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Economic Impacts of Healthcare in the Rural Health Networks of Florida¹

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Introduction

Healthcare in Regional Economies

The healthcare sector is important to state and regional economies, particularly in rural areas where it is a major employer second only to public schools. Healthcare is also an important element of rural economic development. Quality healthcare services and facilities help attract new businesses to an area and retain existing firms. Indeed, healthcare quality in a community may be a critical factor for businesses investigating potential locations. It is also a major consideration for retirees, which is significant in Florida since the state attracts many retirees.

The healthcare sector, as with any basic industry, has both direct and secondary economic impacts. Direct economic impacts include output, employment, and value added contributions directly associated with healthcare providers. These businesses make purchases from other regional suppliers, which experience increased sales and employment as a result (indirect effects). Subsequently, the income accruing to employees in the region from direct and indirect activities leads to

increased spending by regional households (induced effects).

For example, in the case of a local hospital, the facility employs staff and provides medical services in exchange for monetary payment (direct impacts). The hospital also purchases inputs from other regional businesses such as office and medical suppliers (indirect impacts). Workers from hospitals and complementary businesses, whose jobs are supported by the hospital, make personal consumption expenditures to grocery stores, restaurants, and the like (induced impacts). These impacts are magnified if the hospital purchases inputs predominantly from regional businesses and receives service payments from sources located outside the region. The total impact to the regional economy is the sum of the direct, indirect, and induced effects.

Florida's Rural Health Networks

This report summarizes the economic impacts of existing healthcare institutions in Florida's eight Rural Health Networks. A list of Florida counties included in each Rural Health Network is provided in Table 1. Note that only a portion of the counties of

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Alachua, Clay, Escambia, Leon, Martin, Palm Beach, St. Johns, and Santa Rosa are part of a Rural Health Network. Additionally, the economic impacts of healthcare institutions in Florida counties that are not part of a Rural Health Network were estimated for comparison.

This study is part of a larger project involving compilation of data pertinent to Rural Health Network planners, including demographic information, economic indicators, number of healthcare providers and facilities, and community health status in addition to the economic impact analysis featured in the present study (<http://economicimpact.ifas.ufl.edu>, 2001).

Methodology

Healthcare Sector Definition

Five economic sectors make up the healthcare industry and are analyzed in this report:

1. Doctors and dentists.
2. Nursing and protective care.
3. Hospitals.
4. Other medical services.
5. Pharmaceuticals.

The doctors and dentists sector includes offices and clinics of doctors of medicine, dentists, doctors of osteopathy, chiropractors, optometrists, and podiatrists. Nursing and protective care includes skilled nursing care and intermediate care facilities. The hospital sector includes general medical, surgical, psychiatric, and other specialty hospitals. Other medical services include medical and dental laboratories, home health care services, kidney dialysis centers, and other specialty outpatient facilities. The pharmaceutical sector represents pharmaceutical-related sales by drug stores.

Data Sources

A variety of data sources were used for this analysis. Data for Doctors and Dentists, and Other Medical Services were obtained from *Implan* data for Florida counties (MIG, 2001). Output data for the

Hospitals and Nursing and Protective Care sectors were provided by the Florida Agency for Health Care Administration. Revenue information on drugstore retail sales were provided by the Florida Department of Revenue. Since drugstores sell non-pharmaceutical products as well, 50 percent of drugstore sales were estimated to represent pharmaceutical sales, based on market research data (Florida Trend Magazine, 2001). Industry output associated with retail drug sales was estimated using an average gross margin of 0.267 for Florida drug stores (U.S. Census Bureau).

Economic Impact Analysis

An input-output (I-O), social accounting matrix framework was used to estimate the direct, indirect, and induced economic impacts of the healthcare industry in Florida. Input-output analysis is a technique that captures the regional economic interdependence between different industries, households and government institutions (Miller and Blair, 1985; Mulkey and Hodges, 2000). Specifically, it describes the relationship between economic sectors and the final demand for goods and services, including purchases for final consumption by households, businesses and government, capital investment, and exports to buyers outside the region. The premise of input-output analysis is that the structure of the economy is technologically fixed, such that for a given change in the final demand, output, or employment for a particular industry or region, there will be predictable changes in other linked sectors of the economy. These changes are measured by estimating the regional economic multipliers associated with the particular industry, using a matrix inversion procedure applied to the matrix of inter-industry transactions. Input-output models have proven useful to policymakers, industry officials, and others interested in estimating regional impacts attributed to economic activity by specific sector(s) and have been applied to a wide array of research problems such as assessing the importance of agriculture, evaluating the economic structure of rural communities, and investigating the economic repercussions of plant openings.

The input-output analysis was conducted using the *IMPLAN PRO*TM software package and associated

databases for Florida counties (MIG, 1999). The *IMPLAN* database offers economic and sociodemographic descriptions for all United States counties across 528 economic sectors that correspond to the U.S. Department of Commerce four digit Standard Industrial Classification (SIC) system. The software component of the *IMPLAN* modeling system performs calculations for a pre-defined study area to assess economic impacts to the region. Multipliers are available from *IMPLAN* for economic output, total value added, employment, employee compensation, personal income, other proprietary income, and indirect business taxes and are provided for direct, indirect, and induced impact effects.

IMPLAN was used to estimate the total economic impacts associated with Florida's healthcare sector by multiplying the value of output against the direct effects multiplier and multiplying non-local funding values (health insurance-covered expenditures) against the indirect and induced effects multipliers and subsequently summing as indicated in Figure 1.

$$T = (Y * M_d) + (E * M_i) + (E * M_{IN})$$

where T is total impact;
 Y is output
 (total healthcare expenditures);
 E is non-local funding
 (expenses covered by insurance);
 M_d is the direct effects multiplier;
 M_i is the indirect effects multiplier;
 M_{IN} is the induced effects multiplier.

Figure 1. Total economic impact calculation.

Economic impacts were estimated for the measures of output, value added, and employment. Value added represents the value of output less the value of inputs used by firms in the production of a good or service (COGS). It is a measure of income and is a useful economic indicator because it avoids the double counting of expenditures on intermediate and final goods inherent in output measures.

Local Versus Non-Local Funding

For the current study, output represents the value of total healthcare expenditures in the region and non-local funding represents the portion of healthcare

expenditures covered by health insurance, including Medicare and Medicaid. Expenditures covered by insurance are assumed to be a non-local funding source, and out-of-pocket patient expenses not covered by insurance are assumed to be internal to the region. Non-local funding represented 77.9 percent of output, based on personal communications with the Florida Department of Health.

Regional Population Adjustments

A number of Florida counties have only a portion of their area as part of a Rural Health Network, including Alachua, Clay, Escambia, Leon, Martin, Palm Beach, Santa Rosa, St. Johns, and Volusia Counties. However, the *IMPLAN* model does not classify regions on a sub-county level. This could lead to an overestimation of economic impacts if both the urbanized and rural portions of these counties are included in Rural Health Network county definitions. In order to more accurately estimate economic impacts, county populations were expressed as a proportion of rural populations, as indicated by the 1990 Bureau of the Census, and health expenditures were then adjusted downward proportional to the reduction in county populations. As an example, according to the 1990 Bureau of the Census, 34.2 percent of Alachua County's population was rural. Total county health expenditures were multiplied by 34.2 percent to reflect the portion of health expenditures attributed to rural residents. Per-capita economic impact estimates were based on these adjusted population levels. Total impact values for the state of Florida include both the urbanized and rural portions of all Rural Health Network counties in addition to the non-Rural Health Network counties. Therefore, state totals are greater than the sum of impacts for non-Rural Health Network counties and Rural Health Networks.

Findings

The total economic impacts of the healthcare services sector in the Rural Health Networks of Florida include \$13.9 billion in output, 222,836 jobs, and \$9.1 billion in value added. These impacts were considerably lower than those estimated for the non-Rural Health Network counties of Florida, amounting to \$123.2 billion in output, 1.8 million

jobs, and \$80.4 million in value added. Total per-capita output impacts were \$6,928 in the Rural Health Networks of Florida and \$11,502 in the non-Rural Health Network counties of Florida. The fact that non-Rural Health Network counties receive greater impacts on a total and per-capita basis is not surprising, given that greater populated areas attract proportionately higher levels of economic activity. Two Rural Health Network regions had particularly low economic impacts in relation to the population base: the Panhandle and Rural Health Network of Monroe County. The Heartland, Lake Okeechobee, and Northwest Florida Rural Health Networks had relatively higher economic impacts.

Output Impacts

Total output impacts across all healthcare sectors in the Rural Health Networks of Florida totaled \$13.9 billion (Table 2). By comparison, the non-Rural Health Network counties generated \$123.2 billion in total output impacts. The Heartland Rural Health Network had the largest output impacts (\$5.5 billion) followed by Northwest Florida (\$2.4 billion), St. Johns River (\$1.8 billion), Health Partnership of North Central Florida (\$1.4 billion), Lake Okeechobee (\$1.2 billion), Big Bend (\$825.7 million), Rural Health Network of Monroe County (\$421.8 million), and the Panhandle Area Health Network (\$404.7 million). Among all Rural Health Networks, the Hospital sector accounted for the majority of total output impacts (70 percent), followed by Doctors and Dentists (13 percent), Nursing and Protective Care (nine percent), Other Medical Services (seven percent), and Pharmaceuticals (one percent).

Employment Impacts

Annual total employment impacts related to the healthcare sector of the Rural Health Networks of Florida were 222,836 jobs (Table 3). By comparison, the non-Rural Health Network counties of Florida had total employment impacts of 1.8 million jobs. The Heartland Rural Health Network had the largest employment impacts (87,117 jobs), followed by Northwest Florida (39,111 jobs), St. Johns River (29,862 jobs), Health Partnership of North Central Florida (23,043 jobs), Lake Okeechobee (17,211 jobs), Big Bend (12,954 jobs), Panhandle Area

(6,895 jobs), and the Rural Health Network of Monroe County (6,643 jobs). Among all Rural Health Networks, the Hospital sector captured the majority of total employment impacts (65 percent), followed by Nursing and Protective Care (13 percent), Doctors and Dentists (12 percent), Other Medical Services (eight percent), and Pharmaceuticals (two percent).

Value Added Impacts

The healthcare services sector in the Rural Health Networks of Florida generated annual total value added impacts of \$9.1 billion (Table 4). By comparison, the non-Rural Health Network counties of Florida yielded total value added impacts of \$80.4 billion. The Heartland Rural Health Network had the largest value added impacts at \$3.6 billion, followed by Northwest Florida (\$1.6 billion), St. Johns River (\$1.2 billion), Health Partnership of North Central Florida (\$915.3 million), Lake Okeechobee (\$785.9 million), Big Bend (\$481.7 million), Rural Health Network of Monroe County (\$279.1 million), and the Panhandle Area Health Network (\$276.2 million). Among all Rural Health Networks, the Hospital sector accounted for the majority of total output impacts (68 percent), followed by Doctors and Dentists sector (14 percent), Nursing and Protective Care (10 percent), Other Medical Services (seven percent), and Pharmaceuticals (one percent).

Per-Capita Output Impacts

Given the wide range in overall size of the Rural Health Network regions of Florida, economic impacts are more meaningfully expressed on a per-capita basis. For example, the Rural Health Network of Monroe County consists of only one county, whereas the Lake Okeechobee Rural health Network consists of five counties. Total per-capita output impacts were \$6,928 among all healthcare sectors in the Rural Health Networks of Florida (Table 5). The Doctors and Dentists sector had per-capita output impacts of \$1723, the Nursing and Protective Care sector had \$550, Hospitals claimed \$4139, Other Medical Services were \$444, and Pharmaceuticals had \$71 in per-capita output impacts. Total per-capita output impacts were \$11,502 for the non-Rural Health Network counties across all sectors. Lake Okeechobee had the greatest per-capita output

impacts at \$8,287, followed by Northwest Florida (\$7,817), Heartland (\$7,726), Health Partnership of North Central Florida (\$6,620), St. Johns River (\$5,884), Big Bend (\$5,502), Rural Health Network of Monroe County (\$5,217), and the Panhandle Area Health Network (\$3,948).

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Table 1. Counties in the Rural Health Networks of Florida.

Name of Agency	Number of Counties	Names of Counties Within Agency
Big Bend Rural Health Network	6	Gadsden, Jefferson, Leon,* Madison, Taylor, and Wakulla
Health Partnership of North Central Florida	8	Alachua,* Bradford, Dixie, Gilchrist, Hamilton, Levy, Suwannee, and Union
Heartland Rural Health Network	5	Charlotte, DeSoto, Hardee, Highlands, and Polk
Lake Okeechobee Rural Health Network	5	Glades, Hendry, Martin,* Okeechobee, and Palm Beach*
Northwest Florida Rural Health Network	4	Escambia,* Okaloosa, Santa Rosa,* and Walton
Panhandle Area Health Network	5	Calhoun, Holmes, Jackson, Liberty, and Washington
Rural Health Network of Monroe County	1	Monroe
St. Johns River Rural Health Network	6	Baker, Clay,* Flagler, Putnam, St. Johns,* and Volusia*
Non-Rural Health Network Counties	27	Bay, Brevard, Broward, Citrus, Collier, Columbia, Duval, Franklin, Gulf, Hernando, Hillsborough, Indian River, Lafayette, Lake, Lee, Manatee, Marion, Miami-Dade, Nassau, Orange, Osceola, Pasco, Pinellas, St. Lucie, Sarasota, Seminole, and Sumter
* Portion of county		

Table 2. Total output impacts in the Rural Health Networks of Florida (\$ millions), 1998-99.

Rural Health Network	Doctors & Dentists	Nursing & Protective Care	Hospitals	Other Medical Services	Pharmaceuticals	Total Healthcare Sectors
			(\$ millions)			
Big Bend Rural Health Network	182.7	176.1	411.3	48.3	7.3	825.7
Health Partnership of North Central Florida	317.5	96.3	823.8	136.1	8.0	1,381.7
Heartland Rural Health Network	1,405.1	360.4	3,357.1	292.9	54.9	5,470.4
Lake Okeechobee Rural Health Network	282.3	71.4	735.7	92.3	13.0	1,194.7
Northwest Florida Rural Health Network	624.1	122.8	1,511.9	154.4	21.3	2,434.5
Panhandle Area Health Network	105.9	78.3	194.8	23.0	2.7	404.7
Rural Health Network of Monroe County, Florida	86.1	20.9	270.9	28.6	15.3	421.8
St. Johns River Rural Health Network	457.4	178.4	1,009.1	117.1	20.1	1,782.1
Total Rural Health Networks	3,461.1	1,104.6	8,314.6	892.7	142.6	13,915.6
Non-Rural Health Network Counties in Florida	32,214.9	6,703.9	74,556.4	8,265.0	1,454.6	123,194.8
Total Florida*	41,748.4	9,607.3	94,488.4	10,802.1	2,898.8	162,545.0
Source: MIG, Florida Department of Revenue, Agency for Health Care Administration.						
*Florida totals reflect the urbanized and rural portions of all Rural Health Network counties in addition to the on-Rural Health Network counties.						

Table 3. Total employment impacts in the Rural Health Networks of Florida (jobs), 1998-99.

Rural Health Network	Doctors & Dentists	Nursing & Protective Care	Hospitals	Other Medical Services	Pharmaceuticals	Total Healthcare Sectors
			<i>(jobs)</i>			
Big Bend Rural Health Network	2,432	4,258	5,173	892	199	12,954
Health Partnership of North Central Florida	4,466	2,385	13,466	2,513	213	23,043
Heartland Rural Health Network	18,394	8,385	54,041	4,942	1,355	87,117
Lake Okeechobee Rural Health Network	3,163	1,505	10,874	1,412	257	17,211
Northwest Florida Rural Health Network	8,221	2,880	24,827	2,685	498	39,111
Panhandle Area Health Network	1,395	1,836	3,200	400	64	6,895
Rural Health Network of Monroe County, Florida	1,106	463	4,240	495	339	6,643
St. Johns River Rural Health Network	6,187	4,236	16,821	2,109	509	29,862
Total Rural Health Networks	45,364	25,948	132,642	15,448	3,434	222,836
Non-Rural Health Network Counties in Florida	394,139	136,927	1,113,813	127,577	28,430	1,800,886
Total Florida*	513,976	204,248	1,469,454	169,830	61,362	2,418,870
Source: MIG, Florida Department of Revenue, Agency for Health Care Administration.						
*Florida totals reflect the urbanized and rural portions of all Rural Health Network counties in addition to the on-Rural Health Network counties.						

Table 4. Total value added* impacts in the Rural Health Networks of Florida (\$ millions), 1998-99.

Rural Health Network	Doctors & Dentists	Nursing & Protective Care	Hospitals	Other Medical Services	Pharmaceuticals	Total Healthcare Sectors
			(\$ millions)			
Big Bend Rural Health Network	124.5	126.8	195.5	29.1	5.8	481.7
Health Partnership of North Central Florida	212.6	68.4	546.2	81.9	6.2	915.3
Heartland Rural Health Network	927.5	252.7	2,156.8	177.0	42.0	3,556.0
Lake Okeechobee Rural Health Network	191.1	50.4	477.6	56.9	9.9	785.9
Northwest Florida Rural Health Network	433.0	88.5	1,007.5	96.9	16.7	1,642.6
Panhandle Area Health Network	73.5	56.4	129.8	14.4	2.1	276.2
Rural Health Network of Monroe County, Florida	57.4	15.0	177.7	17.2	11.8	279.1
St. Johns River Rural Health Network	299.7	124.8	642.7	69.1	15.3	1,151.8
Total Rural Health Networks	2,319.3	783.0	5,333.8	542.5	109.8	9,088.4
Non-Rural Health Network Counties in Florida	21,385.5	4,673.5	48,135.9	5,089.4	1,086.5	80,370.8
Total Florida**	27,813.2	6,735.0	62,736.9	6,638.4	2,195.9	106,119.4
Source: MIG, Florida Department of Revenue, Agency for Health Care Administration.						
* Represents the value of output less the value of inputs used by firms in the production of goods and services.						
**Florida totals reflect the urbanized and rural portions of all Rural Health Network counties in addition to the on-Rural Health Network counties.						

Table 5. Total per-capital output impacts in the Rural Health Networks of Florida, 1998-99.

Rural Health Network	Doctors & Dentists	Nursing & Protective Care	Hospitals	Other Medical Services	Pharmaceuticals	Total Healthcare Sectors
			<i>(dollars)</i>			
Big Bend Rural Health Network	1,217	1,173	2,741	322	49	5,502
Health Partnership of North Central Florida	1,521	461	3,947	652	38	6,620
Heartland Rural Health Network	1,984	509	4,741	414	78	7,726
Lake Okeechobee Rural Health Network	1,958	495	5,103	640	90	8,287
Northwest Florida Rural Health Network	2,004	394	4,855	496	68	7,817
Panhandle Area Health Network	1,033	764	1,900	224	26	3,948
Rural Health Network of Monroe County, Florida	1,065	258	3,351	354	189	5,217
St. Johns River Rural Health Network	1,510	589	3,332	387	66	5,884
Total Rural Health Networks	1,723	550	4,139	444	71	6,928
Non-Rural Health Network Counties in Florida	3,008	626	6,961	772	136	11,502
Total Florida*	2,800	644	6,539	725	194	10,903
Source: MIG, Florida Department of Revenue, Agency for Health Care Administration.						
*Florida totals reflect the urbanized and rural portions of all Rural Health Network counties in addition to the on-Rural Health Network counties.						