

The Economic Impact of Lafayette Regional Health Center on Lafayette County, Missouri



Prepared by:

National Center for Rural Health Works
Oklahoma Cooperative Extension Service
Oklahoma State University

February 2010

**The Economic Impact
of Lafayette Regional Health Center
on Lafayette County, Missouri**

Prepared for:

Lafayette Regional Health Center
Lexington, Lafayette County, Missouri

Prepared by:

Cheryl F. St. Clair, Associate State Extension Specialist
Email: cheryl@okstate.edu

Pamela S. Hartman, Extension Associate
Email: pamela.hartman@okstate.edu

Gerald A. Doeksen, Regents Professor/Extension Economist
Email: gad@okstate.edu

National Center for Rural Health Works
Oklahoma Cooperative Extension Service
Oklahoma State University
(405) 744-6083

February 2010

The Economic Impact of Lafayette Regional Health Center on Lafayette County, Missouri

Medical facilities have a tremendous medical and economic impact on the county in which they are located. This is especially true with health care facilities, such as hospitals and nursing homes. These facilities not only employ a number of people and have a large payroll, but they also draw into the county a large number of people from rural areas that need medical services and may also attract visitors to the area through tourism activities. The overall objective of this study is to measure the economic impact of Lafayette Regional Health Center on Lafayette County in Missouri. 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 Lafayette County;
3. Summarize the direct economic activities of Lafayette Regional Health Center from operating activities and construction activities in Lafayette County;
4. Present concepts of county economics and multipliers; and
5. Estimate the economic impact of Lafayette Regional Health Center from operating activities and construction activities on Lafayette County, Missouri.

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.

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 county economic development corporation, the presence of good health and education services is imperative to industrial and business leaders as they select a county for location. Employees and participating management may offer strong resistance if they are asked to move into a county 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., 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. 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 county. Only protective services were mentioned more often than health services as a “must have” service.

Health Services and Job Growth

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 2008;
- Per capita health expenditures increased from \$356 in 1970 to \$7,681 in 2008;

Table 1
United States Health Expenditures and Employment Data
1970-2008; Projected for 2009, 2012, 2015 & 2018

Year	Total Health Expenditures (\$Billions)	Per Capita Health Expenditures (\$)	Health as % of GDP (%)	Health Sector Employment (000)	Ave. 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	1,352.9	4,789	13.6%	10,858 ^a	3.9%
2001	1,469.2	5,150	14.3%	11,188 ^a	3.0%
2002	1,602.4	5,564	15.1%	11,536 ^a	3.1%
2003	1,735.2	5,973	15.6%	11,817 ^b	N/A
2004	1,855.4	6,328	15.6%	12,055 ^b	2.0%
2005	1,982.5	6,701	15.7%	12,314 ^b	2.1%
2006	2,112.5	7,071	15.8%	12,602 ^b	2.3%
2007	2,239.7	7,423	15.9%	12,946 ^b	2.7%
2008	2,338.7	7,681	16.2%	13,469 ^b	4.0%
Projections					
2009	2,509.5	8,160	17.6%		
2012	2,930.7	9,282	18.0%		
2015	3,541.3	10,929	18.9%		
2018	4,353.2	13,100	20.3%		

SOURCES: 2010 Bureau of Labor Statistics (www.bls.gov [January 2010]); 2010 Centers for Medicare & Medicaid Services, National Health Expenditures 1970-2008 and National Health Expenditure Projections 2008-2018 (<http://www.cms.hhs.gov/nationalhealthexpenddata> [January 2010]).

N/A - Not Available.

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

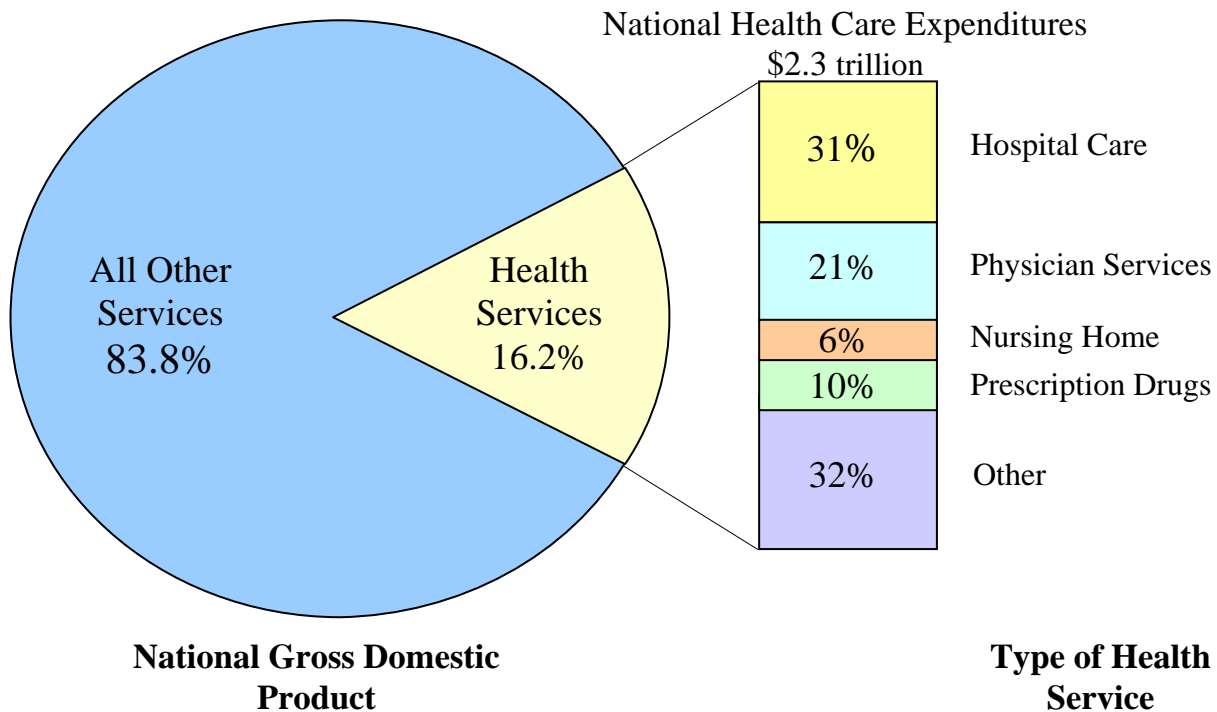
^b Based on North American Industrial Classification System (NAICS) for health sector employment.

- Employment in the health sector increased over 341.3 percent from 1970 to 2008; and
- Annual increases in employment from 2003 to 2008 ranged from 2.0 percent to 4.0 percent.

In addition, the Bureau of Labor Statistics projects substantial increases in health care expenditures from 2008 through 2018. In fact, the U. S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, predicts that health care expenditures will account for 18.9 percent of GDP by 2015 and increase to 20.3 percent of GDP in 2018. Per capita health care expenditures are projected to increase to \$10,929 in 2015 and to \$13,100 in 2018. Total health expenditures are projected to increase to almost \$4.4 trillion in 2018.

Figure 1 illustrates 2008 health expenditures by percent of gross domestic product and by type of health service. The largest health service type was hospital care, representing 31.0 percent of the total. The next largest type of health services was physician services with 21.0 percent of the total.

Figure 1. National Health Expenditures as a Percent of Gross Domestic Product and by Health Service Type, 2008



Lafayette County Demographic and Economic Data

Lafayette Regional Health Center is located in Lexington city in Lafayette County in west central Missouri. The medical service area of Lafayette Regional Health Center is all of Lafayette County, Missouri. Lafayette County in relation to the State of Missouri is illustrated in **Figure 2**.

From the U.S. Census Bureau, data in **Table 2** show the populations for cities and towns, Lafayette County and Missouri for Census years 1990 and 2000 and estimated for 2008. The estimated populations can be subject to error since these are estimates for the years between Censuses. From the 2000 Census, the largest population center in Lafayette County was Odessa city with 4,818, followed closely by Higginsville city with 4,682, and Lexington city with 4,453. Lexington is the county seat. The population in Odessa city was estimated to decrease from 2000 to 2008 estimates by 1.7 percent, the population in Higginsville city was also estimated to decrease by 2.4 percent, while the population in Lexington city was estimated to increase by 2.2 percent. Lafayette County population slightly changed from 2000 to 2008. The population of the State of Missouri was estimated to increase by 6.1 percent for the same years.

Tables 3a and 3b show the 2000 population and the 2030 projected population by age and gender from the Missouri Census Data Center for Lafayette County and Missouri. For Lafayette County (**Table 3a**), the total population changed slightly from Census 2000 to the 2030 projected population. The largest population by age group for Census 2000 was tied between the 10-14 and the 35-39 age groups with 7.9 percent of the population. The age group with the lowest percent of total population from the 2000 Census was the 80-84 age group, with 2.2 percent. The largest age group in the 2030 projections is the 10-14 age group with 7.2 percent of the total. The age group with the smallest proportion of population from the 2030

Figure 2.
Lafayette County in Relation to
the State of Missouri

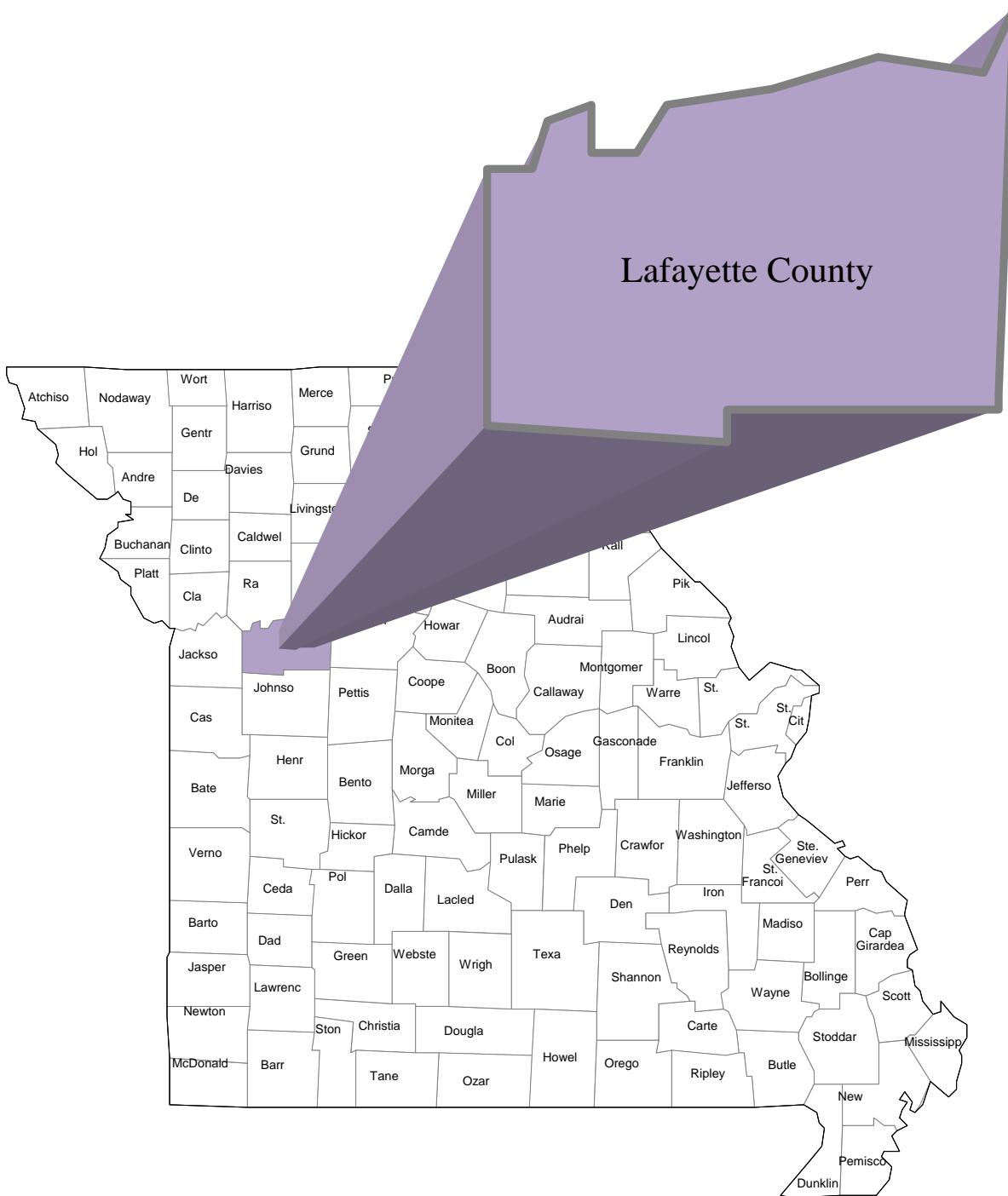


Table 2
Census Population, Population Estimates, and Percent Changes
for Lafayette County Cities and Towns, Lafayette County, and the State of Missouri

	<u>Census</u>		<u>Estimates</u>	<u>10 Years</u>	<u>8 Years</u>
	1990	2000	2008	'90-'00	'00-'08
Alma city	446	399	368	-11.8%	-8.4%
Aullville village	72	86	84	16.3%	-2.4%
Bates City city	197	245	266	19.6%	7.9%
Blackburn city (pt.)	NA	23	22	--	-4.5%
Concordia city	2,160	2,360	2,384	8.5%	1.0%
Corder city	485	427	414	-13.6%	-3.1%
Dover town	115	108	105	-6.5%	-2.9%
Emma city (pt.)	NA	99	96	--	-3.1%
Higginsville city	4,693	4,682	4,571	-0.2%	-2.4%
Lake Lafayette city	NA	346	367	--	5.7%
Lexington city	4,860	4,453	4,551	-9.1%	2.2%
Mayview city	279	294	286	5.1%	-2.8%
Napoleon city	233	208	196	-12.0%	-6.1%
Oak Grove city (pt.)	NA	18	88	--	79.5%
Odessa city	3,695	4,818	4,737	23.3%	-1.7%
Waverly city	837	806	787	-3.8%	-2.4%
Wellington city	<u>779</u>	<u>784</u>	<u>763</u>	0.6%	-2.8%
Balance of County	<u>12,256</u>	<u>12,804</u>	<u>12,828</u>	4.3%	0.2%
Lafayette County	<u>31,107</u>	<u>32,960</u>	<u>32,913</u>	5.6%	-0.1%
State of Missouri	<u>5,117,073</u>	<u>5,595,211</u>	<u>5,956,335</u>	8.5%	6.1%

SOURCE: U.S. Census Bureau; 1990 & 2000 Census population; 2008 Census population estimates (www.census.gov [February 2010]).

NA = partial populations for cities and towns were not available in the 1990 population dataset.

Table 3a
2000 Census Population and 2030 Projected Population by Gender and Age Groups
for Lafayette County, Missouri

Age Group	2000 Census Population				2030 Projected Population				% Chg '00-'30
	Total	Number Male	Female	Percent Total	Total	Number Male	Female	Percent Total	
Total	<u>32,960</u>	<u>16,131</u>	<u>16,829</u>	<u>100.0%</u>	<u>32,947</u>	<u>16,011</u>	<u>16,936</u>	<u>100.0%</u>	<u>0.0%</u>
0 - 4	2,008	1,023	985	6.1%	2,090	1,072	1,018	6.3%	4.1%
5 - 9	2,393	1,224	1,169	7.3%	2,245	1,152	1,093	6.8%	-6.2%
10 - 14	2,600	1,362	1,238	7.9%	2,361	1,212	1,149	7.2%	-9.2%
15 - 19	2,464	1,301	1,163	7.5%	2,247	1,167	1,080	6.8%	-8.8%
20 - 24	1,665	844	821	5.1%	1,873	941	932	5.7%	12.5%
25 - 29	1,865	932	933	5.7%	1,740	828	912	5.3%	-6.7%
30 - 34	2,035	963	1,072	6.2%	1,705	787	918	5.2%	-16.2%
35 - 39	2,620	1,329	1,291	7.9%	1,980	918	1,062	6.0%	-24.4%
40 - 44	2,542	1,279	1,263	7.7%	2,108	1,007	1,101	6.4%	-17.1%
45 - 49	2,301	1,137	1,164	7.0%	2,045	983	1,062	6.2%	-11.1%
50 - 54	2,061	1,014	1,047	6.3%	1,556	740	816	4.7%	-24.5%
55 - 59	1,840	916	924	5.6%	1,762	862	900	5.3%	-4.2%
60 - 64	1,487	732	755	4.5%	1,779	836	943	5.4%	19.6%
65 - 69	1,269	593	676	3.9%	2,066	1,043	1,023	6.3%	62.8%
70 - 74	1,234	600	634	3.7%	1,817	900	917	5.5%	47.2%
75 - 79	1,020	399	621	3.1%	1,440	674	766	4.4%	41.2%
80 - 84	725	254	471	2.2%	1,066	474	592	3.2%	47.0%
85+	831	229	602	2.5%	1,067	415	652	3.2%	28.4%

SOURCE: U.S. Census Bureau; 2000 Census population; (www.census.gov [February 2010]); Missouri Census Data Center; 2030 population projections (<http://mcdc2.missouri.edu/trends/projections.shtml> [February 2010]).

Table 3b
2000 and 2030 Projected Populations by Gender and Age Groups
for the State of Missouri

Age Group	2000 Projected Population				2030 Projected Population				% Chg '00-'30
	Total	Number Male	Number Female	Percent Total	Total	Number Male	Number Female	Percent Total	
Total	<u>5,596,687</u>	<u>2,721,664</u>	<u>2,875,023</u>	<u>100.0%</u>	<u>6,746,762</u>	<u>3,362,702</u>	<u>3,384,060</u>	<u>100.0%</u>	<u>20.5%</u>
0 - 4	369,898	189,250	180,648	6.6%	416,469	213,586	202,883	6.2%	12.6%
5 - 9	398,900	204,038	194,862	7.1%	426,274	218,588	207,686	6.3%	6.9%
10 - 14	412,080	211,383	200,697	7.4%	426,816	218,836	207,980	6.3%	3.6%
15 - 19	413,316	210,855	202,461	7.4%	428,151	218,723	209,428	6.3%	3.6%
20 - 24	369,640	184,827	184,813	6.6%	431,328	220,804	210,524	6.4%	16.7%
25 - 29	362,497	180,476	182,021	6.5%	409,885	209,748	200,137	6.1%	13.1%
30 - 34	376,714	187,732	188,982	6.7%	412,334	211,623	200,711	6.1%	9.5%
35 - 39	443,570	220,259	223,311	7.9%	436,454	223,976	212,478	6.5%	-1.6%
40 - 44	444,529	219,683	224,846	7.9%	448,449	230,672	217,777	6.6%	0.9%
45 - 49	395,729	193,786	201,943	7.1%	427,830	218,697	209,133	6.3%	8.1%
50 - 54	346,941	168,773	178,168	6.2%	352,588	175,746	176,842	5.2%	1.6%
55 - 59	279,100	134,479	144,621	5.0%	361,522	179,035	182,487	5.4%	29.5%
60 - 64	228,357	108,852	119,505	4.1%	354,396	174,504	179,892	5.3%	55.2%
65 - 69	205,386	94,903	110,483	3.7%	395,493	193,271	202,222	5.9%	92.6%
70 - 74	187,870	83,214	104,656	3.4%	360,272	173,065	187,207	5.3%	91.8%
75 - 79	157,213	64,165	93,048	2.8%	279,984	129,558	150,426	4.1%	78.1%
80 - 84	106,375	38,046	68,329	1.9%	202,417	87,903	114,514	3.0%	90.3%
85+	98,572	26,943	71,629	1.8%	176,200	64,467	111,733	2.6%	78.8%

SOURCE: Missouri Census Data Center; 2000 & 2030 population projections (<http://mcdc2.missouri.edu/> [February 2010]).

NOTE: The 2000 populations from the Census and the 2000 projected populations from the Missouri Census Data Center differ by 1,476. The greater population is referenced by the Missouri Census Data Center.

projections is tied between the 80-84 and the 85+ age groups with 3.2 percent of the total. The largest change from the Census 2000 and the 2030 projections is the 65-69 age group with an increase of 62.8 percent. Conversely, the age group with the largest decrease was the 50-54 age group with 24.5 percent.

Table 3b presents the 2000 and 2030 projected populations by age and gender from the Missouri Census Data Center for the State of Missouri. The State of Missouri is projected to increase in population by 20.5 percent from the 2000 projected population to the 2030 projected population. The largest projected population by age group for the 2000 projected populations was tied between the 35-39 and the 40-44 age groups with 7.9 percent of the population. The age group with the lowest percent of total population from the projected 2000 data was the 85+ age group with 1.8 percent. The largest age group in the 2030 projections is the 40-44 group with 6.6 percent. The age group with the smallest proportion of population from the 2030 projections is the 85+ age group with 2.6 percent of the total. The largest amount of change between the 2000 and the 2030 projections is the 65-69 age group with an increase of 92.6 percent. Conversely, the age group with the largest decrease was the 35-39 age group with 1.6 percent.

Table 4 shows population and distribution by age group from the 2008 Census population estimates for Lafayette County. From the data, the age group with the largest proportion of the total is the 45-49 age group with 8.0 percent. The smallest proportion of the population is represented by the 80-84 age group with 2.4 percent.

Data in **Table 5** represent the Lafayette County population by race and Hispanic origin. The county is projected to show very little difference in racial population distribution between Census 2000 and Census estimates for 2008; however, the Hispanic population is projected to increase in Lafayette County from 2.1 percent to 6.4 percent for the same time period.

Table 4
Age Groups and Gender
for Lafayette County, Missouri

Age	Male	Female	Total	% of Total
2008 Estimated Population				
0-4	1,080	995	2,075	6.3%
5-9	1,012	984	1,996	6.1%
10-14	1,115	1,014	2,129	6.5%
15-19	1,160	1,093	2,253	6.8%
20-24	984	973	1,957	5.9%
25-29	1,143	1,094	2,237	6.8%
30-34	928	878	1,806	5.5%
35-39	953	1,012	1,965	6.0%
40-44	1,102	1,079	2,181	6.6%
45-49	1,305	1,340	2,645	8.0%
50-54	1,183	1,163	2,346	7.1%
55-59	1,044	1,076	2,120	6.4%
60-64	843	946	1,789	5.4%
65-69	768	769	1,537	4.7%
70-74	545	650	1,195	3.6%
75-79	401	541	942	2.9%
80-84	318	481	799	2.4%
85+	<u>266</u>	675	<u>941</u>	<u>2.9%</u>
Total	<u>16,150</u>	<u>16,763</u>	<u>32,913</u>	<u>100.0%</u>

SOURCE: U.S. Census Bureau, 2008 County Population Estimates (www.census.gov [February 2010]).

Table 5
Race and Ethnic Groups
Population and Percent of Total Population
for Lafayette County and the State of Missouri

Race/Ethnic Group	<u>Lafayette County</u>		<u>State of Missouri</u>	
	Number	Percent	Number	Percent
1990 Census				
White	29,976	96.4%	4,486,228	87.7%
Black	880	2.8%	548,208	10.7%
Native American ¹	106	0.3%	19,835	0.4%
Other ²	145	0.5%	62,802	1.2%
Two or more Races ³	N/A	N/A	N/A	N/A
Hispanic Origin ⁴	219	0.7%	61,702	1.2%
2000 Census				
White	31,485	95.5%	4,748,083	84.9%
Black	749	2.3%	629,391	11.2%
Native American ¹	96	0.3%	25,076	0.4%
Other ²	260	0.8%	110,600	2.0%
Two or more Races ³	370	1.1%	82,061	1.5%
Hispanic Origin ⁴	386	1.2%	118,592	2.1%
2008 Census Estimate				
White	31,470	95.6%	5,026,572	85.0%
Black	799	2.4%	679,223	11.5%
Native American ¹	119	0.4%	30,034	0.5%
Other ²	119	0.4%	90,484	1.5%
Two or more Races ³	406	1.2%	85,292	1.4%
Hispanic Origin ⁴	487	1.5%	379,400	6.4%

SOURCE: U.S. Census Bureau, 1990 & 2000 Census data, 2008 Census estimates (www.census.gov [January 2010]).

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.

NA = Not Available.

Data in **Table 6** are from the U.S. Census Bureau, County Business Patterns. The table is based on employment and payroll for both health services and total county services for Lafayette County and shows health services as a percent of total population for both Lafayette County and the State of Missouri; thus, illustrating how health services are growing over time. Health services employment in Lafayette County increased 27.0 percent from 882 employees in 1999 to 1,120 employees in 2007. During the same time period, the total county employment decreased 1.9 percent. In 1999, county health services employment represented 12.3 percent of total county employment and increased to 16.0 percent in 2007. In 1999, the state health services employment was 13.6 percent and grew 14.6 percent of total state employment.

The county health services payroll grew 71.5 percent from \$14.9 million in 1999 to \$25.6 million in 2007; this compares to an increase of 29.2 percent for the total county payroll (**Table 6**). In 1999, county health services payroll represented 12.2 percent of total county payroll and grew to 16.3 percent in 2007. The state health services payroll represented 12.8 percent of total state payroll in 1999 and grew to 14.0 percent in 2007.

Basic economic indicators for Lafayette County, the State of Missouri and the United States are illustrated in **Table 7**. Based on Bureau of Economic Analysis data, the 2007 per capita income for Lafayette County was \$31,823, which is slightly lower than that for the State of Missouri of \$33,964 and somewhat lower than the United States with \$34,445. According to the Bureau of Labor Statistics, the unemployment rate for Lafayette County was 9.4 percent for 2009, which was higher than the state's rate of 9.0 percent and the national rate of 9.3 percent. In December 2009, the unemployment rate for Lafayette County had increased to 10.7 percent, the State rate increased to 9.2 percent and the national rate to 9.7 percent.

Table 6
Employment and Payroll for County Business Patterns*
Lafayette County and the State of Missouri

Based on NAICS ¹	Employment			
	Health Services Employment	Total County Employment	Health Services as a % of Total Co. Employment	Health Services as a % of Total State Employment
1999	882	7,147	12.3%	13.6%
2000	857	7,087	12.1%	13.5%
2001	841	6,799	12.4%	13.8%
2002	1,092	7,012	15.6%	14.4%
2003	1,076	6,908	15.6%	14.3%
2004	1,046	7,225	14.5%	14.3%
2005	1,055	7,176	14.7%	14.6%
2006	1,118	7,274	15.4%	14.7%
2007	1,120	7,010	16.0%	14.6%
% Change '99 - '07	27.0%	-1.9%		

Based on NAICS ¹	Payroll			
	Hlth. Svcs. Payroll (\$1,000s)	Total Co. Payroll (\$1,000s)	Health Services as a % of Total Co. Payroll	Health Services as a % of Total State Payroll
1999	14,930	121,938	12.2%	12.8%
2000	15,577	122,350	12.7%	12.5%
2001	16,040	128,820	12.5%	12.9%
2002	19,618	133,176	14.7%	13.9%
2003	19,293	139,347	13.8%	13.8%
2004	21,427	147,166	14.6%	14.1%
2005	22,418	150,448	14.9%	14.2%
2006	23,113	155,843	14.8%	14.2%
2007	25,602	157,495	16.3%	14.0%
% Change '99 - '07	71.5%	29.2%		

Source: U.S. Census Bureau, County Business Patterns; 1999-2007 data (www.census.gov [February 2010]).

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

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

Table 7
Economic Indicators for Lafayette County, the State of Missouri and the United States

Indicator	Lafayette County	State of Missouri	United States
Total Personal Income (2007)	\$1,039,563,000	\$199,655,237,000	\$11,894,100,000,000
Per Capita Income (2007)	\$31,823	\$33,964	\$34,445
Employment (2009)	14,882	2,734,332	139,877,000
Unemployment (2009)	1,550	182,837	14,265,000
Unemployment Rate (2009)	9.4%	9.0%	9.3%
Employment (Dec 2009)	14,562	2,684,737	137,953,000
Unemployment (Dec 2009)	1,751	273,416	14,740,000
Unemployment Rate (Dec 2009)	10.7%	9.2%	9.7%
% of People in Poverty (2008)	13.1%	13.5%	13.2%
% of < 18 in Poverty (2008)	16.8%	18.9%	18.2%
Transfer Dollars (2007)	\$234,419,000	\$34,898,705,000	\$1,712,794,000,000
Transfer Dollars as percentage of Total Personal Income (2007)	22.5%	17.5%	14.4%

SOURCES: U.S. Department of Labor, Bureau of Labor Statistics (www.bls.gov [February 2010]); U. S. Department of Commerce, Bureau of Economic Analysis (www.bea.gov [February 2010]); U.S. Census Bureau (www.census.gov [February 2010]).

From the U. S. Census Bureau, the percent of people in poverty in Lafayette County was 13.1 percent in 2008, as compared to 13.5 percent for the State of Missouri and 13.2 percent for the nation. The percentage of people under age 18 in poverty in 2008 in Lafayette County was 16.8 percent, lower than the State's percentage of 18.9 percent and the nation's 18.2 percent.

Another economic indicator is the percent of personal income from transfer receipts. Based on Bureau of Economic Analysis data, Lafayette County had 22.5 percent of total personal income from transfer receipts. Transfer receipts represent that portion of total personal income whose source is state and federal funds. Lafayette County had significantly higher income from transfer dollars in 2007 than the state's 17.5 percent and the nation's 14.4 percent.

To further illustrate the transfer receipts in Lafayette County, **Table 8** includes 2007 Bureau of Economic Analysis data. Total transfer receipts into Lafayette County were \$234.4 million. Retirement and disability insurance benefit payments represented 36.2 percent of the total and medical payments represented an additional 50.6 percent. Further details for all transfer receipts are included in **Table 8**.

Table 8
Transfer Receipts for Lafayette County and the State of Missouri, 2007

Transfer Receipt Categories	Lafayette County			State of Missouri	
	Payments (\$1,000s)	% of Total	% of Sub- Totals	% of Total	% of Sub- Totals
Total transfer receipts	<u>234,419</u>	<u>100.0%</u>		<u>100.0%</u>	
Crrnt receipts of individs from govt	<u>226,642</u>	<u>96.7%</u>		<u>100.0%</u>	
Ret & disab ins benefits	<u>84,963</u>	<u>36.2%</u>	<u>100.0%</u>	<u>36.2%</u>	<u>100.0%</u>
Old-age, surv & disab ins benefits	82,515	35.2%	97.1%	35.2%	97.1%
Railroad ret & disab benefits	1,450	0.6%	1.7%	0.6%	1.7%
Workers' comp	620	0.3%	0.7%	0.3%	0.7%
Other govt disab ins & ret benefits ¹	<u>378</u>	<u>0.2%</u>	<u>0.4%</u>	0.2%	<u>0.4%</u>
Medical benefits	<u>118,690</u>	<u>50.6%</u>	<u>100.0%</u>	<u>50.6%</u>	<u>100.0%</u>
Medicare benefits	60,250	25.7%	50.8%	25.7%	50.8%
Public asst medical care benefits ²	57,565	24.6%	48.5%	24.6%	48.5%
Military medical ins benefits ³	<u>875</u>	<u>0.4%</u>	<u>0.7%</u>	<u>0.4%</u>	0.7%
Income maintenance benefits	<u>14,267</u>	<u>6.1%</u>	<u>100.0%</u>	<u>6.1%</u>	<u>100.0%</u>
Suppl security income (SSI) benefits	2,403	1.0%	16.8%	1.0%	16.8%
Family asst ⁴	1,137	0.5%	8.0%	0.5%	8.0%
Food stamps	3,813	1.6%	26.7%	1.6%	26.7%
Other income maintenance benefits ⁵	<u>6,914</u>	<u>2.9%</u>	<u>48.5%</u>	<u>2.9%</u>	<u>48.5%</u>
Unemp ins compensation	<u>2,557</u>	<u>1.1%</u>	<u>100.0%</u>	<u>1.1%</u>	<u>100.0%</u>
State unemp ins comp	2,526	1.1%	98.8%	1.1%	98.8%
Unemp comp for fed cvln Empl (UCFE)	(L)	**	**	(L)	**
Unemp comp for railroad empl	(L)	**	**	(L)	**
Unemp comp for veterans (UCX)	(L)	**	**	(L)	**
Other unemp comp ⁶	<u>0</u>	**	**	<u>(L)</u>	**
Veterans benefits	<u>4,674</u>	<u>2.0%</u>	<u>100.0%</u>	<u>2.0%</u>	<u>100.0%</u>
Veterans pension & disab benefits	4,145	1.8%	88.7%	1.8%	88.7%
Veterans readjustment benefits ⁷	113	0.0%	2.4%	0.0%	2.4%
Veterans life ins benefits	416	0.2%	8.9%	0.2%	8.9%
Other asst to veterans ⁸	<u>0</u>	**	**	<u>(L)</u>	**
Fed educ & trng asst ⁹	<u>1,368</u>	<u>0.6%</u>	<u>100.0%</u>	<u>0.6%</u>	<u>100.0%</u>
Other receipts of individs from govt ¹⁰	<u>123</u>	<u>0.1%</u>	<u>100.0%</u>	<u>0.1%</u>	<u>100.0%</u>
Current receipts of nonprofit institutions	<u>5,862</u>	<u>2.5%</u>	<u>100.0%</u>	<u>2.5%</u>	<u>100.0%</u>
Receipts from Federal govt	1,194	0.5%	20.4%	0.5%	20.4%
Receipts from state and local govts ¹¹	3,115	1.3%	53.1%	1.3%	53.1%
Receipts from businesses	<u>1,553</u>	<u>0.7%</u>	<u>26.5%</u>	<u>0.7%</u>	<u>26.5%</u>
Current receipts of individs from bus ¹²	<u>1,915</u>	<u>0.8%</u>	<u>100.0%</u>	<u>0.8%</u>	<u>100.0%</u>

SOURCE: U. S. Department of Commerce, Bureau of Economic Analysis, 2007 data (www.census.gov [February 2010]).

Table 8 Footnotes (Continued)

- ¹ Consists largely of temporary disability payments and black lung payments.
- ² Consists of Medicaid and other medical vendor payments.
- ³ Consists of payments made under the TriCare Management Program (formerly called CHAMPUS) for the medical care of dependents of active duty military personnel and of retired military personnel and their dependents at nonmilitary medical facilities.
- ⁴ Consists of benefits -- generally known as temporary assistance for needy families -- provided under the Personal Responsibility and Work Opportunity Reconciliation Act of 1996.
- ⁵ Consists largely of general assistance, refugee assistance, foster home care and adoption assistance, earned income tax credits, and energy assistance.
- ⁶ Consists of trade readjustment allowance payments, Redwood Park benefit payments, public service employment benefit payments, and transitional benefit payments.
- ⁷ Consists largely of veterans' readjustment benefit payments, educational assistance to spouses and children of disabled or deceased veterans, payments to paraplegics, and payments for autos and conveyances for disabled veterans.
- ⁸ Consists of State and local government payments to veterans.
- ⁹ Consists largely of federal fellowship payments (National Science Foundation fellowships and traineeships, subsistence payments to State maritime academy cadets, and other federal fellowships), interest subsidy on higher education loans, basic educational opportunity grants, and Job Corps payments.
- ¹⁰ Consists largely of Bureau of Indian Affairs payments, education exchange payments, compensation of survivors of public safety officers, compensation of victims of crime, disaster relief payments, compensation for Japanese internment, and other special payments to individuals.
- ¹¹ Consists of State and local government educational assistance payments to nonprofit institutions, and other State and local government payments to nonprofit institutions.
- ¹² Consists largely of personal injury payments to individuals other than employees and other business transfer payments.
- (L) Less than \$50,000, but the estimates for this item are included in the totals.
- ** Percent not shown because the total number is not shown; see (L).

Statistics of Lafayette Regional Health Center

The economic impact of Lafayette Regional Health Center will be measured by employment (jobs) and wages and salaries plus benefits (income). Lafayette Regional Health Center provides the following services:

- 25-bed critical access hospital
- Full service laboratory
- State-of-the-art imaging and testing services
- Full range of general and laparoscopic surgeries
- Emergency services available 24/7
- Staff trained in pediatric and advanced cardiac life support
- Nearly 20 medical specialties covered
- Wellness programs and rehabilitation services

Lafayette Regional Health Center represents a significant impact on the economy of Lafayette County with a total of 237 full- and part-time employees and an annual income of \$15.4 million. These are the direct economic activities of Lafayette Regional Health Center; i.e. the employees directly employed by the hospital and the income paid directly by the hospital (Table 9)

**Table 9
Direct Economic Activities
of Lafayette Regional Health Center in Lafayette County, Missouri**

Health Care Component	Number of Full-Time and Part-Time Employees	Income (Wages and Salaries plus Benefits)
Lafayette Regional Health Center	<u>237</u>	<u>\$15,396,742</u>

SOURCE: Local data from Lafayette Regional Health Center, 2010.

The Impact of Lafayette Regional Health Center

The economic impact of Lafayette Regional Health Center, measured by employment and income, is significant. However, this does not tell the complete story as secondary economic impacts are created when Lafayette Regional Health Center 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 United States.

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 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 3**. 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 3**), labor from the residents or "households" of the county (left side of **Figure 3**), and inputs from service industries located within the county (right side of **Figure 3**). The flow of labor, goods, and services in the county is completed by households using their earnings to purchase goods and services from the county's service industries (bottom of **Figure 3**). It is evident from the interrelationships shown in **Figure 3** 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

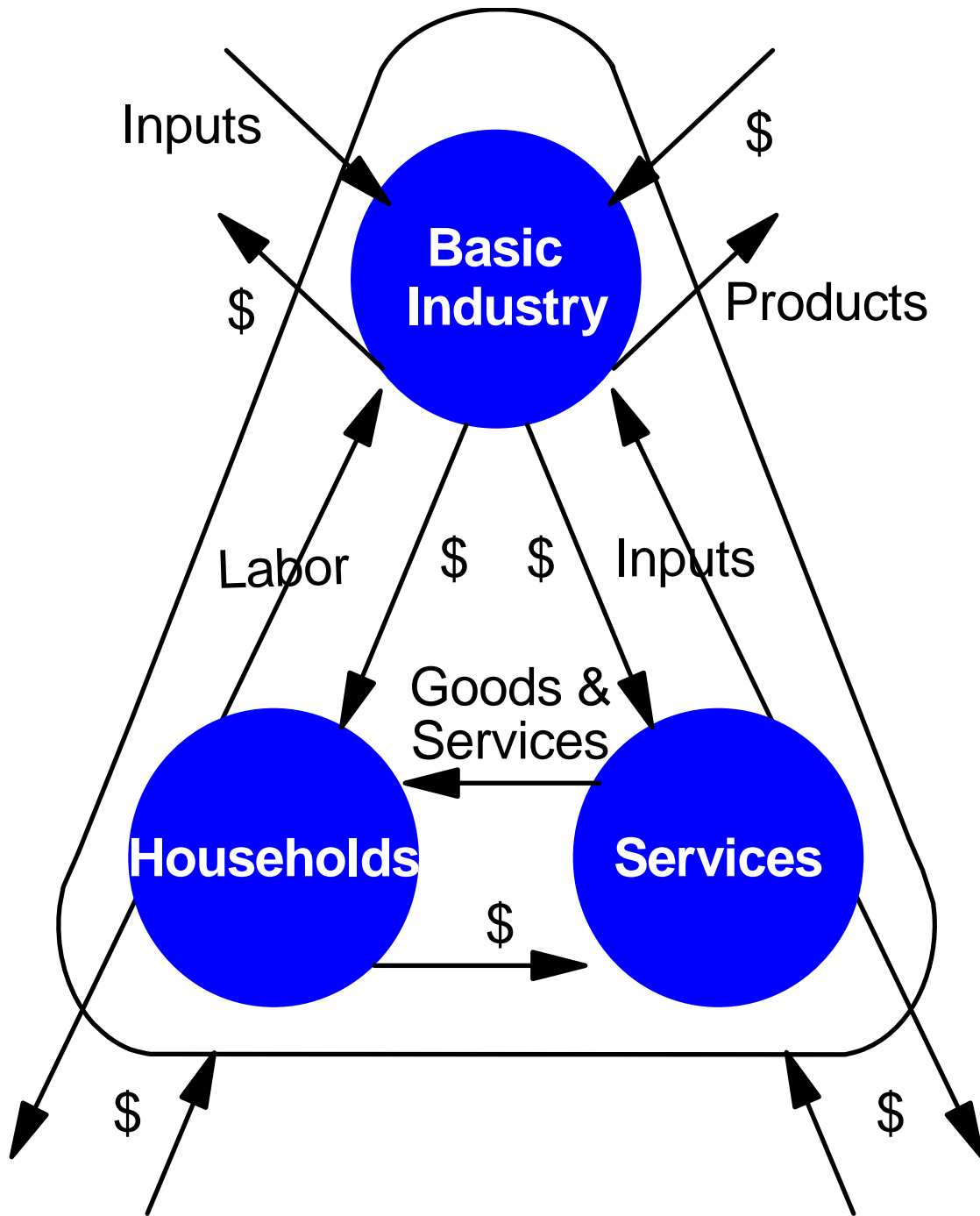


Figure 3.
County Economic System

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. The combined indirect and induced impacts are referred to as the secondary 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 multipliers.

The Impact from Operating Activities

The employment impact of Lafayette Regional Health Center is presented in **Table 10**. Employment (jobs) and income (payroll including wages, salaries, and benefits) from operating activities were obtained from Lafayette Regional Health Center. The hospital employs 237 employees. The hospital employment multiplier is 1.56; this means for every job in the hospital sector, another 0.56 job is created in other businesses and industries in the county. The secondary employment generated in the county from the hospital sector is estimated to be 133 jobs. The hospital has a total impact of 370 jobs on the economy of Lafayette County. ***The total employment impact of Lafayette Regional Health Center is 370 employees on Lafayette County; the direct hospital employment impact is 237 full- and part-time employees and the secondary employment impact is 133 full- and part-time employees.***

**Table 10
Total Employment Impact
of Lafayette Regional Health Center on Lafayette County, Missouri**

Health Care Component	Number of Employees	Employment Multiplier	Secondary Employment Impact	Total Employment Impact
Lafayette Regional Health Center	<u>237</u>	1.56	<u>133</u>	<u>370</u>

SOURCE: Local employment data from Lafayette Regional Health Center; employment multiplier from IMPLAN data, Minnesota IMPLAN Group, Inc.

Data on the income impact of Lafayette Regional Health Center are presented in **Table 11**. Data obtained from Lafayette Regional Health Center indicate that total income (wages, salaries, and benefits) for the hospital is \$15,396,742. Using the hospital income multiplier of 1.25, Lafayette Regional Health Center generates secondary income impact of \$3,849,186 and

Table 11
Total Income Impact
of Lafayette Regional Health Center on Lafayette County, Missouri

Health Care Component	Income	Income Multiplier	Secondary Income Impact	Total Income Impact
Lafayette Regional Health Center	<u>\$15,396,742</u>	1.25	<u>\$3,849,186</u>	<u>\$19,245,928</u>
	Retail Sales Subject to Sales Tax		One Percent Sales Tax Collections	
Retail Sales	<u>\$4,346,608</u>		<u>\$43,466</u>	

SOURCE: Local income (payroll plus benefits) data from Lafayette Regional Health Center; income multiplier from IMPLAN data, Minnesota IMPLAN Group, Inc.

total income impact of \$19,245,928. *The total direct income from Lafayette Regional Health Center is \$15.4 million, the secondary income impact is \$3.8 million, and the total income impact is estimated at \$19.2 million throughout the economy of Lafayette County.*

Income also has an impact on retail sales. If the county ratio between retail sales and income continues as in the past several years, then direct and secondary retail sales generated by Lafayette Regional Health Center and its employees equals \$4.3 million (**Table 11**). The income impacts are utilized to determine the retail sales at a 1-cent sales tax rate. A 1-cent sales tax is used as an example due to the varying sales tax rates. A 1-cent sales tax collection is estimated to generate \$43,466 annually as a result of the hospital income impact. This estimate is probably low, as many health care employees will spend a larger proportion of their income in local establishments that collect sales tax. The bottom line is that Lafayette Regional Health Center

not only contributes greatly to the medical health of Lafayette County, but also to the economic health of Lafayette County.

The Impact from Construction Activities

The construction activities of Lafayette Regional Health Center are progressive and will have a major impact on the economy of Lafayette County. This impact is often overlooked. Lafayette Regional Health Center is constructing a new facility over a period of two years. The total capital investment during construction will be \$35.6 million; approximately \$23.7 million in **Year 1** and \$11.9 million in **Year 2**. Data in **Table 12** show estimated employment and income generated by the capital investment from Lafayette Regional Health Center for the new facility.

Table 12
New Facility Construction Costs with Estimated Employment and Income
for Lafayette Regional Health Center in Lafayette County, Missouri

	Construction Costs	Estimated Employment	Estimated Income
Year 1	\$23,719,051	185	\$6,575,543
Year 2	\$11,859,525	92	\$3,270,000

SOURCE: Construction costs from Lafayette Regional Health Center; estimated employment and income from IMPLAN, Minnesota IMPLAN Group, Inc.

Data from the IMPLAN model were utilized in estimating employment and wages and salaries resulting from construction costs. The data were checked against industry standard and appear to be very accurate estimates. The construction or capital impacts only occur during the year the expenditures are incurred. In **Year 1**, the \$23.7 million capital investment created 185 full- and part-time jobs and generated \$6.6 million in income (**Table 12**). In **Year 2**, the \$11.9 million capital investment created 92 full- and part-time jobs and generated \$3.3 million in

income. These are the direct impacts from the construction activities and not the total construction impact, which will be estimated with multipliers.

The total employment impact from Lafayette Regional Health Center’s construction activities is presented in **Table 13**. The construction employment multiplier of 1.50 indicates that 0.50 jobs are created in other businesses and industries in the county due to each job associated with construction activities. These jobs in other businesses and industries are referred to as secondary jobs. For **Year 1**, direct employment was estimated to be 185 jobs, secondary employment is estimated to be 93 jobs, and the total employment impact estimate was 278 jobs. For **Year 2**, direct employment was estimated to be 92 jobs, secondary employment was estimated to be 46 jobs, and total employment impact estimate was 138 jobs.

Table 13
Employment Impact from Construction Activities
of Lafayette Regional Health Center on Lafayette County, Missouri

Year	Direct Employment	Construction Multiplier	Secondary Impact	Total Impact
Year 1	185	1.50	93	278
Year 2	92	1.50	46	138

SOURCE: Lafayette Regional Health Center, 2010; employment multiplier from IMPLAN, Minnesota IMPLAN Group, Inc.

The impact on income from construction is presented in **Table 14**. The construction income multiplier is 1.48, which means that for each dollar of wages and salaries paid to construction workers, another \$0.48 of wages and salaries is generated in other businesses and industries in Lafayette County. For **Year 1**, the direct income impact was estimated to be \$6.6 million and secondary income impact was estimated to be \$3.1 million, for total income impact

of \$9.7 million. For **Year 2**, the direct income impact was estimated to be \$3.3 million and secondary income impact was estimated to be \$1.6 million, for total income impact of \$4.8 million.

Table 14
Income Impact from Construction Activities
of Lafayette Regional Health Center on Lafayette County, Missouri

Year	Direct Income (Millions)	Construction Multiplier	Secondary Impact (Millions)	Total Impact (Millions)
Year 1	\$6,575,543	1.48	\$3,156,261	\$9,731,804
Year 2	\$3,270,000	1.48	\$1,569,600	\$4,839,600

	Retail Sales Subject to Sales Tax	One Percent Sales Tax Collections
Year 1	\$2,197,885	\$21,979
Year 2	\$1,093,002	\$10,930

SOURCE: Lafayette Regional Health Center, 2010; income multiplier from IMPLAN, Minnesota IMPLAN Group, Inc.

Income that results from construction activities also has an impact on retail sales. The direct and secondary retail sales generated by the construction activities of Lafayette Regional Health Center and construction employees equals \$2.2 million for **Year 1** and \$1.1 million for **Year 2 (Table 14)**. The income impacts are utilized to determine the retail sales at a 1-cent sales tax rate. A 1-cent sales tax collection is estimated to generate \$21,979 in **Year 1** and \$10,930 in **Year 2** as a result of the total income impact from construction activities.

Summary

Both the operating activities and construction activities of Lafayette Regional Health Center have significant impacts on the economy of Lafayette County. Often overlooked is the economic impact created from construction activities. This report measures the impact that Lafayette Regional Health Center will have on Lafayette County due to its normal operating activities and its construction activities. The operating impact occurs every year; whereas, the construction impact occurs only during the construction year. To carry on its services, Lafayette Regional Health Center currently employs 237 full- and part-time employees and generates \$15.4 million in income. If the secondary benefits are included, the total employment impact is 370 jobs and the total income impact is \$19.2 million.

The employment impact from construction activities is extremely important to the economy of Lafayette County. The facility construction is estimated to cost \$35.6 over a two-year period. For **Year 1**, the estimated construction costs are \$23.7 million. This would generate 185 jobs and \$6.6 million in income. The impact of construction costs in **Year 1** total 278 jobs and \$9.7 million in income. For **Year 2**, the estimated construction costs are \$11.9 million. This would generate 92 jobs and \$3.3 million in income. The impact of construction costs in **Year 1** total 138 jobs and \$4.8 million in income. Again, the construction impacts occur only during the construction period.

Notably, the economic impacts generated by Lafayette Regional Health Center are critical to the economy of Lafayette County. The employment and income impacts from operating activities are annual and will continue each and every year that Lafayette Regional Health Center operates in the future. These are long term economic benefits of Lafayette Regional Health Center. The fact that Lafayette County 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 Lafayette County. Also, research clearly states that retirees are attracted to communities with quality health care services. All of these factors illustrate that Lafayette Regional Health Center is critically important for the economic growth of Lafayette County. Given this, not only does Lafayette Regional Health Center contribute to the health and wellness of the county residents but, also, to the overall economic strength of Lafayette County.

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

References

- Alward, G., Sivertz, E., Olson, D., Wagnor, J., Serf, D., and Lindall, S. Micro IMPLAN Software Manual. Stillwater, MN, University of Minnesota Press. 1989.
- Chirilos, Thomas N. and Gilbert Nostel (1985). "Further Evidence on the Economic Effects of Poor Health." Review of Economics and Statistics. 67(1), 61-69.
- Doeksen, Gerald A., Tom Johnson, Diane Biard-Holmes and Val Schott (1988). "A Healthy Health Sector is Crucial for County Economic Development." Journal of Rural Health. Vol. 14, No. 1, pp. 66-72.
- Doeksen, Gerald A., Johnson, Tom, and Willoughby, Chuck. Measuring the Economic Importance of the Health Sector on a Local Economy: A Brief Literature Review and Procedures to Measure Local Impacts. Southern Rural Development Center. SRDC Pub. No. 202. 1997.
- Lyne, Jack (1988). "Quality-of-Life Factors Dominate Many Facility Location Decision." Site Selection Handbook. (33) 868-870.
- Lyne, Jack (1990). "Health Care and Education: Important QOL Factors, But Who's Accurately Measuring Them?" Site Selection Handbook. 35(5), 832-838.
- McGuire T. (1986). On the Relationship Between Infrastructure and Economic Development. Stony Brook: State University of New York.
- Miernyk, W.H. The Element of Input-Output Analysis. New York, NY; Random House. 1965.
- Minnesota IMPLAN Group, Inc. User's Guide, Analysis Guide, Data Guide: IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2nd Edition. June 2000.
- Reginer, V. and L.E. Gelwicks (1981). "Preferred Supportive Services for Middle to Higher Income Retirement Housing." The Gerontologist. 21(1), 54-58.
- Scott, Loren C., Lewis H. Smith, and Brian Rungeling (1997). "Labor Force Participation in Southern Rural Labor Markets." American Journal of Agricultural Economics. 59(2), 266-274.
- Siverts, Eric, Charles Palmer, Ken Walters, and Greg Alward. IMPLAN USER'S GUIDE. U.S. Department of Agriculture, Forest Service, Systems Application Unit, Land Management Planning, Fort Collins, Colorado. 1983.
- Toseland, R., and J. Rasch (1978). "Factors Contributing to Older Persons' Satisfaction with Their Communities." The Gerontologist. 18(4), 395-402.

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 county 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 county 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 county 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).

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.