



Estimate the Economic Impact of a Rural Primary Care Physician

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Key Findings

- A rural primary care physician generates economic impacts at the local hospital from the inpatient admissions and outpatient referrals.
- A rural primary care physician practicing in a community with a local hospital creates an estimated 23.3 local jobs and more than \$1.7 million in income (wages, salaries and benefits) from the clinic and the hospital.
- 54.5% of all patient visits are to primary care physician

Background

A primary care provider in rural areas delivers needed medical services. Visits to a primary care service provider are a major part of our health care needs. An estimated 54.5 percent of all physician visits are to primary care physicians (PCP).¹ Availability of adequate primary care services is essential for a strong health care system, but these primary care visits also account for health expenditures in the form of revenues to the medical clinic. A large portion of the revenues create employment opportunities and wages, salaries and benefits for clinical staff, which in turn are returned

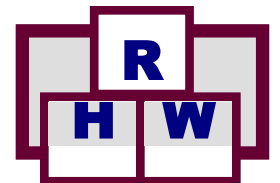
to the local economy as the clinic and employees spend locally. Furthermore, the total economic impact of a primary care service provider is greater than the impact at the clinic when the community has a local hospital. The physician contributes to the local hospital through inpatient admissions and outpatient referrals. Not only is the support vital for maintaining sufficient hospital utilization, but the revenue generated at the hospital creates even more jobs and income.

The employment opportunities and the resulting wages, salaries and benefits make the health care system an extremely important part of the local economy. Research from the National Center for Rural Health Works indicates that between 10 and 15 percent of the jobs in many rural communities are in the health care sector.² Hospitals often are the second largest employer in rural communities, trailing only local school systems.

Employee spending, along with clinic and hospital spending at local businesses, stimulates additional economic growth or secondary impacts in other parts of the economy. Much of this economic activity generates additional tax revenues that can be used by the local government to fund important community services.

Historically, a physician in an independently-owned clinic was the typical delivery method for rural

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primary care services. More recently, the independent practice model is moving toward a multi-physician practice or an employment model. But still, a majority (56%) of primary care offices are owned by a physician or physician group.³ Fewer primary care physician graduates are starting their own practices and many practicing physicians are opting for employment. The increase of hospital-owned clinics, rural health clinics, urgent care clinics and retail clinics has created new employment opportunities.

In 2017, research using only the American Medication Association Physician Masterfile indicated that of the 699,670 office-based, direct care physicians, 31.9% practice a primary care specialty (Family Medicine, Geriatrics, General Practice, General Internal Medicine and General Pediatrics).⁴ (Note: Due to the lack of inclusion of Osteopathic Physicians in the AMA Physician Masterfile,^{5,6} the percentage practicing primary care is assumed to be higher.)

As far as primary care practices ownership, approximately 56% are full or part owners of their practices, which is a significant increase since 2012 (30%). Twenty-six percent (26%) of the PCP are employees of a non-physician owned practice with the other 16% employed in insurance or health plan HMO owned practices.⁷

This shift suggests a stronger than ever need to refine the economic impact that PCP bring or can bring to the community they serve. Hospitals and clinics can utilize the financial estimates in determining the potential revenue an additional PCP will bring to a community for a grant application or in justifying a clinic or hospital's current providers during a board/community presentation.

Purpose of the Study

The objective of this study is to estimate the economic contributions of a rural primary care physician to employment and labor income in the community and surrounding area including the local hospital. The estimates of direct and secondary impacts underestimate the total contribution as the impact is not included from sectors such as pharmacy and nursing homes. The study includes impacts from:

- clinic employment and wages, salaries and benefits (labor income), and
- local hospital employment and wages, salaries and benefits (labor income).

Scope of Research

With the more recent and expanding utilization of Hospitalists specialty physicians in most hospitals (urban primarily), we decided with this update to utilize additional data sources to determine the impact of primary care physicians upon small hospitals. Utilizing the CMS Medicare Standard Analytical File (SAF) for hospital IPPS claims, we studies 113 Critical Access Hospitals key attending providers to determine their specialty. Using the National Center for the Analysis of Healthcare Data's Enhanced State Licensure (ESL) data, we tracked the providers by their specialty and if a PCP, identified their affiliate clinics in the area surround the hospital. Nearly 56% of the surveyed hospitals had at least one PCP that had a clinic in the area. Using both their clinic website and phone calling, we were about to determine an average clinic staffing mix that we used to determine our cost and employee estimates. Salary estimates for this study are based on data from the U.S. Department of Labor, Bureau of Labor Statistics (BLS). We were able to further validate our clinic staff mix estimates through work we conducted simultaneously on Rural Health Clinics.

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Hospitals must have support from local primary care service providers to maintain sufficient utilization and financial stability. In addition to inpatient admissions, primary care physicians generate significant outpatient activities that contribute to hospital revenues. Hospitals allocate a significant portion of their revenues to employee compensation costs. Therefore, it was assumed that the direct impacts to a hospital could be estimated by allocating hospital employment and compensation to the primary care providers practicing in the hospital medical service area. The economic impact measured in this study results from rural primary care providers that practice in a clinic and utilize the local hospital for services.

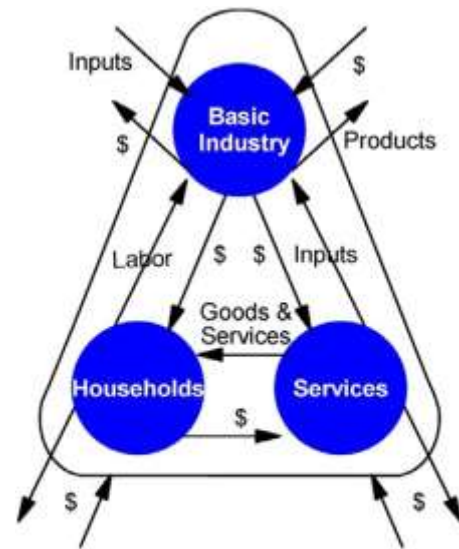
Approach

The methodology will estimate the economic impact from the clinic and hospital per physician and their PA/NP within their office/clinic. Due to differences in regulations among states, the patient activity for PAs/NPs varies significantly.

For this study, PAs/NPs were assumed as one-half of a primary care physician. The direct impacts include the employees and labor income at the clinic and the proportionate share of the hospital employees and their labor income. The secondary impacts are calculated with an input-output model and data from IMPLAN. **Figure 1** illustrates a community economic system. The primary care clinic generates jobs and labor income from its revenues. Additional jobs and labor income are created at the hospital through inpatient admissions and outpatient referrals. In turn, secondary impacts are created as the clinic and the hospital and the individuals working for the clinic/hospital purchase goods and services within the local economy.

Figure 1 illustrates that a change in any one segment of a community's economy will cause reverberations throughout the entire economic system of the

community. A multiplier from an input-output model can measure the effect created by an increase or decrease in economic activity. The multiplier not only measures the economic activity from the physician clinic and hospital employees but also includes the economic activity from additional business spending and household spending.



Community Economic System
Figure 1

The model calculates multipliers for employment (in terms of full- and part-time jobs) and labor income (in terms of wages, salaries and benefits.) The model generates multipliers that are medical service area-specific due to differences in locally-available goods and services across different states, counties, or zip codes.

Direct Impacts of a Rural Primary Care Physician

Estimating the Direct Impacts of the Clinic

Data in **Table 1** present the direct impacts of the clinic in terms of employment and labor income. Average income for providers was determined from total compensation and full-time equivalent employment (FTE) from the US. Bureau of Labor Statistics.⁸

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The total clinic employment impact including a physician was estimated to be five jobs. The clinic staff may include a part-time lab technician and some rural clinics might have additional labor income from medical assistants.

Table 1		
2019 Estimated Direct Impacts on Employment and Labor Income from a Primary Care Clinic		
Provider Type	Employment	Labor Income
Physician	1	\$208,000
Nurse	1	\$71,730
Clinic Staff*	3	\$149,598
Staff Benefits		\$51,519
Total	5	\$480,867

*Includes admin., lab techs and medical assist.

The national average income was \$71,730 for a registered nurse and \$49,886 for a lab tech within a clinical setting. For the physicians, we averaged the physician pay from 113 rural clinics. For the benefits, we used the average 12% suggested by BLS. Incomes could be slightly less in rural areas but rural specific data are unavailable. Total estimated direct labor income from the clinic was \$480,867.

Estimating the Direct Impacts at the Hospital

The direct impacts that a rural primary care physician has at the hospital are reflected in **Table 2** below. Hospitals are an integral part of the local healthcare sector. As previously mentioned the community hospital is a significant source of jobs and labor income in the local medical service area. Hospitals require inpatient admissions and outpatient referrals from physicians. To determine the direct impacts primary care physicians have upon a hospital, a methodology was created utilizing American Hospital Directory data, and PCP historic referral rates to hospitals inpatient and

Outpatient clinics. The hospital data includes 113 critical access hospitals in the following ten states: Alabama, Arizona, Illinois, Kentucky, Louisiana, North Carolina, South Carolina, New Mexico, Tennessee, and Virginia.

In order to determine the direct employment and labor income impact, the percent of hospital revenue that is due to primary care physicians referring to the hospital's inpatient and outpatient clinics needed to be calculated. The percent of hospital revenue due to PCP referrals was calculated by utilizing previous research completed on the referral rates in rural communities and nationally. After completing the research, the average national PCP referral rate is eight percent.⁹ Next, the hospitals net patient revenue to determine the revenue that was created to a PCP referring to the hospital multiplied the referral rate. Finally, we multiplied the revenue created by PCP referrals by the personnel expense ratio to determine the percentage of revenue created by the PCP referral utilized for personnel expenses. By determining the amount of revenue utilized for personnel expenses, allows us to measure the number of jobs supported by revenue created by a primary care physician. Furthermore, in order to, ascertain the number of jobs created by PCP referrals, the average wage per employee for each hospital was calculated by dividing the sum of the salary, contract labor, and benefits provided by AHD. This was then divided by the number of employees of the hospital.

The average estimated employment generated at the rural hospital is 12.5 employees per physician. The estimated average labor income per hospital employee was \$75,718, resulting in \$946,475 total labor income at the hospital from a rural primary care physicians patient referral activity. This result is based on a full-capacity clinic practice providing the maximum impact on the local hospital. It is important to note, that it may take new provider three to five years before practice is at full capacity and can generate a full impact on the community. Actual impacts on the hospital may be affected their available capacity, the individual referral rates of physicians in the communities and types of insurance plans offered in the region, i.e., HMO, which requires a referral from a PCP to see a specialty.

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Table 2		
2019 Employment and Labor Income at the Local Hospital fby a Primary Care Physician		
Employment		12.5
Labor Income		\$946,675

The estimated average labor income per hospital employee was \$75,734, resulting in \$946,675 total labor income at the hospital from a rural primary care physician’s patient referral activity. These data are based on a full-capacity clinic practice, providing the maximum impact on the local hospital.

Total Impacts of a Rural Primary Care Physician

As stated earlier, the direct employment and labor income will further benefit the community by generating secondary jobs and labor income throughout the local economy. Data in **Table 3** present the total impacts per physician from the physician clinic and the hospital visits attributed to the primary care physician. For this analysis, the RHC and Hospital employment and income multipliers from Rural Health Works were averaged from 84 rural hospital counties in 9 states.

Table 3			
Total Impact of a Rural Primary Care Physician			
from Clinic and Hospital, 2019			
	Employment	Employment Multiplier	Total Impact
Clinic	5	1.36	6.8
Hospital	<u>12.5</u>	<u>1.32</u>	<u>16.5</u>
Total	17.5		23.3
	Wages, Salaries, and Benefits	Wages, Salaries, and Benefits Multiplier	Total Impact
Clinic	\$480,867	1.22	<u>\$586,658</u>
Hospital	<u>\$946,675</u>	<u>1.18</u>	<u>\$1,117,077</u>
Total	\$1,427,542		\$1,703,734

The clinic employment multiplier of 1.36 estimates that if the primary care clinic, then an additional 0.36 jobs are created in other businesses due to the clinic and employee spending creates one job. Using the employment and labor income data from **Tables 1** and **2**, an estimate of total labor income and employment created from the primary care clinic and hospital are can be made. The total employment impact per physician from the clinic is 6.8 jobs. The same methodology used for the hospital yields 16.5 jobs for a total employment impact of 23.3 jobs. The direct labor income estimates result in total labor income impact of \$1,703,734.

Summary

The importance of a local primary care provider and the medical contribution that he or she makes to the community are revealed through improvements in residents' health and higher quality of life indicators. This report documents the economic importance of a rural primary care physician. A rural primary care physician practicing in a community with a local hospital creates approximately 23.3 local jobs and more

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than \$1.7 million in labor income (wages, salaries and benefits). The estimate is low as this study measures only the impacts from the clinic

and hospital and does not include impacts from pharmacy, nursing home, etc. The impact is created through clinic employment, inpatient admissions, outpatient referrals and the multiplier effect of these activities. The rural primary care physician's economic contributions are important to a community.

Template to Measure the Annual Economic Impact of a Rural Primary Care Physician

The research results provide a template to assist local leaders interested in estimating the economic impact of a rural primary care physician practice. Local data should be utilized to derive the most realistic estimates for the local community. If local data are unavailable, the national estimates from the previous tables can be used. All assumptions should be closely examined by local decision-makers to verify that they reflect local conditions.

The first step is to estimate the direct employment and labor income from the clinic and the hospital. After the direct impacts have been determined, the total impacts including secondary impacts can be estimated. Specific county or zip code multipliers are available through IMPLAN and can be generated and utilized to make the results community specific.

The State Offices of Rural Health, County/State Extension Offices, state hospital associations and other state agencies are possible resources for technical assistance with county-specific multipliers. If local data are unavailable, the national multipliers provided are the average of 84 rural hospital counties located in 9 states.

TEMPLATE

Estimating the Total Employment and Labor Income Impacts of a Rural Primary Care Practice

	Direct Employment	Multiplier	Total Impact
Clinic	_____	1.36	_____
Hospital	=====	1.32	=====
Total	_____		_____

	Direct Income	Multiplier	Total Impact
Clinic	\$ _____	1.22	\$ _____
Hospital	\$ _____	1.18	\$ _____
Total	\$ _____		\$ _____

A Review of Input-Output Analysis

Input-output (I/O) (Miernyk, 1965) was designed to analyze the transactions among the industries in an economy. These models are largely based on the work of Wassily Leontief (1936). Detailed I/O analysis captures the indirect and induced interrelated circular behavior of the economy. For example, an increase in the demand for health services requires more equipment, more labor, and more supplies, which, in turn, requires more labor to produce the supplies, etc. By simultaneously accounting for structural interaction between sectors and industries, I/O analysis gives expression to the general economic equilibrium system. The analysis utilizes assumptions based on linear and fixed coefficients and limited substitutions among inputs and outputs. The analysis also assumes that average and marginal I/O coefficients are equal.

Nonetheless, the framework has been widely accepted and used. I/O analysis is useful when carefully executed and interpreted in defining the structure of an area, the interdependencies among industries, and forecasting economic outcomes.

The I/O model coefficients describe the structural interdependence of an economy. From the coefficients, various predictive devices can be computed, which can be useful in analyzing economic changes in a state, an area or a county. Multipliers indicate the relationship between some observed change in the economy and the total change in economic activity created throughout the economy.

The basis of IMPLAN was developed by the U. S. Forest Service to construct input/output accounts and models. The complexity of this type of modeling had hindered practitioners from constructing models specific to a community requesting an analysis. The University of Minnesota utilized the U.S. Forest Service model to further develop the methodology and expand the data sources to form the model known as IMPLAN.

The founders of IMPLAN, Scott Lindall and Doug Olson, joined the University of Minnesota in 1984 and, as an outgrowth of their work with the University of Minnesota, entered into a technology transfer agreement with the University of Minnesota that allowed them to form Minnesota IMPLAN Group, Inc. (MIG).

IMPLAN Software and Data

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

IMPLAN Multipliers

Five different sets of multipliers are estimated by IMPLAN, corresponding to five measures of regional economic activity. These are: total industry output, personal income, total income, value added, and employment. Two types of multipliers are generated. Type I multipliers measure the impact in terms of direct and indirect effects. Direct impacts are the changes in the activities of the focus industry or firm, such as the closing of a hospital.

The focus business changes its purchases of inputs as a result of the direct impacts. This produces indirect impacts in other business sectors. However, the total impact of a change in the economy consists of direct, indirect, and induced changes. Both the direct and indirect impacts change the flow of dollars to the households. Subsequently, the households alter their consumption accordingly.

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The effect of the changes in household consumption on businesses in a community is referred to as an induced effect. To measure the total impact, a Type II (or Type SAM) multiplier is used. The Type II multiplier compares direct, indirect, and induced effects with the direct effects generated by a change in final demand (the sum of direct, indirect, and induced divided by direct) activities of the focus industry or firm, such as the closing of a hospital.

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