospital and Clinics employs 220 full- and part-time employees and has a payroll with benefits of \$11.0 million. St. Mary's Hospital and Clinics includes a 25-bed critical access hospital with emergency medical services, home health, and a rural health clinic system based in Cottonwood with six full-time and one part-time family practice physicians and one full-time mid-level practitioner. The rural health clinic systems are part of the hospitals and, therefore, the employment and income of the rural health clinic systems are included in the hospital data.

Table 6
Direct Economic Activities of Health Services
on the Economy of Idaho County, Idaho

Health Service	Total Employment ¹	Total Income ²
Hospitals		
Syringa Hospital and Clinics (A 16-bed critical access hospital with EMS, physical therapy, home health, and a rural health clinic system based in Grangeville)	149	\$6,819,853
St. Mary's Hospital and Clinics (A 25-bed critical access hospital with EMS, home health, and a rural health clinic system based in Cottonwood)	220	\$11,010,276
<hr/>		
Combined Hospitals	369	\$17,830,129
Physicians, Dentists, & Other Health Professionals (Includes one private physician practice [one family practice physician] and one out-of-county hospital physician clinic [three part-time family practice physicians and one FT and one PT physician assistants], four dental offices [five dentists and seven dental hygienists], two optometry offices, & two chiropractor practices) (The hospital rural health clinic systems are included in the hospital data above.)	46	\$2,576,185
Home Health Services (Includes five home health agencies)	84	\$1,451,661
Pharmacies (Includes four pharmacies)	34	\$1,297,603
Other Health & Medical Services (Includes one nursing home with health and rehabilitation, one assisted living facility, EMS, quick response units (QRUs), private physical therapy, health department, department of health and welfare, three mental health agencies, Opportunities Unlimited, two school nurses, two massage therapy businesses, & one durable medical equipment provider)	<u>154</u>	<u>\$5,055,349</u>
Total Health Services	<u>687</u>	<u>\$28,210,926</u>

SOURCE: All employment data and income data for hospital only from local decision makers; all other income estimated from state average salaries from U. S. Department of Labor, Bureau of Labor Statistics, May 2007 State Occupational Employment and Wage Estimates for Idaho (May 2009 [www.bls.gov]).

¹ Employment is defined as total full- and part-time employees, including allowances for local contractual employment.

² Income is defined as all personal income including wages, salaries, proprietor income, and benefits.

The physicians, dentists, and other health professionals' component includes 46 total employees with income of \$2.6 million. The physician portion includes one private practice physician clinic (with one family practice physician) and one out-of-county hospital physician clinic (with three part-time family practice physicians and one full- and one part-time physician assistants). This component also includes four dental offices with five dentists and seven dental hygienists, two optometry offices, and two chiropractor practices. There are also the two hospital rural health clinic systems in the county that are included with the hospital data.

The home health services' component includes five home health agencies; total employment is 84 and total payroll plus benefits is \$1.5 million. Nursing and residential care facilities' component, which includes a nursing home with health and rehabilitation and an assisted living facility, will be combined with the other health and medical services component to ensure the privacy of individual employers or agencies. The pharmacies' component includes four pharmacies with 34 employees and a payroll of \$1.3 million including benefits. The other health and medical services' component includes the nursing home with health and rehabilitation, an assisted living facility, three volunteer emergency medical services (EMS), six volunteer quick response units (QRUs), a private physical therapy facility, health department, department of health and welfare, three mental health agencies, Opportunities Unlimited (for the developmentally disabled), two school nurses, two massage therapy businesses, and one durable medical equipment provider. This component includes 154 full- and part-time employees with income of \$5.1 million (wages, salaries, and benefits, and proprietor income).

Notably, many rural counties have a large number of elderly, and the ranchers and farmers often retire in the towns. Thus, nursing and residential care facilities are an important component of the health services sector. In summary, the health services sector is vitally

important as a county employer and important to the county's economy. The health services sector definitely employs a large number of residents. The health services sector and the employees in the health services sector purchase a large amount of goods and services from businesses in Idaho County. These impacts are referred to as secondary impacts or benefits to the economy. Before the secondary impacts of the health services sector are discussed, basic concepts of county economics will be discussed.

Some Basic Concepts of County Economics and Income and Employment Multipliers

Figure 3 illustrates the major flows of goods, services, and dollars of any economy. The foundation of a county's economy are those businesses which sell some or all of their goods and services to buyers outside of the county. Such a business is a basic industry. The flow of products out of, and dollars into, a county are represented by the two arrows in the upper right portion of **Figure 3**. To produce these goods and services for "export" outside the county, the basic industry purchases inputs from outside of the county (upper left portion of **Figure 3**), labor from the residents or "households" of the county (left side of **Figure 3**), and inputs from service industries located within the county (right side of **Figure 3**). The flow of labor, goods, and services in the county is completed by households using their earnings to purchase goods and services from the county's service industries (bottom of **Figure 3**). **Figure 3** illustrates that a change in any one segment of a county's economy will have reverberations throughout the entire economic system of the county.

Consider, for instance, the hypothetical closing of a hospital. The services sector will no longer pay employees and dollars going to households will stop. Likewise, the hospital will not purchase goods from other businesses and dollar flow to other businesses will stop. This decreases income in the "households" segment of the economy. Since earnings would decrease, households decrease their purchases of goods and services from businesses within the "services" segment of the economy. This, in turn, decreases these businesses' purchases of labor and inputs. Thus, the change in the economic base works its way throughout the entire local economy.

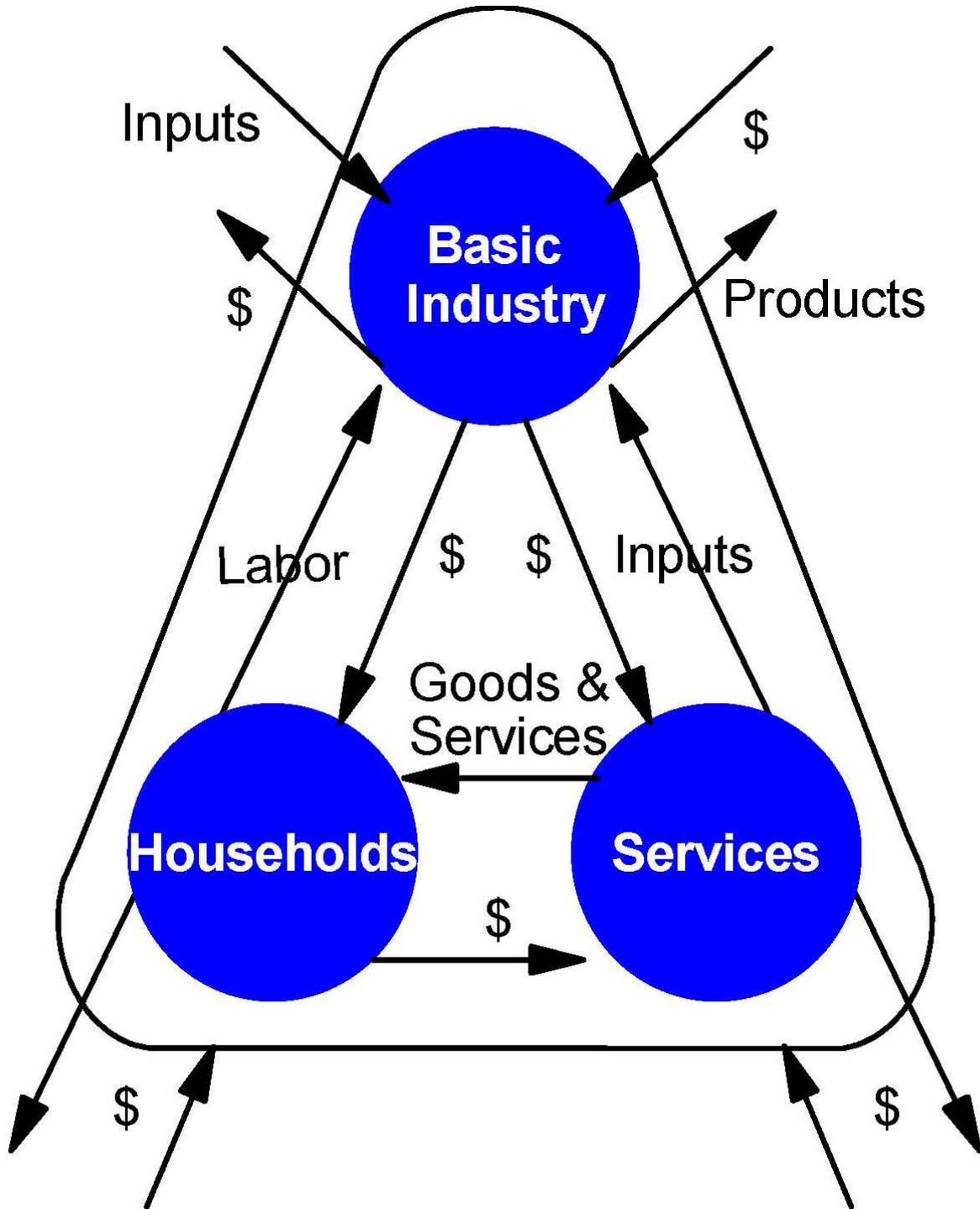


Figure 3.
County Economic System

The total impact of a change in the economy consists of direct, indirect, and induced impacts. Direct impacts are the changes in the activities of the impacting industry, such as the closing of a hospital. The impacting business, such as the hospital, changes its purchases of inputs as a result of the direct impact. This produces an indirect impact in the business sectors. Both the direct and indirect impacts change the flow of dollars to the county's households. The households alter their consumption accordingly. The effect of this change in household consumption upon businesses in a county is referred to as an induced impact.

A measure is needed that yields the effects created by an increase or decrease in economic activity. In economics, this measure is called the multiplier effect. Multipliers are used in this report. An employment multiplier is defined as:

“...the ratio between direct employment, or that employment used by the industry initially experiencing a change in final demand and the direct, indirect, and induced employment.”

An employment multiplier of 3.0 indicates that if one job is created by a new industry, 2.0 jobs are created in other sectors due to business (indirect) and household (induced) spending.

Secondary Impacts of Health Services on the Economy of Idaho County, Idaho

Employment and income multipliers for the area have been calculated by use of the IMPLAN model. It was developed by the U.S. Forest Service and is a model which derives county multipliers. Additional information on IMPLAN is included in **Appendix A**.

The employment multipliers for the components of the health services are shown in **Table 7**. The employment multiplier for the hospital component is 1.50. This indicates that for each job created in that sector, a 0.50 job is created throughout the area due to business (indirect) and household (induced) spending. The employment multipliers for the other components are also shown in **Table 7**.

Table 7
Employment Impact of Health Services
on the Economic of Idaho County, Idaho

Health Sector Component	Number of Employees	Employment Multiplier	Secondary Impact	Total Impact
Hospital				
Syringa Hospital & Clinics	149	1.50	75	224
St. Mary's Hospital & Clinics	220	1.50	110	330
<hr/>				
Combined Hospitals	369	1.50	185	554
Physicians, Dentists, & Other Health Professionals	46	1.35	16	62
Home Health Services	84	1.17	14	98
Pharmacies	34	1.40	14	48
Other Health & Medical Services	<u>154</u>	1.13	<u>20</u>	<u>174</u>
TOTALS	<u>687</u>		<u>249</u>	<u>936</u>

SOURCE: Local employment data for all health services; multipliers from IMPLAN 2007 data, Minnesota IMPLAN Group, Inc. [www.implan.com].

Applying the employment multipliers to the employment for each of the components yields an estimate of each component's employment impact on Idaho County (**Table 7**). For example, the hospital component has employment of 369 employees; applying the employment multiplier of 1.50 to the employment number of 369 brings the total employment impact of the hospital component to 554 employees ($369 \times 1.50 = 554$). The secondary impact of the hospital component is 185 employees ($369 \times 0.50 = 185$); these are the jobs created in other industry sectors in the Idaho County economy as a result of the spending of the hospital and the spending of the 369 hospital employees. The same multiplier applies to each of the hospitals individually to illustrate each hospital's impact on the Idaho County economy.

The offices of physicians, dentists and other health professionals have a direct impact of 46 employees and after the application of the multiplier of 1.35, the secondary impact is 16

employees and the total impact comes to 62 employees. The direct, secondary, and total employment impacts of each of the health sector components are shown in **Table 7**. The total employment impact of health services in Idaho County is estimated to be 936 employees with a secondary employment impact of 249 employees.

The income multiplier for the hospital component is 1.24 (**Table 8**). This indicates that for each dollar created in that sector, \$0.24 is created throughout the area due to business (indirect) and household (induced) spending. The income multipliers for the other health services' components are also given in **Table 8**.

Applying the income multipliers to the income (wages, salaries, and proprietor income plus benefits) for each of the components yields an estimate of each component's income impact on Idaho County (**Table 8**). The hospital component has a total payroll of \$17.8 million; applying the income multiplier of 1.24 brings the total hospital income impact to \$22.1 million ($\$17.8 \text{ million} \times 1.24 = \22.1 million). The secondary income impact from the hospital component is \$4.3 million, which is the income generated in the other industry sectors in the Idaho County economy due to the hospital spending and the hospital employees' spending. Each individual hospital in Idaho County is illustrated in **Table 8**, also. All the income multipliers are applied to the income for each component and the resulting secondary and total income impacts are shown for each component. The total secondary income impact of health services in Idaho County is estimated to be \$6.9 million, with the total income impact of health services in Idaho County estimated to be \$35.1 million (**Table 8**).

Table 8
Income¹ Impact of Health Services
on the Economy of Idaho County, Idaho

Health Service	Direct Impact	Income Multiplier	Secondary Impact	Total Impact	Retail Sales	6% County Sales Tax
Hospital						
Syringa Hospital & Clinics	\$6,819,853	1.24	\$1,636,765	\$8,456,618	\$2,508,141	\$150,488
St. Mary's Hospital & Clinics	\$11,010,276	1.24	\$2,642,466	\$13,652,742	\$4,049,255	\$242,955
Combined Hospitals	\$17,830,129	1.24	\$4,279,231	\$22,109,360	\$6,557,396	\$393,444
Physicians, Dentists, & Other Health Professionals	\$2,576,185	1.22	\$566,761	\$3,142,946	\$932,164	\$55,930
Home Health Services	\$1,451,661	1.19	\$275,816	\$1,727,477	\$512,351	\$30,741
Pharmacies	\$1,297,603	1.23	\$298,449	\$1,596,051	\$473,371	\$28,402
Other Health & Medical Services	\$5,055,349	1.29	\$1,466,051	\$6,521,400	\$1,934,176	\$116,051
TOTALS	\$28,210,926		\$6,886,308	\$35,097,234	\$10,409,458	\$624,568

SOURCE: Hospital income provided by local sources; income data for all other health services (except hospital) were estimated utilizing state average incomes from the U. S. Department of Labor, Bureau of Labor Statistics, May 2007 State Occupational Employment and Wage Estimates for Alabama (April 2009 [www.bls.gov]); multipliers from 2007 IMPLAN data, Minnesota IMPLAN Group, Inc. [www.implan.com].

¹ Income is defined as all personal income including wages, salaries, proprietor income, & benefits.

Income also has an impact on retail sales. If the county ratio between retail sales and income continues as in the past several years, then direct and secondary retail sales generated by health services and its employees equals \$10.4 million (**Table 8**). Each of the components' income impacts were utilized to determine the retail sales and a 6.0 percent county sales tax collection for each component. Then the health services' components are totaled to determine the direct and secondary retail sales generated by health services. A 6.0 percent county sales tax collection is estimated to generate \$624,568 in Idaho County as a result of the total income impact (**Table 8**). This estimate is probably low, as many health care employees will spend a larger proportion of their income in local establishments that collect sales tax. The bottom line is that health services not only contribute greatly to the medical health of the county, but also to the economic health of the county.

Summary

The economic impact of health services upon the economy of Idaho County is tremendous. Health services employ a large number of residents, similar to a large industrial firm. The secondary impact occurring in the county is extremely large and measures the total impact of health services. If the health services increase or decrease in size, the medical health of the county as well as the economic health of the county are greatly affected. For the attraction of industrial firms, businesses, and retirees, it is crucial that the area have quality health services. Often overlooked is the fact that prosperous health services contribute to the economic health of the county.

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APPENDIX A

Model and Data Used to Estimate Employment and Income Multipliers

Appendix A

Model and Data Used to Estimate Employment and Income Multipliers

A computer spreadsheet that uses state IMPLAN multipliers was developed to enable community development specialists to easily measure the secondary benefits of the health sector on a state, regional or county economy. The complete methodology, which includes an aggregate version, a disaggregate version, and a dynamic version, 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). A brief review of input-output analysis and IMPLAN are presented here.

A Review of Input-Output Analysis

Input-output (I/O) (Miernyk, 1965) was designed to analyze the transactions among the industries in an economy. These models are largely based on the work of Wassily Leontief (1936). 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, etc. By simultaneously accounting for structural interaction between sectors and industries, I/O analysis gives expression to the general economic equilibrium system. The analysis utilizes assumptions based on linear and fixed coefficients and limited substitutions among inputs and outputs. The analysis also assumes that average and marginal I/O coefficients are equal.

Nonetheless, the framework has been widely accepted and used. 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 interdependence of an economy. From the coefficients, various predictive devices can be computed, which can be useful in analyzing economic changes in a state, a region or a county. Multipliers indicate the relationship between some observed change in the economy and the total change in economic activity created throughout the economy.

MicroIMPLAN

MicroIMPLAN is a computer program developed by the United States Forest Service (Alward, et al., 1989) to construct I/O accounts and models. Typically, the complexity of I/O modeling has hindered practitioners from constructing models specific to a community requesting an analysis. Too often, inappropriate U.S. multipliers have been used to estimate local economic impacts. In contrast, IMPLAN can construct a model for any county, region, state, or zip code area in the United States by using available state, county, and zip code level 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. These are: total industry output, personal income, total income, value added, and employment. Two 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 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 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 accordingly. 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 divided by direct). IMPLAN also estimates a modified Type II multiplier, called a Type III multiplier that also includes the direct, indirect, and induced effects. The Type III multiplier further modifies the induced effect to include spending patterns of households based on a breakdown of households by nine difference income groups.

Minnesota IMPLAN Group, Inc. (MIG)

Dr. Wilbur Maki at the University of Minnesota utilized the input/output model and database work from the U. S. Forest Service's Land Management Planning Unit in Fort Collins to further develop the methodology and to expand the data sources. Scott Lindall and Doug Olson joined the University of Minnesota in 1984 and worked with Maki and the model.

As an outgrowth of their work with the University of Minnesota, Lindall and Olson entered into a technology transfer agreement with the University of Minnesota that allowed them to form MIG. At first, MIG focused on database development and provided data that could be used in the Forest Service version of the software. In 1995, MIG took on the task of writing a new version of the IMPLAN software from scratch. This new version extended the previous Forest Service version by creating an entirely new modeling system that included creating Social Accounting Matrices (SAMs) – an extension of input-output accounts, and resulting SAM multipliers. Version 2 of the new IMPLAN software became available in May of 1999. For more information about Minnesota IMPLAN Group, Inc., please contact Scott Lindall or Doug Olson by phone at 651-439-4421 or by email at info@implan.com or review their website at www.implan.com.