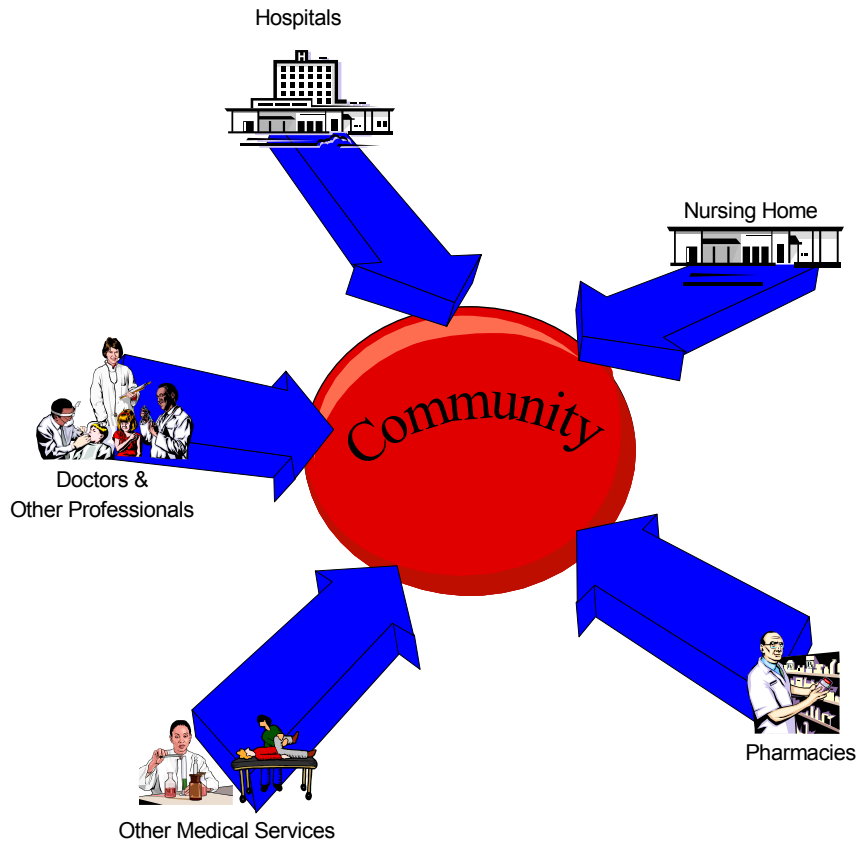


Shetek Hospitals Service Area - Economic Impact of the Health Sector



A Collaborative Project of:

Minnesota Department of Health,
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The Economic Impact of the Health Sector on the Economy of the Shetek
Hospitals Service Area, Murray County, Minnesota

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THE ECONOMIC IMPACT OF THE HEALTH SECTOR ON THE ECONOMY OF THE SHETEK HOSPITALS SERVICE AREA, MURRAY COUNTY, MINNESOTA

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 the Shetek Hospitals Service Area, which includes the three hospitals in the Shetek Hospitals system -- Tracy Area Medical Services (TAMS), Westbrook Health Center (WHC) and Murray County Memorial Hospital (MCMH). Communities covered include essentially all of Murray County; Tracy, Garvin, Amiret, and Balaton in Lyon County; Walnut Grove, Revere, Milroy, and Lamberton in Redwood County; and Westbrook, Jeffers and Storden in Cottonwood County. The specific objectives of this report are to:

1. summarize the direct economic activities of the health sector;
2. review concepts of community economics and multipliers; and
3. estimate the secondary impacts of the health sector on the economy of the service area.

No recommendations will be made in this report.

Health Services And Rural Development

The nexus between health care services and rural development is often overlooked. At least three primary areas of commonality exist. A strong health care system can help attract and maintain business and industry growth, and attract and retain retirees. A strong health care system can also create jobs in the local area.

Business and Industry Growth

Quality-of-life (QOL) factors play a dramatic role in business and industry location decisions. Among the most significant of those QOL variabilities are health care services, which is important for at least three reasons. Good health and education services are imperative to industrial and business leaders as they select a community for location. Employees and participating management may offer strong resistance if they are asked to move into a community with substandard or inconveniently located health services.

Secondly, when a business or industry makes a location decision, it 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 can be expected to yield dividends in the form of increased labor productivity.

The cost of health care services is the third factor that is considered by business and industry in development decisions.

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 can be a significant source of income for the local economy. Many rural areas have environments (e.g., moderate climate and outdoor activities) that enable them to be in a good position to attract and retain retirees. The amount of spending

embodied in this population, 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. Health services may be a critical variable that influences the location decision of retirees.

Health Services and Job Growth

A factor important to the success of rural economic development is job creation. Nationally, employment in health care services increased by 28 percent from 1990 to 2000, and by more than 200 percent since 1970 (**Table 1**). In rural areas, employment in health-related services often accounts for 10 to 15 percent of total employment. This is reflected in the fact that the hospital is often the second largest employer in a rural community.

It is also important to note that the health sector is a growing sector. **Table 1** shows how health services, as a share of gross domestic product (GDP), have increased over time. In 1970, Americans spent \$73.1 billion on health care, which accounted for 7.0 percent of the GDP. In 2000, health care costs ballooned to nearly \$1.3 trillion, or about 13.2 percent of the GDP. Capturing this economic growth can only help a rural community.

Table 1
National Health Expenditures and Employment Data
1970-2000

Year	Total Expenditures (\$\$ Billions)	Per Capita Expenditures (\$\$)	Expenditures as a Percent of GDP	Employment in Health Sector (000 Jobs)	Annual Increase in Employment
1970	\$73	\$348	7.0	3,053	
1980	246	1,067	8.8	5,278	5.6%
1990	696	2,736	12.0	7,814	4.0%
1996	1,038	3,842	13.3	9,477	3.3%
1997	1,094	4,011	13.2	9,710	2.5%
1998	1,150	4,177	13.1	9,846	1.4%
1999	1,216	4,377	13.1	9,977	1.3%
2000	1,300	4,637	13.2	10,103	1.3%

SOURCE: Centers for Medicare and Medicaid Services, National Health Expenditures and Selected Economic Indicators, <cms.hhs.gov/statistics/nhc/projections-2001/t1.asp>, Bureau of Labor Statistics (BLS), <stats.bls.gov/data/home.htm>.

DETERMINING YOUR COMMUNITY'S ECONOMIC POTENTIAL FOR HEALTH CARE

So, how can your community take advantage of the economic benefits of health care? Do you have a strong health care system that is well supported by the community, or are the health care dollars from your community “outmigrating” to the next largest community? Do you want to retain the businesses and residents in your area and attract new ones to expand your economic base? Active participation in the health care decision-making process in your community by community citizens and leaders can make a huge difference and, hopefully, reap the rewards economically and health-wise for the entire community.

For 2000, the average annual per person expenditure on health care in the U.S. was \$4,637. The amount of this health spending retained by a rural community depends on several factors and may have a potentially large and immediate impact on the local economy, the number of jobs created, and the number of new residents moving into the community. The secondary impact of increased health care spending, such as higher retail sales in non-health areas or new housing starts, may also have a sizeable impact on the community.

Determining the Potential

How can you determine if health care is important or should be important to your community's economy? The first step is to determine what types of health services are used in your community, and what the expenditures are for those services. The first column of **Table 2** shows the 2001 Minnesota per capita expenditures by major categories of health care, which were estimated by the Centers for Medicare and Medicaid Services (CMS) and totaled \$4,225 for the year.

These averages are larger than many people expect. One reason is that health care expenditures are highly skewed with many people paying less and a few paying much more. Medical Expenditure Panel Survey (MEPS) data from the Agency for Health Care Policy and Research shows the skewed nature of health care expenditures (Machlin et al.). MEPS omits nursing home residents and looks at a less extensive range of expense items than did the CMS, so the MEPS numbers are lower. The MEPS 1996 average expense per capita (including people with no expenses) was \$2,038 but half of all people had expenses of less than \$395. A large portion of health care expenditures occur in later life. People 65 years and older averaged \$5,370 for the year, while those between 18 and 64 averaged only \$1,861 (see **Figure 1**).

The second column of **Table 2** estimates the percent of the health care services that could be provided locally. The third column uses those percentages to estimate per capita medical expenditures in the local community. The estimated population of the hospital's market area, consisting mainly of Murray County; Tracy, Garvin, Amiret, and Balaton in Lyon County; Walnut Grove, Revere, Milroy, and Lamberton in Redwood County; and Westbrook, Jeffers and Storden in Cottonwood County., is 20,380. Column four multiplies the per capita expenditures by that estimated service area population to arrive at an estimated economic impact of providing those services in the county, \$59,591,120. (See Appendix A for a detailed description of how these numbers were derived.)

Table 2
Estimated Potential Personal Primary Care Expenditures
for the Shetek Hospitals Service Area¹.

Health Services	2001 Minnesota Per Capita ^a	Percent Primary Care	Primary Care Per Capita	Market Area Potential Expenditures ^b
Hospital Care	\$1,329	61% ²	\$811	\$16,528,180
Physician & Other Professional Services	1,428	75% ³	1,071	21,826,980
Home Health Care	94	100% ⁴	94	1,915,720
Nursing Home Care	439	100% ⁵	439	8,946,820
Dental Services	229	75% ³	172	3,505,360
Drugs & Other Non-Durables	449	75% ³	337	6,868,060
Medical Durables	74	- ³	-	-
<u>Other Personal Health Care</u>	<u>182</u>	- ³	-	-
Total	\$4,225	69%	\$2,924	59,591,120

SOURCE: Centers for Medicare and Medicaid Services
 [<cms.hhs.gov/statistics/nhe/default.asp >](http://cms.hhs.gov/statistics/nhe/default.asp)

Numbered footnotes are presented in **Appendix A**.

^aPer capita expenditures are 1998 data adjusted for inflation using the GDP implicit price deflator. These are expenditures paid to health care providers by all payers including Medicare, Medicaid, private health insurers and out-of-pocket payments. Additional details on the methodology used are available on the above website.

^bBased on per capita amounts and a market area population estimate of 20,380 people.

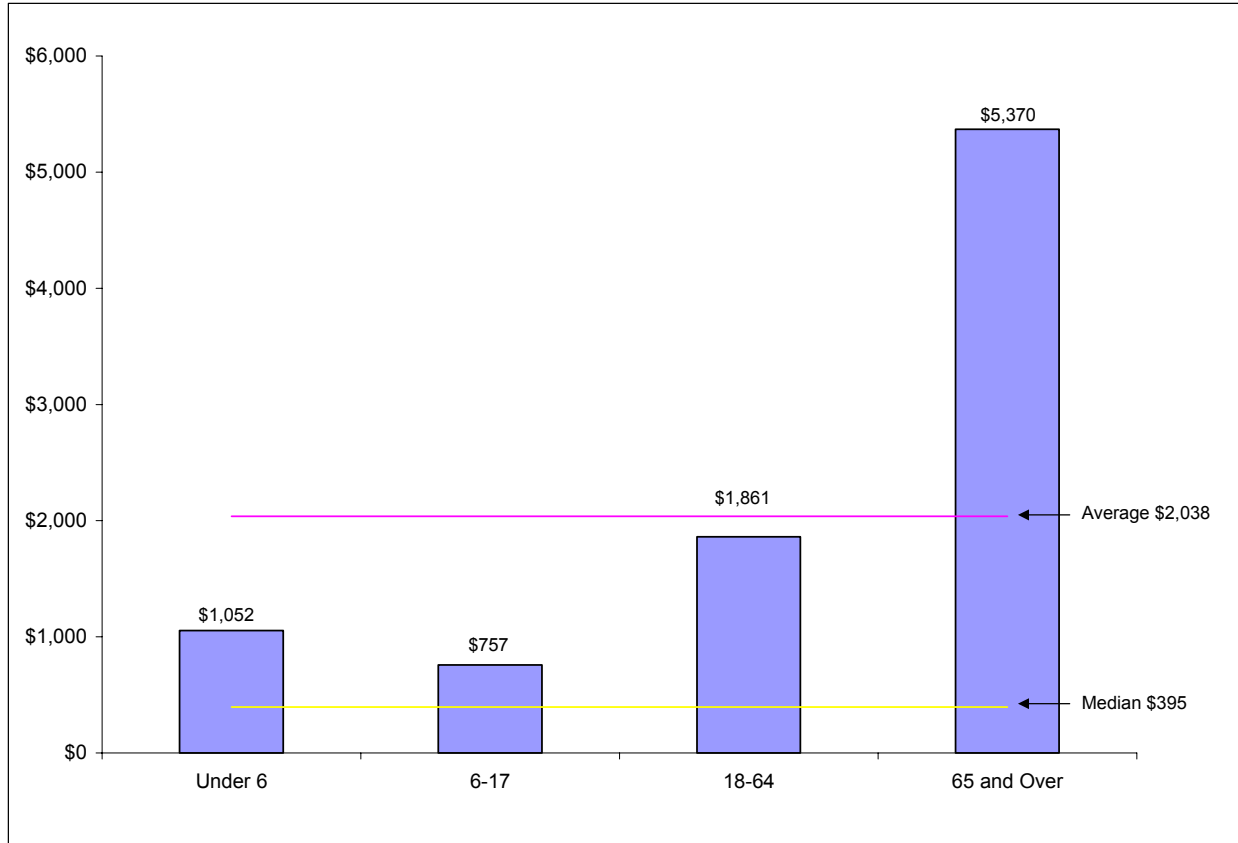


Figure 1. Average U.S. Medical Expenses Per Person by Age, 1996.

Source: Machlin, et al. "Chartbook #5: Health Care Expenses in the Community Population, 1996." Agency for Healthcare Research and Quality, http://www.meps.ahrq.gov/papers/cb5_01-0027/cb5.htm.

By comparing the potential impact with actual local data, your community can determine how much health care is provided locally, and if there is an opportunity to expand these offerings, thus bringing more health dollars into the local economy. For example, the hospital will have an annual estimate of total billings. If this figure is below the potential, there may be room to expand hospital services and retain more dollars in your community. Another example is nursing homes, a service that can be provided completely within the service area. One simple way to determine if local needs are being met is to see if there is a waiting list at the existing facilities or if residents are using facilities outside the service area. If residents are going outside the service area, then there is a potential to expand locally.

These estimates provide a starting point (albeit a somewhat crude one to be sure) to measure the potential for health spending in rural communities. The most important caveat to remember in this process is that health spending involves the use of goods and services, which may not be produced locally. While laboratory and radiology services may be provided locally, particularly if there is a large clinic or hospital in the community, other goods and services are imported and provide little economic wealth to the community. This can include supplies, equipment, medical instruments and implantable devices, drugs, and itinerant sub-specialist physicians.

Very few rural communities have realized the full potential of local health care as an economic and community development tool. Rural communities have an extraordinary opportunity to shift the tide in their local economies and develop health care as a local business. The “warms you twice” adage of wood chopping also can be applied to health care. Every health care service provided locally benefits the rural community twice—first, it improves people’s health, and second, it improves the health of the local economy.

Table 3 shows the economic potential of the health care industry from another perspective – the growth in health-related occupations. Statewide, health care represented 181,899 jobs, or about seven percent of all jobs in the state. Health-related jobs are expected to increase by 23 percent by 2008. When both employment increases and replacements are considered, total openings through 2008 are expected to be 74,580. Health care jobs are made up of roughly two-thirds professional and technician positions, and one-third in services and related occupations. Employment projections are not available on a county basis, but for the 23-county Southwestern Region health care represented 13,728 jobs in 1998 and is expected to increase 21 percent by 2008, to 16,621.

Table 3
Employment Potential in Health-Related Occupations in Southwestern
Minnesota, 1998 and Projected 2008.

Occupations	1998 Estimated Employment	2008 Projected Employment	1998-2008 Percent Change	1998-2008 Total Openings ^a
<i>Statewide:</i>				
Health Practitioners and Technicians	122,495	148,292	21%	48,757
<u>Health Service and Related Occupations</u>	<u>59,404</u>	<u>75,719</u>	27%	<u>25,823</u>
Total Health Practitioners, Technicians, Health Service and Related Occupations	181,899	224,011	23%	74,580
TOTAL, ALL OCCUPATIONS	2,761,900	3,196,670	16%	1,102,522
Health Occupations as % of Total	7%	7%		7%
<i>Southwestern Minnesota^b:</i>				
Health Practitioners and Technicians	8,539	10,118	18%	3,206
<u>Health Service and Related Occupations</u>	<u>5,189</u>	<u>6,503</u>	25%	2,117
Total Health Practitioners, Technicians, Health Service and Related Occupations	13,728	16,621	21%	5,323
TOTAL, ALL OCCUPATIONS	209,993	230,960	10%	73,438
Health Occupations as % of Total	7%	7%		7%

SOURCE: Minnesota Department of Economic Security Workforce Center.

^aTotal job openings represent the sum of employment increases and net replacements. Net replacement openings is an estimate of the need for new work force entrants to replace workers who leave an occupation. It estimates the net movement of 1) experienced workers who leave the geographic area, minus 2) experienced workers who move into such an opening. It thus does not represent the total number of jobs to be filled due to the need to replace workers. If employment change is negative, job openings due to growth are zero and total job openings equals net replacements.

^bThe Southwestern Minnesota region includes Big Stone, Blue Earth, Brown, Chippewa, Cottonwood, Faribault, Jackson, Lac qui Parle, Le Sueur, Lincoln, Lyon, Martin, Murray, Nicollet, Nobles, Pipestone, Redwood, Rock, Sibley, Swift, Waseca, Watonwan, and Yellow Medicine Counties.

What Do You Know About Your County?

To make informed decisions about the economic impact of health care on your community, it is imperative that you understand the “who, what, where, when, and how” about your community. The rest of the information in this report discusses county-specific information that will help your community determine its “health impact.”

Demographics

The population and employment for Murray County will be illustrated in this section. The population of Murray County has decreased in recent years, while that of the state has increased. The population of Murray County was 9,165 in 2000 according to the U.S. Census Bureau and was estimated to be 9,155 in 2001 according to the Minnesota State Demographer’s Office (**Table 4**). Between 1990 and 2000, Minnesota’s population increased 9.8 percent. Over that same period, Murray County experienced a change of -5.1 percent.

Murray County’s population in 2000 was 98.3 percent white, 0.2 percent American Indian, 0.1 percent black, and 0.6 percent “other” (Asian Americans, Native Hawaiian, and all others). Approximately 0.7 percent indicated two or more races while 1.5 percent of Murray County were of Hispanic origin. These estimates show a slight deviation from the state’s numbers. Population by age estimates revealed that 27.1 percent of the population was age 19 and under, while 26.3 percent was age 60 years or older. Compared to the state’s estimates, Murray County has a greater proportion of older residents.

Table 4
Selected Demographic Data for Murray County and the State of Minnesota

Selected Item	Murray County	County Percent	State Percent
Population Change (1980-1990)	11,507→9,660	-16.1	+7.4
(1990-2000)	9,660→9,165	-5.1	+12.4
Population Projections:	Year 2005 = 8,870		
	Year 2010 = 8,710		
	Year 2015 = 8,630		
Population by Race (2000)			
White	9,009	98.3	89.4
American Indian ¹	18	0.2	1.1
Black	9	0.1	3.5
Other ²	55	0.6	4.2
Two or more races ³	64	0.7	1.7
Hispanic ethnic background ⁴	137	1.5	2.9
Population by Age (2000)			
0-19	2,478	27.1	29.1
20-24	348	3.8	6.6
25-34	846	9.2	13.7
35-44	1,285	14.0	16.8
45-54	1,279	14.0	13.5
55-59	518	5.7	5.6
60+	2,411	26.3	16.0
Population by Community (2001)			
Slayton	2,073		
Fulda	1,316		
Chandler	273		
Lake Wilson	269		
Currie	220		

SOURCE: U.S. Census Bureau, 2000 data available from the Minnesota Planning Agency <www.mnplan.state.mn.us/demography/index.html>. The estimates for 2005-2015 are from the Minnesota State Demographer's Office.

¹Native American includes American Indian and Alaska Natives

²Other defined as: Asian Americans, Native Hawaiian, Pacific Islander and all others.

³Two or more races indicate a person is included in more than one race group.

⁴Hispanic population is not a race group but rather a description of ethnic origin; Hispanics are included in all four race groups.

Economic Indicators and Personal Income

Table 5 shows economic indicators for Murray County and the state. The average per capita income was \$23,844 for the county compared to \$31,935 for Minnesota. An estimated 8.3 percent of Murray County's population had personal incomes below the poverty rate compared to the state rate of 5.1 percent. The data indicates that 18.0 percent of total personal income for Murray County came from transfer payments.

Table 5
Economic Indicators for Murray County, the
State of Minnesota and the Nation

Indicator	County	State	Nation
Total Personal Income (2000)	\$217,890,000	\$157.4 billion	\$8.31 trillion
Per Capita Income (2000)	\$23,844	\$31,935	\$29,469
Civilian Labor Force (2001) ^a	4,198	2,814,357	135 million
Unemployment (2001)	210	104,059	6.7 million
Unemployment Rate (2001)	5.0%	3.7%	5.0%
Poverty Rate (2001) ^b	8.3%	5.1%	11.3%
Transfer Dollars (2000) ^b	\$39,315,000	\$16.8 billion	\$1.07 trillion
Transfer Dollars as percentage of Total Personal Income (2000)	18.0%	10.7%	12.9%

SOURCE: U.S. Bureau of Economic Analysis <www.bea.doc.gov/bea/regional/reis/>, Bureau of Labor Statistics <www.bls.gov/data/home.htm>, and Census Bureau <www.census.gov/hhes/www/poverty.html>

^aLabor force estimates are from the U.S. Bureau of Labor Statistics Current Population Survey. Employed persons holding more than one job are only counted once.

^bDefinitions are in Appendix B, Glossary of Terms.

Employment

Employment data by industry for Murray County are presented in **Table 6**; data is for 2000 from the Bureau of Economic Analysis, Regional Economic Information System. The industry sectors with the largest employment are services (1,094), government and government enterprises (670), and state and local government (582). Murray County has a services, government and government enterprises, and state and local government economic base.

The Direct Economic Activities

Employment and payroll are the important direct economic activities created in the Shetek Hospitals Service Area from the health sector. The health sector is divided into the following five components:

- Hospitals
- Doctors and Dentists (includes other medical professionals)
- Nursing and Protective Care
- Other Medical and Health Services (includes home health care and county health departments)
- Pharmacies

The total health sector in the service area employs 891 employees and has an estimated 2003 payroll of \$19,721,835 (**Table 7**). The health sector in the Shetek Hospitals Service Area is typical of many rural areas, with three hospitals, nine physician offices, five dental offices, seven nursing homes plus two assisted living facilities, and three pharmacies. The Hospital component employs 265 people with an annual payroll of \$7,206,569. The Doctors and

Dentists (& Other Medical Professionals) component employs 58 employees, with an annual payroll of \$2,005,892^a. The Nursing and Protective Care Component employs 553 people with an annual payroll of \$10,230,796. The Other Medical and Health Services component employs 4 employees, with an annual payroll cost of \$88,302. The Pharmacies component has a total of 11 employees totaling a payroll of \$190,276. It should be noted that many rural communities have a large number of elderly, and the ranchers and farmers often retire in the towns. Thus, Nursing and Protective Care facilities are an important component of the health sector.

The health sector also purchases goods and services from other sectors of the economy, totaling an estimated \$17,289,498. Together with payroll, health sector expenditures amounted to \$37,011,333 in 2003^b.

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 Murray County and the rest of the service area. 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.

^a Payroll data for professional services such as physicians and dentists is estimated from sources such as the U.S. Census Bureau's County Business Patterns database. For services with offices in several counties, census bureau staff allocates the payroll totals to individual counties.

^b Hospital total expenditures are assumed equal to net service revenue. Expenditures for the other health care sectors are estimated from secondary data.

Table 6
Employment in Murray County, Minnesota, 2000

Employment Type or Industry	Employees
TOTAL EMPLOYMENT	5,162 ^a
By Type:	
Wage and Salary	3,192
Proprietors	1,970
Farm	889
Nonfarm	1,081
By Industry:	
Farm	1,098
Nonfarm	4,064
Private	3,394
Agricultural services, forestry, fishing, and other	(D)
Mining	(D)
Construction	413
Manufacturing	(D)
Transportation and public utilities	232
Wholesale trade	242
Retail trade	548
Finance, insurance, and real estate	307
Services	1,094
Government and government enterprises	670
Federal, civilian	53
Military	35
State and local ^b	582

SOURCE: U.S. Bureau of Economic Analysis, Regional Economic Information System
<www.bea.doc.gov/bea/regional/reis/>.

^aThe number of employees shown in Table 6 is greater than in Table 5 because employees holding more than one job are counted at each job. Table 5 counts them only once.

^bBecause the hospitals are publicly owned, their 265 full-time and part-time employees are included under the state and local government category.

(D) = not disclosed.

Table 7
Direct Economic Activities of the Health Sector in the Shetek Hospitals
Service Area, Minnesota, 2003

Component	Estimated Employees	Estimated Expenditures
<u>Estimated Payroll</u>		
Hospital	265	\$7,206,569
Doctors and Dentists (nine physician offices, five dentists, plus chiropractors, optometrists, and other services)	58	2,005,892
Nursing & Protective Care (seven nursing homes plus two assisted living facilities)	553	10,230,796
Other Medical & Health Services	4	88,302
Pharmacies and Related (three are listed)	11	190,276
Total Employees and Payroll	891	\$19,721,835
<u>Expenditures for Goods and Services Other than Payroll</u>		\$17,289,498
TOTAL EXPENDITURES		\$37,011,333

SOURCE: From local survey and 2000 IMPLAN data estimated from U.S. Census Bureau County Business Patterns and U.S. Bureau of Economic Analysis reports, indexed to 2003 dollars.

Some Basic Concepts of Community Economics and Income and Employment Multipliers

Figure 2 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 the figure. 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 2**), labor from the residents or "households" of the community (left side of **Figure 2**), and inputs from service industries located within the community (right side of **Figure 2**). 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 2**). It is evident from the interrelationships illustrated in **Figure 2** 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 the 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.

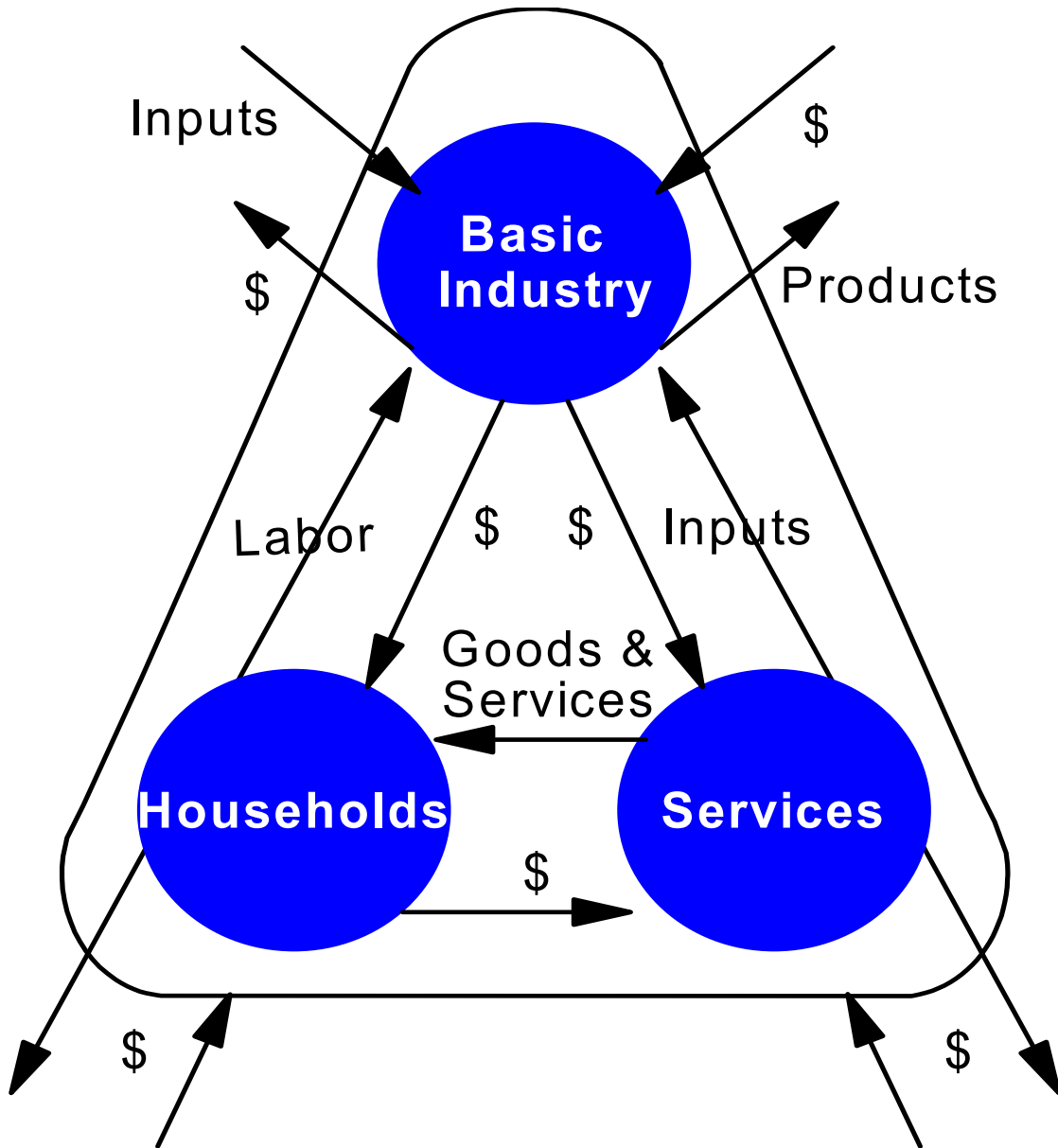


Figure 2.
Community Economic System

Secondary Impacts of Health Sector on the Economy of Murray County, Minnesota

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. Employment and income multipliers for the area have been calculated by use of the IMPLAN model. IMPLAN was developed by the U.S. Forest Service and is a model that allows for development of county multipliers[°]. A Type SAM multiplier is used in this report. It 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. For example, an employment multiplier of 2.0 indicates that if one job is created by a new industry, one other job is created in other sectors due to business (indirect) and household (induced) spending.

[°] For complete details of the IMPLAN model and an explanation of different types of IMPLAN multipliers, see [1]. Type SAM multipliers are calculated using a “social accounting matrix” methodology that accounts for commuting, social security tax payments as well as household income taxes and savings. Type SAM multipliers separate the effects of market income such as employment payrolls, from government expenditures such as social security payments. Thus, Type SAM multipliers give estimates that are more accurate than earlier versions described in the literature as Type II and Type III multipliers.

The IMPLAN employment multipliers for the five components of the health sector are shown in **Table 8**, column 3. The employment multiplier for the hospital component is 1.23. This indicates that for each job created in that sector, 0.23 jobs are created throughout the area due to business (indirect) and household (induced) spending. The employment multipliers for the other health sector components are also shown. The income multiplier for the hospital sector is 1.16 (**Table 8**, column 6). This indicates that for each dollar created in that sector, 0.16 dollars are created throughout the area due to business (indirect) and household (induced) spending. The Type SAM income multipliers for the other four health sector components are also given.

Table 8
Economic Impact of the Health Sector
on Employment and Income in Murray County, Minnesota, 2003

(1) Health Sector Component	(2) Employment	(3) Type SAM Multiplier ^a	(4) Employment Impact	(5) Estimated Expenditures	(6) Type SAM Multiplier ^a	(7) Income Impact
Hospitals	265	1.23	326	\$7,206,569	1.16	\$8,330,102
Doctors & Dentists	58	1.34	78	2,005,892	1.18	2,369,799
Nursing & Protective Care	553	1.13	626	10,230,796	1.13	11,548,860
Other Medical & Health Services	4	1.21	5	88,302	1.18	103,926
Pharmacies and Related	11	1.16	13	190,276	1.17	222,718
TOTALS	891		1,047	\$19,721,835		\$22,575,405
Health-Related as % of County Total ^b	17.3%		20.3%	19.5%		22.3%
Expenditures Other Than Payroll				\$17,289,498		\$25,333,493
Total Expenditures				\$37,011,333		\$47,908,898
% of County Total Economic Output				7.7%		9.9%

SOURCE: 2000 IMPLAN Data Base indexed to 2003 dollars.

^aA Type SAM employment multiplier is calculated using the formula: (direct employment in these industries + employment generated indirectly in input supplier firms + additional employment induced by the employees' consumer spending)/(direct employment). A type SAM income multiplier is calculated in a similar fashion.

^bThe comparison to county totals provides a general indication of sector size, but is somewhat misleading in that providers in the market area extending into the surrounding counties are included in the health care sector numbers.

Applying the employment multipliers to the employment for each of the five health sector components yields an estimate of each component's employment impact on Murray County (**Table 8**, columns 2, 3, and 4). For example, the hospital's 265 employees; applying the Type SAM employment multiplier of 1.23 to the employment number of 265 brings the total employment impact of the hospitals to 326 employees ($265 \times 1.23 = 326$). The Doctors and Dentists component has a direct impact of 58 employees and with the application of the Type SAM multiplier of 1.34, the total impact comes to 78 employees. The Nursing and Protective Care component has a direct effect of 553 employees and an employment multiplier of 1.13, to bring the total impact to 626 employees. The Other Medical & Health Services component has a direct effect of 4 employees, an employment multiplier of 1.21, and a total employment impact of 5 employees. The Pharmacies component has 11 employees and a total impact of 13 employees, applying the employment multiplier of 1.16. The total employment impact of the health sector in Murray County is estimated at 1,047 employees (**Table 8**, total of column 4).

Total wages and salaries paid by the health care sectors in Murray County are estimated at \$19,721,835. Applying the income multipliers to the income (employee compensation and proprietors income) for each of the five health sector components yields an estimate of each component's income impact on Murray County (**Table 8**, columns 5, 6, and 7). The Hospital component has a total payroll of \$7,206,569; applying the Type SAM income multiplier of 1.16 brings the total Hospital income impact to \$8,330,102 ($\$7,206,569 \times 1.16 = \$8,330,102$). The Doctors and Dentists have a total income impact of \$2,369,799, based on the application of the income multiplier of 1.18 to the payroll of the Doctors and Dentists component of \$2,005,892. The Nursing & Protective Care component has a payroll of \$10,230,796, a multiplier of 1.13, resulting in an income impact of \$11,548,860. The Other Medical & Health Services has an

income impact of \$103,926, based on the direct payroll of \$88,302 and the income multiplier of 1.18. The Pharmacies has an income impact of \$222,718, based on the direct payroll of \$190,276 and the income multiplier of 1.17. The total income impact of the health sector in Murray County is projected to be \$22,575,405 (**Table 8**, total of column 7).

The relative impacts on different sectors of the Murray County economy affected by health care economic activity are shown in **Table 9**. A total of 46 additional jobs are generated in non-health-related components of the services sector, for example, while 43 jobs are generated in non-health-related parts of the trade sector.

Note that the health care sector wages and salaries mentioned above do not represent the entire expenditures and revenues that flow through the sectors. Revenues go to purchase inputs from other supplier industries as well, in and out of the county. Total revenues of the health care sectors are estimated at around \$37 million (see Table 8). Comparing this number to the \$60 million of potential county primary care expenditures discussed earlier (see Table 2), 62 percent of these expenditures are probably going to the local health care sectors while the rest is going to providers outside the county. However, as Figure 1 and Table 4 show, older people tend to spend more on health care and this area has a higher proportion of older residents than does the state overall. So, the potential expenditures in this area may be higher than the state per-capita averages indicate, and the percentage being captured by the local health care sector may be less than that shown here.

Table 9
Economic Impact of the Health Sector on Employment in the Shetek Hospitals Service Area, Minnesota, by Major Sector Groups

Industry	Number of Employees		
	Direct	Secondary	Total
<i>Hospitals</i>	265	12	277
<i>Doctors & Dentists</i>	58	4	62
<i>Nursing & Protective Care</i>	553	6	559
<i>Other Medical & Health Services</i>	4		4
<i>Services Not Related to Health Care</i>	0	46	46
Total Service Sectors	880	68	949
<i>Pharmacies and Related Sectors</i>	11	3	14
<i>Trade Sectors Not Related to Health Care</i>	0	43	43
Total Trade Sectors	11	46	57
Financial, Insurance & Real Estate	0	12	12
Transportation, Communications & Public Utilities	0	8	8
Construction	0	6	6
Agriculture	0	3	3
Manufacturing	0	3	3
Government	0	7	7
<u>Other</u>	0		
Total Health Sector Impact	891	156	1,047
Total County Employment (from Table 6)			5,162
Health-Related as % of County Total	17.3%		20.3%

Summary

The economic impact of the health sector upon the economy of Murray County and the rest of the service area is significant. The health sector employs a large number of residents, similar to a large industrial firm. The secondary impact occurring in the community is quite 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 retention and 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 also contributes to the *economic* health of the community.

Appendix A

Footnotes for Table 2

¹The Health Care Financing Administration develops the per capita expenditure for health care annually. The data are secondary sources that are tabulated for other purposes. National health expenditures reported here include spending by type of expenditure (i.e., hospital care, physician care, dental care, and other professional care; home health; drugs and other medical non-durables; vision products and other medical durables; nursing home care and other personal health expenditures. Not included are non-personal expenditures for such items as public health, research, construction of medical facilities and administration). The primary care percentages are adapted from an Oklahoma study [2].

²This estimate is extrapolation from Kentucky experience. Kentucky's Medicaid program offers a wider range of services than required by Medicaid. To restrain Medicaid cost increases, Kentucky established a primary care gatekeeper program several years ago. This program is thought to have an impact with respect to appropriate utilization of care, but is not felt to be fully effective. Kentucky Medicaid eligible may use health care more appropriately than individuals insured through commercial insurance plans. A 1996 study compared local to non-local use by 300,500 Medicaid eligible who reside in 49 rural counties in Southeast Kentucky. The aggregate of the 49 counties retained 61% of all hospital *expenditures*. Measuring by expenditure is important, particularly in hospital care, because tertiary care is far more expensive. This percentage was applied to Table 2. Other examples of hospital expenditure retention include a large (50,000) rural county in the western part of Kentucky with two large hospitals. These hospitals reported an aggregate retention of 96% of all inpatient admissions (expenditure data were not available). A small, 71-bed hospital in a county with 17,000 people retained 64% of all admissions. A very large 288-bed hospital in a county of 30,000 retained 77% of all admissions. This county has as a large sub-specialty complement of physicians.

³The federal Bureau of Primary Health Care (BPHC) required that applicants for Community/Migrant Health Centers (C/MHC) grants (330 clinics) develop a needs assessment to justify staffing of the clinic with physicians, midlevels, dentists, optometrists, pharmacists, and other providers. To help support the needs assessment and assure consistency in needs assessment assumptions, BPHC provided a formula, based on age and sex of the service area population that derived the total number of all ambulatory care visits. The formula estimates that 75% of all ambulatory care visits would be to primary care physicians. Note that these estimates use visits as the denominator. The problem with applying the use rates in Table 2 to estimate expenditure retention is that a visit to a sub-specialist costs more than a visit to the primary care provider. However, the difference in expenditure is not as great as comparing a hospital stay for a simple appendectomy with a hospital stay for open-heart surgery. Although it may overstate the potential expenditure, the BPHC rate was applied here.

⁴Home health care is low technology care and can easily be offered by rural-based providers.

⁵Nursing home care is low technology care, yet very expensive. In Kentucky, the average annual cost per patient excluding physician services and drugs is \$35,000 per patient year. Nursing

home costs may vary significantly by state. Nursing home care can easily be provided in any rural community.

Appendix B **Glossary of Terms**

Unless otherwise notes, definitions were adapted from the National Rural Health Association monograph, Rural Health Dictionary of Terms, Acronyms and Organizations, Kansas City, Missouri 1997.

Income multipliers: the estimated rate of impact each dollars worth of income generated in the health care sector has on business and industries in the community (adapted from page 17 of [2]).

Indirect impact: county jobs and income created in other sectors due to health business spending money locally.

Induced impact: county jobs and income created in other sectors due to health employees' spending money locally.

Poverty rate: percent of individuals who live at or below the federal poverty level. In 1998, the federal poverty level of a family of four was \$16,450.

Transfer dollars: dollars flowing to individuals in the community as income or income subsidy from state or federal sources, such as government payments for health care (Medicare and Medicaid), supplemental security income (SSI), social security and other retirement income, and TAN-F.

Type SAM employment multiplier: indicates total jobs created in the county due to one job in the health sector.

Type SAM income multiplier: indicates total income generated in the county due to one dollar worth of income in the health sector.

References

- [1] Minnesota IMPLAN Group, Inc. IMPLAN Professional Version 2.0 User's Guide, 1725 Tower Drive West, Suite 140, Stillwater, Minnesota 55082, ,www.implan.com.>
- [2] Eilrich, F. C. St. Clair and G.A. Doeksen. The Importance of the Health Care Sector on the Economy of Atoka County, Oklahoma, Rural Development, Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma.
- [3] Steven R. Machlin, M.S. Joel W. Cohen, Ph.D. Samuel H. Zuvekas, Ph.D. Joshua Thorpe, M.P.H. Christopher T. Lee, M.P.H. Chartbook #5: Health Care Expenses in the Community Population, 1996. Agency for Healthcare Research and Quality, http://www.meps.ahrq.gov/papers/cb5_01-0027/cb5.htm