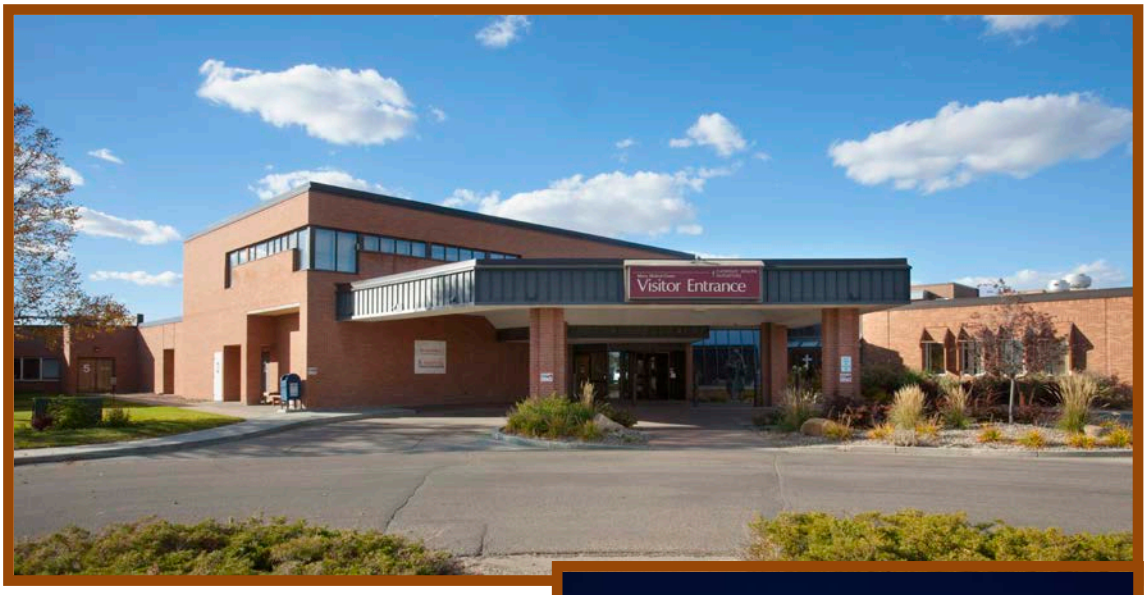
The Economic Impact of CHI St. Alexius Health - Williston Medical Center on Williams County, North Dakota



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August 2016

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Medical facilities have a tremendous medical and economic impact on the community or county in which they are located. This is especially true with health care facilities, such as hospitals and nursing homes. These facilities not only employ a number of people and have a large payroll, but they also draw into the community or county a large number of people from rural areas that need medical services. The overall objective of this study is to measure the economic impact of CHI St. Alexius Health - Williston Medical Center on Williams County in North Dakota. The hospital will be referred to as Williston Medical Center throughout the remainder of this study. The specific objectives of this report are to:

1. Discuss the importance of health care services to rural development, including national health trend data;
2. Review demographic and economic data for Williams County;
3. Summarize the direct economic activities of Williston Medical Center from operations in Williams County;
4. Present concepts of community economics and multipliers; and
5. Estimate the economic impact of Williston Medical Center from operating activities in Williams County.

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 (**Table 1**). A strong health care system can also create jobs in the local area.

Table 1
Services that Impact Rural Development

Type of Growth	Services Important to Attract Growth
Industrial and Business	Health and Education
Retirees	Health and Safety

Studies have found that quality-of-life (QOL) factors are playing a dramatic role in business and industry location decisions. Among the most significant of the QOL variables are health care services, which are important for at least three reasons.

Business and Industry Growth

First, as noted by a member of the Board of Directors of a community economic development corporation, the presence of good health and education services is 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. Research shows that corporations take a serious look at health care costs in determining site locations. Sites that provide health care services at a lower cost are given higher consideration for new industry than sites with much higher health care costs.

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., 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. Although the data are limited, several studies suggest health services may be a critical variable that influences the location decision of retirees. For example, one study found that four items were the best predictors of retirement locations: safety, recreational facilities, dwelling units, and health care. Another study found that nearly 60 percent of potential retirees said health services were in the "must have" category when considering a retirement community. Only protective services were mentioned more often than health services as a "must have" service.

Health Services and Job Growth

A factor important to the success of rural economic development is job creation. ***The health care sector is an extremely fast growing sector, and based on the current demographics, there is every reason to expect this trend to continue.*** Data in **Table 2** 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 7.0 percent and increased to 17.5 percent in 2014;
- Per capita health expenditures increased from $356 in 1970 to $9,523 in 2014;

Table 2
United States Health Expenditures and Employment Data
1970-2014; Projected for 2018-2024

Year	Total Health Expenditures ($Billions)	Per Capita Health Expenditures ($)	Health as % of GDP (%)	Health Sector Employment (000)	Avg Annual Increase in Employment (%)
Historical					
1970	$74.6	$355	6.9%	3,052 [a]	
1980	255.3	1,108	8.9%	5,278 [a]	7.3%
1990	721.4	2,843	12.1%	8,211 [a]	5.6%
2000	1,369.7	4,857	13.3%	10,858 [a]	3.2%
2010	2,595.7	8,402	17.3%	13,894 [b]	2.7%
2011	2,696.6	8,666	17.4%	14,128 [b]	1.7%
2012	2,799.0	8,927	17.3%	14,397 [b]	1.9%
2013	2,879.9	9,115	17.3%	14,555 [b]	1.1%
2014	3,031.3	9,523	17.5%	14,831	1.9%
				Avg Annual Increase 2000 to 2014	2.6%
Projections					
2018	3,785.5	11,499	18.1%		
2020	4,273.8	12,741	18.5%		
2022	4,825.4	14,129	19.1%		
2024	5,425.1	15,618	19.6%		

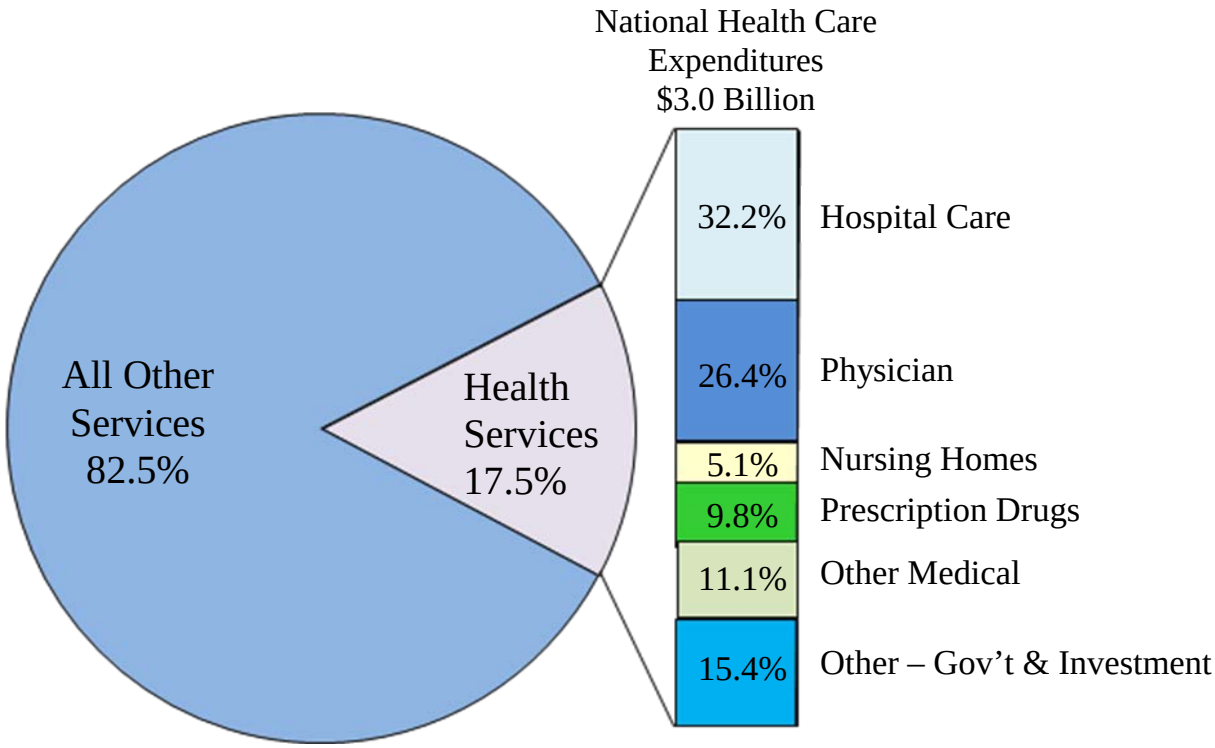
SOURCES: U.S. Department of Labor, Bureau of Labor Statistics (www.bls.gov [May 2016]); U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, National Health Expenditures 1960-2014 and National Health Expenditure Projections 2018-2024 (https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected.html [May 2016]).
[a] Based on Standard Industrial Classification (SIC) codes for health sector employment.
[b] Based on North American Industrial Classification System (NAICS) for health sector employment.

- Employment in the health sector increased 385.9 percent from 1970 to 2014; and
- Annual increases in employment from 2000 to 2013 ranged from 1.7 percent to 3.2 percent, with an average of 2.6 percent.

The U. S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, also projects that health care expenditures will account for 18.5 percent of GDP by 2020 and increase to 19.6 percent of GDP in 2024. Per capita health care expenditures are projected to increase to $12,741 in 2020 and to $15,618 in 2024. Total health expenditures are projected to increase to over $5.4 trillion in 2024.

Figure 1 illustrates 2014 health expenditures by percent of GDP and by type of health service. Health services represented 17.5 percent of national GDP in 2013. The largest category of health services was hospital care, representing 32.2 percent of the total and the second largest category was physician services with 26.4 percent of the total.

Figure 1
National Health Expenditures as a Percent of Gross Domestic Product and by Health Service Type, 2014



SOURCE: U. S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, National Health Expenditures 2014 (http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/index.html [August 2016]).

Williams County Demographic and Economic Data

Williston Medical Center is located in Williston in Williams County, North Dakota. The medical service area is Williams County, North Dakota. **Table 3** illustrates the last two U. S. Census Bureau populations for Williams County cities and surrounding rural area, Williams County and North Dakota. The most current population estimates for 2014 and 2015 are also provided.

The data in **Table 3** show Williston, the county seat and location of the hospital, had population of 12,512 in 2000 which increased to 14,716 in 2010 and to 19,849 in 2014; 17.6 percent and 34.9 percent increases, respectively. The rural area increased 4.3 percent from 2000 to 2010 and then decreased 5.8 percent from 2010 to 2014. These populations compare to Williams County and the state increasing for both times periods. Population estimates for 2015 are only available for the county and the state. The population is estimated to increase for both the county and the state from 2010 to 2015.

The 2010 Census populations and population projections for the county and state are illustrated in **Table 4**. The 2010 populations are from the U. S. Census Bureau and the projections from the North Dakota Housing Finance Agency, 2012 North Dakota Statewide Housing Assessment: Housing Forecast report. The populations are projected to increase for both the county and the state from 2010 through 2025.

Tables 5a-5d show the populations for the county and state by age group and gender for the 2000 and 2010 Census years and the 2014 and 2015 estimate years. From 2000 to 2010 for the county, the age group 20-24 had the largest increase, the age 45-64 group had the second largest increase, and the age 25-44 age group was third largest. These three age groups continued

Table 3
Population and Percent Change for Williams County Cities/Towns, Williams County, and the State of North Dakota, 2000, 2010, and 2014-2015 Estimates

	2000 Population	2010 Population	2014 Estimate	2015 Estimate	% Change '00 to '10	% Change '10-'14	% Change '10-'15
Alamo	51	57	62	N/A	11.8%	8.8%	N/A
Epping	79	100	107	N/A	26.6%	7.0%	N/A
Grenora	202	244	187	N/A	20.8%	-23.4%	N/A
Ray	534	592	651	N/A	10.9%	10.0%	N/A
Springbrook	26	27	11	N/A	3.8%	-59.3%	N/A
Tioga	1,125	1,230	1,097	N/A	9.3%	-10.8%	N/A
Wildrose	129	110	90	N/A	-14.7%	-18.2%	N/A
Williston (County Seat)	12,512	14,716	19,849	N/A	17.6%	34.9%	N/A
Rural Area	5,103	5,322	5,012	N/A	4.3%	-5.8%	N/A
Williams County	19,761	22,398	27,066	35,294	13.3%	20.8%	57.6%
North Dakota	642,200	672,591	704,925	756,927	4.7%	4.8%	12.5%

SOURCE: U.S. Census Bureau (www.census.gov [August 2016]).

Table 4
2010 Census Population and Population Projections for Williston, Williams County, and North Dakota

	2010 Census	2020 Projection	2025 Projection	% Change '10-'20	% Change '20-'25
Williston	14,716	30,756	32,860	109.0%	6.8%
Williams County	22,398	47,075	51,106	110.2%	8.6%
North Dakota	672,591	806,541	841,820	19.9%	4.4%

SOURCE: U.S. Census Bureau (www.census.gov [August 2016]); 2012 North Dakota Statewide Housing Needs Assessment: Housing Forecast: A detailed analysis to better understand housing needs in North Dakota (https://www.ndhfa.org [August 2016]).

U.S. Census Bureau Population by Age Groups and Gender,
2000, 2010, and 2014- 2015 Estimates

	Age Groups							Gender	
	0-14	15-19	20-24	25-44	45-64	65+	Totals	Male	Female
2000 Census									
Alamo	3	3	2	7	21	15	51	28	23
Epping	15	4	4	20	27	9	79	40	39
Grenora	28	14	5	47	49	59	202	112	90
Ray	91	47	15	117	155	109	534	269	265
Springbrook	2	3	3	4	7	7	26	14	12
Tioga	186	92	22	263	264	298	1,125	520	605
Wildrose	21	12	2	32	29	33	129	65	64
Williston	2,536	1,119	716	3,227	2,810	2,104	12,512	5,992	6,520
Rural Area	1,149	473	150	1,328	1,376	627	5,103	2,647	2,456
Williams County	4,031	1,767	919	5,045	4,738	3,261	19,761	9,687	10,074
Percent of Total	20.4%	8.9%	4.7%	25.5%	24.0%	16.5%	100.0%	49.0%	51.0%
North Dakota	129,846	53,618	50,503	174,891	138,864	94,478	642,200	320,524	321,676
Percent of Total	20.2%	8.3%	7.9%	27.2%	21.6%	14.7%	100.0%	49.9%	50.1%

Table 5b
U.S. Census Bureau Population by Age Groups and Gender,
2000, 2010, and 2014- 2015 Estimates

	Age Groups							Gender	
	0-14	15-19	20-24	25-44	45-64	65+	Totals	Male	Female
2010 Census									
Alamo	14	0	1	17	14	11	57	32	25
Epping	26	5	4	20	33	12	100	49	51
Grenora	67	9	7	64	63	34	244	117	127
Ray	107	26	35	120	207	97	592	315	277
Springbrook	8	0	1	6	11	1	27	10	17
Tioga	178	77	59	265	339	312	1,230	625	605
Wildrose	11	5	2	16	51	25	110	54	56
Williston	2,918	934	1,085	3,926	3,738	2,115	14,716	7,507	7,209
Rural Area	951	379	235	1,105	1,931	721	5,322	2,839	2,483
Williams County	4,280	1,435	1,429	5,539	6,387	3,328	22,398	11,548	10,850
Percent of Total	19.1%	6.4%	6.4%	24.7%	28.5%	14.9%	100.0%	51.6%	48.4%
North Dakota	124,461	47,474	58,956	165,747	178,476	97,477	672,591	339,864	332,727
Percent of Total	18.5%	7.1%	8.8%	24.6%	26.5%	14.5%	100.0%	50.5%	49.5%

Table 5c
U.S. Census Bureau Population by Age Groups and Gender,
2000, 2010, and 2014- 2015 Estimates

	Age Groups							Gender	
	0-14	15-19	20-24	25-44	45-64	65+	Totals	Male	Female
2014 Estimates									
Alamo	8	10	0	20	17	7	62	40	22
Epping	37	4	0	41	22	3	107	41	66
Grenora	43	10	8	70	38	18	187	103	84
Ray	127	63	110	152	125	74	651	346	305
Springbrook	3	0	0	3	5	0	11	7	4
Tioga	155	53	39	258	298	294	1,097	573	524
Wildrose	20	0	3	15	43	9	90	43	47
Williston	4,005	1,041	1,739	5,966	4,936	2,162	19,849	10,519	9,330
Rural Area	1,158	446	200	1,156	1,494	558	5,012	2,722	2,290
Williams County	5,556	1,627	2,099	7,681	6,978	3,125	27,066	14,394	12,672
Percent of Total	24.8%	7.3%	9.4%	34.3%	31.2%	14.0%	120.8%	64.3%	56.6%
North Dakota	132,664	48,403	65,331	176,711	180,914	100,902	704,925	358,862	346,063
Percent of Total	19.7%	7.2%	9.7%	26.3%	26.9%	15.0%	104.8%	53.4%	51.5%

Table 5d
U.S. Census Bureau Population by Age Groups and Gender,
2000, 2010, and 2014- 2015 Estimates

	Age Groups							Gender	
	0-14	15-19	20-24	25-44	45-64	65+	Totals	Male	Female
2015 Estimates (Cities/Towns not currently available)									
Williams County	8,038	2,148	3,009	11,005	8,081	3,013	35,294	19,267	16,027
Percent of Total	22.8%	6.1%	8.5%	31.2%	22.9%	8.5%	100.0%	54.6%	45.4%
North Dakota	147,666	49,444	72,293	197,791	182,452	107,281	756,927	388,853	368,074
Percent of Total	19.5%	6.5%	9.6%	26.1%	24.1%	14.2%	100.0%	51.4%	48.6%
% Change '00 to '10									
Williams County	6.2%	-18.8%	55.5%	9.8%	34.8%	2.1%	13.3%	19.2%	7.7%
North Dakota	-4.1%	-11.5%	16.7%	-5.2%	28.5%	3.2%	4.7%	6.0%	3.4%
% Change '10 to '14									
Williams County	29.8%	13.4%	46.9%	38.7%	9.3%	-6.1%	20.8%	24.6%	16.8%
North Dakota	6.6%	2.0%	10.8%	6.6%	1.4%	3.5%	4.8%	5.6%	4.0%
% Change '10 to '15									
Williams County	87.8%	49.7%	110.6%	98.7%	26.5%	-9.5%	57.6%	66.8%	47.7%
North Dakota	18.6%	4.1%	22.6%	19.3%	2.2%	10.1%	12.5%	14.4%	10.6%

SOURCE: 2000 and 2010 Census population and 2015 population estimates by age groups, ACS Demographic and Housing Estimates, U.S. Census Bureau (www.census.gov [August 2016]).

to grow through 2015. The age 0-14 age group increased significantly from 2010 to 2014 and 2015 for the county. The age 15-19 age group also increased from 2010 to 2014 and to 2015 for the county. The age 65+ group increased slightly from 2000 to 2010 and then decreased from 2010 through 2015 for the county. North Dakota showed the 45-64 year old age group with the greatest increase from 2000 to 2010 and the age 20-24 age group with the greatest increase from 2010 to 2015; the age 25-44 increased significantly from 2010 to 2015. The state had continual increased in the age 65+ for all time periods. For the county for 2000 to 2015, the male population has increased continuously over all time periods and is increasing at a much faster rate than the female population. The state has increased in both male and female, with the male increasing faster than the female population; however, the state is increasing at a slower rate than the county for both the male and female population.

Tables 6a-6d provide the populations of Williams and North Dakota by race groups and Hispanic origin. For all time periods, the county and the state show increases in the white race groups; however, the white race group, although increasing numbers, is decreasing in terms of the percent of total populations for both the county and the state. The black race group and the two or more races group are both increasing in population numbers and in terms of the percent of total populations for the county. by 162.5 percent followed by the some other race group with a 155.6 percent increase. North Dakota also shows an increase in all race groups from 2000 to 2014 across the board. In 2015, the state increased in all groups but the some other race group. Hispanic origin increased in both the county and the state over all time periods, with the county increasing at a faster rate than the state..

Data from County Business Patterns and Bureau of Economic Analysis show trends in the health services employment and payroll (income) over time; the two data sources have

Table 6a
U.S. Census Bureau Population by Race and Hispanic Origin,
2000, 2010 and 2014-2015 Estimates

	White	Black	Native American	Asian	Native HI'n/ Pacific Islndr	Some Other Race	Two or More Races	Totals	Hispanic Origin
2000 Census									
Alamo	51	0	0	0	0	0	0	51	0
Epping	75	0	4	0	0	0	0	79	0
Grenora	198	0	2	0	0	0	2	202	0
Ray	529	0	3	0	0	0	2	534	3
Springbrook	26	0	0	0	0	0	0	26	4
Tioga	1,096	2	10	0	0	2	15	1,125	1
Wildrose	125	0	0	4	0	0	0	129	0
Williston	11,723	21	457	30	2	21	258	12,512	154
Rural Area	4,544	1	393	2	0	4	159	5,103	23
County	18,367	24	869	36	2	27	436	19,761	185
% of Total	92.9%	0.1%	4.4%	0.2%	0.0%	0.1%	2.2%	100.0%	0.9%
ND	593,181	3,916	31,329	3,606	230	2,540	7,398	642,200	7,786
% of Total	92.4%	0.6%	4.9%	0.6%	0.0%	0.4%	1.2%	100.0%	1.2%

Table 6b
U.S. Census Bureau Population by Race and Hispanic Origin,
2000, 2010 and 2014-2015 Estimates

	White	Black	Native American	Asian	Native HI'n/ Pacific Islndr	Some Other Race	Two or More Races	Totals	Hispanic Origin
2010 Census									
Alamo	49	0	0	0	0	7	1	57	7
Epping	81	0	11	5	0	0	3	100	0
Grenora	238	1	2	0	0	0	3	244	11
Ray	568	0	15	2	0	0	7	592	6
Springbrook	27	0	0	0	0	0	0	27	0
Tioga	1,192	1	6	7	1	2	21	1,230	8
Wildrose	106	0	3	0	0	0	1	110	5
Williston	13,634	51	488	48	4	52	439	14,716	328
Rural Area	4,744	10	374	17	0	8	169	5,322	71
County	20,639	63	899	79	5	69	644	22,398	436
% of Total	92.1%	0.3%	4.0%	0.4%	0.0%	0.3%	2.9%	100.0%	1.9%
ND	605,449	7,960	36,591	6,909	320	3,509	11,853	672,591	13,467
% of Total	90.0%	1.2%	5.4%	1.0%	0.0%	0.5%	1.8%	100.0%	2.0%

Table 6c
U.S. Census Bureau Population by Race and Hispanic Origin,
2000, 2010 and 2014-2015 Estimates

	White	Black	Native American	Asian	Native HI'n/ Pacific Islndr	Some Other Race	Two or More Races	Totals	Hispanic Origin
2014 Estimates									
Alamo	59	0	0	0	0	0	3	62	0
Epping	83	0	16	0	8	0	0	107	0
Grenora	179	8	0	0	0	0	0	187	0
Ray	555	0	90	0	0	1	5	651	1
Springbrook	9	0	0	0	0	0	2	11	0
Tioga	997	0	0	18	0	42	40	1,097	111
Wildrose	87	0	0	0	0	0	3	90	12
Williston	18,202	245	671	97	0	294	340	19,849	743
Rural Area	4,393	49	350	34	0	6	180	5,012	124
County	24,564	302	1,127	149	8	343	573	27,066	991
% of Total	90.8%	1.1%	4.2%	0.6%	0.0%	1.3%	2.1%	100.0%	3.7%
ND	628,770	10,781	36,989	8,124	312	5,113	14,836	704,925	18,250
% of Total	89.2%	1.5%	5.2%	1.2%	0.0%	0.7%	2.1%	100.0%	2.6%

Table 6d

U.S. Census Bureau Population by Race and Hispanic Origin

Williams County and the State of North Dakota, 2000, 2010 and 2015 Estimates

	White	Black	Native American	Asian	Native HI'n/ Pacific Islndr	Some Other Race	Two or More Races	Totals	Hispanic Origin
2015 Estimates (Cities/Towns not currently available)									
County	31,287	1,286	1,328	307	40	0	1,046	35,294	991
% of Total	88.6%	3.6%	3.8%	0.9%	0.1%	0.0%	3.0%	100.0%	2.8%
ND	670,430	18,392	41,315	10,564	623	0	15,603	756,927	18,250
% of Total	88.6%	2.4%	5.5%	1.4%	0.1%	0.0%	2.1%	100.0%	2.4%
% Change '00 to '10									
County	12.4%	162.5%	3.5%	119.4%	150.0%	155.6%	47.7%	13.3%	135.7%
ND	2.1%	103.3%	16.8%	91.6%	39.1%	38.1%	60.2%	4.7%	73.0%
% Change '10 to '14									
County	19.0%	379.4%	25.4%	88.6%	60.0%	397.1%	-11.0%	20.8%	127.3%
ND	3.9%	35.4%	1.1%	17.6%	-2.5%	45.7%	25.2%	4.8%	35.5%
% Change '10 to '15									
County	51.6%	1,941.3%	47.7%	288.6%	700.0%	-100.0%	62.4%	57.6%	127.3%
ND	10.7%	131.1%	12.9%	52.9%	94.7%	-100.0%	31.6%	12.5%	35.5%

SOURCE: 2000 and 2010 Census population and 2014-2015 population estimates by race and ethnic origin, U.S. Census Bureau (www.census.gov [August 2016]).

different definitions but the trends show how health services and industries, in general, change over time. Data from U.S. Census Bureau, County Business Patterns, are illustrated in **Table 7**, showing employment and payroll for health services compared to the total employment and payroll for the county and the state. The data show that the county health services employment decreased 7.6 percent from 2004 to 2014 while the total county employment increased 281.3 percent. County health services employment as a percent of total county employment was 20.3 percent in 2004 and decreased to 4.9 percent in 2014; the state health services employment was 19.4 percent of total state employment in 2004 and decreased to 16.5 percent in 2014.

County health services payroll increased 48.6 percent from 2004 to 2014, while total county payroll increased 1,048.4 percent. County health services payroll as a percent of total county payroll was 23.4 percent in 2004 and decreased to 3.0 percent in 2014. This compares to the state health services payroll as a percent of total state payroll of 20.9 percent in 2004 and decreasing to 15.7 percent in 2014.

Data from U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis (BEA) are illustrated in **Tables 8** and **9**. **Table 8** shows employment by type and by industry. Total county employment increased 10.1 percent from 2013 to 2014. The health care and social assistance sector showed county employment of 1,688 in 2013 and 1,712 in 2014, a 1.4 percent increase from 2013 to 2014. The state health care and social assistance sector showed a 0.6 percent increase during the same time. For the county for both years, the largest industry was the mining, oil and gas industry and second largest was construction. For the state for both years, the largest industry was the health care and social assistance sector and the second largest was retail trade. For the county, the industry with the largest percent change from 2013 to 2014 was professional/scientific/technical services, with the

Table 7
Employment and Payroll for Health Services
in Williams County and North Dakota, 2004-2014

	Employment			
	Health Services	Total County	Health Services as a % of Total County Employment	Health Services as a % of Total State Employment
2004	1,385	6,806	20.3%	19.4%
2005	1,402	7,335	19.1%	18.6%
2006	1,500	7,785	19.3%	18.4%
2007	1,393	8,224	16.9%	17.5%
2008	1,416	8,964	15.8%	17.0%
2009	1,434	9,308	15.4%	18.0%
2010	1,471	10,623	13.8%	18.6%
2011	1,432	14,113	10.1%	18.4%
2012	1,722	20,020	8.6%	17.4%
2013	1,395	22,543	6.2%	17.3%
2014	1,280	25,952	4.9%	16.5%
% Chg '04-'14	-7.6%	281.3%		
	Payroll (1,000s)			
	Health Services	Total County	Health Services as a % of Total County Payroll	Health Services as a % of Total State Payroll
2004	$40,773	$174,302	23.4%	20.9%
2005	$43,771	$208,035	21.0%	20.7%
2006	$41,043	$236,116	17.4%	19.9%
2007	$39,581	$296,572	13.3%	18.6%
2008	$41,930	$378,458	11.1%	18.4%
2009	$45,158	$402,048	11.2%	19.5%
2010	$47,475	$556,709	8.5%	19.5%
2011	$51,317	$941,715	5.4%	18.7%
2012	$67,657	$1,418,771	4.8%	17.0%
2013	$58,412	$1,588,022	3.7%	16.6%
2014	$60,574	$2,001,685	3.0%	15.7%
% Chg '04-'14	48.6%	1,048.4%		

SOURCE: U.S. Census Bureau, County Business Patterns; 2004-2014 based on NAICS (www.census.gov [August 2016]).

Table 8
Full- & Part-Time Employment by NAICS[1] Industry
for Williams County and North Dakota, 2013 and 2014

Employment Categories	2013 Williams County No. of Jobs	2013 Williams County % of Total	2013 State % of Total	2014 Williams County No. of Jobs	2014 Williams County % of Total	2014 State % of Total	'13-'14 % Change Williams County	'13-'14 % Change North Dakota
Total Employment	43,430	100.0	100.0	47,809	100.0	100.0	10.1%	3.3%
Wage/Salary	38,597	88.9%	79.8%	42,893	89.7%	80.4%	11.1%	4.0%
Proprietors'	4,833	11.1%	20.2%	4,916	10.3%	19.6%	1.7%	0.6%
Proprietors'	4,833	100.0	100.0	4,916	100.0	100.0	1.7%	0.6%
Farm proprtrs'	667	13.8%	23.0%	656	13.3%	22.5%	-1.6%	-1.6%
Nonfarm proprtrs'[2]	4,166	86.2%	77.0%	4,260	86.7%	77.5%	2.3%	1.3%
By Industry:	43,430	100.0	100.0	47,809	100.0	100.0	10.1%	3.3%
Farm empl	771	1.8%	5.8%	771	1.6%	5.6%	0.0%	0.7%
Nonfarm empl	42,659	98.2%	94.2%	47,038	98.4%	94.4%	10.3%	3.5%
Nonfarm empl	42,659	100.0	100.0	47,038	100.0	100.0	10.3%	3.5%
Private nonfarm empl	40,396	94.7%	84.1%	44,557	94.7%	84.6%	10.3%	4.0%
Govt/govt enterpr	2,263	5.3%	15.9%	2,481	5.3%	15.4%	9.6%	0.7%
Private nonfarm empl	40,396	100.0	100.0	44,557	100.0	100.0	10.3%	4.0%
For/fshng/related	(D)	N/A	1.0%	(D)	N/A	1.0%	N/A	0.2%
Mining/Oil/Gas	13,639	33.8%	6.6%	15,508	34.8%	7.2%	13.7%	13.1%
Utilities	227	0.6%	0.8%	257	0.6%	0.8%	13.2%	3.2%
Construction	5,162	12.8%	9.2%	5,536	12.4%	9.4%	7.2%	6.2%
Manufacturing	579	1.4%	5.8%	590	1.3%	5.7%	1.9%	2.4%
Wholesale trade	3,332	8.2%	6.0%	3,327	7.5%	6.0%	-0.2%	3.3%
Retail trade	2,900	7.2%	13.0%	3,112	7.0%	12.9%	7.3%	2.9%
Transp/wrhsng	3,657	9.1%	5.9%	4,206	9.4%	6.1%	15.0%	8.0%
Information	210	0.5%	1.7%	216	0.5%	1.6%	2.9%	0.4%
Finance/ins	613	1.5%	5.7%	613	1.4%	5.6%	0.0%	2.1%
RE/rental/leasing	1,735	4.3%	3.7%	2,015	4.5%	3.7%	16.1%	4.2%
Prof/sci/techn svcs	1,296	3.2%	4.8%	1,537	3.4%	4.9%	18.6%	5.6%
Mgmt/cos/enterpr	(D)	N/A	1.2%	(D)	N/A	1.2%	N/A	3.1%
Admin/waste svcs	1,197	3.0%	4.0%	1,414	3.2%	4.0%	18.1%	4.5%
Educ services	157	0.4%	1.3%	172	0.4%	1.3%	9.6%	3.5%
Hlth care/soc asst	**1,688**	**4.2%**	**13.6%**	**1,712**	**3.8%**	**13.2%**	**1.4%**	**0.6%**
Arts/entrtnmnt/rec	200	0.5%	1.6%	198	0.4%	1.6%	-1.0%	2.7%
Accomm/food svcs	2,368	5.9%	8.1%	2,597	5.8%	8.1%	9.7%	3.1%
Other/not pub adm	1,250	3.1%	5.7%	1,345	3.0%	5.7%	7.6%	3.2%
Sum (D)s[3]	186	0.5%		202	0.5%		8.6%	

SOURCE: U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis (www.bea.gov [August 2016]).

[1] The estimates for 2011 forward are based on the 2012 NAICS.

[2] Excludes limited partners.

[3] All (D) categories have been totaled to show the total amount of missing data from private earnings.

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

Table 9
Personal Income Earnings by Place of Work and by Industry (NAICS) [1]
for Williams County and the State of North Dakota, 2013-2014

Earnings (Income) Categories	2013			2014			'13-14	'13-14
	Williams County		State	Williams County		State	Co.	State
	Income ($1,000s)	% of Total	% of Total	Income ($1,000s)	% of Total	% of Total	% Chg	% Chg
Ttl Pers Inc	3,428,204	100.0%	100.0%	3,905,011	100.0%	100.0%	13.9%	4.8%
Ttl plc wk	3,627,995	105.8%	79.7%	4,203,468	107.6%	80.5%	15.9%	5.8%
Ttl plc wk	3,627,995	100.0%	100.0%	4,203,468	100.0%	100.0%	15.9%	5.8%
Wage/salary	2,975,872	82.0%	69.2%	3,499,099	83.2%	72.3%	17.6%	10.7%
Proprs' inc [2]	209,944	5.8%	16.3%	199,601	4.7%	12.9%	-4.9%	-16.5%
Other	442,179	12.2%	14.5%	504,768	12.0%	14.8%	14.2%	7.8%
By Industry	3,627,995	100.0%	100.0%	4,203,468	100.0%	100.0%	15.9%	5.8%
Farm	69,810	1.9%	7.4%	47,740	1.3%	4.1%	-31.6%	-41.8%
Nonfarm	3,558,185	98.1%	92.6%	4,155,728	114.5%	95.9%	16.8%	9.7%
Nonfarm	3,558,185	100.0%	100.0%	4,155,728	100.0%	100.0%	16.8%	10.8%
Prvt nonfarm	3,443,982	96.8%	83.7%	4,025,018	96.9%	84.6%	16.9%	10.8%
Govt/govt entrp	114,203	3.2%	16.3%	130,710	3.7%	15.4%	14.5%	3.6%
Prvt nonfarm	3,443,982	100.0%	100.0%	4,025,018	100.0%	100.0%	16.9%	10.8%
For/fshng/rel	(D)	N/A	0.6%	(D)	N/A	0.6%	N/A	7.5%
Mnng/Oil/Gas	1,479,383	43.0%	12.9%	1,777,684	44.2%	14.0%	20.2%	20.4%
Utilities	21,539	0.6%	1.8%	26,241	0.7%	1.8%	21.8%	8.9%
Constr	471,517	13.7%	12.1%	523,499	13.0%	12.5%	11.0%	14.6%
Mfg	38,820	1.1%	6.5%	42,797	1.1%	6.2%	10.2%	6.2%
Whlsl trd	362,862	10.5%	9.0%	378,357	9.4%	8.8%	4.3%	7.9%
Rtl trade	120,679	3.5%	7.5%	135,573	3.4%	7.3%	12.3%	7.8%
Trasp/wrhs	328,125	9.5%	8.2%	395,212	9.8%	8.4%	20.4%	12.7%
Info	12,261	0.4%	2.0%	13,000	0.3%	1.9%	6.0%	6.4%
Fin/ins	29,497	0.9%	5.1%	31,887	0.8%	4.9%	8.1%	7.6%
RE/rntl/lsng	161,045	4.7%	3.7%	207,530	5.2%	3.7%	28.9%	12.2%
Prof/sci/techn	121,885	3.5%	5.7%	153,214	3.8%	5.9%	25.7%	13.2%
Mgmt/cos/entpr	(D)	N/A	1.8%	(D)	N/A	1.8%	N/A	10.5%
Adm/waste	54,559	1.6%	2.4%	71,573	1.8%	2.4%	31.2%	12.2%
Education	2,509	0.1%	0.5%	2,813	0.1%	0.5%	12.1%	6.6%
Hlth/soc asst	**85,102**	**2.5%**	**12.8%**	**92,331**	**2.3%**	**12.1%**	**8.5%**	**4.8%**
Arts/entert/rec	2,868	0.1%	0.4%	2,868	0.1%	0.4%	0.0%	5.7%
Accom/food	87,437	2.5%	3.3%	95,529	2.4%	3.3%	9.3%	9.5%
Other	55,533	1.6%	3.7%	64,368	1.6%	3.6%	15.9%	8.4%
Sum of (D)s [3]	8,361	0.2%		10,542	0.3%		26.1%	

SOURCE: U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis (www.bea.gov [August 2016]).
[1]The estimates are based on the North American Industry Classification System (NAICS). The estimates for 2011 forward are based on the 2012 NAICS.
[2]Proprietors' income includes the inventory valuation adjustment and capital consumption adjustment.
[3]All (D) categories have been totaled to show the total amount of missing data from private earnings.

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

second largest, administrative and waste services. For the state, the industry with the largest percent change from 2013 to 2014 was the mining, oil and gas industry and the second largest was administrative and waste services.

Table 9 shows earnings (income) by type and by industry. Total personal income increased 13.9 percent from 2013 to 2014 for the county, compared to the state with only 4.8 percent. The health care and social assistance sector showed county earnings of $85.1 million in 2013 and $92.3 million in 2014, an 8.5 percent increase. The state health care and social assistance sector showed a 4.8 percent increase during the same time. For the county for both years, the largest industry was the mining, oil and gas industry and second largest was construction. The largest industry was the mining, oil and gas for the state for both years. The second largest state industry was health care and social assistance sector in 2013 and construction in 2014. For the county, the industry with the largest percent change from 2013 to 2014 was the administrative and waste services industry and the second largest percent change was in the real estate, rental and leasing industry. For the state, the industry with the largest percent change from 2013 to 2014 was the mining, oil and gas industry and the second largest was construction.

Basic economic indicators for Williams County, North Dakota, and the United States are illustrated in **Table 10**. BEA data for 2014 show per capita income in Williams County at $121,538 with both the state ($55,802) and the nation ($46,049) much lower. The employment and labor force data are from the U.S. Department of Labor, Bureau of Labor Statistics. For 2015, the annual unemployment rate was 2.2 percent for Williams County, compared to 2.7 percent for the state and 5.3 percent for the U.S. For the preliminary year-to-date June 2016 employment and labor force data, the unemployment rate for Williams County was 4.8 percent; this compared to 3.4 percent for the state and 4.9 percent for the U.S.

Table 10
Economic Indicators for Williams County, North Dakota and the United States

Indicator	Williams County	North Dakota	United States
Total Personal Income (2014)	3,905,011,000	41,264,895,000	14,683,147,000,000
Per Capita Income (2014)	121,538	55,802	46,049
Employment (2015)	28,385	403,058	148,834,000
Unemployment (2015)	647	11,286	8,296,000
Unemployment Rate (2015)	2.2%	2.7%	5.3%
Employment (June 2016)	23,640	413,791	151,097,000
Unemployment (June 2016)	1,196	14,575	7,783,000
Unemployment Rate (June 2016)	4.8%	3.4%	4.9%
% of People in Poverty (2014)	8.2%	11.9%	15.6%
% Under 18 in Poverty (2014)	11.3%	14.5%	21.9%
Transfer Receipts (2014)	172,202,000	5,054,891,000	2,592,400,000,000
Transfer Receipts as a % of Total Personal Income	4.4%	12.2%	17.7%
Subcategories-Transfer Rcpts			
Medicare (2014)	27,796,000	1,056,455,000	611,100,000,000
% of Total	16.1%	20.9%	23.6%
Medicaid (2014)	28,647,000	900,119,000	513,500,000,000
% of Total	16.6%	17.8%	19.8%

SOURCE: Employment and unemployment data, U.S. Department of Labor, Bureau of Labor Statistics (www.bls.gov [August 2016]); Personal income, per capita income, and transfer receipts, U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis (www.bea.gov [August 2016]); Poverty data, U.S. Census Bureau (www.census.gov [August 2016]).

Based on 2014 U. S. Census poverty data, the county had lower poverty rates than the state and the nation. From BEA 2014 data, transfer receipts as a percentage for total personal income for the county were much lower than the state or the nation. This indicator shows the entity's percent of total personal income that comes from federal and state funds. With a low percent of transfer receipts as a percent of total income, the county is not reliant upon state and federal funds for income.

Direct Economic Activities of Williston Medical Center

CHI St. Alexius Health – Williston Medical Center is a fully accredited Joint Commission, 25-bed critical access regional medical facility, located in Williston, the county seat of Williams County, North Dakota. Williston Medical Center has a longstanding commitment to improve the healthcare services in the community. The facilities are constantly growing to meet the needs and expectations of the patients and their families. Although their name has changed, their mission remains to provide exceptional health care close to home. Williston Medical Center provides comprehensive hospital and clinical services. Equipped with advanced medical technology, and staffed by a team of skilled healthcare professionals, Williston Medical Center is committed to providing quality care in a friendly environment. Services provided by Williston Medical Center include the following:

- Anesthesiology
- Behavioral health (Outpatient)
- Cardiac Rehabilitation
- Cardiology
- Critical Care
- Diabetes Education
- Durable Medical Equipment
- Ear, Nose, and Throat
- Emergency Services
- Family Medicine
- Family Medicine Residency Clinic

- General Surgery
- Hospital Medicine
- Imaging Services
- Internal Medicine
- Interventional Radiology
- Interventional Pain Management
- Laboratory Services
- Maternal Child Services (Postpartum, Labor & Delivery, Nursery)
- Neurology
- Nutrition Services
- Occupational Health
- Occupational Therapy
- Oncology – Medical
- Oncology - Radiation
- Orthopedics
- Pathology
- Pediatrics
- Perioperative Services (Day Surgery, Operating Room, Recovery)
- Physical Therapy
- Pharmacy (including Outpatient Coagulation Clinic)
- Plastic Surgery
- Podiatry
- Psychiatry/Psychology
- Renal Dialysis
- Respiratory Care
- Sleep Lab
- Speech Therapy
- Urology Clinic
- Women's Health

The direct economic activities of Williston Medical Center include the employees and their wages, salaries, and benefits to provide the health care services. From **Table 11**, the total direct employment of Williston Medical Center includes 490 full- and part-time and contractual employees with direct wages, salaries, and benefits and contractual compensation (referred to as labor income) of $43.7 million.

Table 11
Direct Economic Activities of CHI St. Alexius Health - Williston Medical Center in Williams County, North Dakota

DIRECT ACTIVITIES FROM OPERATIONS		
Categories	Employees	Labor Income
Hospital, 2016	**490**	**$43,691,000**

DIRECT ACTIVITIES FROM CONSTRUCTION			
Categories	Construction	Employees	Labor Income
Construction Activities, 2017	**$1,250,000**	**6**	**$502,995**

SOURCE: Local data from CHI St. Alexius Health - Williston, 2016; Construction ratios and average construction compensation from IMPLAN Group, LLC.

The economic impact of construction activities can also be measured for employment and labor income. These activities only occur during the year of construction, while operations occur each and every year that hospital continues to operate. Williston Medical Center has $1.25 million in construction activities planned for 2017. The impact of the $1.25 construction in 2017 will generate direct employment of six jobs with $502,995 in labor income (**Table 11**).

The Impact of Williston Medical Center

The direct impacts of Williston Medical Center, measured by employment and labor income, are only a portion of the total impact. There are additional economic impacts created as Williston Medical Center and its employees spend money. These are known as secondary impacts and 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 2**. **Figure 2** 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

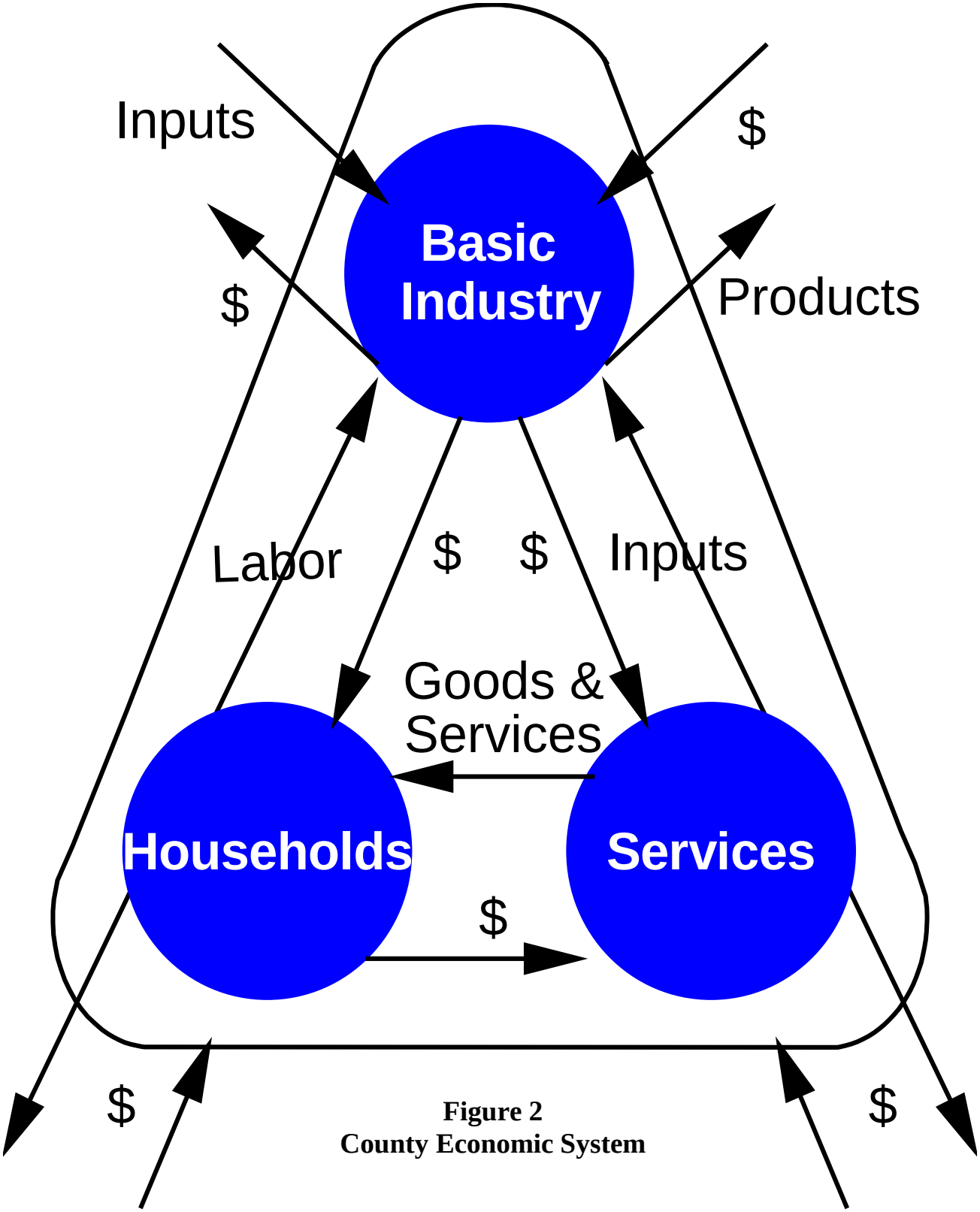


Figure 2
County Economic System

of the county are the foundation of a county's economy. Such a business is a basic industry. The flow of products out of, and dollars into, a county are represented by the two arrows in the upper right portion of **Figure 2**. To produce these goods and services for "export" outside of the county, the basic industry purchases inputs from outside of the county (upper left portion of **Figure 2**), labor from the residents or "households" of the county (left side of **Figure 2**), and inputs from service industries located within the county (right side of **Figure 2**). The flow of labor, goods, and services in the county is completed by households using their earnings to purchase goods and services from the county's service industries (bottom of **Figure 2**). It is evident from the the interrelationships shown in **Figure 2** that a change in any one segment of a county's economy will have reverberations throughout the entire economic system of the county.

Consider, for instance, the 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 county's households. The households alter their consumption accordingly. The effect of this change in

household consumption upon businesses in a county is referred to as an induced impact.

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

> ***"…the ratio between direct employment, or that employment used by the industry initially experiencing a change in final demand and the direct, indirect, and induced employment."***

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

The Impact from Operating Activities

The employment and labor income impacts of Williston Medical Center from operating activities are presented in **Table 12**. Direct employment and labor income from operating activities were obtained from Williston Medical Center. The multipliers specific to Williams County, ND, are derived from IMPLAN data.

The hospital employs 490 employees. The hospital employment multiplier is 1.31; this means for every job in the hospital sector, another 0.31 job is created in other sectors (businesses) in Williams County. The secondary employment generated in Williams County from the hospital sector is estimated to be 152 jobs. The hospital has a total impact of 642 jobs on the local economy of Williams County.

Data obtained from Williston Medical Center indicate that direct labor income for the hospital is $43.7 million. Using the hospital labor income multiplier of 1.21 derived from IMPLAN, Williston Medical Center generates secondary labor income impact of $9.2 million and total labor income impact of $52.9 million.

Table 12
Economic Impact of Operations of CHI St. Alexius Health - Williston Medical Center on Williams County, 2016

EMPLOYMENT IMPACT FROM OPERATIONS				
Categories	Direct Employment	Employment Multiplier	Secondary Employment Impact	Total Employment Impact
Hospital, 2016	**490**	1.31	**152**	**642**
LABOR INCOME IMPACT FROM OPERATIONS				
Categories	Direct Labor Income	Labor Income Multiplier	Secondary Labor Income Impact	Total Labor Income Impact
Hospital, 2016	**$43,691,000**	1.21	**$9,175,110**	**$52,866,110**

SOURCE: Direct employment and labor income data for 2016 provided by CHI St. Alexius Health - Williston, 2016; Multipliers from IMPLAN Group, LLC.

The Impact from Construction Activities

The employment and labor income impacts of Williston Medical Center from construction activities are presented in **Table 13**. Direct employment of six jobs and labor income of $502,995 from construction activities in 2017 were derived from IMPLAN data; these are based on total construction activities estimated at $1.25 million in 2017. In 2017 with a construction employment multiplier of 1.30, the construction activities will generate six direct employment impact, two secondary employment impact and eight total employment impact. In 2017 with a construction labor income multiplier of 1.24, the construction activities will generate $502,995 direct labor income impact, $120,719 secondary labor income impact, and $623,714 In total labor income impact.

Table 13
Economic Impact of Construction Activities of CHI St. Alexius Health - Williston Medical Center on Williams County, 2017

EMPLOYMENT IMPACT FROM CONSTRUCTION				
Categories	Direct Employment	Employment Multiplier	Secondary Employment Impact	Total Employment Impact
Construction Estimates	**6**	1.30	**2**	**8**

LABOR INCOME IMPACT FROM CONSTRUCTION				
Categories	Direct Labor Income	Labor Income Multiplier	Secondary Labor Income Impact	Total Labor Income Impact
Construction Estimates	**$502,995**	1.24	**$120,719**	**$623,714**

SOURCE: Construction ratios and construction average compensation used to estimate construction employment and labor income from IMPLAN data and multipliers from IMPLAN Group, LLC.

Summary

Both the operating activities and construction activities of Williston Medical Center impact the economy of Williams County. Often overlooked can be the economic impact created from construction activities. This report measures the impact that Williston Medical Center will have on the economy due to its normal operating activities in 2016 and its construction activities in 2017. The operating impact occurs every year; whereas, the construction impact will only occur during the construction year.

In 2016, Williston Medical Center and Clinic employed 490 full-time and part-time and contractual employees, this generated $43.7 million in labor income (wages, salaries, and benefits and contractual compensation). When the secondary impacts are included, the total employment impact is 642 jobs and the total labor income impact is $52.9 million. The employment and labor income impacts from operating activities are annual and will continue

each and every year that Williston Medical Center operates in the future; these are long term economic benefits of Williston Medical Center.

In 2017, Williston Medical Center is planning $1.25 million in construction. This construction will generate six direct jobs with $502,995 in direct labor income. The total impact from the construction is estimated to be eight jobs and $623,714 labor income. These construction impacts only occur during the year of construction.

The impacts generated by Williston Medical Center contribute to the local economy of Williams County. The hospital employs local residents. The hospital and its employees spend money in Williams County and generate a secondary impact. If the hospital increases or decreases in size, the medical health of Williams County as well as the economic health of Williams County can be affected.

For the attraction of industrial firms, businesses, and retirees, the local area should have quality hospital and health services. A quality hospital and health sector can contribute to the overall economic health of Williams County, as well as the overall medical health of the Williams County residents. Given this, not only does Williston Medical Center contribute to the health and wellness of the local residents but Williston Medical Center also contributes to the overall economic strength of Williams County.

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Appendix A

IMPLAN Software and Data from IMPLAN Group, LLC:

Model and Data Used to Derive Multipliers

APPENDIX A
IMPLAN Software and Data from IMPLAN Group, LLC: Model and Data Used to Derive Multipliers

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 an area, 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, an area 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.

The basis of IMPLAN was developed by the U. S. Forest Service to construct input/output accounts and models. The complexity of this type of modeling had hindered practitioners from constructing models specific to a community requesting an analysis. The University of Minnesota utilized the U.S. Forest Service model to further develop the methodology and expand the data sources to form the model known as IMPLAN. The founders of IMPLAN, Scott Lindall and Doug Olson, joined the University of Minnesota in 1984 and, as an outgrowth of their work with the University of Minnesota, entered into a technology transfer agreement with the University of Minnesota that allowed them to form Minnesota IMPLAN Group, Inc. (MIG).

In 2013 Minnesota IMPLAN Group, Inc. was purchased by IMPLAN Group, LLC and relocated to:

IMPLAN Group, LLC
16740 Birkdale Commons Parkway Suite 206
Huntersville, NC 28078

Support hours are 8 am – 7 pm Eastern time and can be reached by email at info@implan.com or by phone at 800-507-9426.

IMPLAN Software and Data

At first, IMPLAN focused on database development and provided data that could be used in the Forest Service version of the software. In 1995, IMPLAN took on the task of writing a new version of the IMPLAN software from scratch that extended the previous Forest Service version by creating an entirely new modeling system – an extension of input-output accounts and resulting Social Accounting Matrices (SAM) multipliers. Version 2 of the new IMPLAN software became available in May of 1999. The latest development of the software is now available, IMPLAN Version 3 Software System, the new economic impact assessment software system.

With IMPLAN Version 3 software, the packaging of products has changed. Version 3 utilizes 2007 or later data. When data are ordered, the data cost plus shipping are the only costs. Version 3.0 software and the new IMPLAN appliance are included in the cost of the data. There are no additional fees to upgrade to IMPLAN Version 3.0. Data files are licensed to an individual user. Version 2 is no longer compatible with 2008 and later data sets.

Version 3 allows the user to do much more detailed analyses. Users can continue to create detailed economic impact estimates. Version 3.0 takes the analysis further, providing a new method for estimating regional imports and exports is being implemented - a trade model. IMPLAN can construct a model for any state, region, area, county, or zip code area in the United States by using available national, state, county, and zip code level data. Impact analysis can be performed once a regional input/output model is constructed.

IMPLAN Multipliers

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 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 (or Type SAM) 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).

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