

Economic Impact of Marshall County Hospital
On Marshall County, Kentucky

Prepared By:

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PREFACE

This report is being furnished to the Marshall County Hospital through their request. The Kentucky Rural Health Works Program (a program of the University of Kentucky Department of Agricultural Economics, UK Cooperative Extension Service, Kentucky State Office of Rural Health and UK Center for Rural Health) was contacted to conduct an economic impact study. The Kentucky Rural Health Works Program offers decision-making information to rural health care providers, local community leaders and policymakers regarding health care and its impact on rural economies. This is carried out through market demand studies, feasibility studies, policy research studies and economic impact studies. The Kentucky Rural Health Works Program combines the health care knowledge and strengths of the UK Center for Rural Health with economic development expertise of the UK College of Agriculture.

Questions or concerns regarding this analysis should be directed to Dr. Eric Scorsone, Assistant Professor of Agricultural Economics at the University of Kentucky College of Agriculture.

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INTRODUCTION

The Health care sector plays an important role in rural economies. There are four major roles for health care in rural economic development. First, rural health care services keep local dollars at home within the community. Second, it attracts external dollars into the community from outside the local area. Third, the local health care system attracts and retains industries and companies into the community. Lastly, the health care system can promote a healthy and productive workforce within a rural community.

A local economy can be conceived of as a barrel with inflows and outflows. The inflows represent external dollars coming into the community that expand the size and strength of the economy. The outflows represent leakages from the local economy, which does not create jobs or local income. In determining the economic impact of a hospital on a rural community, two major purchasing categories need to be considered: 1) local purchases, and 2) non-local purchases. Local and non-local purchases affect these inflows and outflows in the economy. The hospital and its employees are a major source of economic impact in the local community because of their local spending and support of other local businesses. .

This report examines the economic impact of Marshall County Hospital on Marshall County and its community. This analysis is divided into four sections and shows the economic impact of output (sales), employment, labor income and value added due to Marshall County Hospital. On average, Marshall County Hospital generates a total impact of 17,474,608 dollars in output (sales). The 17,474,608 dollars represents the amount of local sales or revenue generated in the Marshall County due to the impact of the Marshall County Hospital. Marshall County Hospital directly creates 259 jobs, indirectly creates 17.8 jobs and hospital employee spending creates 42.2 jobs. Marshall County Hospital represents a total impact of 9,250,992 dollars in labor income in the Marshall County economy. Overall, the results indicate that the economic activities of the hospital and its employees created 319 local jobs, 17.4 million in local revenues, 9.2 million dollars in labor income and 11 million in valued added in Marshall County.

METHODOLOGY AND DATA

Methodology

The IMPLAN Model was used to generate the economic impact of Marshall County Hospital. IMPLAN is an input-output Model that can be used to examine the economic impact of new industries, loss of an existing industry, fiscal impact analysis and the existence of supply demand gaps. Model version 2.0 was used in this study with the 2000 Kentucky data and structural matrices.

For this study, it was important to capture the nature of Marshall Hospital's purchasing patterns as opposed to the use of national standard production function. After the initial model for Marshall County was developed, the expenditure records for the hospital were reviewed to determine hospital spending patterns. These patterns were in some cases slightly different from the original IMPLAN hospital expenditure patterns. Also, the regional purchase coefficients were significantly different in some cases between the original IMPLAN Model and the revisions based on Marshall County records. The revisions of local spending correspond with findings from other studies that rural hospitals generally effect wholesale and retail trade activities in the county.

A series of steps were followed to generate the economic impact results. First, the Marshall County 2000 Model was estimated from IMPLAN. Second, the study area data was edited to include the actual hospital figures in sector 492. Under the hospital sector, the sales and employment figures were entered along with the changes in the gross absorption coefficients, as well as, the differences between national and local production functions. Changes in the production function were based on an examination of hospital records for the 2003 preliminary financial report. Finally, the model was re-run to calculate the new multiplier values. These new multipliers represent the revised Marshall Hospital's direct, indirect and induced economic effects. By moving the hospital sector through the Impact screen and determining the loss in employment, labor income and output calculated the economic impact.

Data

The data for this report came from the IMPLAN Model and Marshall County Hospital's accounting records and financial statements. The 2000 Kentucky data set was used for the IMPLAN Model. The Marshall County Hospital financial statements indicated that \$11,379,836 in cash expenditures existed during the 2003 fiscal year. This figure includes cash expenses related to depreciation and amortization. Out of the \$11,379,836 in total expenditures, \$5,620,140 was related to wage and salaried employees. The payroll figures show that approximately 77 percent of the hospital employees live in Marshall County. The remaining payroll expenditures from the 23 percent of the 'out-of-county' employees are assumed to be a leak (a loss) from the Marshall County economy.

RESULTS AND DISCUSSION

Local and Non-local Purchases

A local economy can be conceived of as a barrel with inflows and outflows. The inflows represent external dollars coming into the community that expand the size and strength of the local economy. Inflows include federal and state expenditures, tourists and other people driving into the community to shop at a local retail outlet. The outflows represent leakages (a loss) from the economy, which reduces job creation or local income. Outflows include state and federal taxes, non-local purchases of goods and services and people traveling to other sites for vacation or receiving medical care in another county or urban area. Local taxes are not an outflow as they are spent on creating local public goods such as roads, schools and police and fire protection.

The economic impact of a hospital is dependent on a number of factors. In determining the economic impact of a hospital, there are two major purchasing categories to consider: 1) local purchases, and 2) non-local purchases. In effect, non-local purchases represent a leakage to a local economy. For hospitals, many purchases by necessity must be made to distant locations.

The complex technology and equipment of modern medicine is subject to large economies of scale and are only produced in a few places in the nation. This equipment might include x-ray machines, MRI equipment and other surgical equipment. Pharmaceutical supplies and drugs are also subject to these same forces. Further, some types of audits, and legal and accounting services must be purchased from outside the local area due to the complexity of services.

Hospital employees are a major source of the economic impact in the local economy. These employees, turned consumers, spend large amounts of their income in local retail outlets, housing and other services. These consumer expenditures, in turn, support a large number of local resident service jobs such as mechanics, retail clerks, real estate agents and bankers.

Economic Impact Multipliers

The impact of the hospital and the hospital employee expenditures are measured in IMPLAN using a technique called multiplier analysis. Multiplier effects are a simplified and compact way of representing these economic effects in a local economy. The multiplier is interpreted as the impact of a one-unit change in sales, employment, income and value added in an “X” impact on the local economy. In essence, the multiplier represents the recycling of local dollars and income. This recycling process creates new job opportunities and higher wages for individuals. Leakage of dollars and income out of the community, via taxes or non-local spending, reduces the size of the multiplier effect and reduces the potential size of the local economy.

There are several types of multipliers based on the type of economic impact analysis (see **Table 1**). The economic impacts are classified in terms of how they are generated in the economy. The **direct** impact is directly attributable to the revenues generated by businesses that serve the hospital, thus measuring the value of production or services. The direct multiplier is based on the industry’s or firm’s initial economic impact on the community. For example, if a manufacturing plant has generated revenue of 5 million dollars, then this figure becomes the direct economic impact on the community.

The **indirect** multiplier is based on industry-to-industry transactions only. Indirect impacts count the expenditures made by the industry or company on the output and purchases of their suppliers. For example, the hospital purchases local laundry services, food, landscaping or floral arrangements. These purchases affect the revenue of those local suppliers. The indirect multiplier does not include the effect of employee spending on the local community.

The **induced** multiplier includes both the industry-to-industry transactions and household purchases. Therefore, the induced effects include the impacts from the spending in the local economy by employees and owners of directly and indirectly affected businesses. Finally, the **total** impact is the sum of the direct, indirect and induced effects and measures the complete impact of an activity as it ripples throughout the local economy.

There is a further subdivision of multipliers into sales, employment, income and value added multipliers (see **Table 1**). **Sales or output** multipliers represent the change in local sales or revenue due to a change in an industry. Economic output is measured as a change in total sales for a new or existing business or institution in a region. **Employment** multipliers are the impact of a one million dollar change in economic output on the number of jobs in a local economy. **Income** multipliers are a one-unit change in economic output on local income. **Value added** multipliers reflect a one unite change in economic returns to labor, in the economy, due to a unite change in the returns from labor, management and ownership generated by the hospital.

Table 1: Economic Impact Multipliers

Multiplier Type	Direct Multiplier	Indirect Multiplier	Induced Multiplier
Employment	Health care jobs	Health care supplier jobs	Local retail and service jobs related to health care employee spending
Incomer	Health care employee income	Health care supplier employee income	Local retail and service income related to health care employee spending
Sales or Output	Health care revenue	Health care supplier revenue	Local retail and service revenue related to health care employee spending
Value Added	Hospital returns to labor, management and ownership	Hospital supplier returns to labor, management and ownership	Local retail and service returns to labor, management and ownership

Economic Impact Analysis

The results of this analysis are divided into four sections according to following multipliers: 1) output or sales, 2) employment, 3) labor income, and 4) value added. Each section shows the direct, indirect, induced and total economic impacts for the various economic impact categories.

The sales or output multiplier represents the amount of local sales or revenue generated in the Marshall County due to the impact of the Marshall County Hospital (see **Table 2**). This revenue represents sales from vendors to the Marshall County Hospital. The 13,182,659 dollars in **Table 2** represents the direct sales from the Marshall County Hospital and is the direct multiplier effect. Marshall County Hospital vendors are supplied by other dealers and wholesalers, which in turn, creates other income opportunities within the local community. Subsequently, the indirect impact is 1,720,515 dollars, which represents Marshall County Hospital vendors' spending within the local area. This 1,720,515 dollars is associated with industry-to-industry transactions within Marshall County area. Hospital employees purchase goods and services in the local economy and represent the induced impact on the community. The induced impact on Marshall County economy is 2,571,433 dollars and is associated with the employees' purchases of goods and services within their communities. Based on the total expenditures (direct impact) of 13,182,659 dollars for fiscal year 2003, Marshall County Hospital has a significant total economic impact of 17,474,608 dollars. The total impact represents generated revenue based on direct suppliers to the hospital, indirect suppliers to the hospital and employees purchases in the local economy.

Table 2: Marshall County Hospital Impact on Marshall County Output (Sales)

Direct Impact of the Hospital Output	Indirect Impact of the Hospital Output	Induced Impact of the Hospital Output	Output (Sales) Multiplier	Total Impact of the Hospital Output (Sales)
\$13,182,659	\$1,720,515	\$2,571,433	1.33	\$17,474,608

Source: 2000 IMPLAN Data Base and 2003 hospital data

The employment multiplier demonstrates the relationship between the Marshall County Hospital expenditures and employment creation in the Marshall County and its community. In essence, Marshall County local community jobs rely on the hospital for their existence. Marshall County Hospital directly creates approximately 259 jobs within Marshall County and its community (see **Table 3**). For Marshall County Hospital, the employment impact from 259 jobs creates an additional 60 jobs within the community through hospital and employee spending; 17.8 of these jobs are based on industry-to-industry transactions and 42.2 of these jobs are based on employee spending within the local community. The Marshall County Hospital employment multiplier is 1.23 as shown in **Table 3**. The employment multiplier indicates that for every one Marshall County Hospital job, an additional 0.23 jobs are created in the local economy. In total, 319 jobs in Marshall County are directly or indirectly tied to the existence of the hospital.

Table 3: Marshall County Hospital Impact on Marshall County Employment

Direct Impact of the Hospital Employment	Indirect Impact of the Hospital Employment	Induced Impact of the Hospital Employment	Employment Multiplier	Total Impact of the Hospital Employment.
259 jobs	17.8 jobs	42.2 jobs	1.23	319 jobs

Source: 2000 IMPLAN Data Base and 2003 hospital data

Table 4 shows the direct, indirect and induced impact on the Marshall County labor income due to Marshall County Hospital. The impact from labor income indicates the level of personal income dependent on the existence of the hospital. Marshall County’s employees are paid an estimated 5,620,140 dollars in payroll in Fiscal Year 2003. This income translates into local spending and more jobs, which creates more income in the community. The indirect impact from labor income for the Marshall County Hospital is estimated to be 600,877 dollars. The induced impact is 818,236 dollars and the total labor income impact of 9,250,992 dollars for the Marshall County. The Marshall County Hospital income multiplier is 1.18. This means that for every dollar

of income generated by Marshall County Hospital, an additional 0.18 cents of income is generated in the rest of the Marshall County economy.

Table 4: Marshall County Hospital Impact on Marshall County Labor Income

Direct Impact of the Hospital Income	Indirect Impact of the Hospital Income	Induced Impact of the Hospital Income	Income Multiplier	Total Impact of the Hospital Income.
\$7,831,878	\$600,877	\$818,236	1.18	\$9,250,992

Source: 2000 IMPLAN Data Base and 2003 hospital data

Table 5 shows the value added impact of Marshall County Hospital on Marshall County and its community. Valued added impacts represent the compensation or returns of labor, management and ownership generated by the activities of Marshall County Hospital. The direct impact of value added from employees' compensation, proprietor income, other property income, plus the indirect business taxes are estimated at 8,790,580 dollars. This value added revenue indirectly generates an additional 998,229 dollars and has an induced effect of 1,645,540 dollars in Marshall County economy. The total economic impact on Marshall County's local economy from value added through Marshall County Hospital and its employees' financial activities was estimated to be 11,434,348 dollars. The value added multiplier was determined to be 1.30. For every dollar of value added from the hospital and its employees, an additional 0.30 cents of value added is generated in other local businesses.

Table 5: Marshall County Hospital Impact on Marshall County Value Added

Direct Impact of the Hospital Value Added	Indirect Impact of the Hospital Value Added	Induced Impact of the Hospital Value Added	Value Added Multiplier	Total Impact of the Hospital Value Added
\$8,790,580	\$998,229	\$1,645,540	1.30	\$11,434,348

Source: 2000 IMPLAN Data Base and 2003 hospital data

SUMMARY

The results indicate that Marshall County Hospital is an important economic contributor to Marshall County and its community. For example, approximately 4.3 percent of the local jobs in Marshall County are dependent upon Marshall County Hospital. **Table 6** shows a summary of the economic impact tables. Its impact is primary felt through hospital expenditures on local services as well as employee spending in the local retail and service sector. Like many rural and urban hospitals, complex medical equipment must be purchased outside the community, which reduces the size of the economic impact.

Table 6: Economic Impacts of Marshall County Hospital on Marshall County, Kentucky

Multiplier Type	Direct	Indirect	Induced	Multiplier	Total
Output (Sales)	\$13,182,659	\$1,720,515	\$2,571,433	1.33	\$17,474,608
Labor Income	\$7,831,878	\$600,877	\$818,236	1.18	\$9,250,992
Value Added	\$8,790,580	\$998,229	\$1,645,540	1.30	\$11,434,348
Employment	259 jobs	17.8 jobs	42.2 jobs	1.23	319 jobs

Source: 2000 IMPLAN Data Base and 2003 hospital data

To reiterate, the sales or output multiplier represents the amount of local sales or revenue generated in the Marshall County due to the impact of the Marshall County Hospital. Based on the sales or output multiplier, the Marshall County Hospital has a total economic impact of about 17,474,608 dollars. The employment multiplier demonstrates the relationship between Marshall County Hospital expenditures and employment creation within the community. Marshall County Hospital directly creates 259 jobs, indirectly creates 17.8 jobs and hospital employee spending creates 42.2 jobs. The employment multiplier indicates that for every one Marshall County Hospital job, an additional 0.23 jobs are created in the local economy. The total impact of labor income from Marshall County Hospital was estimated to be 9,250,992 dollars. The income multiplier

indicates the level of Marshall County income that is dependent on Marshall County Hospital's payroll. The Marshall County Hospital labor income multiplier is 1.18. This means that for every dollar of labor income generated by the Marshall County Hospital an additional 0.18 cents of income is generated in the rest of the economy. The total impact of the value added from the hospital and its employees was estimated to be 11,434,348 dollars for Marshall County and its community. For every dollar of value added from the hospital and its employees, an additional 0.30 cents of value added is generated in other local businesses.

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