

Estimating Spending for Local Healthcare

- working paper -

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Abstract

In the last decade, the U.S. healthcare sector experienced faster real growth annually than the national economy - personal healthcare spending in the nation has more than doubled since 1990. The healthcare sector is often a substantial, yet neglected part of small, rural economies. Regional economists who study health issues often estimate local spending for healthcare. This is because of the paucity of local data. In the past five years a number of economic impact reports across the nation have included an analysis of local spending for healthcare. The current methodology consists of adjusting state per-capita spending with a local purchase coefficient, which is then multiplied by the population. While this approach is convenient, and serves as a rough indicator of local spending for healthcare, it often suffers because the local purchase coefficients have limited usefulness: they have, except on rare occasion, no relationship with the area under study, and are derived from a source whose provenance is difficult to ascertain. This paper examines the problems associated with using these coefficients, and proposes a new methodology for estimating local spending for healthcare.

Introduction

An analysis of healthcare spending is useful for gauging trends in the healthcare sector, which includes hospitals, doctors, dentists, nursing homes, community and migrant health centers. Nationwide, healthcare spending more than doubled from \$609 billion in 1990 to more than \$1.2 trillion in 2001 (Figure 1). Personal healthcare spending in the U.S as a fraction of the total economy was more than 14% in 2001.

In rural communities the healthcare sector is often a substantial component of the local economy. Obviously healthcare is important in a social context, because it has positive impacts on the perceptions people have about their quality-of-life. Yet the economic implications of a strong healthcare sector point to its importance for the development of a vibrant local economy. Hospitals in small rural communities are often one of the largest sources of local employment.

Even businesses in seemingly unrelated sectors are often affected by the healthcare status and capacity of a local community. Businesses often make location decisions based on information about the availability of healthcare. Spending in the healthcare sector stimulates economic growth in many other parts of the economy, especially the trade, finance, insurance, and transportation sectors.

Healthcare dollars come from businesses, consumers and governments. Expenditures for healthcare are as important for local economic health as any other type of expenditure. Dollars that remain in the local economy support jobs and stimulate inter-industry purchasing that results in a multiplier-effect. A strong healthcare sector, by “exporting” its local character, can represent a gain of potential jobs and income by attracting patients and healthcare expenditures from outside. Conversely, leakages, healthcare expenditures made outside a local area, represent a loss of potential jobs and income to local residents.

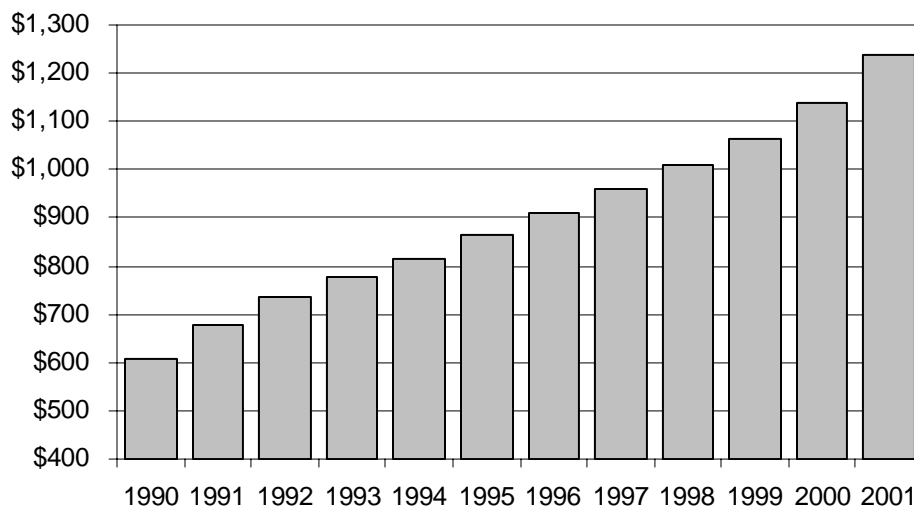


Figure 1. Personal Healthcare Spending in the U.S. (\$Billion)

Estimating Local Spending for Healthcare

National and state-level reports on healthcare spending are a good source of information on healthcare expenditures. Recent reports suggest that the burden of health care spending for businesses and the Federal Government has stabilized or improved since 1993, while the burden for State and local governments has deteriorated (Cowan, et al., 2002). While this macro perspective is important for state and national policy, local leaders and decision makers seek information about the importance of healthcare in their own communities. Information about health status and behavior is becoming more readily available, yet there still exists no source of information about local spending for healthcare.

Current Methodology

In the past few years a number of reports have presented estimates of county-level healthcare spending¹. The current methodology consists of adjusting state per-capita spending with a local purchase coefficient. The value obtained represents local per-capita spending (1), that when multiplied by the level of the current population in the county produces an estimate of total spending for healthcare in the county (Table 1).

$$\text{Local per-capita spending} = \text{state per-capita spending} * \text{local purchase coefficient} \quad (1)$$

Table 1. Example Estimation of Local Healthcare Spending for a Hypothetical County.

| Category | (\$) State Per-Capita Spending | LPC | (\$) Local Per-Capita Spending | Local Population | (\$) Total Spending |
|----------------------|-----------------------------------|----------|-----------------------------------|---------------------|------------------------|
| Hospitals | 1,798 | 61.00% | 1,097 | 38,781 | 42,526,730 |
| Physicians | 1,019 | 75.00% | 764 | 38,781 | 29,632,650 |
| Home Health Care | 130 | 100.00% | 130 | 38,781 | 5,034,292 |
| Nursing Homes | 294 | 100.00% | 294 | 38,781 | 11,417,054 |
| Dental | 143 | 75.00% | 107 | 38,781 | 4,146,548 |
| Medical Durables | 42 | 75.00% | 31 | 38,781 | 1,213,624 |
| Drugs & Non-durables | 515 | 75.00% | 386 | 38,781 | 14,968,028 |
| Other | 88 | 75.00% | 66 | 38,781 | 2,562,095 |
| TOTAL | 4,028 | - | 2,875 | | 111,501,021 |

Naturally, the validity of this approach is based in large part on the accuracy of the local purchase coefficients (LPC). Each LPC reflects the aggregate spending pattern in the study area (usually a county) in relation to the state-level of spending for each healthcare sub-sector.

For example, in Mississippi the 2000 state-level per-capita spending for the hospital sub-sector is \$1,798 (Evans, 2004). For the hypothetical county in Table 1 the local purchase coefficient is 61%, which means that local per-capita spending for the hospital sub-sector

¹ At last count there were 144 reports in five states that estimated local healthcare spending.

is \$1,097. Total spending is simply extrapolated to be \$42.5 million by multiplying by the population in the county (38,781).

The LPC is particularly informative, suggesting that local spending is 61% of state-level spending. Alternatively, it suggests that 39% of the population spend their (or their employers', governments', etc.) healthcare dollars in hospitals outside of the county. Regardless of the perspective, an LPC of less than 100% suggests a healthcare spending leakage, caused perhaps by residents seeking care elsewhere.

Generally speaking there are few objections to this approach. It is a practical and convenient way to estimate local healthcare spending, and appears methodologically sound. However, as stated previously, the validity of this approach rests squarely on the accuracy of the LPC, thus enjoining an oft-heralded computer axiom².

Obtaining LPCs for health sub-sectors in a single county is not a particularly straightforward task. There is no single source of secondary data that directly provides this information. Even local health providers, who are perhaps the most tuned-in to the community's health scene, may not be fully aware of available health resources, much less have accurate knowledge about local spending habits. Therefore, as often becomes the case, LPCs are estimated.

Unfortunately, a standardized method of estimating LPCs for health care doesn't appear in the current literature. Perhaps for this reason it has become a common practice throughout the nation to use the same LPCs from state to state, and without regard for local variations (Table 2).

Table 2. Commonly Used Local Purchase Coefficients for Healthcare

| Category | LPC | Reference |
|----------------------------|------|----------------|
| Hospitals | 61% | Medicaid Study |
| Physicians | 75% | BPHC Formula |
| Home Health Care | 100% | Observations |
| Nursing Homes | 100% | Observations |
| Dental | 75% | BPHC Formula |
| Personal Medical Supplies* | 75% | BPHC Formula |

* includes medical durables, non-durables, and other expenditures not elsewhere classified.

In the past five years a number of county-level studies have used the same LPCs in Table 2 to estimate healthcare spending. In almost every case the reader is referred to the same appendix, which is excerpted here:

Medicaid Study: 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 healthcare differently than individuals insured through commercial insurance plans. A 1996 study compared local to non-

² Garbage-In-Garbage-Out

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 [used].

BPHC Formula: The federal Bureau of Primary Healthcare (BPHC) required that applicants for Community/Migrant Health Centers (330 clinics) grants 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.

Observations: Home healthcare is low technology care and can easily be offered by rural-based providers. 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.

The LPC for hospital expenditures has limited usefulness. The LPC of 61% for hospital expenditures, though dated, is perhaps a reasonably good estimate for analyses performed in Kentucky. Even so, the estimate is based on spending habits of Medicaid-eligible persons, which further limits its use. Total spending for healthcare is funded from both private and public sources. Private sources include out-of-pocket spending and private health insurance. Public spending is either federal, such as Medicare, or state-based, such as Medicaid. Nationwide, private health insurance funds the largest portion of overall healthcare spending (Levit et al., 2003).

There are several problems with the LPCs based on the BPHC source. The most obvious is the vague reference to a formula that was provided to 300 or so community health centers applying for grants at some undetermined time. According to the National Association of Community Health Centers, there are more than 1,000 community-based health care organizations in the United States. It is not clear then to which clinics this refers. The details of the formula are left to the reader's imagination³, though it is evident that it has something to do with the age and sex of a population in a service area. The other problem is that the formula "derived the total number of all ambulatory care visits". Assuming there exists some general relevancy of the number of ambulatory care visits with local spending for doctors, dentists, and personal medical supplies, there is still lacking a thorough exposition of how (or if) this can be used outside of those service areas. Community and migrant care centers are important sources of health care for many people in rural areas, yet they are not the "only game in town". This is especially true in non-rural, urban and metropolitan areas.

The observation that all spending for home health care and nursing home care is local cannot be entirely disputed. Home health care by definition is residence-based. Thus, it seems likely that expenditures would be near 100%. Analysts can also assume that most

³ Queries to the BPHC have, as yet, been unfruitful.

nursing home expenditures are local, though there would certainly be some leakage in counties without a facility (eg., Issaquena County Mississippi), or in particularly competitive markets. Personal observations based on local data, or drawn from local sources are always recommended. It may be of interest that the majority of funding for long-term health care (about 60 percent) comes from public sources (Scanlon, 1998).

New Methodology

Hospital Expenditures

In 2000, hospital-related expenditures accounted for a major portion (36%) of all personal health care expenditures in the nation (Centers for Medicare and Medicaid Services). Thus, the local purchase coefficient for hospital expenditures is important in terms of accuracy. Local spending for hospital care is largely a function of where people receive care. In this sense local hospital purchases resemble any other type of purchase, and can be assessed, perhaps with some modification, by standard retail leakage methodology.

One approach is to utilize primary data from consumer surveys. Unfortunately this information, especially in the context of medical care, is fraught with confidentiality issues and is expensive and time consuming. An alternative is to use patient discharge data, which in some states is available from a centralized repository⁴. For example, in Mississippi the State Department of Health provides analysis and data (for a fee) based on its annual Patient Discharge Survey. Patient discharge data that identifies the number of patients discharged from hospitals by county, and to which county they reside can be used to estimate local hospital expenditures. Count-data, when available, is preferable to surveys because of seasonal variations. One must also aware be that patients can be discharged to facilities located away from their county of residence, a source of bias that, even so, may be offset by non-resident discharges to the same county.

Professional Care Expenditures

Professional care, which includes physicians and dentists, accounted for 37.3% of national personal health care expenditures in 2000. There is little reason to assume that local spending for this sub-sector is the same throughout the nation; and estimating the local purchase coefficient for professional care is not particularly difficult.

The approach consists of using a state-level (or federally mandated⁵) benchmark as an estimate of the level of the population per physicians and dentists. This information is

⁴ Some states do not collect patient discharge data. The National Center for Health Statistics maintains the National Hospital Discharge Survey, but does not make county-discharge information available in its public-use files.

⁵ The U.S. Department of Health and Human Services develops shortage designation criteria to identify Health Professional Shortage Areas (HPSA).

available from the Kaiser Family Foundation, an independent non-profit organization based in California. The data are typically denoted as (primary care) physicians/dentists per 100,000 population, and are available for each state. The ratio of population served to the current population becomes an estimate of the local purchase coefficient. The accuracy of this estimate naturally rests on the assumption that local professional care is at full capacity. This may be a likely scenario in many rural areas of the country where health care shortages exist.

Personal Care Expenditures

Personal care spending represents a variety of goods and services purchased to meet some medical need, and includes durable goods, such as crutches and eyewear; and non-durables, such as prescription and over-the-counter drugs, syringes, bandages, and other medical supplies that may not be otherwise classified. Estimating a local purchase coefficient for the entire sub-sector in aggregate may seem a daunting task, yet with only a few assumptions is easily accomplished. The approach is based on one of the oldest tools in regional economics: trade area analysis.

Trade area capture analysis provides an estimate of the number of the customers attracted to an area. The only force causing a variation in spending patterns is income (Hustedde et al., 1984). The result, which assumes that people buy goods and services at the same rate as the state per-capita average, is an estimate of the number of customer equivalents (1).

$$TAC = RETAIL_{local} \div [(RETAIL_{state\ per\ capita}) \times (PCI_{local} \div PCI_{state})] \quad (2)$$

Where:

- TAC = trade area capture
- RETAIL = sales in the drug store sector
- PCI = per-capita income

The LPC for Personal Care Spending sector is estimated by dividing the TAC by the resident population. If TAC is less than the resident population, then the sector is not capturing the retail sales of the residents, an indication of market leakage as residents make purchases outside the community⁶.

⁶ It can also be caused by local residents spending less than the statewide average.

Conclusion

A common practice for many analysts has been to use a standard set of LPCs when estimating local spending for healthcare. In this paper a new methodology is introduced for estimating local purchase coefficients for health care spending.

The LPC for hospital expenditures is based on hospital discharge data. The LPCs for doctors and dentists are based on a state-level or federally mandated benchmarks. The LPC for personal care spending is based on trade area capture analysis. Local purchase coefficients should naturally vary from county-to-county, depending upon the population, income, health migration patterns, and number of providers in each study area.

What remains is to provide a consistent interpretation of the estimates obtained with these new methods. The estimates described here have, in more than one instance, been referred to as *potential spending* because the actual amount of spending could be greater than or less than this value depending on the type, size and quality of local providers (Berry *et al.*, 2001). As was previously discussed, it is a matter of debate whether accurate estimates (potential or otherwise) can be obtained with a vague set of LPCs.

The methods described in this paper account for the type and number of providers. Therefore, the estimates obtained with these methods represent *current spending*. The methods vary slightly depending on the health sub-sector, and naturally each LPC has its own set of limitations, but the aggregate estimate represents total expenditures in the local healthcare sector.

One issue worth considering is what to do with a local purchase coefficient greater than unity. It is possible to have LPCs greater than 100%, especially for the professional and personal care spending groups. Interpretation depends on how these are treated: if nominal values are used, then the spending estimate represents the sum of local and non-local expenditures; if the LPC is capped at unity, then non-local spending is discounted, and the estimate represents only local expenditures. The method described for estimating the hospital sector LPC implicitly has an upper bound of 100%, so some care may be necessary to insure a consistent interpretation of results.

The current practice of using a standard set of LPCs is seriously flawed. It is hoped that the methods described here will improve the accuracy of local health spending estimates by replacing a standard set of estimates with a standardized methodology for estimating LPCs. Local purchase coefficients are particularly revealing, because they help identify where dollars are leaking out of the local economy. Increasing the percentage of local purchases necessarily improves the economy, as well as quality-of-life issues related to healthcare.

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