
State Health Expenditure Accounts: Purposes, Priorities, and Procedures

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This article reports on the State Health Expenditure Account (SHEA) project which developed procedures States can use in tracking their health care expenditures. The purposes, priorities, and concepts of SHEAs were designed to meet the needs of State policymakers. The resulting methods are discussed and illustrated using calculations of SHEAs for California. Contrasts with the National Health Expenditure (NHE) framework are provided. Recommendations for cooperation between the Health Care Financing Administration (HCFA) and the States that would facilitate the adoption and estimation of SHEAs are offered. Details of the methods used for the California estimates can be found in the Technical Note of this article.

INTRODUCTION

Over the last 25 years the Federal Government has carefully developed a system of national health spending accounts that are estimated annually and are used widely. Periodically, HCFA expands this effort to produce estimates for each State using the NHE framework, most recently during the 1993-1994 debate about health care reform and its potential effects on individual States (Levit et al., 1993). For many States, these estimates are the only comprehensive picture of their health care spending and are invaluable. However, the account framework that meets the needs of

national policymakers does not always provide information most suited to the needs and priorities of State policymakers. Therefore, we carried out a study—known as the SHEA project—to develop procedures for States to use in tracking their health care expenditures that were designed around the specific policy needs of the States. This project was part of the technical assistance to States provided under the RWJF State Initiatives in Health Care Reform program (Robert Wood Johnson Foundation, 1996). This article describes the framework and methodology developed under this project, the experiences of eight States that produced health accounts as part of the project, and the lessons we learned from these State experiences.

PURPOSES OF THE SHEA PROJECT

- The SHEA project had several purposes:
- To identify the information needs of State policymakers that can be served by the accounts, and to prioritize them.
 - To develop operational concepts and estimating approaches consistent with these information needs.
 - To assist several participating States in estimating their own SHEAs under a common methodology.
 - To produce and disseminate materials describing the outcomes of this process to all States.

In achieving these purposes, we were guided by several objectives. Foremost among our objectives was to develop methods that will generate information that

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can be used by State policymakers. A second objective was to produce consistent estimates from State to State, so the levels and growth rates of spending can be compared among States. Moreover, we sought to provide methods that are sufficiently flexible to permit comparability with the national accounts as well as special estimates that only may be of concern to an individual State. Finally, if the methods produced by this project are to be used year in and year out, they must be realistic in their requirements on States' resources. To do so, they must recognize both staffing constraints and the varied circumstances across States in current data availability and in the environment for expanded data collection in the future.

The first phase of the project involved a 1994 meeting with representatives from six States and selected national experts to discuss the different policy objectives that SHEA might address and to develop the framework and concepts to serve those needs. The discussion and conclusions from that meeting are described in the following two sections of this article.

During the second phase of the project, (1995-1996) we developed a set of estimation principles and illustrations (described later) to guide States in producing their own SHEA. To illustrate the measurement of the accounts, we constructed a SHEA for California for the year 1994 using the definitions and concepts adopted for this project. A detailed set of worksheets (available upon request from the authors) shows the steps in producing the California SHEA.

Several States participated in this SHEA project by producing SHEA estimates using data from their own States. We report later on their experiences and problems, and conclude with recommendations for States undertaking similar efforts. We also offer some suggestions about ways HCFA might facilitate State efforts.

WHY DO STATES NEED HEALTH SPENDING ACCOUNTS?

A health expenditure account is a way of summarizing information for policymakers about activities in the health care sector. A health account can provide information to meet four general needs: (1) to monitor the health system, (2) to evaluate the effects of past policy changes, (3) to contain rising health care costs, and (4) to design policy proposals for the future.

The appropriate health account framework—i.e., how data are aggregated and summarized and the units of measure—will vary depending upon the specific policy question. Therefore, the first goal of the project was to identify the priorities of State policymakers in order to develop a framework that would serve the most important data needs. Some of the key policy questions raised in the first phase of the project are summarized next.

Monitoring the Health System

Health accounts provide policymakers with information to monitor the magnitude of the health sector and to assess the importance of various components. What reader of this article has not heard the following questions, or variants of them, asked by State legislators and key policymakers from States: How much was spent in total on health care in our State last year? How much of total State health spending is supported by employers and how much by government funds; do these respective shares vary by the type of health service?

Raised as frequently as questions about the level of spending are questions about changes in spending over time—that is, information about trends. Information on trends can signal progress in improving access to needed services, or it can provide

early warning of problems in containing costs. What was the percentage growth in total health spending in our State last year, and how did it compare with that of neighboring States and of the Nation? How fast are families' out-of-pocket costs for health care rising?

State policymakers attending our planning meeting emphasized a special need for information that would permit States to monitor how their private insurance markets are changing. Several aspects were mentioned, including the role of self-insured employers; cost and premium growth; and shifting responsibility for payment to individuals, both through larger shares of premiums and increased cost sharing. In addition, they voiced a need for information to measure how fast the delivery system is changing under managed care and the implications for changing types of care and costs.

Evaluating the Effects of Past Policy Changes

Once estimates have been made for several years, the information from the SHEAs can be one source for evaluating the effects of past policies. The following evaluation questions are illustrative: As a measure of the success of our relatively competitive, market-oriented health care delivery system, how does the per capita health care spending in our State compare with that of other States and the Nation? How has the mix of inpatient and outpatient spending changed as the role of managed care has increased in this State?

Cost Containment

States trying to contain rising health care costs can also use the information from their SHEA for this purpose. For example, many States have had programs

to set hospital payments. Often they have created special information systems to monitor costs under their programs; a SHEA could, in principle, provide the same type of information. The advantage of a SHEA is that it not only measures the services being regulated, but it also permits measurement of related services, to which there could be spillover spending in response to the regulation. During the current decade, some States have passed legislation calling for State health expenditure targets or growth targets. SHEA can provide information needed to establish and monitor these targets; they have been used by a few States for this purpose.

Designing Policy Proposals for the Future

Analysis of proposed legislation generally involves the preparation of cost and impact estimates, usually for some legislatively relevant future time period. SHEA estimates can be helpful in this function, both in providing baseline measures of current activity and in providing trend data for forecasting to later years. For example, in order to estimate the additional premiums that would be received by our State-subsidized insurance program, what is the per capita cost under typical private insurance plans? What is the current growth rate of total health spending and what would be the cumulative savings by the year 2000 if we reduced that rate of growth by an additional 1 percentage point each year over this period?

SHEA CONCEPTS

The account framework that was selected for the SHEA project is illustrated in the Technical Note (Table A). State governments have limited resources which must be divided among many competing health-

related activities, and so the development and estimation of SHEA will receive limited funding in any year. As a result, States will not be able to cover all their SHEA needs in the first year that they are measured and States must rank their priorities.¹ Participants in the SHEA project emphasized the development of personal health spending accounts for the major services that are usually covered by insurance: hospital, physician, other professional services, and prescription drugs. The accounts would show the flow of funds from all payers for these services. The accounts should be resident-based, defined by service type, and based on payments as the primary unit.

Thus, like the NHE framework, the State accounts are a matrix of services by payers and they measure payment flows. However, they differ from HCFA's accounts in several ways:²

- *Scope*—Only the major acute-care categories (hospital, physician, other professional services, and prescription drugs) are included in the “first generation” accounts.
- *Dimensions*—The accounts include more service and payer categories than the NHE. They include separate accounts for inpatient and outpatient hospital care, and inpatient and outpatient physician care. Private insurance plan categories include: fully insured, self-insured, State and local employees, and medigap and other individual plans.
- *Service Category*—The State accounts are based on service, not provider, category.
- *Resident-Based*—The State accounts are based on medical goods and services

¹ All States viewed this framework as the “first generation” of accounts produced by States and would expand it to cover other services in the future.

² While the SHEA employ some different concepts than the NHE, State health policy analysts also want to compare their account data with the State data produced by HCFA. Consequently, all agreed that the estimation would also require a cross-walk between the SHEA concepts and the NHE concepts.

consumed by State residents, rather than all care delivered in the State.

- *Public Health*—Direct delivery of care is included in the appropriate personal health service account. Other public health activities not related to delivery of personal care are excluded from the “first generation” of State accounts.

Next we summarize questions posed to State representatives participating in the SHEA project about the key concepts that define the scope and measurement of the SHEA and their recommendations that led to this framework.

Definitions and Scope

A key issue in establishing the accounting framework is defining the scope of health care expenditures and defining what is meant by State expenditure. What services should be measured? Should the State accounts include all or a subset of the personal care services that are part of the NHE? Are there expenditures other than those to health care providers represented in the NHE that should be included in State accounts—for example, nutrition services for pregnant women or custodial care for the chronically ill? Should the State accounts include public health activity, administrative costs, capital, and research?

State representatives agreed that priority be given to measuring the personal health care services routinely covered by private insurance, especially the major components of hospital, physician, and prescription drug spending. Expanding the accounts to measure spending for long-term care (LTC), other services, capital, and research could come later. However, including information about administrative costs was viewed as important in order to have a complete picture of the financing of health care services. In addition, some reforms are aimed at reducing administrative costs (such as

pooled purchasing arrangements to make insurance more affordable) and so monitoring administrative costs over time is important in evaluating any savings resulting from these arrangements.

How are interstate flows of expenditures for health care treated in the State health account? There are at least three ways that State expenditures might be defined: (1) they might include expenditures for all care delivered by providers located in the State, whether to residents or to non-residents, (2) they might cover all care received by residents of the State, regardless of where the care was delivered, and (3) they might allocate expenditures to a State based on the location of the insurer or employer. Each approach has utility for State health expenditure monitoring and policy. For States that have adopted some form of ratesetting system, a provider-based expenditure account represents the health care services that are affected by that policy and provides information for monitoring its effects. Most State reforms are intended to improve access to care and make it more affordable to State residents, calling for a patient-based account. Many insurance market reforms and insurance regulations affect the cost and characteristics of insurance, much of which is financed by employers, with consequences for health spending in the State. Thus, a system based on the location of insurers and employers is useful for understanding the effects of these reforms. Participants in the SHEA project were interested in all of these concepts, but attached highest priority to monitoring per capita health expenditure trends and so measuring all expenditures for care received by State residents.

Dimensions

How should expenditures be categorized? The NHE classifies spending by payer and service. Other classification

dimensions might also be used in this framework. Classifying expenditures according to the age or income of the patient might be useful for monitoring access among certain population groups or evaluating reforms to expand access. Classifying expenditures by type of delivery system—for example, fee-for-service (FFS) system, managed care system, public health system—might be useful for monitoring and understanding the evolving delivery system. Information on expenditures by type of treatment (for example, preventive services, mental health services, maternal and infant health care, and chronic conditions) or by type of procedure (for example, evaluation and management services, surgical services, radiology services, and pathology and laboratory services) might be useful for monitoring changes in the practice of care. Data on how expenditures vary across different areas of a State might help to identify problems of geographic access and might be essential for monitoring area expenditures in States that are promoting substate purchasing pools.

There was consensus among the project participants that information about the flow of funds from payers to services was the highest State priority. However, greater detail than is provided by the NHE, especially about private payers, is highly desirable. States all perceive a need for more information to monitor changes in the private insurance sector such as shifts between self-insured and fully insured employer coverage, and shifts from FFS to managed care coverage.

Some greater detail on the service categorization—especially distinguishing inpatient and outpatient hospital and physician services—was also a priority. Furthermore, States recommended that the accounts measure spending according to the service concept rather than the

provider or establishment concept used in the NHE. Thus, drugs dispensed in hospitals and physician offices would be a part of the prescription drug account. Services delivered by salaried hospital physicians would be included in the physician account. State health analysts are particularly concerned about using the Standard Industrial Classification establishment categories to define service categories when health maintenance organizations (HMOs), networks, and integrated delivery systems produce a full array of medical services. States also recommended that direct delivery of services in the public health system be allocated to the corresponding service category, rather than be included with other, non-patient care public health sector activities.

The service categories in the SHEA framework are defined as follows:

- *Hospital*—Room and board and related ancillary services for outpatient care and acute inpatient care. This includes payments for use of facilities such as the operating room and emergency room and payments for nursing services, laboratory services, food services, and other personnel services related to the use of the facilities. It does not include payment for services of physicians and other health practitioners such as physical therapists and speech therapists, nor does it include pharmacy charges. This account also excludes payments for LTC services provided in a hospital.
- *Physician*—Includes payments for services provided in physician offices or clinics (including public clinics), payments for private physician procedures and visits to hospitalized patients, and payments for services of physicians working under salary to a hospital. It also includes payments to independent laboratories. It does not include payments for drugs dispensed in offices or clinics.
- *Other Professional Services*—Includes services provided in the offices and clinics of chiropractors, optometrists,³ podiatrists, and offices and clinics of other health practitioners such as physical and speech therapists. It also includes care provided in kidney dialysis centers and other specialty outpatient facilities such as drug treatment centers.
- *Prescription Drugs*—Includes retail sales of prescription drugs in community pharmacies, in HMO pharmacies, in grocery store pharmacies, and mail order establishments. It also includes prescription drugs provided to patients by hospitals, LTC facilities, and by physicians in their offices.

Units of Measurement

What measurement unit or units are needed—payments, costs, quantities of service, prices, numbers of people? The NHE measures revenues or receipts, reflecting payments for services delivered. Measuring payments, however, may not reflect the resource cost of health care. For example, private insurers typically pay most or all of a provider's charge, which generally will exceed the average cost of providing the care. On the other hand, it is commonly accepted that some government programs reimburse providers an amount that falls short of the full cost of services delivered. Therefore, accounts measured in both payment and cost units can provide information about cost shifting among payers.

In addition to dollar units of measurement, measuring the accounts in quantities of services and unit prices of services may help in factoring the sources of expenditure trends. Quantifying the number of people receiving health care services and the source of their financing provide indicators to monitor access to care.

³ Payments for eyeglasses are not included in this account.

Many participants wanted better data for measuring cost shifting. In addition, they wanted information to monitor changes in private health insurance premiums and shifts in the mix of premium payments, cost-sharing payments, and uncovered service payments falling on private sector patients. However, all agreed that the primary goal is to develop State health accounts to measure payment flows. The unit of measure for the SHEAs is, therefore, payment for services made by the patient, on behalf of a patient by a third-party, or Government transfers to cover patient services (such as tax appropriations to public hospitals). We measure flows of payments in a year, rather than payment obligations incurred because of the services actually delivered in a year. Our accounts measure the flow of funds during a calendar year (CY).

Other State Priorities

State health officials also gave priority to some information that is not reflected in the service-by-payer framework adopted for the SHEA. For example, they would like to know how many dollars of health services are managed and how many are not. Administrative costs were also accorded high priority. While it would be possible to incorporate some of these concepts into the basic table, it would add to the complexity of the estimate and States do not need all of the detail that would result. Therefore, States agreed they would accomplish this objective, and other similar ones, by measuring separate tables or breakouts of account data. These are often called “sidebars.”⁴

Among the most important sidebar tables, States enumerated the following:

- Private insurance by type of managed care. The growth of managed care is of interest to health policy analysts, particularly those in States that are encouraging managed care.

- Administrative costs by type of payer. State policies are sometimes directed toward reducing administrative costs. Information on administrative costs by size of firm, for example, would be useful in examining the effects of health insurance purchasing pools.

- Privately insured spending including premiums, cost sharing, and uncovered services. State policy analysts are interested in the effects of cost sharing on incentives.

The framework that we adopted for this project was selected to meet the most pressing data needs faced by State analysts and policymakers. Over the longer term, however, most States would like to expand their account estimates to include all health service categories. In other words, they would include nursing care, home health care, dental services, medical non-durables, and other minor services and products in the State accounts. Many States would like their measurement efforts to answer a number of other important policy questions. These include:

- Geographical detail, especially details by substate planning regions or health alliance areas, would be useful for analysis of health reform.
- Subpopulation information, especially by age, would be highly desirable for analysis of family policies.
- Capital and research spending accounts would be useful when analyzing an industry that is driven by medical technology.
- Public health spending, other than that for personal services, is needed to analyze public health programs.
- Units of analysis such as costs, prices, and premiums also would be useful to policymakers. For example, costs of covering the uninsured does not fit into the

⁴ One example of a sidebar is the breakout of NHE by business, government, and consumer as sources, published by HCFA (Levit and Cowan, 1990; Cowan and Braden, 1997).

payment concepts embedded in the State spending accounts that we have proposed in the short and intermediate run.

These, however, represent goals for the next generation of accounts and were not part of this project.

ESTIMATION

Estimation Overview

This section outlines some general principles in our development of a common estimation approach for SHEAs for all States. A Technical Note provides more specifics of the estimation which is intended to serve as a guidebook to States that wish to produce their own accounts.

Differing State Databases and Resources

State databases and resources for estimating SHEAs differ. Some States will have limited state-specific data resources to draw on to estimate their SHEAs. Other States have the authority and resources to undertake special data collection to support the construction of SHEAs. A common methodology needs to account for this diversity. Therefore, our focus is on developing a common set of definitions and estimation techniques. We do not wish to constrain all States to use the same databases in producing the SHEA estimates. Each State should apply the definitions and techniques to the best data that are available on spending in their State.

Estimates, Not Audited Accounts

SHEAs are estimates, not audited accounts. Typically, there is no single source available to provide a measure for any cell in the matrix shown in the Technical Note according to the concepts and definitions given. Nor are there often

data sources that provide a measure for a column or row total using our SHEA concepts. However, the definitions and concepts that we have adopted are those that policymakers indicated are most useful to them. Therefore, our SHEA methods use data collected according to definitions that differ from our concepts, and adjust or convert these quantities into estimates of the concepts that we wish to measure. Moreover, entries for the SHEA matrix often have to be estimated because of time lags in data availability; cell values may have to be estimated based on data from periods earlier than the year for which the SHEA is prepared.

Multiple Data Sources Are Better

Multiple sources of data provide better estimates. We can reduce estimation errors if we use more than one source of data to estimate any SHEA concept. The adjustments to data that we make to match our estimating concepts rely on some assumptions. The assumptions depend upon what information we can find to use as the basis for making these adjustments. For example, we might assume that the share of hospital spending that is for inpatient services in a particular State is the same in all States if the only information that we have on this mix is a national aggregate. If we have information upon how this mix varies depending on characteristics of the population, we can use an adjustment factor that is based on the demographic composition of the population in the State. But these assumptions and adjustments mean that any data source will estimate a SHEA quantity with some error. If we use more than one data source to estimate each concept and reconcile the different estimates, we can reduce our estimation errors. Where possible, therefore, we use multiple approaches to estimating.

Periodic Updates and Revisions

SHEA estimates are updated and revised periodically. Constructing the SHEAs for a particular year is not a one-time process, rather the estimates are initially constructed with the best data and methods available at the time and revised as improved data and methods emerge. For example, typically policymakers will want estimates of SHEA for the immediately preceding year, whereas many data sources pertaining to that same time period will become available only with much longer lags. To construct last year's accounts, therefore, analysts will have to rely on data from earlier years and project estimates from an earlier year to the estimation time period. However, as data pertaining to last year become available, the accounts for last year will be revised to incorporate the improved information. Similarly, over time new information about some of the assumptions used to translate observed data into SHEA concepts may come available. This new information will be incorporated into future SHEA estimates. But it should also be used to revise earlier SHEA estimates so trends are not distorted by methods changes.

California SHEA

Our final SHEA for California for 1994 is shown in Table 1. In Table 2, the estimates of service payments for California using the SHEA concepts are contrasted with the estimates based on the NHE concepts. Using the SHEA concepts, total payments for hospital care, physicians and other professional services, and prescription drugs totaled \$69.1 billion in 1994—about 9 percent lower than the estimate derived using NHE measurement concepts. The lower SHEA estimate is due primarily to removing payments

to hospitals that are for LTC and home health services from the hospital account.

The different concepts produce a different picture of the distribution of expenditures among services. Using the NHE concepts, hospital expenditures account for 51 percent of the total and physician services for 36 percent. In contrast, using the SHEA concepts, physician expenditures constitute 42 percent of the total and hospital expenditures make up only 38 percent of the total. This occurs in part because we eliminate payments for LTC and home health services from the hospital account under the SHEA concept, thereby reducing the hospital total. In addition, the SHEA concept incorporates payments to hospital-based physician staff and staff in public health clinics and other public direct delivery settings in the physician account; in the NHE the former are part of the physician account and the latter are not included in the personal health services account. The SHEA concepts also show that expenditures for prescription drugs represent a much higher share of total spending (about 11 percent) than reflected in the NHE accounts (6.5 percent). This difference reflects the incorporation of hospital pharmacy payments in the prescription drug account in the SHEA as compared with its incorporation in the hospital account in the NHE accounts.

STATE EXPERIENCES AND LESSONS LEARNED

Variety of State Experiences

Eight States (Alaska, Colorado, Florida, Minnesota, New Mexico, Oregon, Vermont, and Washington) participated in the SHEA project and produced accounts for at least 1 year. The States represented

Table 1
California Health Expenditure Accounts, Detailed Payer, by Service Estimates: 1994

| Payer Category | Total | Hospital | | Physician | | Other Professional | Prescription Drug |
|--------------------------|--------|-----------|------------------|------------------|------------|--------------------|-------------------|
| | | Inpatient | Outpatient | Inpatient | Outpatient | | |
| Amount in Billions | | | | | | | |
| Total Service | \$69.1 | \$19.8 | \$6.4 | \$6.9 | \$22.1 | \$6.3 | \$7.6 |
| Private Insurance | | | | | | | |
| Employer | | | | | | | |
| State/Local Employees | 3.0 | 0.5 | 0.3 | 0.3 | 1.1 | 0.3 | 0.4 |
| Fully Insured Private | 15.0 | 2.7 | 1.4 | 1.5 | 5.8 | 1.8 | 1.8 |
| Self-Insured Private | 9.4 | 1.7 | 0.9 | 0.9 | 3.6 | 1.1 | 1.2 |
| Individual | | | | | | | |
| Medigap | 0.8 | 0.1 | 0.1 | 0.1 | 0.3 | 0.1 | 0.1 |
| Other Individual | 3.1 | 0.6 | 0.3 | 0.3 | 1.2 | 0.4 | 0.4 |
| Government | | | | | | | |
| Federal | | | | | | | |
| Medicare | 15.1 | 6.7 | 1.5 | 1.7 | 3.9 | 0.5 | 0.7 |
| Medicaid | 5.3 | 2.7 | 0.4 | 0.4 | 0.7 | 0.4 | 0.8 |
| Other | 2.9 | 0.5 | 0.3 | 0.3 | 1.1 | 0.3 | 0.4 |
| State and Local | | | | | | | |
| Medicaid | 5.3 | 2.7 | 0.4 | 0.4 | 0.7 | 0.4 | 0.8 |
| State Direct Delivery | 0.5 | 0.1 | 0.0 ¹ | 0.0 ¹ | 0.2 | 0.1 | 0.1 |
| Other State | 2.4 | 0.4 | 0.2 | 0.2 | 0.9 | 0.3 | 0.3 |
| Local Direct Delivery | 1.1 | 0.2 | 0.1 | 0.1 | 0.4 | 0.1 | 0.1 |
| Other Local | 1.2 | 0.2 | 0.1 | 0.1 | 0.5 | 0.1 | 0.1 |
| Direct Patient Payment | 3.9 | 0.7 | 0.4 | 0.4 | 1.5 | 0.5 | 0.5 |

¹ Less than 0.05

SOURCE: Authors' calculations, based on a large number of national and California sources, 1995-1997.

Table 2
California Health Expenditure Accounts, Comparison of SHEA and NHE Concepts: 1994

| Service Category | SHEA Concept | | NHE Concept | |
|-----------------------------|---------------------|---------|---------------------|------------------|
| | Billions of Dollars | Percent | Billions of Dollars | Percent |
| Total | \$69.1 | 100.0 | \$75.9 | 100.0 |
| Hospital Expenditure | 26.2 | 38.0 | 38.3 | 50.5 |
| Inpatient | 19.8 | 28.7 | (¹) | (¹) |
| Outpatient | 6.4 | 9.3 | (¹) | (¹) |
| Physician Expenditure | 28.9 | 41.9 | 27.4 | 36.1 |
| Inpatient | 6.9 | 10.0 | (¹) | (¹) |
| Outpatient | 22.1 | 31.9 | (¹) | (¹) |
| Other Medical Professionals | 6.3 | 9.1 | 5.2 | 6.9 |
| Prescription Drugs | 7.6 | 11.0 | 4.9 | 6.5 |

¹ NHE estimates do not separate hospital and physician expenditures into their inpatient and outpatient components.

NOTES: SHEA is State health expenditure account. NHE is national health expenditure.

SOURCE: Authors' calculations, based on a large number of national and California sources, 1995-1997.

great variety in the legislative or regulatory authority and staff resources that they had available for SHEA, and in their experience in estimating health accounts. Three of the States are mandated by law to produce the accounts; in the remaining five States the

accounts are voluntary. Four of the States produced an annual SHEA estimate and report with 0.5 full-time equivalent person years or fewer, three States used about 1 person year of effort, and one State required about 1.5 person years.

The three States that are required by statute to report on State health care spending have been doing so for 2 years or more, and had initiated their efforts before this project began. One other State had also started producing health accounts annually prior to the start of this project, and has developed accounts for 2 years. One participating State produced accounts for several years as part of the SHEA project, the remaining three States produced estimates for 1 year.⁵ All but one State indicated plans to continue producing SHEA and reporting the accounts to policymakers in the future.

Not all of the States were able to adhere to the SHEA framework previously described. Because most available data are provider data rather than service data, two of the States used provider-based categories rather than adjust the reported data to the service concepts. States also encountered difficulty in obtaining the detail necessary to estimate all of the payer categories. Only four of the States produced accounts using the payer detail shown in the Technical Note. The other States did not obtain detail to separate private payers by type of policy.⁶

Barriers For States in Producing SHEAs

States are significantly hampered in their ability to produce SHEAs on an annual basis by competing priorities for limited resources and by lack of continuity in staffing. Except for States in which annual expenditure estimates are legislatively mandated, demands on staff time to address issues related to immediate prob-

lems of legislative interest often forestall producing SHEAs. SHEAs are given low priority in staffing, unless the expenditure accounts are viewed as providing specific answers to a current policy issue and interest. Therefore, States that build SHEAs into the existing programs of executive or legislative budget offices, or into health data collection and reporting programs, are likely to be most successful at maintaining SHEAs.

High staff turnover in State offices, however, is also a threat to maintaining an ongoing SHEA series—especially in States that are just beginning to monitor State spending. Lack of staff continuity compromises the comparability of data over time if much of the methodology resides with the original estimators. Full and careful documentation of data sources, estimation assumptions, and estimation procedures would help to reduce this threat, but with competing priorities for staff it is often neglected.

SHEA estimation is also hindered in some States by lack of necessary data and by the lack of well-defined methodologies for estimating certain elements of the matrix. In some States, the national databases used in our California illustration were not readily available to the State analysts. In other States, data problems were encountered because of poor linkages among different State agencies in information systems.

State analysts involved in producing SHEAs also lacked the time and sometimes the knowledge or expertise to develop new methodologies for estimating concepts for which data and estimation techniques are not well developed. The most significant methodological problems encountered involved estimating self-insured group payments, estimating out-of-pocket payments, and reconciling disparate estimates. The first two problems relate to data gaps. Because the States do

⁵ One State was unable to produce a full account, but instead produced estimates for selected service and payer categories.

⁶ Several of the States also did not categorize public spending according to the framework. This, however, reflected primarily the States' practice in preparing earlier health accounts rather than a lack of data.

not regulate self-insured group plans, they do not have data on payments for services by these plans. Few States have data on consumer out-of-pocket payments for health care, unless they conduct surveys of the population or of physicians. The third large methodological problem—reconciling disparate estimates—is one that requires detailed information about the different data sources and their strengths and weaknesses. Acquiring this information is a time-consuming task that involves detailed institutional knowledge—time and information that are often unavailable to the SHEA estimator.

Recommendations for SHEAs

We believe the future of SHEAs and their utility to States would be maximized if HCFA and the States forge a cooperative effort for the future. Data, methodological expertise, and experience in estimating payments to providers in each State is vested in the National Accounts Team at HCFA. The HCFA estimates produce a consistent series for each State which are comparable over time and place. The HCFA National Accounts Team has constructed and is updating the border-crossing adjustments to permit estimates of residence-based spending for each State, which was a State priority. Although the HCFA accounts do not correspond to the service concept that State policymakers advocated, based on our subsequent work with States we believe that the provider concept suits most of the State needs. Adjusting to the service concept, we believe, is of lower priority to States than having timely information that is consistent and comparable across States.

Therefore, we recommend that HCFA produce timely, annual State estimates of payments to providers by provider category

for each State. For many States, the HCFA estimates—if produced annually—can substitute for State effort to estimate provider payments. Other States will continue to make their own estimates, either because they are legally mandated to do so or because their legislators are not willing to make State policy on the basis of national data (Frank and Kivlahan, 1997). The HCFA estimates, in these cases, serve as a useful benchmark. Moreover, some of these States have undertaken special data efforts to improve their estimates. For example, Vermont conducts surveys of special health professions to produce their SHEA; Minnesota conducts annual surveys of group purchasers and health care providers, as well as analyses of hospital revenue and expense reports. Sharing of such information between the States and HCFA may assist HCFA in future refinements of methods.

We recommend that the States—especially those that are just launching efforts to estimate SHEAs—focus on estimating the distribution of payments by payer category. HCFA has not historically produced complete payer distributions at a State level. Furthermore, States have better access to state-specific data to make these estimates than does HCFA. In particular, States will typically have better information about private insurer payments in their State from the State regulatory authorities and detailed information about State and local payments for health care. In addition, some States have designed new data collection procedures to produce information about private insurance payments. For example, Vermont designed a supplement to the insurance company annual statements to provide detail needed for SHEA. The Minnesota Department of Health conducts an annual survey of all State-regulated insurance companies that do business

in the State to collect data for spending estimates by payer and provider category. These are the kind of efforts that HCFA is unable to undertake.

Nonetheless, there are several ways that HCFA can assist States in producing the payer expenditure distributions. First, they can provide States with annual State estimates of payments by Medicare, Medicaid, and other Federal programs standardized to the health account concepts. Second, they can publish State estimates of aggregate self-insured and fully-insured group premium payments from the National Employer Health Insurance Survey and the Medical Expenditure Panel Survey Insurance Component. The data on the relative size of the self-insured market would help States estimate the self-insured plan component of the payer distribution, which we noted previously was one of the significant data gaps identified by our participating States.

The proposed information sharing would be greatly facilitated if HCFA were to provide and maintain a dedicated SHEA site on the World Wide Web. HCFA should use the site to update its State estimates and to provide other data, such as selected payer information and border-crossing parameters. If States were permitted to post their SHEA reports on this site, communication among them would be greatly facilitated. States have difficulty knowing which of their counterparts are making estimates, let alone knowing when the next set has been made available.

In sum, we recommend a cooperative effort in which HCFA produces a distribution of State health expenditure payments by provider and the State produces a distribution of State health expenditure payments by payer. This will result in two independent estimates of total spending; discrepancies will occur and require study and reconciliation. However, the process

of sharing information and reconciliation will help improve methodologies both at HCFA and within the States. This effort can provide a model for Federal and State cooperation in developing data systems and serving State data needs.

TECHNICAL NOTE

ESTIMATING SHEAs—THE BASE CASE

In this Technical Note, we discuss the steps to construct a SHEA estimate for a State. Our example uses national databases and data sources that are available to most States. Most States will use some or all of these data sources in constructing their SHEAs. Some States will have other state-specific databases to replace or supplement the data sources and estimates that we describe here. Thus, our example may be thought of as a base case.

We illustrate the construction of SHEAs by example. We constructed accounts for the CY 1994 for the State of California. A detailed step-by-step guide to the estimation process is given in a set of worksheets (available upon request from the authors). The worksheets show each calculation that we made to produce an entry in the SHEA matrix from the original data source. Following our estimation principles, many of the cell entries are estimated using multiple sources of data. The worksheets illustrate how these multiple sources were reconciled and combined to produce the final SHEAs for California.

Our discussion describes the generic steps to produce estimates of the SHEA concepts, drawing on selected illustrations from the worksheets. It focuses on estimating the matrix following the SHEA concepts. It also provides procedures for estimating the flow of funds matrix corresponding to the NHE concepts—specifically,

ly, provider-based measurement. The worksheets detail the calculation of NHE concepts as well as the SHEA concepts and present illustrations for California. However, it is important to note that this is not a replication of the State estimates that HCFA produces. It is an estimate corresponding to the NHE concepts using state-specific data. Our estimation strategies do not always match the HCFA approaches and so our estimates will diverge from those published by HCFA. For example, HCFA scales all State estimates to the national account totals, which is not a step that we or any particular State are likely to undertake. In addition, we have drawn on some databases that HCFA does not use in producing estimates (such as State hospital discharge data).

Getting Started

The first step is to choose the estimating year. Obviously there is a trade-off between the timeliness of the estimates and the accuracy of the estimates. Policymakers will want information about the most recent year.⁷ However, because of lags in data availability, this will typically necessitate using data from earlier years and projecting to the estimation year. For our example, we have chosen to estimate the California accounts for calendar year 1994 using data from the 1991-1994 period.⁸ Projections are more reliable when the health system and its components are only changing slowly. When rapid changes are

⁷ We assume that States will want to estimate accounts annually and for a full year. Data are lacking to make more frequent (e.g., quarterly) estimates. In addition, trends over shorter time periods are less reliable indicators of change than annual trends.

⁸ Most of our service data come from 1991 and 1992 while most of our payer data come from 1993 and 1994. In combining these, we assume that changes in the payer distribution that occurred from the 1991-1992 to the 1993-1994 study period did not affect the distribution of spending among services.

occurring that might affect total spending and its distribution—for example, a rapid shift to managed care plans—it becomes more important to base estimates on data that are concurrent with the study period.

Databases

The primary sources of data that we used in our estimation of the California SHEA project are listed in Table 3. In addition to these databases, there are a variety of national databases that we used to develop operators to adjust measured quantities to match our SHEA concepts. For example, we used data from the 1993 Service Annual Survey (United States Bureau of the Census, 1995) to estimate the share of physician spending that is for inpatient services nationally in order to allocate total California physician payments between inpatient and outpatient settings. As a second example, we developed trend models to project payments by service in earlier years to our estimation year based on changes in prices, population, and other State characteristics using historical data from all States.

Measuring the SHEA Concepts

The databases available to us do not provide direct measures of the quantities in our SHEA matrix. The databases and the matrix concepts may differ in several ways: the time period covered, the definition of services included, the scope of who is counted in the measure; the unit of measurement, and the estimation year. We discuss some of the strategies that we adopted for adjusting for these differences with reference to the example in the worksheets.

Table 3
Data Sources for California State Health Expenditure Accounts: 1994

| Database | Source | Data Form | Release Date | Data Year | Cost | Contact |
|---|--|---|------------------------------|---------------------------------------|--|--|
| AHA Annual Survey of Hospitals | AHA | Diskette | 01/01/96 | 1994 | \$6,500 | Order Department 800-242-2626 |
| Census of Service Industries, Geographic Area Series State Level Data | U.S. Bureau of the Census | Print (Each State) CD-Rom Disk 1F ¹ (All States) World Wide Web | Available Available | 1992 1992 | \$3.75-\$15 \$150 | Customer Services 301-457-4100 |
| Census of Retail Trade Geographic Area Series State Level Data | U.S. Bureau of the Census | Print (Each State) CD-Rom Disk 1G ¹ World Wide Web | Available Early 1996 | 1992 1992 | \$5-\$15 \$150 | Customer Services 301-457-4100 |
| Current Population Survey, March Interview | U.S. Bureau of the Census | Tape CD-Rom | September Each Year | Annual | \$250-\$300 \$150 | Customer Services 301-457-4100 |
| HCFA Annual Medicare and Medicaid Statistical Supplement | HCFA | Print | January 1996 January 1995 | 1994 1993 | \$29 (Annual Subscription to Health Care Financing Review) | Superintendent of Documents FAX: 202-512-2250 |
| Medicare Cost Reports | HCFA | Tape or Cartridge | Annual | Fiscal Years 10/1/93 to 9/30/94 | \$715 | HCFA Office of Information Services 410-786-0173 |
| Internal Revenue Service Business Master File | HCFA | Print | Available | 1993 Tax Year | None | (2) |
| National Employer Health Insurance Survey | National Center for Health Statistics | (3) | 1996 | 1993 | (3) | (3) |
| State Border-Crossing Index | HCFA | Print | 1996 | — | None | (2) |
| Medicaid Form 64s | State | — | — | — | — | — |
| State Hospital Discharge Data | State | — | — | — | — | — |
| State Hospital Cost Reporting System | State | — | — | — | — | — |

¹ Each disk contains both Census of Service Industries and Census of Retail Trade, but disk 1F does not include merchandise line sales from Census of Retail Trade.
² HCFA has agreed to make State information available.

³ Public use files not yet available. Contact the National Center for Health Statistics on availability and for special tabulations.

NOTES: AHA is American Hospital Association. HCFA is Health Care Financing Administration.

SOURCE: Compiled by the authors, 1995-1997.

Adjusting for Missing Data

The data sources may be missing some critical variables for some of the observations. For example, the California Hospital Discharge Data is missing charge information for some discharges, and we base one estimate of hospital payments on the charge variable from these data. The first step was to adjust or impute for this missing data, otherwise a simple sum of observed charges would have understated aggregate hospital charges. Missing data was not a significant problem in the datasets used in our example, and so we adopted simple assumptions in imputing (such as average charges per day for hospital stays that were missing charges are the same as average per day charges for the observed data). We do not discuss imputing for missing data in detail here nor in the worksheets because the strategies will depend upon the amount of missing data, the data source, and what other information is available to use for imputation.

Adjusting to CY

Not all of the databases provide measures on a CY basis. Some (for example the Medicare Cost Reports and the Medicaid Form 64s) refer to the federal fiscal year; others (eg, the American Hospital Association (AHA) annual survey data) allow reporting units flexibility in the period of reporting. A first step in such cases is to use adjacent reporting years to adjust to a CY basis. We adopted some simple assumptions for this adjustment. We assumed that quantities are distributed uniformly over the year. Then we could determine the share of months in the CY

included in each reporting period, and combine information from adjacent years using these shares as weights.

In general, we chose to make adjustments on aggregates rather than adjust each micro-reporting unit. So, for example, we combined aggregate information from adjacent reporting years in the AHA survey using an estimate of the share of CY expenses in each AHA reporting year, rather than estimating CY expenses for each hospital and then aggregating these estimates over all hospitals.⁹

Adjusting for Scope of Coverage

The database may not cover the universe of what we wish to measure. For example, the Medicare provider payment reports in the HCFA Medicare and Medicaid Statistical Supplement do not include payments to capitated plans. Measures obtained from the State Insurance Commissioner will not include information about self-insured plans. The Census of Service Industries does not include information on payments for physician services provided in public clinics by salaried staff. Therefore, other databases or sources of information need to be used in combination with the primary database to adjust for the difference in scope. For example, we used information on Medicare enrollments in HMO plans to adjust the data we had on provider payments. We used information from the 1993 RWJF Employer Health Insurance Survey on enrollments in self-insured plans to adjust the data we obtained from various California sources on health

⁹ We compared our aggregate adjustment with the micro-adjustment strategy using survey data from both California and Montana. For both States, the two strategies produced CY estimates of expenses that differed by less than 0.5 percent.

insurance premiums.¹⁰ We gathered information from the State about salaries to physicians and other professionals providing care in the public direct delivery system to augment the data about physicians in private practice from the Internal Revenue Service and Census of Services Industries.

Adjusting for Double Counting

When multiple sources are used to measure a concept, care must be taken to avoid double counting some components. For example, revenues reported by independent laboratories are also counted as revenues to physicians when the physician bills for these services. We adjusted for this double counting using information on sources of physician revenues from the 1993 Service Annual Survey (U.S. Bureau of the Census, 1995). A number of public programs receive funding from federal, county, and State sources. In developing measures of public payer amounts, therefore, analysts need to be careful in attributing program revenues so as to avoid double counting payer amounts. As another example, data on payments to physicians and other professionals providing care in the public direct delivery system include contract payments to physicians in private practice as well as staff salaries. The former are also included in our measures of revenues of private practice providers. We required an estimate of these contract payment amounts to adjust for potential double counting of these payments.

¹⁰ States included in the 10 State 1993 RWJF Employer Survey have access to those data for the type of adjustments that we describe in the worksheet. We have used data from the 10 States or selected States as a "stand-in" for California in our example work, since the 1994 National Employer Health Insurance Survey (NEHIS) has not been released as a public use file. States that were not included in the 1993 RWJF survey may wish to contact the U.S. National Center for Health Statistics for special tabulations from NEHIS to assist them in developing their SHEAs.

Converting to the SHEA Unit of Measure

In some of the databases, the quantities measured do not correspond to our flow of payment concept. In particular, the hospital databases report charges, expenses, or costs rather than payments. We use estimates of payment-to-charge ratios, payment-to-expense ratios, and payment-to-cost ratios to convert the observed quantities to our SHEA concept.

To develop this conversion factor, we need to define what we mean by payment. For the SHEA, we have defined payment to be monies received by hospitals to compensate for services rendered to patients. Operationally, we have measured this as direct payments from patients or their third-party payers and tax appropriations. We have not included other operating revenue and non-operating revenue in our estimate of payments. While some of this revenue may be on account of patient services, some of it is payment for other service (such as gift shops and food concessions) and some of it is investment income. Note that our measurement of payment differs from the NHE measure which includes all hospital revenues.

Another quantity that forms the base for some of our estimates is premium payments. This quantity also does not correspond to our unit of measure—payment for service. Premium payments include expected service payments plus costs of administration and risk bearing. We adjust our estimate of premium payments for the costs of operation. Over the long run, on average, expected service payments and actual service payments will be equal, and so we make no additional adjustment beyond that for operating expenses.

Adjusting to the SHEA Service Concept

Most of the databases measure provider revenues. However, the SHEAs are service-oriented. All payments for physicians, including hospital staff, are included in the SHEA physician account, though some are covered in the hospital databases. All payments for drugs, including those provided to hospital inpatients and in physician offices, are included in the SHEA prescription drug account, though some are measured in the hospital and physician databases respectively. The SHEA hospital account includes acute care hospital services, but the hospital databases also measure LTC provided by the hospital.

We have adopted a variety of methods to adjust the measured quantities to our estimating concepts. We estimated the amount of hospital payroll and benefits paid to physicians to adjust the hospital and physician accounts for hospital-based physicians using state-specific data on hospital personnel and hospital payroll and national estimates of average earnings for different types of health care personnel from the U.S. Bureau of the Census Current Population Survey. We used state-specific data from Medicare Hospital Cost Reports to estimate the share of hospital costs attributed to the pharmacy to adjust the hospital and pharmacy accounts. We used data from the 1993 Service Annual Survey (U.S. Bureau of the Census, 1995) on sources of physician revenues to estimate payments for prescription drugs provided in physician offices, and we transferred this quantity to the prescription drug account. We used state-specific data on the share of hospital facility days that are for LTC to adjust the hospital account to reflect acute care services only.

A second type of adjustment that we need to make to the available data to measure the SHEA service concepts is in the detail that we provide about hospital and physician care. Both of these services are disaggregated according to whether the service is provided to inpatients or to outpatients. To accomplish this disaggregation, hospital revenues are allocated based on the share of revenues attributable to inpatients from AHA data. Physician revenues are allocated to inpatient and outpatient services using information from the 1993 Service Annual Survey (U.S. Bureau of the Census, 1995).

Projecting to the Estimating Year

Few of the available data that we had for California cover our estimating year, 1994, but rather provide a measure for some earlier year. To construct our 1994 CY account, we projected the estimates for the earlier period to estimate the 1994 payment. To do this, we developed a set of trend models to predict the change in payments in each service category depending upon the changes in medical prices, population, income, and the age of the population in the State. These prediction or trend models are based on data on spending in each State for the period 1987-1993. The State data to fit the model were obtained from HCFA from their diskette: National Health Expenditures by State and Region, 1980-1993 and from the annual Statistical Abstract prepared by the U.S. Bureau of the Census. These trend models take into account the effect of changes in the population and income levels on health care spending as well as adjust for price inflation. Occasionally, we had to assume that an unknown California growth rate was equal to the known national average growth rate.

Adjusting for Border-Crossing

As noted, most of the databases are provider oriented. Therefore, the quantities measured refer to services delivered by providers in the State to all patients they treat, whether those patients reside in the State or come from out-of-State. Moreover, these State provider databases do not provide information on services delivered to residents of the State by providers in other States. To match our SHEA concept, therefore, we need to account for this border crossing. HCFA has analyzed Medicare claims data to produce estimates of a border crossing index for each State to convert a measure of payments to providers in the State to an estimate of payments for care delivered to State residents (Basu, 1996). In applying this border-crossing index to all payments, we assume that the patterns of importing and exporting of services for the population as a whole are the same as the patterns for the Medicare population.

Order of Adjustments

Many of the adjustments that we describe in the worksheets are multiplicative. For example, we allocate hospital payments to inpatient and outpatient payments by multiplying our estimate of the total by an estimate of the ratio of outpatient revenue to total revenue. We adjust for border crossing by multiplying a measure of total payments by a border-crossing index.

When all of the adjustments are multiplicative, the order of adjustment will not matter. But the order of adjustment will make a difference when quantities are added or subtracted. For example, we adjust hospital payments to our service concept by subtracting an estimate of professional fees paid to physicians and an estimate of compensation for staff physicians. Because we assume that these

providers are paid the value of the product they produce, and that this is the flow of payment for services they provide, we subtract this estimate from our estimate of total hospital payments. Because we don't observe payments in our hospital databases, we must convert the quantities that we do measure (charges or expenses) to payments before adjusting to the service concept. It is important, therefore, to lay out the definitions and concepts in the database, compare them with the SHEA concepts, and be explicit about the assumptions in making adjustments.

Reconciling Estimates

Reconciling Estimates from Multiple Sources

Because we draw on multiple data sources for any concept whenever possible, we have differing estimates that need to be combined in some way. Reconciliation is a matter of weighting and of judgment. For example, we produced two different estimates of physician spending in California. While these estimates were reassuringly similar, we do need a single number for our matrix. Because we have roughly equal confidence in the different data sources, we took the simple average as our best estimate. That is, we gave the different estimates equal weight.

In many instances, however, there will be reasons to differentially weight disparate estimates. If an estimate from one source is viewed as more reliable or valid than an estimate from another source, the analyst will want to give a greater weight to the more reliable estimate. For example, we had greater confidence in the estimates of hospital inpatient spending produced from the California Hospital Discharge Data and the Census of Service Industries data than from the AHA survey data.

Thus, we gave a greater weight to the first two sources and a smaller weight to the survey data. Developing the appropriate weights is where professional judgment enters and requires an assessment of the quality of different data sources.

Reconciling the Matrix Entries

In addition to combining different estimates of the same concept, the process of reconciling numbers also requires that the matrix be internally consistent. For example, the sum of payments by Medicare for each type of service needs to equal the total Medicare payments row. The sum of payments by each type of payer for hospital inpatient care needs to equal the hospital inpatient column total. In general, we have much greater confidence in the row totals

and column totals that we estimate than in the individual cells. Because of this, our process of reconciling cell entries typically normalizes the distribution of payments across a column or row to equal the column total or row total (refer to worksheets).

Reconciliation within the matrix is also a kind of weighting. There are no hard and fast rules; it relies on the analyst’s detailed knowledge of the quality of the data sources.

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Table A
State Health Expenditure Account: Short-Run Framework

| Payers | Hospital | | Physician | | Other Medical Professional | Prescription Drugs |
|-----------------------|-----------|------------|-----------|------------|----------------------------|--------------------|
| | Inpatient | Outpatient | Inpatient | Outpatient | | |
| Private Insurance | | | | | | |
| Employer | | | | | | |
| Fully Insured | | | | | | |
| Self-Insured | | | | | | |
| State/Local Employees | | | | | | |
| Individual | | | | | | |
| Medigap | | | | | | |
| Other | | | | | | |
| Government | | | | | | |
| Federal | | | | | | |
| Medicare | | | | | | |
| Medicaid | | | | | | |
| Other | | | | | | |
| State | | | | | | |
| Medicaid | | | | | | |
| Direct Delivery | | | | | | |
| Other State | | | | | | |
| Other Local | | | | | | |
| Direct Patient Pay | | | | | | |

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