

The Economic Impact of Northern Cochise Community Hospital on the Local Economy



Prepared by:

National Center for Rural Health Works
Oklahoma State University

This study was made possible with funding support from the Rural Hospital Medicare Flexibility (Flex) Program, Rural Health Office, The University of Arizona, Mel and Enid Zuckerman College of Public Health. The Flex Program is funded by HRSA Office of Rural Health Policy.

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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 and may also attract visitors to the area through tourism activities. The overall objective of this study is to measure the economic impact of Northern Cochise Community Hospital on the local economy in Arizona. The specific objectives of this report are to:

- 1.** Illustrate national health trend data;
- 2.** Identify the medical service area and review the demographic and economic data;
- 3.** Summarize the direct economic activities of Northern Cochise Community Hospital from operations and capital expenditures in the medical service area;
- 4.** Present concepts of community economics and multipliers; and
- 5.** Estimate the economic impact of Northern Cochise Community Hospital from operating activities and construction activities on the local economy in Arizona.

No recommendations will be made in this report.

National Health Expenditures and Employment 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.

In 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.

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%		

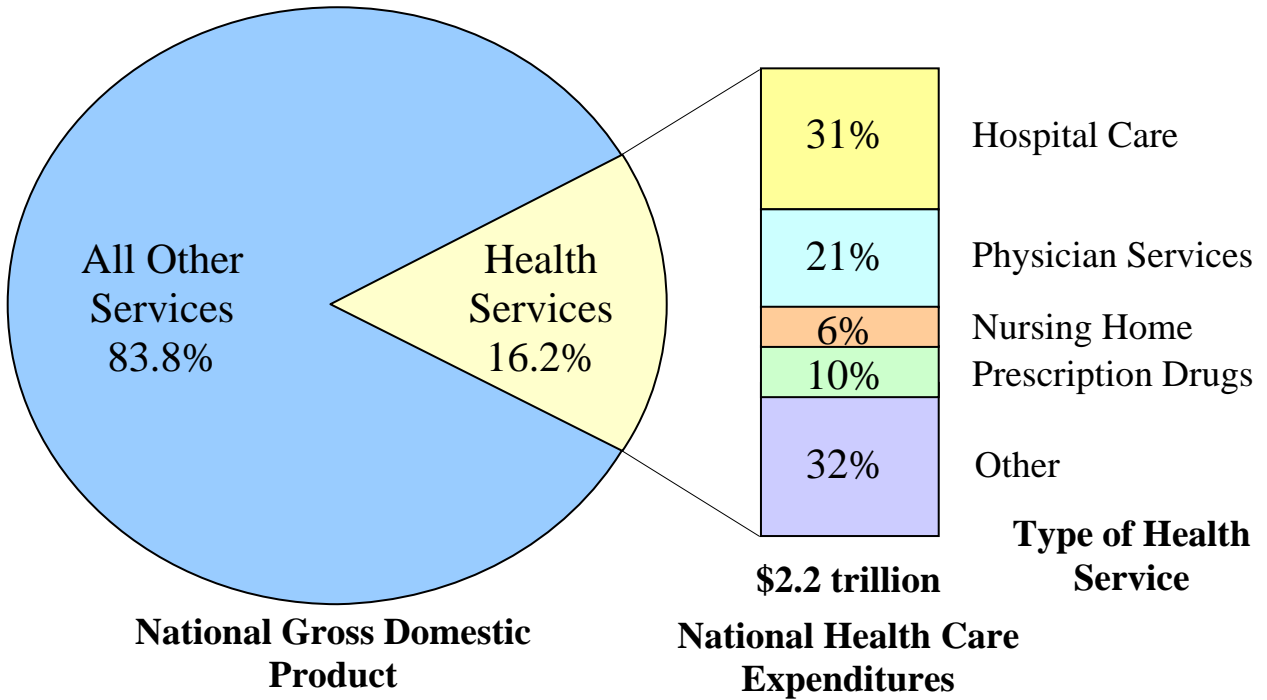
SOURCES: U. S. Department of Labor, Bureau of Labor Statistics (www.bls.gov [March 2009]); U. S. Department of Commerce, Bureau of Economic Analysis (www.bea.gov [March 2009]); U. S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, National Health Expenditures 1970-2007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

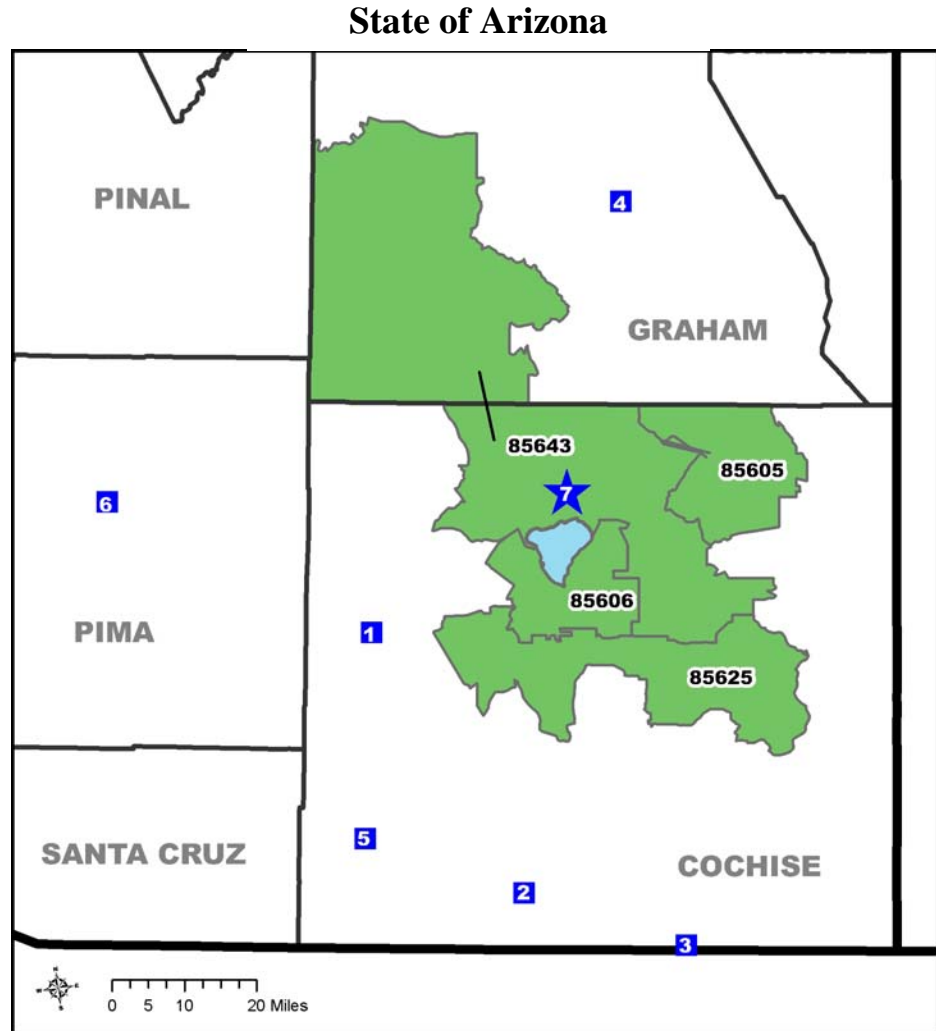
Figure 1. National Health Expenditures as a Percent of Gross Domestic Product and by Health Service Type, 2007



Medical Service Area Demographic and Economic Data

Northern Cochise Community Hospital is located in the community of Willcox in northern Cochise County, Arizona. The medical service area (MSA) is delineated by zip code areas in **Figure 2**.

Figure 2. Medical Service Area by Zip Codes for Northern Cochise Community Hospital



- | | | |
|---|----------------|--|
| 1 | Benson | Benson Hospital |
| 2 | Bisbee | Copper Queen Community Hospital |
| 3 | Douglas | Southeast Arizona Medical Center |
| 4 | Safford | Mt. Graham Regional Medical Center |
| 5 | Sierra Vista | Sierra Vista Regional Health Center |
| 6 | Tucson | Tucson Hospitals |
| 7 | Willcox | Northern Cochise Community Hospital |

The population of the MSA is illustrated in **Table 2**. The MSA includes the zip code areas of: 85605 Bowie, 85606 Cochise, 85625 Pearce, and 85643 Willcox. The zip code area, 85643 Willcox, overlaps into a portion of southern Graham County, Arizona. Using 2000 census data, the zip code areas in the MSA reporting the largest populations were 85643 Willcox, and 85625 Pearce with 8,529 and 2,104, respectively. The MSA population totals 12,931 based on the 2000 census. A second source, ESRI's Community Sourcebook of Zip Code Demographics,

Table 2
Population by Zip Code Area and Medical Service Area
for Northern Cochise Community Hospital

Zip Code Area	2000 Census	2000 ESRI	2008 ESRI	2013 ESRI
85605 Bowie	706	N/A	N/A	N/A
85606 Cochise	1,592	1,385	1,461	1,553
85625 Pearce	2,104	2,008	2,018	2,099
85643 Willcox	<u>8,529</u>	<u>9,045</u>	<u>9,817</u>	<u>10,490</u>
Total Medical Service Area	<u>12,931</u>	<u>12,438</u>	<u>13,296</u>	<u>14,142</u>
% Increase from 2000			6.9%	13.7%
Cochise County	<u>117,755</u>			
State of Arizona	<u>5,130,632</u>			

SOURCE: U. S. Census Bureau, 2000 census population (www.census.gov [March 2009]); Community Sourcebook of Zip Code Demographics, 22nd Edition, 2008, ESRI, ESRI 2000 census population and 2008 and 2013 projected populations.

NOTE: Zip code boundaries and methods for breaking down population by zip code boundaries vary by source; thus, causing some minor discrepancies in the zip code area data.

N/A = Not available.

reports the MSA population as 12,438. Populations by zip code areas do not match from the two different sources due to variance in zip code area boundaries. Using the ESRI projected populations, the MSA population will increase by 6.9 percent from 2000 to 2008 and by 13.7 percent from 2000 to 2013.

Table 3 shows the projected populations for both Cochise County and the state of Arizona from the 2000 census year through 2010, 2015, 2020, 2025 and 2030. Both the county and the state are projected to steadily increase in population through all of the projection years, with the state at a higher rate than the county.

Table 3
Population, Projections, and Percent Change
for Cochise County and the State of Arizona

County/ State	Census 2000	Population Projections				
		2010	2015	2020	2025	2030
Cochise County	117,755	146,037	158,650	169,717	179,317	187,725
% Change from 2000		24.0%	34.7%	44.1%	52.3%	59.4%
State of Arizona	5,130,632	6,999,810	7,915,629	8,779,567	9,588,745	10,347,543
% Change from 2000		36.4%	54.3%	71.1%	86.9%	101.7%

Source: Arizona Department of Economic Security, Research Administration, Population Statistics Unit, March 2006. (<http://www.azcommerce.com/EconInfo/Demographics/> [March 2009]); U.S. Census Bureau; 2000 Census Population (www.census.gov [March 2009]).

Data in **Table 4** represent the MSA population by race and Hispanic origin. The MSA is projected to show a decrease in the white population from 79.9 percent from the 2000 Census data to 76.1 percent from the 2008 ESRI data. The Hispanic population is projected to increase in the medical service area from 30.0 percent to 38.1 percent from the 2000 Census data to the 2008 ESRI data.

Table 4
Zip Code Population of Medical Service Areas for Race and Ethnic Groups
for Northern Cochise Community Hospital

Zip Code	Zip Code Area	White	Black	Native American ¹	Other ²	Two + Races ³	Totals	Hispanic Origin ⁴
85605	Bowie	482	1	2	208	13	706	301
85606	Cochise	1,407	2	14	135	34	1,592	278
85625	Pearce	1,992	7	11	62	32	2,104	200
85643	Willcox	<u>6,448</u>	<u>166</u>	<u>148</u>	<u>1,475</u>	<u>292</u>	<u>8,529</u>	<u>3,098</u>
2000 Census Totals		<u>10,329</u>	<u>176</u>	<u>175</u>	<u>1,880</u>	<u>371</u>	<u>12,931</u>	<u>3,877</u>
2000 % of Total		<u>79.9%</u>	<u>1.4%</u>	<u>1.4%</u>	<u>14.5%</u>	<u>2.9%</u>	<u>100.0%</u>	<u>30.0%</u>
2008 ESRI Totals		<u>10,117</u>	<u>201</u>	N/A	N/A	N/A	<u>13,296</u>	<u>5,072</u>
2008 % of Total		<u>76.1%</u>	<u>1.5%</u>	N/A	N/A	N/A	<u>100.0%</u>	<u>38.1%</u>

SOURCE: U. S. Census Bureau, 2000 census population (www.census.gov [March 2009]); Community Sourcebook of Zip Code Demographics, 22nd Edition, 2008, ESRI, ESRI 2000 census population and 2008 and 2013 projected populations.

¹ Native American includes American Indians and Alaska Natives.

² Other is defined as Asian Americans, Native Hawaiians, Pacific Islanders and all others.

³ Two or more races indicates a person is included in more than one race group; it was introduced as a new category in the 2000 Census.

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

N/A = Not available.

Table 5 shows MSA population and distribution by age group for the 2000 census year and for the 2008 ESRI projections. In 2000, the MSA showed the largest proportion of population concentrated in the 45-64 year old age group with 25.2 percent, followed closely by the 25-44 year old age group. The 2008 ESRI projection showed the largest population age group being the 45-64 year olds with 28.7 percent, with the next largest also being the age 25-44 age group with 23.8 percent.

Table 5
Zip Code Population of Medical Service Areas by Age Groups
for Northern Cochise Community Hospital

Zip Code	Zip Code Area	Age Groups						Totals
		0-14	15-19	20-24	25-44	45-64	65+	
85605	Bowie	173	39	34	134	183	143	706
85606	Cochise	293	106	58	324	468	343	1,592
85625	Pearce	269	91	45	353	638	708	2,104
85643	Willcox	<u>1,785</u>	<u>684</u>	<u>540</u>	<u>2,401</u>	<u>1,973</u>	<u>1,146</u>	<u>8,529</u>
2000 Census Totals		<u>2,520</u>	<u>920</u>	<u>677</u>	<u>3,212</u>	<u>3,262</u>	<u>2,340</u>	<u>12,931</u>
2000 % of Total		<u>19.5%</u>	<u>7.1%</u>	<u>5.2%</u>	<u>24.8%</u>	<u>25.2%</u>	<u>18.1%</u>	<u>100.0%</u>
2008 ESRI Totals		<u>2,260</u>	<u>779</u>	<u>840</u>	<u>3,159</u>	<u>3,811</u>	<u>2,447</u>	<u>13,296</u>
2008 % of Total		<u>17.0%</u>	<u>5.9%</u>	<u>6.3%</u>	<u>23.8%</u>	<u>28.7%</u>	<u>18.4%</u>	<u>100.0%</u>

SOURCE: U. S. Census Bureau, 2000 census population (www.census.gov [March 2009]); Community Sourcebook of Zip Code Demographics, 22nd Edition, 2008, ESRI, ESRI 2000 census population and 2008 and 2013 projected populations.

Data in **Tables 6** and **7** are from the U. S. Department of Commerce, Bureau of Economic Analysis, based on NAICS. The purpose of **Tables 6** and **7** is to demonstrate the importance of the health sector as compared to the entire economy. In 2006, the health care and social assistance sector (which includes hospitals) accounted for 4,536 full- and part-time employees, which was 11.6 percent of the private employment in Cochise County (**Table 6**). This was slightly lower than the state health care and social assistance sector employment of 10.1 percent. Of the categories with reported data, the health care sector was the second largest sector of the private employment for Cochise County, with retail trade as the largest private employer with 18.1 percent of the total private employment jobs.

In 2006, the health care sector accounted for \$164.3 million in total earnings which was 14.5 percent of the total private earnings for the county (**Table 7**). Again, this was lower than the state percent of total private earnings for the health care sector of 11.4 percent. Of the categories with reported data, the health sector was the third largest sector, with manufacturing first with 11.9 percent and construction second with 11.7 percent of the total private earnings.

Table 6
Full- and Part-Time Employment by Type of Employment and by Major Industry
for Cochise County and the State of Arizona ¹

Employment Categories	Cochise County			State of Arizona	
	No. of Jobs	% of Total	% of Private	% of Total	% of Private
Total FT & PT	<u>58,382</u>	<u>100.0%</u>		<u>100.0%</u>	
Wage & salary	45,277	77.6%		82.2%	
Proprietors'	<u>13,105</u>	<u>22.4%</u>		<u>17.8%</u>	
Farm proprietors'	1,301	9.9%		1.7%	
Nonfarm proprietors' ²	<u>11,804</u>	<u>90.1%</u>		<u>98.3%</u>	
By Industry:					
Farm employment	2,048	3.5%		0.7%	
Nonfarm employment	<u>56,334</u>	<u>96.5%</u>		<u>99.3%</u>	
Private employment	<u>39,021</u>	69.3%	<u>100.0%</u>	86.9%	<u>100.0%</u>
Forestry, fishing, related ³	348		0.9%		0.7%
Mining	101		0.3%		0.5%
Utilities	532		1.4%		0.4%
Construction	3,751		9.6%		10.0%
Manufacturing	1,083		2.8%		6.8%
Wholesale trade	751		1.9%		4.1%
Retail trade	7,059		18.1%		13.5%
Transp & wrhsng	806		2.1%		3.1%
Information	597		1.5%		1.9%
Finance & ins	1,132		2.9%		6.1%
RE rental & leasing	2,874		7.4%		7.1%
Prof & techn svcs	4,345		11.1%		7.0%
Mgmt of cos & enterp	129		0.3%		0.9%
Admin & waste svcs	2,513		6.4%		9.7%
Educational svcs	578		1.5%		1.8%
Hlth care & soc assist	4,536		11.6%		10.1%
Arts, entert, & rec	920		2.4%		2.2%
Accomm & food svcs	4,028		10.3%		8.5%
Other svcs, not pub admin	<u>2,938</u>		<u>7.5%</u>		<u>5.5%</u>
Govt & govt enterprises	<u>17,313</u>	<u>30.7%</u>		<u>13.1%</u>	

SOURCE: U. S. Department of Commerce, Bureau of Economic Analysis, 2006 data (www.bea.gov [March 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 7
Personal Income, Earnings by Place of Work and by Industry
for Cochise County and the State of Arizona ¹

Employment Categories	Cochise County			State of Arizona	
	Income (\$1,000s)	% of Total	% of Private	% of Total	% of Private
Total Personal Income					
Total earnings by place of work	<u>2,427,779</u>	<u>100.0%</u>		<u>100.0%</u>	
Wage & salary disbursements	1,681,261	69.3%		73.5%	
Proprietors' income ²	170,534	7.0%		10.7%	
Other	<u>575,984</u>	<u>23.7%</u>		<u>15.8%</u>	
Earnings by Industry					
Total by industry	<u>2,427,779</u>	<u>100.0%</u>		<u>100.0%</u>	
Farm earnings	26,564	1.1%		0.4%	
Nonfarm earnings	<u>2,401,215</u>	<u>98.9%</u>		<u>99.6%</u>	
Private earnings	<u>1,131,952</u>	47.1%	<u>100.0%</u>	83.7%	<u>100.0%</u>
For, fshng, rel ³	7,371		0.7%		0.4%
Mining	3,790		0.3%		0.8%
Utilities	48,865		4.3%		1.1%
Construction	130,296		11.5%		11.7%
Manufacturing	32,579		2.9%		11.9%
Wholesale trade	24,907		2.2%		6.3%
Retail trade	161,088		14.2%		9.8%
Transp & wrhsng	29,468		2.6%		3.7%
Information	23,699		2.1%		2.6%
Finance & ins	39,067		3.5%		8.3%
RE rental & leasing	34,896		3.1%		4.4%
Prof & techn svcs	243,975		21.6%		9.5%
Mgmt of cos & enterp	4,010		0.4%		1.6%
Admin & waste svcs	61,160		5.4%		7.0%
Educational svcs	9,758		0.9%		1.3%
Hlth care & soc assist	164,313		14.5%		11.4%
Arts, entert, & rec	10,503		0.9%		1.3%
Accomm & food svcs	55,313		4.9%		4.0%
Other svcs, not pub admin	<u>46,894</u>		<u>4.1%</u>		<u>3.1%</u>
Govt & govt enterprises	<u>1,269,263</u>	<u>52.9%</u>		<u>16.3%</u>	

SOURCE: U. S. Department of Commerce, Bureau of Economic Analysis, 2006 data (www.bea.gov [March 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.

Direct Economic Activities

The economic impact will be measured by employment (jobs) and wages and salaries plus benefits (income). Northern Cochise Community Hospital provides the following services:

- Medicare-certified rural primary care hospital, Northern Cochise Community Hospital
- Emergency room, 24 hours a day, seven days a week, staffed with physicians
- Full service clinical laboratory
- LifeNet air-medical transport for critically ill or injured patients
- Long term care through Northern Cochise Nursing Home with a 24-bed capacity
- Nursing services to support all functions of Northern Cochise Community Hospital
- Nutritional services - hospital patients, nursing home residents, the guest dining room
- Outpatient service including minor outpatient diagnostic procedures (colonoscopies and esophagogastroduodenoscopies)
- Pharmacy
- Radiology including mammography, multi-slice CT scan, CT bone mineral density, full scope sonography/ultrasound, and magnetic resonance imaging (MRI)
- Comprehensive rehabilitation services including Physical Therapy, Occupational Therapy, and Speech Therapy
- Respiratory care includes therapeutic and diagnostic services to all patients
- Specialty clinic including specialties of:
 - Allergy
 - Audiology and hearing aids
 - Cardiology including pediatric
 - Gastroenterology
 - General surgery
 - OB sonogram and prenatal
 - Orthopedics
 - Podiatry
 - Pulmonology
 - Urology

Northern Cochise Community Hospital represents a significant impact on the economy of the MSA with a total of 157 full- and part-time employees and an annual payroll including benefits of \$7.9 million (Table 8).

Table 8
Direct Economic Activities
of Northern Cochise Community Hospital

Health Care Component	Number of Full- and Part-Time Employees	Income (Wages and Salaries plus Benefits)
Northern Cochise Community Hospital	<u>157</u>	<u>\$7,917,816</u>

SOURCE: Local data from Northern Cochise Community Hospital, 2009.

Some Basic Concepts of Community Economics and Income and Employment Multipliers

The economic impact of Northern Cochise Community Hospital, measured by employment and payroll, is significant. However, this does not tell the complete story as secondary economic impacts are created when Northern Cochise Community Hospital and its employees spend money. These secondary benefits are measured by multipliers using an input-output model and data from IMPLAN (the model and data are further discussed in **Appendix A**). This model is widely used by economists and other academics across the U.S.

A brief description of the input-output model and the multiplier effect is included and illustrated in **Figure 3**. **Figure 3** illustrates the major flows of goods, services, and dollars of any economy. The businesses which sell some or all of their goods and services to buyers outside of the community are the foundation of a community's economy. 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 of 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 shown 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.

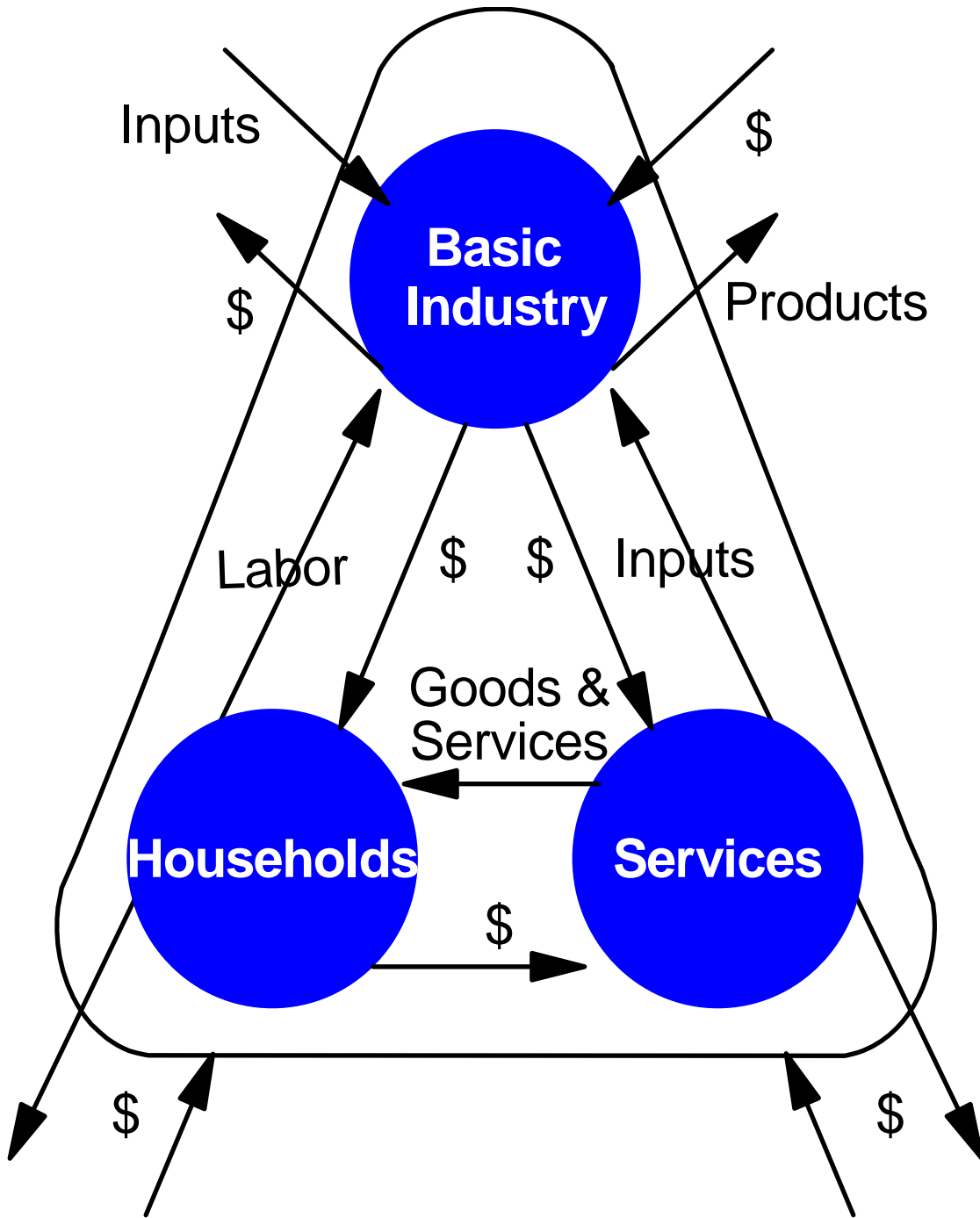


Figure 3.
Community Economic System

Consider, for instance, the closing of a hospital. The services sector will no longer pay employees, and the 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.

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 also 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. The same concept applies to income and output multipliers.

The Economic Impact of Northern Cochise Community Hospital

The employment impact of Northern Cochise Community Hospital is presented in **Table 9**. Employment (jobs) and income (payroll including wages, salaries, and benefits) from operating activities were obtained from Northern Cochise Community Hospital. Northern Cochise Community Hospital employment includes 157 full- and part-time employees. The hospital employment multiplier is 1.28; this means for every job in the hospital sector, another 0.28 job is created in other sectors (businesses) in the MSA. The secondary employment generated in the MSA from the hospital sector is estimated to be 44 jobs. The hospital has a total impact of 201 jobs on the economy of the MSA. *The total employment impact of Northern Cochise Community Hospital is 201 employees in the medical service area; the direct hospital employment is 157 full- and part-time employees and the secondary employment is 44 full- and part-time employees.*

Table 9
Total Employment Impact
of Northern Cochise Community Hospital

Health Care Component	Number of Employees	Multiplier	Secondary Employment Impact	Total Employment Impact
Northern Cochise Community Hospital	<u>157</u>	1.28	<u>44</u>	<u>201</u>

SOURCE: Local employment data from Northern Cochise Community Hospital; employment multiplier from IMPLAN data, Minnesota IMPLAN Group, Inc.

Data on the income impact of Northern Cochise Community Hospital are presented in **Table 10**. Data obtained from Northern Cochise Community Hospital indicate that total income (wages, salaries, and benefits) for the hospital is \$7,917,816. Using the hospital income multiplier of 1.20, Northern Cochise Community Hospital generates secondary income impact of \$1.6 million and total income impact of \$9.5 million. *The total direct income from Northern*

Cochise Community Hospital is \$7.9 million, the secondary income impact is \$1.6 million, and the total income impact is estimated at \$9.5 million throughout the economy of the medical service area.

Table 10
Total Income Impact
of Northern Cochise Community Hospital

Health Care Component	Income	Multiplier	Secondary Income Impact	Total Income Impact
Northern Cochise Community Hospital	<u>\$7,917,816</u>	1.20	<u>\$1,583,563</u>	<u>\$9,501,379</u>

SOURCE: Local income (payroll plus benefits) data from Northern Cochise Community Hospital; income multiplier from IMPLAN data, Minnesota IMPLAN Group, Inc.

The Impact from Capital Improvement Activities

The capital improvement activities of Northern Cochise Community Hospital could include equipment purchases and/or construction. Northern Cochise Community Hospital had no construction activities nor planned construction activities during Fiscal Years 2007-2008, 2008-2009, or 2009-2010. Equipment purchases were made or were planned during these three fiscal years (**Table 11**). Equipment purchases for medical facilities are typically very specialized and are bought from outside the medical service area; therefore, equipment purchases have very little impact on the economy of the medical service area.

Table 11
Equipment Purchases
for Northern Cochise Community Hospital

Fiscal Year	Equipment Purchases
2007-2008	\$644,974
2008-2009	\$1,900,461
2009-2010	\$814,483

SOURCE: Local data from Northern Cochise Community Hospital, 2009.

If construction activities were present, the IMPLAN model could be utilized to estimate employment and income generated from the construction activities each year, as well as the economic impact of the construction employment and income each year.

Summary

This report measures the economic impact that Northern Cochise Community Hospital has on the economy due to its normal operating activities. To carry on its services, Northern Cochise Community Hospital employs 157 full- and part-time employees and generates \$7.9 million in wages, salaries, and benefits. If the secondary benefits are included, the total employment impact is 201 jobs and the total income impact is \$9.5 million.

Notably, the economic impacts generated by Northern Cochise Community Hospital are critical to the economy of the medical service area. The employment and income impacts from operating activities are annual and will continue each and every year that Northern Cochise Community Hospital operates in the future. These are long term economic benefits of Northern Cochise Community Hospital. The fact that the medical service area of Northern Cochise Community Hospital has a quality hospital with outstanding technology and health care services will enhance the opportunity to attract new business and industry. This could, in turn, result in new jobs and new families moving into the community. Also, research clearly states that retirees are attracted to communities with quality health care services. All of these factors illustrate that Northern Cochise Community Hospital is critically important for the economic growth of the medical service area. Given this, not only does Northern Cochise Community Hospital contribute to the health and wellness of the medical service area residents but, also, to the overall economic strength of the medical service area in Cochise County, Arizona.

The economic impact of the health sector upon the economy of the medical service area of Northern Cochise Community Hospital 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.