

**Measuring the Impact of the Health Care Sector on a Local Economy:
Carroll County, Mississippi**

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Measuring the Impact of the Health Sector on a Local Economy:

Carroll County, Mississippi

Introduction

Communities often overlook the economic influence of the health care sector on their economies. Hospitals, nursing homes, physicians, dentists, pharmacies, home health agencies and ambulance services are just a few of the providers that make up the health care sector. In a rural community, this particular sector generally represents a proportionally larger share of the local economy than it does in urban areas, with the rural hospital typically being one of the largest employers in the area.

The health care industry is changing not only in urban areas but also in rural areas due to policy- and market-driven forces (Ormand et al.). With the passing of the Balanced Budget Act of 1997, Medicare and Medicaid payments to small rural hospitals are often inadequate to maintain the financial health of those institutions. The higher proportion of an elderly population in rural areas with chronic conditions makes it difficult for a variety of health care providers to achieve a patient mix that is needed to offset the costs of high use among a few. This situation could trigger a reduction in services, the decision to not serve certain types of patients, or the closing of a particular health care entity.

Closure of a rural hospital, for example, can represent a serious threat not only to the health but also to the economic well-being of the community. The availability of quality health care is critical to long-term economic development in rural communities (Doeksen et al.). Employers looking to establish a new businesses choose to locations that has good education and

health care systems. Attracting retirees to a community is also more successful when there are quality health care providers available to meet their demand for services.

The demographic and socioeconomic composition found in rural communities can influence the demand placed on the health care delivery system. The types of services demanded and those supplied may vary between communities based on demographic factors and the availability of quality health care providers.

This report was developed by a team of economists working on a project called Rural Health Works in Mississippi. The following sections will address selected demographics and health statistics of the county population along with the economic importance of the health care sector to the Carroll County economy.

Health Care Expenditures in Mississippi

Consistent with national trends, data in Table 1 show that health care expenditures in Mississippi have more than doubled during the past two decades, growing from \$1.4 billion in 1980 to \$3.6 billion in 1999. Of particular importance is the fact that health care services represent a growing component of the state's economy as well. In 1980, health care expenditures accounted for only 3.23% of Mississippi's gross state product, but by 1999 this figure had increased to 5.60%. This represents an average annual growth rate for health care services of about 5% over the twenty-year period, which is greater than the average annual growth rate of 2% for the total gross state product over the same period.

As shown in Table 2, growth in personal health care spending in Mississippi averages 5.31% from 1980 to 1998, increasing from nearly \$3.5 billion in 1980 to \$8.8 billion in 1998 (in real dollars). The major components of personal health care spending include hospital care, physician and other professionals, prescription drugs, and home health services. The data

Table 1. Gross State Product (GSP) and Health Services Component of GSP, Mississippi, 1980-1999

Year	Total Gross State Product (millions of current \$)	Health Services (millions of current \$)	Total Gross State Product (millions of 1999 \$ ¹)	Health Services (millions of 1999 \$ ¹)	Health Services as a Percent of GSP (%)
1980	21,532	696	43,534	1,407	3.23
1981	24,203	800	44,359	1,466	3.31
1982	24,857	902	42,914	1,557	3.63
1983	26,190	966	43,808	1,616	3.69
1984	29,246	1,051	46,895	1,685	3.59
1985	30,669	1,105	47,486	1,711	3.60
1986	31,438	1,186	47,788	1,803	3.77
1987	33,844	1,352	49,634	1,983	3.99
1988	36,022	1,468	50,729	2,067	4.08
1989	37,657	1,618	50,594	2,174	4.30
1990	39,175	1,829	49,935	2,331	4.67
1991	41,311	2,051	50,532	2,509	4.96
1992	44,222	2,304	52,512	2,736	5.21
1993	47,384	2,412	54,631	2,781	5.09
1994	51,358	2,685	57,734	3,018	5.23
1995	54,562	2,942	59,646	3,216	5.39
1996	56,575	3,267	60,073	3,469	5.77
1997	58,743	3,483	60,976	3,615	5.93
1998	61,417	3,547	62,773	3,625	5.78
1999	64,286	3,603	64,286	3,603	5.60
Average Annual Percentage Growth	5.93	9.04	2.07	5.07	

¹ The CPI-U (1982-84=100) for the U.S. was adjusted to make 1999 the base year and this index was used to deflate nominal dollar values.

Source: Compiled from Bureau of Economic Analysis, Regional Accounts Data.

in Table 2 show more money was spent on home health care than any other health category, averaging 10.9% growth during the period. Prescription drugs and physician and other

professional services ranked second and third highest with annual growth rates of 7.08% and 6.51%, respectively.

Table 2. Personal Health Care Spending, Mississippi, Selected Years, 1980-1998

Health Care Category	Average Annual Percentage Growth (%)	1980	1985	1990	1995	1998
		(millions of 1998 \$ ¹)				
Hospital Care	4.59	1,715	2,163	2,727	3,709	3,848
Physician & Other Professional Services	6.31	736	1,029	1,462	1,874	2,212
Prescription Drugs	7.08	281	362	510	686	962
Nursing Home Care	5.43	265	291	387	557	687
Dental Services	3.93	158	180	216	281	317
Home Health Care	10.90	45	85	178	348	293
Nonprescription Drugs and Other Medical Nondurables	2.38	170	212	236	249	260
Other Personal Health Care	4.91	89	86	112	173	211
Vision Products & Other Medical Durables	4.31	44	52	70	87	93
Total Spending	5.31	3,499	4,458	5,898	7,965	8,882

¹ The CPI-U (1982-84=100) for the U.S. was adjusted to make 1998 the base year and this index was used to deflate nominal dollar values.

Source: Compiled from data obtained from the Health Care Financing Administration

Table 3 contains similar data for the same time period; however, it reflects per capita expenditures on health care. The trends in growth of the health care sector and expenditures are similar and there is no evidence to suggest that these trends will change in the future, given advances in medical technology and the increasing life span of the population.

Table 3. Personal Health Care Spending, Per Capita, Mississippi, Selected Years, 1980-1998

Health Care Category	Average Annual Percentage Growth (%)	1980	1985	1990	1995	1998
				(1998 \$ ¹)		
Hospital Care	4.08	680	836	1,058	1,379	1,398
Physician & Other Professional Services	5.79	292	397	567	697	804
Prescription Drugs	6.56	111	140	198	255	350
Nursing Home Care	4.92	105	112	150	207	250
Dental Services	3.43	63	70	84	105	115
Home Health Care	10.36	18	33	69	129	106
Nonprescription Drugs and Other Medical Nondurables	1.89	67	82	91	93	94
Other Personal Health Care	4.40	35	33	44	64	77
Vision Products & Other Medical Durables	3.80	17	20	27	32	34
Total Spending	4.80	1,388	1,723	2,289	2,961	3,227

¹ The CPI-U (1982-84=100) for the U.S. was adjusted to make 1998 the base year and this index was used to deflate nominal dollar values.

Source: Compiled from data obtained from the Health Care Financing Administration

Potential Demand For Health Care

People require different types of health care equipment and services, some of which may not be available locally. The amount of spending on different types of health care services retained within a local economy depends on a diverse set of factors. The size and types of health care businesses located within the community will have an impact on the welfare of the residents as well as the local economy. For purposes of this study, a business that produces or sells health care goods or services is defined as being a local provider if it is located inside the county. In general, people would prefer to make their purchases from local providers due to

savings in travel expenses and time. However, residents will seek businesses located outside the county if there are no local providers for a particular type of service. Therefore, it is in the best interest of the residents as well as the local economy to maintain a viable health care sector within the county.

As shown previously in Table 3, the average annual per capita expenditure on health care in Mississippi was \$3,228 in 1998. If Carroll County's 10,769 residents (U.S. Census Bureau, 2000) spent this average amount, almost \$25 million would have been spent for health care services in the county. The first column in Table 4 presents Mississippi per capita expenditures by major health care categories the 1998. The second column contains estimated shares of each type of health care service that local businesses could provide *if* these businesses existed. Explanations of these estimated percentages are provided in Appendix A. The third column is the product of the first column multiplied by the second column. Multiplying the numbers in the local spending per capita column by 10,769 provides estimates of potential local (health care) spending in Carroll County. The total local spending potential for this county is estimated to be almost \$25 million per year. The actual amount of spending could be greater than or less than this value depending on the type, size and quality of local providers located in Carroll County. By comparing the potential local expenditures with actual local spending, the opportunity to expand local health care services may be assessed. Because there is no hospital in Carroll County, the spending for hospital care would take place in other counties. However, if there were a hospital in the county, it would generate a certain amount of revenue every year. If this figure is below the potential value, there may be room to expand hospital services and retain more dollars within the local economy. If residents are leaving the county in search of adequate care, then there may be a potential to expand locally. However, any business must have a

reliable consumer base of a certain size in order to remain viable. The size of the consumer base is dependent on population demographics within the county and possibly in nearby counties.

County-level data may help identify important aspects of the local economy and potential impacts from the health care sector. The following sections present various types of information for Carroll County and the state.

Table 4. Estimated Potential Local Spending for Health Care in Carroll County

Health Care Category	Mississippi Spending Per Capita	Percent Local Spending	Local Spending Per Capita	Potential Local Spending
Hospital Care	\$1,398	61% ¹	\$853	\$9,185,957
Physician & Other Professional Services				
Services	804	75% ²	603	\$6,493,707
Prescription Drugs	350	75% ²	263	\$2,832,247
Nursing Home Care	250	100% ³	250	\$2,692,250
Home Health Care	106	100% ⁴	106	\$1,141,514
Dental Services	115	75% ²	86	\$926,134
Nonprescription Drugs and Other				
Medical Nondurables	94	75% ²	71	\$764,599
Other Personal Care	77	75% ²	58	\$624,602
Vision Products & Other Medical				
Durables	34	75% ²	26	\$279,994
Total Spending	\$3,228	72%	\$2,316	\$24,941,004

¹ See Appendix A for footnotes explaining "Percent Local Spending"

Demographics

Population information detailing historical growth and future projections, population density, current age distribution, and household information for Carroll County and Mississippi are presented in Table 5. Between 1990 and 2000, Mississippi's population increased 10.5 percent while Carroll County experienced an increase of 16.6 percent. Carroll County has about one-third the population density as Mississippi, indicating its rural nature. The county's older residents represent a slightly larger proportion of its total population than in the state as a whole. Population in Carroll County is projected through 2025 to increase at a much slower rate than the state. The number of residents in the 65 and over category is expected to increase by almost 39% in the county and by 73.3% in the state.

According to the 2000 Census, the population of Carroll County was 62.7 % white and 36.9 % non-white. These numbers show a slight deviation from those of the state. The percentage of high school graduates in the county is significantly less than that of the state and the percentage of college graduates is lower in the county than the state.

Economic Indicators

Data presented in Table 6 give general observations of economic activity in Carroll County and Mississippi. The county's annual personal income is approximately \$145 million, providing slightly more than \$14,000 of annual income per person (about \$4,000 less than the state average). The median household income in Carroll County is \$24,421, about 15 percent lower than the state income value and the county's poverty rate (18.0%) is almost the same as the state's rate (18.1%).

Table 5. Selected Demographic Data for Carroll County and Mississippi

Item	County	State
Population, 2000	10,769	2,844,658
Population, percent change, 1990 to 2000	16.6%	10.5%
Persons per square mile, 2000	17.1	60.6
Populations by age, percent of total, 2000		
Under 20 years	20.3%	30.7%
20 to 64 years	52.3%	57.3%
65 years and over	13.4%	12.0%
Population projection, percent change to 2025		
Total population	4.4%	18.2%
65 years and over	38.9%	73.3%
Race:		
White	62.7%	61.4%
Non-white	36.9%	38.6%
Persons over 25 graduating from high school	29.0%	34.8%
Persons over 25 graduating from college	5.5%	8.0%
Households, 2000	4,071	1,046,434
Median Household money income, 1997	\$24,421	\$28,527
Persons below poverty, % 1997	18.0%	18.1%

Sources: US Census Bureau, Profile of General Demographic Characteristics: 2000;
US Census Bureau, MapStats; Woods and Poole Economics, Inc.

The civilian labor force in the county is more than 4,300 with slightly less than 400 people employed by governments. All types of local enterprises generate 2,560 jobs. Persons employed in non-farm, private sector jobs total about 780. This indicator has increased by more than 70 percent since 1990, and is significantly higher than the state rate. Average earnings per job are less than \$13,000 per year compared to about \$23,400 for the state.

Table 6. Selected Economic Data for Carroll County and Mississippi

Item	County	State
Personal Income, 1997 (\$1,000)	\$ 145,093	\$ 49,437,285
Personal Income per capita, 1997	\$ 14,454	\$ 18,098
Civilian Labor Force, 1999	4,345	1,269,955
Unemployment, 1999	227	64,666
Full-time and part-time employment by place of work, 1997	2,560	1,425,691
Employment in government, 1997	396	253,888
Local government employment, full-time equivalent, 1997	236	122,256
Private nonfarm employment, 1998	778	937,023
Private nonfarm employment, percent change 1990 to 1998	72.1%	29.6%
Average earnings per job, 1997	\$12,699	\$ 23,388
Private nonfarm establishments with paid employees, 1998	115	59,771
Private nonfarm establishments with less than 20 employees, 1998	107	51,949
Non-employer establishments, 1997	336	121,668
Retail sales, 1997 (\$1,000)	\$ 15,489	\$10,124,822
Retail sales per capita, 1997	\$ 1,544	\$7,605

Sources: Profile of General Demographic Characteristics, 2000, Woods and Poole Economics, Inc.; US Census Bureau MapStats, QuickFacts.

There are 115 private non-farm establishments, but 107 of these have less than 20 employees. There are almost 340 businesses, which do not have any paid employees. Retail sales in the county were about \$15.5 million in 1997. This is approximately \$1,544 per person, and is well below the state average of \$7,605.

Table 7 shows types of employment in Carroll County and the state. Farming, services, retail trade, and manufacturing were the leading employment sectors in 1999.

Table 7. Employment by Industry in Carroll County and Mississippi, 1999

Industry	County	Percent of County	State	Percent of State
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Farm employment	640	25.1%	55,203	3.7%
Ag. services, forestry, fishing	108	424.2%	19,256	1.3%
Mining	(D)	NA	8,101	0.5%
Construction	179	7.0%	84,954	5.7%
Manufacturing	295	11.6%	250,824	16.8%
Transportation/public utilities	74	2.9%	67,269	4.5%
Wholesale trade	53	2.1%	51,052	3.4%
Retail trade	323	12.7%	244,023	16.3%
Finance, insurance, real estate	(D)	NA	76,283	5.1%
Services	450	17.7%	371,730	24.9%
Government		0.0%		
Federal Civilian	29	1.1%	26,033	1.7%
Federal Military	66	2.6%	35,129	2.4%
State	18	0.7%	62,085	4.2%
Local	311	12.2%	141,499	9.5%
Total employment	2546	100.0%	1,493,441	100.0%

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

NA Not available

Source: Bureau of Economic Analysis, Regional Accounts Data

Most health care jobs are in the services sector, while sales of drugs and other medical items would be included in the retail trade sector.

A more detailed view of personal income sources is presented in Table 8. The data indicate that 64.4 percent of total personal income came from total earnings (adjusted to place of residence) with transfer payments contributing 20.1 percent. Other data that 61% of the total earnings that originate in employment within the county are from wages and salaries. Finally, transfer payments were primarily made for retirement and disability benefits (42.2%) with medical payments amounting to 33 percent of total transfer payments.

Table 8. Personal Income for Carroll County and Mississippi, 1999

Source of Income	County Total	County Percent	State Percent
	(\$1,000)		
Total Personal Income ¹	182,262		
Earnings by Place of Residence ²	117,507	64.4%	64.9%
Transfer Payments	36,751	20.1%	18.6%
Total Earnings ³	44,202		
Wages and Salaries	26,957	61.0%	78.1%
Proprietors' Income	13,380	30.2%	11.7%
Other Labor Income	3,865	9.0%	10.3%
Transfer Payments	36,751		
Retirement and Disability	15,536	42.2%	37.4%
Medical Payments	11,964	33.0%	38.6%
Other	9,225	25.1%	23.9%

¹ Definitions are in Appendix B, Glossary of Terms

² Total earnings adjusted to reflect earnings by place of residence.

³ Total earnings by place of work.

Source: Bureau of Economic Analysis (1999 Data)

Health Care Availability and Utilization

Health care resources are summarized in Table 9. These statistics demonstrate the availability of physicians and other selected health care services in the county. The rate of health care service providers in Carroll County was far less than the state in most categories. Carroll County is one of nine counties in the state of Mississippi that does not have a hospital located within its borders. Typically, a hospital located within a rural county is one of the largest employers in the community in terms of the numbers of people it employs. In addition, when a community has a hospital as a part of its health care sector there is an increase in the number of providers and other health care entities in the county.

Table 9. Availability of Selected Medical Providers in Carroll County

Provider	County Number	County Rate/1000	State Rate/1000
Hospitals (2000)			
Licensed Hospital Beds	0	0	4.2
Staffed Hospital Beds	0	0	3.8
Nursing Home (2001)			
Beds	0	0	6.2
Health Care Practitioners (2001)			
M.D.s	2	0.2	2.0
Family Practice	1	0.1	0.2
Internal Medicine	1	0.1	0.3
Other	0	0	1.4
Dentists	1	0.1	0.4
Nurse Practitioners	0	0	0.5
Emergency Medical Personnel (2001)			
EMT Basics & Intermediates	1	0.1	0.6
Paramedics	0	0	0.4

Note: Rate per 1000 based on 2000 Census Bureau county population data.

Sources: Mississippi State Department of Health, Division of Health Facilities Licensure & Certification; Mississippi State Department of Health, Emergency Medical Services Division; Mississippi State Board of Medical Licensure; Mississippi State Board of Nursing; Mississippi State Board of Dental Examiners; Mississippi Medical Association

Hospital Utilization

Fifty-five of Mississippi's eighty-two counties have only one hospital and eighteen counties have two or more hospitals. There are 9 counties that do not have a hospital and Carroll County falls into this category. There are five counties that border Carroll, three of which have one hospital each and there are two hospitals in each of the other two counties.

Table 10. Hospital Discharges of Carroll County Residents by Hospital

Name of Hospital	Number ¹	Percent of Total
Greenwood Leflore Hospital	87	41.23%
Tyler Holmes Memorial Hospital	41	19.43%
Grenada Lake Hospital	27	12.80%
MS Baptist Medical Center	10	4.74%
University Medical Center	7	3.32%
St. Dominic Hospital	6	2.84%
Kilmichael Hospital	5	2.37%
Methodist Hospital of Middle, MS	5	2.37%
Parkwood BHS Olive Branch	4	1.90%
Monfort Jones Memorial Hospital	3	1.42%
River Oaks Hospital	3	1.42%
Baptist Memorial Hospital North MS	2	0.95%
Central MS Medical Center	2	0.95%
Forrest General Hospital	2	0.95%
MS Methodist Hospital & Rehab Cent	2	0.95%
North MS Medical Center	2	0.95%
Hancock Medical Center	1	0.47%
Rankin Medical Center	1	0.47%
Riley Memorial Hospital	1	0.47%
Total	211	100.00%

¹ Aggregate Patient Origin Study, data collected during four 2-week periods from Jan-Oct 2000
Source: Mississippi Office of Rural Health

Table 10 contains data showing where county residents go to receive hospital care (out-flow). Due to the lack of a hospital in Carroll County, residents obtain all of their hospital care outside the county and slightly more than 41% of the time, they seek care at Greenwood Leflore Hospital to the west in Leflore County. Almost 20% of the time, they utilize the services of Tyler Holmes Memorial Hospital to the east in Carroll County. Grenada Lake Hospital, to the north in Grenada County, provides services to Carroll County residents nearly 13% of the time. The three most common health problems of county residents seeking hospital care are respiratory, digestive and circulatory system disorders.

Discharge Diagnoses

Data obtained from the Mississippi State Office of Rural Health show in Table 11 that 15.71% of all discharges of Carroll County residents from hospitals around the state were for respiratory problems, which includes pneumonia, emphysema and other acute and chronic diseases of the lungs. The second and third leading causes of hospitalization for residents were for digestive disorders (14.22%) and circulatory problems (11.85%), which includes all types of heart diseases (hypertension, heart attacks, arteriosclerosis, etc.) and cerebrovascular conditions (transient ischemic attacks, stroke, etc.).

Table 11. Discharge Diagnoses of Carroll County Residents from Hospitals in Mississippi

Disease Group	Number	Percent
Respiratory	32	15.17%
Digestive	30	14.22%
Circulatory	25	11.85%
Injury/Poisoning	19	9.00%
Live newborns	18	8.53%
Pregnancy, childbirth	15	7.11%
Musculoskeletal	12	5.69%
Endocrine, Immune systems	12	5.69%
Genitourinary	8	3.79%
All other categories	40	18.96%
Totals	171	100.0%

Source: Mississippi Office of Rural Health, Patient Origin Study conducted during 4 two-week periods between January and October, 2000.

Table 12. Health Status and Health Indicators for Carroll County and the State of Mississippi

Status or Indicator ¹	County Number	County Percent/Rate	State Percent/Rate ⁴
Hospital Discharges (2000)	0	0	N/A
Medicare Enrollment (1998)			
Aged (65 and over)	1210	12.1%	11.5%
Disabled (Under 65)	280	2.8%	2.9%
Medicaid Eligible (2000)	1925	19.3%	17.9%
Medicaid Served (2000)	1167	11.7%	11.9%
Infant Mortality (1995-1999) ²	2	6.1	20.9
Births to Teens (1995-1999) ³	16	20.5	45.2

¹ Definitions are in Appendix B, Glossary of Terms

² Number represents total resident live births and deaths for 1999; county rate displayed as average annual rate per 1,000 live births

³ Number represents total resident live births to mothers age 12-19 for 1999; county rate displayed as births per 1,000 females (age 12-19)

⁴ State rates are age-adjusted to year 2000 standard; per 100,000 population

Sources: Mississippi State Department of Health, Vital Statistics; Department of Health and Human Services, Division of Medicaid; Health Care Financing Administration; Health Resources and Services Administration, Community Health Status Report (July 2000)

Information concerning hospital admissions, Medicare and Medicaid enrollment, infant mortality and teenage births are detailed in Table 12. The percentage of the county's residents enrolled in Medicare was slightly higher than in the state. These values probably reflect the relatively higher population of aged residents in Carroll County than in the state. A similar trend was observed for the number of residents eligible for Medicaid, however, those actually being served was slightly less than the state's numbers. The rates of infant mortality and births to teenagers were much lower than the state's rates.

Table 13 contains the ten most common causes of death among residents in Carroll County residents in 1999. Cardiovascular disease, cancer, acute and chronic lung diseases were the top four causes of death in this county. This is consistent with state rates for the same causes of death, however, accidents are the third leading cause for deaths in the state.

Table 13. Death Rates from Selected Causes for Carroll County, 1999

Causes of Death	Carroll County		State of Mississippi	
	Number¹	Rate²	Number¹	Rate²
Cardiovascular Diseases *	37	371.2	11,742	424.1
All Types of Cancer	21	210.7	6,131	221.4
Pneumonia & Influenza	6	60.2	796	28.8
Chronic Lung Diseases	6	60.2	1,329	48.0
Diabetes Mellitus	5	50.2	589	21.3
Kidney Diseases	5	50.2	620	22.4
Accidents (all types)	5	50.2	1,639	59.2
Automobile Accidents	4	40.1	954	34.4
Suicide	2	20.1	305	11.0
Liver Diseases	0	0	248	9.0
Homicide	0	0	312	11.3

¹ Numbers are total deaths per 1,000 population

² Rates are per 100,000 population

* Includes hypertension, and all other heart conditions, cerebrovascular diseases and atherosclerosis
Source: Mississippi State Department of Health, Vital Statistics, 1999

Health Care Sector Economic Impact

Businesses generate direct impacts on local economies by providing employment for residents (and possibly non-residents) and income to the employees. In addition, these businesses may purchase goods and services from other local businesses and may provide tax revenue to local, state, and federal governments. Business profits and employee income are then spent in many different ways. Some spending is for goods and services provided by other local businesses, and some spending is “leaked” out of the county. These “indirect” impacts

generated by a sector may be estimated with the help of an input-output model. Such a model was used to estimate the direct and indirect impacts of the health care sector for Carroll County.

Based on 1997 IMPLAN model data, Table 14 shows that the two components that make up the county's health care sector (doctors & dentists; other medical & health services) employ 66 people. Total payroll for the sector is estimated to be slightly more than \$2 million. Even with the relatively small size of the health care sector, it does impact employment and income throughout the other industries in Carroll County by creating an additional 15 jobs, thereby increasing personal income and indirect business tax totals. The total employment impact of Carroll County's health care sector is an estimated 81 jobs that result in a total income of more than \$2.3 million. Indirect business taxes attributed to the health care sector amount to almost 2% of the total in the county while health care as a percent of total personal income accounts for 5.0% . Remember, hospitals are often the largest employer in a rural county but there is no hospital in Carroll County

Table 14. Estimated Contribution of the Local Health Care Sector to the Carroll County Economy

Category	Unit of Measure	Initial Impact of Health Care Sector	Additional Impact of Health care Sector	Total Impact of Health Care Sector	County Total	Health Care as a Percent of Total
Employment	Jobs	66	15	81	2,640	3.1%
Personal Income	\$	2,077,000	238,333	2,315,333	45,982,000	5.0%
Indirect Business Taxes ¹	\$	35,000	43,811	78,811	4,379,000	1.8%

¹Indirect business taxes include: sales taxes, property taxes, excise taxes, and other non-income taxes.

Source: Department of Agricultural Economics, Mississippi State University.

Compiled from 1997 IMPLAN model supplemented with data obtained from the Mississippi Hospital Association.

Summary and Conclusions

The economic influence on a community resulting from the delivery of health care services is often overlooked. Hospitals, nursing homes, physicians, dentists, pharmacies, home health agencies and ambulance services are just a few of the providers that make up a health care sector. In a rural community, this particular sector generally represents a proportionally larger share of the local economy than it does in urban areas, with the rural hospital typically being one of the largest employers in the area.

This report addresses selected demographics and the health status of the population along with emphasizing the economic importance of the health care sector to the Carroll County economy. The income and employment estimates for the county reinforce findings from similar research in other areas.

Carroll County is unique in that it does not have a hospital or nursing home within the county. This forces residents to seek hospital care and nursing home services outside of the local community, causing a “leaking” of dollars out of the county. If these two health care service providers were available within the county, the economic impact would be dramatically increased, as research has shown to be the case in counties where all the components are present.

Health care expenditures (in real dollars) have more than doubled in Mississippi during the past two decades, rising from \$1.4 billion in 1980, to \$3.6 billion in 1999. The economic value of health care as a percent of the state’s gross product also increased during the same time period from 3.23% in 1980, to 5.60% in 1999.

The demand for health care services within a geographical area is dependent upon several factors relating to socioeconomic and health status indicators. Some of these factors include the current age distribution, population density, and health status of county residents. Health care services from a variety of providers located in Carroll County are delivered to residents and non-

residents alike. This creates direct and indirect impacts on the local economy by providing residents (and possibly non-residents) employment and income.

Financial interrelationships captured in an economic model indicate that the total impact (direct and indirect combined) of the health care sector in Carroll County results in the employment of 3.1% (81 jobs) of the county's total workforce and accounts for 5 % (\$2.3 million) of county's total personal income. Indirect business taxes are affected in a similar manner, and those generated as a result of the health care sector account for 1.8% of the total for the county.

The results of research conducted on the Rural Health Works in Mississippi project quantify the importance of the health care sector in a rural economy. Community well-being and economic viability can depend on a strong and growing health care sector. The local health care sector can then be viewed as an economic development engine.

Comprehensive health care planning is essential to develop the strongest health care sector that efficiently and effectively meets local needs. A community can use the economic impact information provided in this report to stimulate community interest in comprehensive health care planning to answer questions such as the following. What health care services are needed and feasible in our community? What changes are needed in our existing health care sector? This can best be accomplished with an open community planning process that includes a cross section of community residents, health care providers and the business community.

Technical assistance can be obtained from Land Grant Universities or Offices of Rural Health.

Appendix A
Footnotes for Table 4

1. This estimate is an extrapolation from Kentucky's experience. Kentucky's Medicaid program offers a wider range of services than required by Medicaid. To restrain Medicaid cost increases, Kentucky established a primary care gatekeeper program several years ago. This program is thought to have an impact with respect to appropriate utilization of care, but is not felt to be fully effective. Kentucky Medicaid eligible may use health care differently than individuals insured through commercial insurance plans. A 1996 study compared local to non-local use by 300,500 Medicaid eligible people who reside in 49 rural counties in Southeast Kentucky. The aggregate of the 49 counties retained 61% of all hospital expenditures. Measuring by expenditure is important, particularly in hospital care, because tertiary care is far more expensive. This percent was applied to Table 4.
2. The federal Bureau of Primary Health Care (BPHC) required that applicants for Community/Migrant Health Centers (C/MHC) grants (330 clinics) develop a needs assessment to justify staffing of the clinic with physicians, midlevels, dentists, optometrists, pharmacists, and other providers. To help support the needs assessment and assure consistency in needs assessment assumptions, BPHC provided a formula, based on age and sex of the service area population that derived the total number of all ambulatory care visits. The formula estimates that 75% of all ambulatory care visits would be to primary care physicians. Note that these estimates use visits as the denominator. The BPHC rate was applied here.
3. Home health care is low technology care and can easily be offered by rural-based providers.
4. Nursing home care is low technology care, yet very expensive. In Kentucky, the average annual cost per patient excluding physician services and drugs is \$35,000 per patient year. Nursing home costs may vary significantly by state. Nursing home care can easily be provided in any rural community.

Appendix B

Glossary of Terms

The Rural Health Works in Mississippi research team recommended that a glossary be included at the end of this county report. The team will review this list and add or delete terms as needed. Some definitions were adapted from the report entitled “The Importance of the Health Care Sector on the Economy of Atoka County, Oklahoma”, Doeksen et al, Oklahoma Cooperative Extension Service at Oklahoma State University.

Balanced Budget Act (BBA): Signed in 1997 by President Clinton, this omnibus legislative package was primarily intended to balance the federal budget by 2002. This legislation contains major Medicare and Medicaid reforms, and a number of key rural health provisions.

Gross state product (GSP): The total output of goods and services produced by labor and property located within the state being considered

Medicaid: State administered program, funded by state and federal governments, which provides medical assistance to persons meeting local income and other eligibility criteria.

Medicare: Federal national insurance program which covers certain health services for persons over age 65 and other selected eligible persons.

Personal income: Income received by individuals from all sources.

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

Primary care physicians: Generally refers to family physicians, general practitioners, obstetricians and gynecologists, and general internists. Primary care physicians provide the first level of comprehensive health care.

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

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