

The Economic Impact of the Health Sector
on the Economy of Summers County, West Virginia

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Medical facilities have a tremendous medical and economic impact on the community 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 community 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 the health sector on the economy of Summers County, West Virginia. 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 the health sector;
4. review concepts of community economics and multipliers;
5. estimate the economic impact of the health sector on the economy of Summers County;

No recommendations will be made in this report.

TRENDS IN THE HEALTH CARE INDUSTRY

National Trends

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. This increased to 16.0 percent in 2006;

- Per capita health expenditures increased from \$356 in 1970 to \$7,026 in 2006;
- Employment in the health sector increased almost 313.0 percent from 1970 to 2006;
and
- Annual increases in employment from 2003 to 2006 ranged from 2.0 percent to 2.3 percent.

In addition, the Bureau of Labor Statistics projects substantial increases in health care expenditures from 2008 through 2017. In fact, 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 2006 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.

Table 1
United States Health Expenditures and Employment Data
1970-2006; Projected for 2008, 2011, 2014 & 2017

United States Data						
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	714.0	2,813	12.3%	7,814	a	4.8%
2000	1,353.6	4,790	13.8%	10,858	a	3.9%
2001	1,469.6	5,148	14.5%	11,188	a	3.0%
2002	1,603.4	5,560	15.3%	11,536	a	3.1%
2003	1,732.4	5,952	15.8%	11,817	b	N/A
2004	1,852.3	6,301	15.9%	12,055	b	2.0%
2005	1,973.3	6,649	15.9%	12,314	b	2.1%
2006	2,105.5	7,026	16.0%	12,602	b	2.3%
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%			

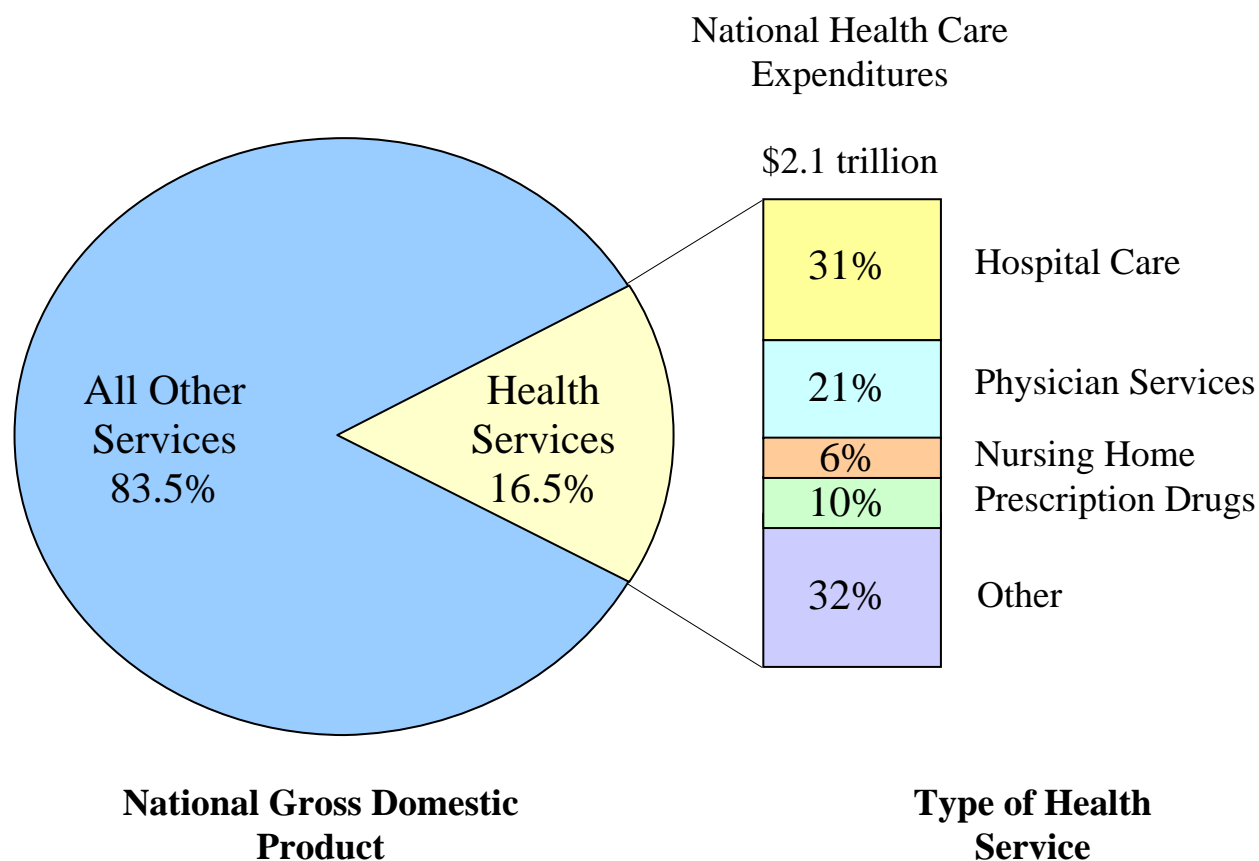
SOURCES: 2008 Bureau of Labor Statistics; 2008 Bureau of Economic Analysis; 2008 Centers for Medicare & Medicaid Services, National Health Expenditures 1970-2006 and National Health Expenditure Projections 2007-2017 (<http://www.cms.hhs.gov/NationalHealthExpendData> [March 2008]).

N/A - Not Available.

^a Based on Standard Industrial Classification (SIC) codes.

^b Based on North American Industry Classification System (NAICS).

Figure 1
National Health Expenditures
As a Percent of Gross Domestic Product
and by Health Service Type, 2006



County Demographic and Economic Data

The population for Summers County, cities in Summers County, and the State of West Virginia are illustrated in **Table 2**. The study is based on the medical service area that includes all of Summers County, West Virginia. Summers County is located in the southeast part of West Virginia (**Figure 2**). Hinton is the county seat of Summers County and is the only incorporated city in the county. The population of Hinton decreased by 16.1 percent from 3,433 in 1990 to 2,880 in 2000. The population is estimated to decrease by 8.0 percent from 2000 to 2006. The

population outside the city of Hinton decreased by 6.1 percent from 1990 to 2000 and is estimated to increase by 7.5 percent from 2000 to 2006. The Census population estimates for 2007 are available for counties and states only. Summers County decreased 8.5 percent in population from 1990 to 2000 and was estimated to have increased by 1.6 percent from 2000 to 2006. The State of West Virginia increased 0.8 percent from 1990 to 2000 and had 0.2 change in population from 2000 to 2007.

Table 2
Census Population, Population Estimates, and Percent Changes
for Summers County Cities, Summers County, and the State of West Virginia

	Census Population		Estimates		<u>10</u> <u>Years</u>	<u>6</u> <u>Years</u>	<u>7</u> <u>Years</u>
	1990	2000	2006	2007	'90-'00	'00-'06	'00-'06
Hinton city	3,433	2,880	2,651	NA	-16.1%	-8.0%	NA
Balance of Summers County	<u>10,771</u>	<u>10,119</u>	<u>10,880</u>	NA	-6.1%	7.5%	NA
Summers County	<u>14,204</u>	<u>12,999</u>	<u>13,531</u>	<u>13,202</u>	-8.5%	4.1%	1.6%
State of West Virginia	1,793,477	1,808,344	1,808,699	1,812,035	0.8%	0.0%	0.2%

SOURCE: U.S. Census Bureau; 1990 & 2000 Census Population; 2006 and 2007 Census Population Estimates (www.census.gov [April 2008]).

NA = not available

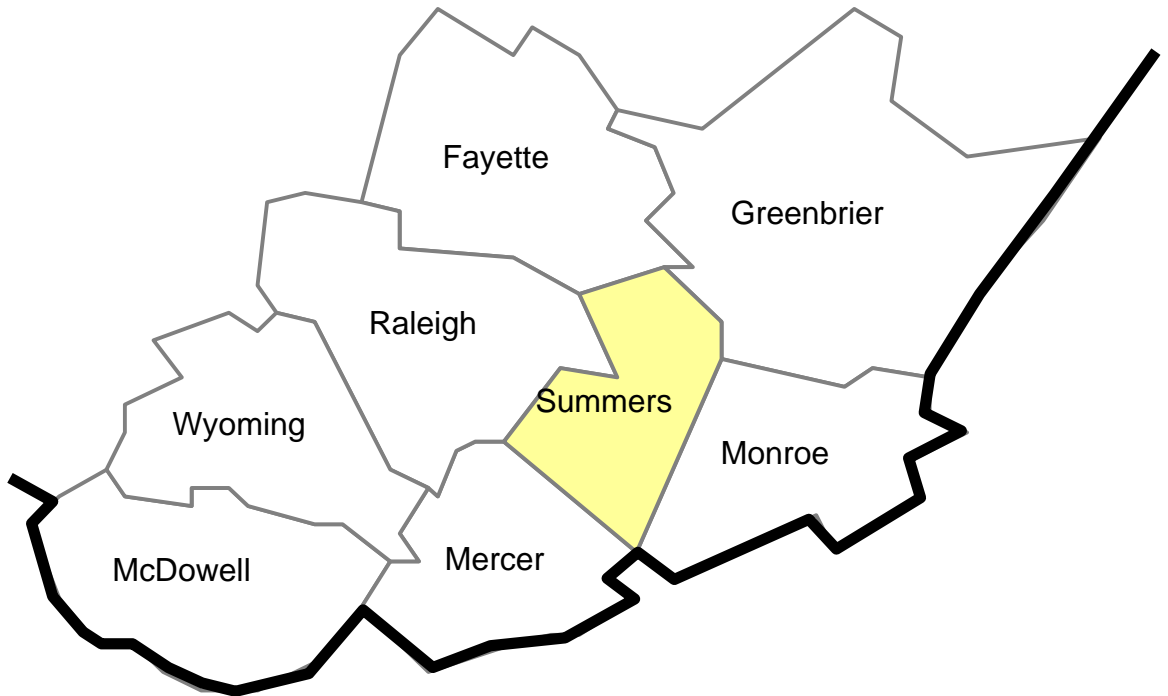
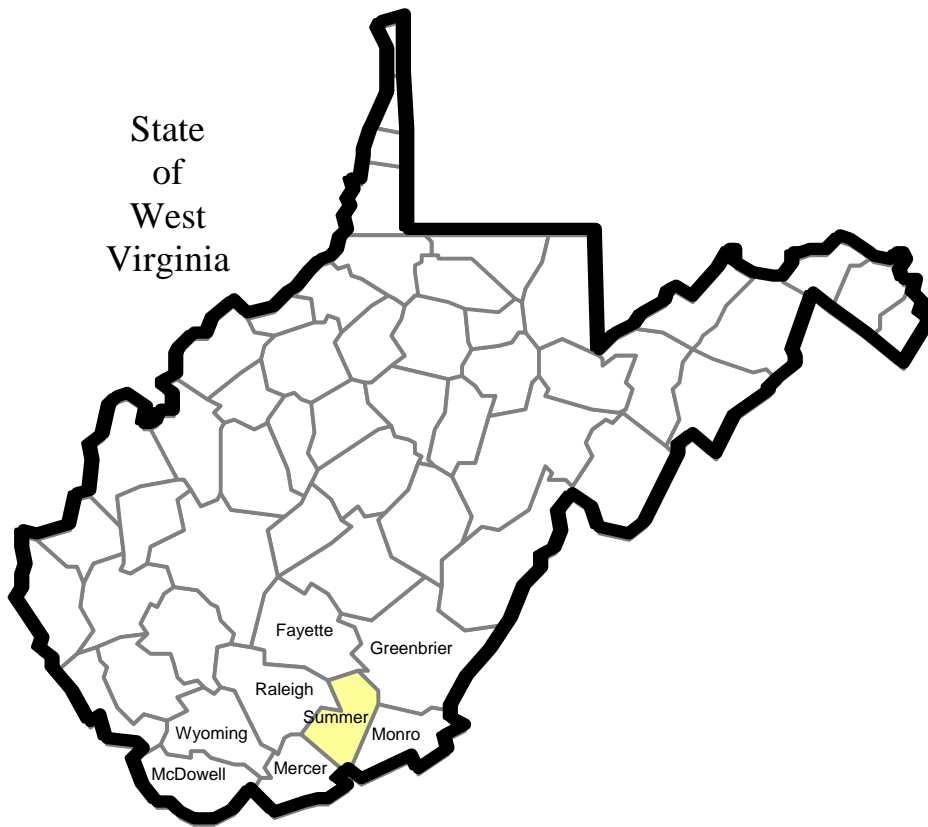


Figure 2
Summers County in relation
to State of West Virginia

Table 3 presents population, population projections and percent changes through 2030 using the 2000 census data as the base year. Summers County is projected to decline in population from 2000 to 2030. The State of West Virginia also is projected to have a decline in population from 2000 to 2015. The state is projected to increase in population from 2015 to 2030.

Table 3
Population, Population Projections, and Percent Changes
for Summers County and the State of West Virginia

	Census 2000	Projected				
		2010	2015	2020	2025	2030
Summers County	12,999	12,323	12,230	12,219	12,239	12,291
% Change from 2000 through projected year		-5.2%	-5.9%	-6.0%	-5.8%	-5.4%
State of West Virginia	1,808,344	1,769,285	1,796,649	1,826,875	1,858,389	1,890,022
% Change from 2000 through projected year		-2.2%	-0.6%	1.0%	2.8%	4.5%

SOURCE: Data from West Virginia University, Regional Research Institute, (<http://www.rri.wvu.edu/> [February 2008]); U.S. Census Bureau, 2000 Census Population (www.census.gov [February 2008]).

Data in **Table 4** are from the U. S. Census Bureau County Business Patterns and illustrate how health services are changing over time in Summers County. From 1998 through 2005, the health services employment increased 0.2 percent from 470 employees in 1990 to 471 employees in 2005. During the same time period, the total county employment increased 9.9 percent. In 1998, county health services employment represented 31.5 percent of total county employment, while the state health services employment represented 18.2 percent of total state employment.

In 2005, the county health services employment decreased to 28.7 percent of total county employment, while the state health services employment increased slightly to 19.9 percent of total state employment.

The county health services payroll increased 20.7 percent from \$9.4 million in 1998 to \$11.3 million in 2005; this compares to growth of 30.8 percent for the total county payroll (**Table 4**). In 1998, county health services payroll represented 35.6 percent of total county payroll, while the state health services payroll represented 19.0 percent of total state payroll. In 2005, the county health services payroll decreased to 32.9 percent of total county payroll, while the state health services payroll only increased to 21.4 percent of total state payroll.

The Direct Economic Activities

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

- Hospital
- Offices of Physicians, Dentists, and Other Health Practitioners
- Pharmacies
- Nursing and Protective Services
- Other Health and Medical Services

The total health sector in Summers County (**Figure 2**) employs 519 full- and part-time employees and has an estimated payroll including benefits of \$19,899,423 (**Table 5**). The hospital component employs 152 full- and part-time people with an annual payroll of \$7,731,445. The hospital component includes Summers County ARH Hospital, a critical access hospital with 25 acute care beds and 26 long term care beds (nursing home in the hospital). Summers County ARH Hospital provides inpatient and outpatient care, a 24/7 emergency room, specialty clinic, Hinton Health Right (free clinic), durable medical equipment (home health store), outpatient rehabilitation, and ancillary services.

Table 4
Employment and Payroll from County Business Patterns*
for Summers County and the State of West Virginia

Employment				
Based on NAICS ¹	Health Services Employment	Total County Employment	Health as a % of Total Co. Employment	Health as a % of Total State Employment
1998	470	1,492	31.5%	18.2%
1999	439	1,471	29.8%	18.4%
2000	427	1,544	27.7%	18.3%
2001	450	1,522	29.6%	18.8%
2002	478	1,639	29.2%	19.3%
2003	486	1,601	30.4%	19.7%
2004	463	1,577	29.4%	20.1%
2005	471	1,639	28.7%	19.9%
% Change '98-'05	0.2%	9.9%		
Payroll (\$1,000s)				
Based on NAICS ¹	Health Services Payroll	Total County Payroll	Health as a % of Total Co. Payroll	Health as a % of Total State Payroll
1998	9,383	26,343	35.6%	19.0%
1999	8,332	25,905	32.2%	19.1%
2000	9,090	26,541	34.2%	19.2%
2001	8,198	26,834	30.6%	19.7%
2002	11,067	30,571	36.2%	20.6%
2003	11,375	30,430	37.4%	20.8%
2004	10,724	32,014	33.5%	21.3%
2005	11,322	34,450	32.9%	21.4%
% Change '98-'05	20.7%	30.8%		

Source: U.S. Census Bureau, County Business Patterns, 1998-2005 data (www.census.gov [February 2008]).

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 are excluded for 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).

Table 5
Direct Impact of Health Services
in Summers County, West Virginia 2008

Health Care Component	Number of Employees	Income (Wages, Salaries, and Proprietors' Income, plus Benefits)
Hospital (Includes Summers County ARH Hospital, a critical access hospital with 25 acute care beds and 26 long term care beds [nursing home in hospital. Provided inpatient and outpatient care, 24/7 emergency room, specialty clinic, Hinton Health Right (free clinic), durable medical equipment [home health store], outpatient rehab, and ancillary services)	152	\$7,731,445
Offices of Physicians, Dentists, and Other Health Practitioners (Includes four primary care practices, a cardiology practice, one dental practice, one chiropractor practice, one optometry practice, and the emergency physicians on contract for hospital emergency room)	53	\$3,517,082
Pharmacies (Includes three pharmacies)	31	\$923,106
Other Health and Medical Services (Includes two nursing homes, DHHR, county health department, emergency medical services, school nurse, FMRS, RN at federal prison, Council on Aging, and an LPN education program)	<u>283</u>	<u>\$7,727,790</u>
TOTALS	519	\$19,899,423

SOURCE: Local data for hospital; local employment data for all other health services; income data for all services but the hospital were estimated utilizing average incomes from the U. S. Bureau of Labor Statistics online (www.bls.gov [April 2008]).

The offices of physicians, dentists, and other health practitioners' component employs 53 full-time and part-time employees, with an annual payroll of \$3,517,082. This component includes four primary care practices, a cardiology practice, one dental practice, one chiropractor practice, one optometry practice, and the emergency physicians on contract for the hospital emergency room. The pharmacy component includes three pharmacies with 31 full- and part-time employees with an annual payroll of \$923,106.

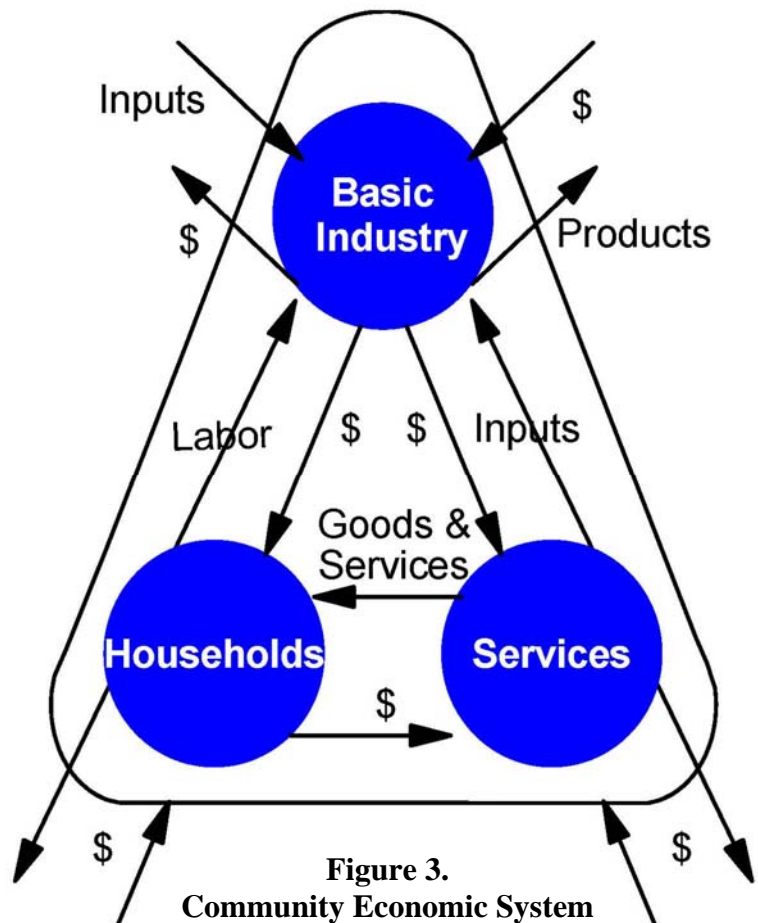
The nursing and protective care component would include the two nursing homes; however, the nursing home data are included in the other health and medical services to ensure the privacy of the individual providers. The other health and medical services component employs 283 full- and part-time employees with an annual payroll of \$7,727,790. This component includes the two nursing homes, DHHR, Summers County Health Department, emergency medical services, school nurse, FMRS, a registered nurse at the federal prison, Council on Aging, and an LPN education program.

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

Some Basic Concepts of Community Economics and Income and Employment Multipliers

Figure 3 illustrates the major flows of goods, services, and dollars of any economy. The foundation of a community's economy are those businesses which sell some or all of their goods and services to buyers outside of the community. Such a business is a basic industry. The flow of products out of, and dollars into, a community are represented by the two arrows in the upper right portion of **Figure 3**. To produce these goods and services for "export" outside the community, the basic industry purchases inputs from outside of the community (upper left portion of **Figure 3**), labor from the residents or "households" of the community (left side of **Figure 3**), and inputs from service industries located within the community (right side of **Figure 3**). The flow of labor, goods, and

services in the community is completed by households using their earnings to purchase goods and services from the community's service industries (bottom of **Figure 3**). It is evident from the interrelationships illustrated in **Figure 3** that a change in any one segment of a community's economy will have reverberations throughout the entire economic system of the community.



Consider, for instance, the closing of a hospital. The services section 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.

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 community's households. The households alter their consumption accordingly. The effect of this change in household consumption upon businesses in a community 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 the Health Sector
on the Economy of Summers County, West Virginia**

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 allows for development of county multipliers. Additional information on IMPLAN is included in

Appendix A.

The employment multipliers for the components of the health sector are shown in **Table 6**. The employment multiplier for the hospital component is 1.38. This indicates that for each job created in that sector, a 0.38 job is created throughout the area due to business (indirect) and

**Table 6
Employment Impact of Health Services
in Summers County, West Virginia 2008**

Health Care Component	Number of Employees	Employment Multiplier	Secondary Impact	Total Impact
Hospital	152	1.38	58	210
Offices of Physicians, Dentists, and Other Health Practitioners	53	1.32	17	70
Pharmacies	31	1.27	8	39
Other Health and Medical Services	<u>283</u>	1.34	<u>96</u>	<u>379</u>
Totals	<u>519</u>		<u>179</u>	<u>698</u>

SOURCE: Health care employment data provided from local sources; multipliers from Minnesota IMPLAN Group, Inc., 2006 IMPLAN Data.

household (induced) spending. The employment multipliers for the other health sector components are also shown in **Table 6**.

Applying the employment multipliers to the employment for each of the health sector components yields an estimate of each component's employment impact on Summers County (**Table 6**). For example, the hospital has employment of 152 employees; applying the employment multiplier of 1.38 to the employment number of 152 brings the total employment impact of the hospital to 210 employees ($152 \times 1.38 = 210$). The secondary impact of the hospital is 58 employees ($152 \times 0.38 = 58$); these are the jobs created in other industry sectors in the Summers County economy as a result of the spending of the hospital and the spending of the 152 hospital employees.

The offices of physicians, dentists and other health practitioners have a direct impact of 53 employees and after the application of the multiplier of 1.32, the secondary impact is 17 employees and the total impact comes to 70 employees. All the employment multipliers are applied in **Table 6**, resulting in a total employment impact of the health sector in Summers County estimated at 698 employees and a secondary employment impact of 179 employees.

The income multiplier for the hospital sector is 1.19 (**Table 7**). This indicates that for each dollar created in that sector, \$0.19 are created throughout the area due to business (indirect) and household (induced) spending. The income multipliers for the other health sector components are also given in **Table 7**.

Applying the income multipliers to the income (wages, salaries, and proprietor income plus benefits) for each of the health sector components yields an estimate of each component's income impact on Summers County (**Table 7**). The hospital component has a total payroll of \$7,731,445; applying the income multiplier of 1.19 brings the total hospital income impact to

Table 7
Income Impact of Health Services
in Summers County, West Virginia 2008

Health Care Component	Income (\$\$)	Income Multiplie r	Secondary Impact	Total Impact
Hospital	\$7,731,445	1.19	\$1,468,975	\$9,200,420
Offices of Physicians, Dentists & Other Health Practitioners	\$3,517,082	1.16	\$562,733	\$4,079,815
Pharmacies	\$923,106	1.17	\$156,928	\$1,080,034
Other Medical and Health Services	<u>\$7,727,790</u>	1.28	<u>\$2,163,781</u>	<u>\$9,891,571</u>
Totals	<u>\$19,899,423</u>		<u>\$4,352,417</u>	<u>\$24,251,840</u>

SOURCE: Hospital income provided by local sources; income data for all services (except hospital) were estimated utilizing average incomes from the U. S. Bureau of Labor Statistics online (www.bls.gov [April 2008]); multipliers from Minnesota IMPLAN Group, Inc., 2006 IMPLAN Data.

\$9,200,420 ($\$7,731,445 \times 1.19 = \$9,200,420$). The secondary income impact from the hospital component is \$1,468,975, which is the income generated in the other industry sectors in the Summers County economy due to the hospital spending and the hospital employees' spending. 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 the health sector in Summers County is estimated to be \$4,352,417, with the total income impact of the health sector in Summers County estimated to be \$24,251,840 (**Table 7**).

Summary

The economic impact of the health sector upon the economy of Summers County is tremendous. The health sector employs a large number of residents, similar to a large industrial firm. The secondary impact occurring in the community is extremely large and measures the total impact of the health sector. If the health sector increases or decreases in size, the medical health of the community as well as the economic health of the community are greatly affected. For the attraction of industrial firms, businesses, and retirees, it is crucial that the area have a quality health sector. Often overlooked is the fact that a prosperous health sector contributes to the economic health of the community.

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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.