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National Health Accounts/ National Income and Product Accounts Reconciliation

Hospital Care and Physician Services

Arthur Sensenig and Ernest Wilcox

7.1 The Reconciliation Project

The Health Care Financing Administration (HCFA), an agency of the Department of Health and Human Services, in its National Health Accounts (NHA), and the Bureau of Economic Analysis (BEA), an agency of the Department of Commerce, in its National Income and Product Accounts (NIPA), each publish national data on expenditures for health care. These data are designed for different purposes and serve somewhat different audiences. The NHA show the interaction between health care services and funding sources and how these relationships change over time, and they also address policy issues that arise in the health care arena. The NIPA, summarized by GDP, provide an up-to-date, overall view of domestic and national production, its distribution, and its use as shown by the interrelated receipts and expenditures of producers, consumers, investors, government, and the foreign suppliers and customers of the United States. The health care estimates in the NIPA and in BEA's input-output accounts are consistent with national accounting conventions used to measure production.

In an effort to improve the consistency of these two sets of estimates, HCFA and BEA are engaged in a joint program to reconcile the health care estimates in the NHA and in the NIPA. The reconciliation project is important for several reasons. First, it will allow data users to understand the differences between the NHA and the NIPA estimates and do a rough

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The views expressed are those of the authors alone and do not represent the positions of the Health Care Financing Administration or the Bureau of Economic Analysis.

Table 7.1 **1996 National Health Accounts, 1992–96 (billions of dollars)**

	1992	1993	1994	1995	1996
National health expenditures	836.6	895.1	945.7	991.4	1,035.1
Research	14.2	14.5	15.9	16.7	17.0
Construction	13.4	14.5	14.6	14.0	14.5
Health services and supplies	809.1	866.1	915.2	960.7	1,003.6
Administration and net cost of private health insurance	45.0	53.8	58.2	60.1	60.9
Public health activity	23.4	25.3	28.5	31.5	35.5
Personal health care	740.7	787.0	828.5	869.0	907.2
Hospital care	305.3	323.0	335.7	346.7	358.5
Physician services	175.9	183.6	190.4	196.4	202.1
Dental services	37.0	38.9	41.5	44.7	47.6
Other professional care	42.1	46.3	50.3	54.3	58.0
Home health care	19.6	22.9	25.6	28.4	30.2
Nondurable medical products	71.2	75.6	79.5	84.9	91.4
Durable medical equipment	11.9	12.3	12.5	13.1	13.3
Nursing home care	62.3	66.3	70.9	75.2	78.5
Other personal health care	15.4	18.0	21.9	25.3	27.6

Source: Levit et al. 1997, table 10.

crosswalk between the two series. In this way, data users will be able to use the series most appropriate to their needs. Second, the reconciliation project will allow HCFA and BEA to improve their estimates by reviewing and discussing their estimating methodologies. Finally, the reconciliation should result in greater consistency in the presentation of the two sets of estimates.

The estimates to be reconciled are shown in table 7.1 (NHA) and in table 7.2 (NIPA). For 1996, national health expenditures amounted to $1,035.1 billion in the NHA and selected health care expenditures amounted to $1,001.1 billion in the NIPA. The reconciliation will identify conceptual and definitional differences, as well as procedural and source data differences.

This paper is a preliminary report covering the reconciliation of hospital care (sec. 7.2) and physician services (sec. 7.3). In each section, there is a presentation of the published estimates, definitions, estimating procedures, and source data for both the NHA and NIPA estimates, and a summary of the differences.

7.2 Hospital Care

As part of the NHA, HCFA publishes annual estimates of total expenditures for hospital care and has underlying detail that provides separate estimates of private hospitals, state and local government hospitals, federal hospitals, hospitals of institutions (primarily university hospitals and state prison hospitals), and hospitals in the U.S. territories and Puerto Rico.

Table 7.2 Selected NIPA Health Care Expenditures, 1992–96 (billions of dollars)

	1992	1993	1994	1995	1996
Selected NIPA health care expenditures	811.6	866.4	909.5	955.2	1,001.1
Private structures (hospitals and institutions)	12.8	13.9	13.7	12.5	13.4
Personal consumption expenditures health care	733.2	785.5	826.1	871.6	912.8
Health insurance	42.7	53.6	55.0	53.6	56.3
Hospitals	268.8	285.8	298.1	310.6	325.1
Physicians	167.2	172.5	180.0	191.4	196.5
Dentists	38.5	40.8	43.9	47.6	50.9
Other professional services	78.2	87.6	95.7	104.4	110.2
Drug preparations and sundries	75.0	78.1	81.6	85.7	90.9
Ophthalmic and orthopedic products	11.6	11.8	12.9	13.1	13.9
Nursing homes	51.2	55.3	58.9	65.2	69.1
Direct government health care expenditures	65.6	67.0	69.7	71.1	74.9
Federal government consumption expenditures and gross investment	33.5	36.0	38.9	39.3	40.7
Health and hospitals	15.2	16.4	17.8	18.2	18.3
Medicare	2.9	3.1	3.2	3.1	3.3
Veterans hospital and medical	15.4	16.5	18.0	18.0	19.0
State and local government consumption expenditures and gross investment	32.1	31.0	30.8	31.8	34.2
Health	21.5	22.6	23.9	25.7	27.6
Hospitals	10.7	8.3	6.9	6.1	6.7

Notes: Except as noted below, these estimates represent those included in GDP. They are drawn from data published in two issues of the *Survey of Current Business:* NIPA tables 5.6 (structures) and 2.4 (personal consumption expenditures) in the August 1997 issue and NIPA tables 3.16 (federal government current expenditures and gross investment) and 3.17 (state and local government current expenditures and gross investment) in the October 1997 issue.

The following health care expenditures are included in GDP but are not included in selected NIPA health care expenditures in this table because separate estimates of this detail are not used in preparing GDP component estimates: purchases of producers' durable equipment, construction of medical care facilities other than hospitals, net exports of medical services, Department of Defense health care, student health care, medical research, and administrative and fundraising expenses of philanthropic organizations related to health care.

The NIPA expenditures data shown in this table are limited to those included in GDP. Consequently, they exclude transfer payments to persons by government such as Medicare and Medicaid, and intermediate expenditures by business, such as on-site health units.

As part of the NIPA, BEA's annual estimates of total expenditures for hospital care appear within two categories: personal consumption expenditures (PCE) and government consumption expenditures. The PCE estimates cover both private and government hospitals, to the extent the latter charge for their services. The government consumption expenditures estimates cover both federal and state and local government hospitals and are

net of the receipts included in PCE. Separate detail is presented for state and local government hospitals. Detail on federal hospitals is not shown separately in the NIPA but is consolidated within other expenditure-type categories, such as military activities and veterans hospitals and medical care. For this paper, estimates have been prepared, beginning in 1993, for one unpublished category, that of federal hospitals operated by the Departments of Defense and Veterans Affairs, using the same U.S. budget data that are used to prepare the estimates of NIPA federal government consumption expenditures. Thus, a total NIPA hospital expenditures estimate is obtained by combining the published NIPA estimate of PCE for hospitals with the published and unpublished consumption expenditures for government hospitals.

7.2.1 Summary of Differences

Table 7.3 shows that overall, NHA hospital care is higher than the NIPA estimates for hospital expenditures by about $13 to $14 billion for 1993–95. The NHA estimates for private hospitals are $15 to $16 billion above the PCE estimates for private hospitals for 1993–95. The NHA estimates for state and local government hospitals are $6 to $7 billion below the corresponding NIPA estimates for 1993–95. The NHA estimates for federal hospitals are about $2 billion above the NIPA estimates for federal hospitals for 1993–95. It appears that the major sources of differences be-

Table 7.3 NHA and NIPA Hospital Expenditures, 1992–96 (billions of dollars)

	1992	1993	1994	1995	1996
NHA hospital care	305.3	323.0	335.7	346.7	358.5
Private hospitals	228.3	240.4	248.6	258.8	267.6e
State and local government hospitals	54.8	58.8	60.5	62.6	64.7e
Federal hospitals	20.7	22.0	22.7	23.2	24.1
Other[a]	1.6	1.7	1.9	2.1	2.1
NIPA hospitals	n.a.	309.8	321.3	333.6	350.0
Private hospitals	213.7	224.6	232.3	242.4	254.4
Proprietary hospitals	30.1	30.7	32.1	34.5	37.1
Nonprofit hospitals	183.6	193.9	200.2	207.9	217.3
State and local government hospitals	62.1	65.3	67.9	69.8	72.4
Federal hospitals[b]	n.a.	19.9	21.1	21.4	23.2
NHA less NIPA					
All hospitals	n.a.	13.2	14.5	13.1	8.5
Private hospitals	14.6	15.8	16.3	16.4	13.2
State and local government hospitals	−7.3	−6.4	−7.3	−7.3	−7.7
Federal hospitals	n.a.	2.1	1.6	1.9	0.9
Other	1.6	1.7	1.9	2.1	2.1

Note: e = estimate. n.a. = not available.

[a]Consists of hospitals of institutions and hospitals in U.S. territories and Puerto Rico.

[b]Consists only of hospitals operated by the Departments of Defense and Veterans Affairs.

tween NHA and NIPA estimates are the valuation of nonprofits and the treatment of nonoperating income, the treatment of secondary products, the timing of incorporation of newly available source data, and the differences in source data.

The first source of differences is conceptual, or definitional. In the NHA, the value of hospital care is a revenue measure for all types of hospitals, except those operated by the federal government, for which hospital care is measured by outlays or expenses. In the NIPA, the value of hospital care is measured by receipts for proprietary hospitals and by current operating expenditures, including consumption of fixed capital,[1] for private nonprofit and government hospitals. Furthermore, even for proprietary hospitals where both NHA and NIPA use revenue as the measure of the value of hospital care or expenditures, revenue is defined differently. NHA revenue includes nonoperating revenue (investment income, rents, gifts, contributions). Nonoperating revenue is excluded from all NIPA measures of expenditures because it is not considered to be related to the concept of current production that underlies gross domestic product.

For nonprofit and government hospitals, the NIPA use current expenditures because these hospitals are treated as nonmarket producers. As a group, they do not have enough receipts from the services they perform to cover operating expenses—in other words, they are supported, to varying degrees, by government taxes, private contributions, or investment income from endowments. To the extent that government appropriations, private contributions, or investment income, in addition to receipts, covered *only* expenses of producing hospital services, there would be no substantive difference between the NHA revenue measure and the NIPA expense measure.

The second source of differences is the coverage of services for each expenditure measure. NHA hospital expenditures consist of the revenue from hospital services, nursing home services, home health services, contract research, cafeteria sales, merchandise sales, and other services; NIPA hospital expenditures are almost entirely for the production of hospital services. Expenditures for nursing home and home health services produced in hospitals are recorded in their own categories in the NIPA.

The third source of differences is the use of different source data. The NHA uses the annual American Hospital Association (AHA) survey at the individual hospital level. The NIPA use the AHA survey at aggregate level for proprietary and nonprofit hospitals, but benchmark these data to the estimates from the quinquennial Census of Service Industries (CSI). The NIPA are currently benchmarked on the 1987 CSI; the effect of intro-

1. The services of fixed assets of nonprofit institutions are measured as the sum of consumption of fixed capital and an estimate of a net rate of return, assumed to equal the net interest paid by these institutions. For general government agencies, including government hospitals, the services of fixed assets are measured only by consumption of fixed capital.

ducing the 1992 CSI benchmark, which will be done in the next comprehensive GDP revision, is expected to increase the NIPA estimates by about $1 billion beginning with 1992. For state and local government hospitals, the NIPA estimates are from the annual Governmental Finance (GF) survey and the quinquennial Census of Governments (COG).

For federal hospitals, most of the difference is due to the exclusion from the NIPA estimates of separately identifiable estimates of consumption expenditures for hospitals operated by federal departments other than Defense and Veterans Affairs, such as the Department of the Interior, which operates the Indian Health Service hospitals. These amount to about $1 billion in the NHA estimates.

7.2.2 National Health Accounts

Since 1964, the U.S. Department of Health and Human Services has published an annual series of statistics presenting total national health expenditures during each year. The basic aim of these statistics, termed National Health Accounts (NHA), is to "identify all goods and services that can be characterized as relating to health care in the nation, and determine the amount of money used for the purchase of these goods and services . . ." (Rice, Cooper, and Gibson 1982).

The NHA constitute the framework within which estimates of spending for health care are constructed. The framework can be considered as a two-dimensional matrix; along one dimension are types of providers or services, and along the other dimension are sources of funds. The NHA recognize several types of spending. "Personal health care" comprises therapeutic goods or services rendered to treat or prevent a specific disease or condition in a specific person. "Government public health activity" involves spending to organize and deliver health services and to prevent or control health problems. "Program administration" covers spending for the cost of running various government health care programs, plus the net cost of private health insurance (the difference between premiums earned by insurers and the claims or losses for which insurers become liable). Finally, "research and construction" spending includes noncommercial biomedical research and the construction of health care facilities.

In addition to these types of expenditures, two layers of aggregation are shown. "Health services and supplies," which represents spending for care rendered during the year, is the sum of personal health care expenditures, government public health activity, and program administration. It is distinguished from research and construction expenditures, which represent an investment in the future health care system. The combined value of health services and supplies, research, and construction in the NHA is known as national health expenditures (NHE).

The NHA show how much is spent on the health of U.S. residents as measured through the revenue of health care providers, the net cost of

health insurance, outlays for public health programs (such as the Centers for Disease Control [CDC] and state health departments), and spending for research and construction. Thus, estimates shown in this report cover the United States.[2] Medical services provided by the Department of Defense to military and civilian personnel overseas are included as well. However, no attempt has been made to increase expenditures by the value of health care "imports" (care rendered to U.S. citizens by providers in foreign countries) nor to reduce expenditures by the value of "exports" (care rendered to foreign citizens by U.S. providers). The scope of the NHA is determined by the type of good, or, in the case of services, the type of establishment providing the service. Goods are classified using the product codes used by the Bureau of the Census for the Census of Manufactures. Services are selected when they are provided through establishments that fall into Standard Industrial Classification (SIC) 80 or through government operations that mimic that classification (Lazenby et al. 1992).

Definitions

In the NHA, hospital care estimates reflect spending for all services provided by hospitals to patients. These services include room and board, ancillary services such as operating room facilities, services of resident physicians, inpatient pharmacy, hospital-based nursing home care, hospital-based home health care, and any other services billed by the hospital. Expenditures for services of physicians who bill independently for patients seen in hospitals are excluded.

Scope

All hospitals in the United States are included in the scope of the NHA. Expenditures are estimated separately for community hospitals and noncommunity hospitals. Community hospitals are nonfederal acute care hospitals that are open to the general public and have an average length of stay of less than thirty days. Noncommunity hospitals include long-term hospitals, hospital units of institutions, psychiatric hospitals, hospitals for tuberculosis and other respiratory diseases, chronic disease hospitals, institutions for the mentally retarded, and alcoholism and chemical dependency hospitals. Noncommunity hospitals are further subdivided into federal and nonfederal noncommunity hospitals for estimation in the NHA. Federal hospitals comprise hospitals operated by the Department of Veterans Affairs (DVA), the Department of Defense (DOD), the Indian Health Service (IHS), the National Institutes of Health (NIH) Clinical Center, federal prison hospitals, the Hansen's Disease hospital, and the Coast Guard Academy clinic/hospital.

2. For hospitals, these estimates also cover U.S. outlying territories (the Virgin Islands, Guam, American Samoa, and the Marshall Islands) and Puerto Rico.

Valuation

The value of nonfederal hospital output is measured by total net revenue. This includes gross patient revenues (billed charges) less contractual adjustments with insurers (indicating intended receipts, not charges), bad debts, and charity care. It also includes government tax appropriations, nonpatient operating revenue (gift shop and cafeteria revenue, parking lot receipts, and educational program revenue, for example), and nonoperating revenues, such as interest income, grants, and contributions. Revenues reflect an incurred rather than a receipt accounting method. Thus, although revenue is measured in accrued terms rather than cash terms, the value is expressed as what the hospital intends or expects to receive, rather than what the hospital charged. Nonpatient revenues are included in the value of national health expenditures because hospitals take anticipated levels of these revenues into account when setting patient revenue targets or charges. Nonpatient operating revenue includes revenue from nonpatient care services to patients and sales and activities to persons other than patients. The value of federal hospital output is measured by federal outlays for the operation of those facilities.

Data Sources

Except for federal hospitals, the basic data source used to prepare the hospital estimates is the AHA Annual Survey, which is on a fiscal year[3] rather than calendar year basis and is currently available through 1995. This survey elicits information from each hospital in the United States and its outlying territories and experiences a response rate of about 90 percent (American Hospital Association 1960–95). Data for nonresponding hospitals are imputed by AHA analysts, using data reported by similar hospitals. In some cases, the AHA survey also includes estimates for separate nursing home and home health care establishments owned by hospitals.

Methodology

Hospital national health expenditure is published at the nonfederal community, nonfederal noncommunity, and federal levels. Nonfederal hospital service estimates are estimated using fiscal year AHA annual survey expenses (table 7.4) for nonfederal community hospitals and noncommunity hospitals (which can be aggregated to private nonprofit, for-profit, and state and local government hospitals). Expenses are then converted to revenues based on revenue-to-expense ratios provided by the AHA.[4] The revenues are then converted to a calendar year basis using monthly data from the AHA National Hospital Panel Survey of participating hospitals.

The AHA data must be modified for the purposes of the NHA. These

3. Individual hospitals have different fiscal years.
4. Revenue is available in the AHA survey only for community hospitals.

Table 7.4 **AHA Annual Survey, Expenses (fiscal year) (billions of dollars)**

	1992	1993	1994	1995
Total	282.5	301.5	310.8	320.3
Federal	18.2	19.6	20.0	20.2
Nonfederal	264.3	281.9	290.8	300.0
Private	213.1	226.4	n.a.	n.a.
Nonprofit	186.4	199.6	n.a.	n.a.
For-profit	26.6	26.8	n.a.	n.a.
State and local government	51.3	55.5	n.a.	n.a.

Note: n.a. = not available.

modifications fall into four parts. First, the AHA Annual Survey is designed to be cross-sectional rather than longitudinal. Thus, these cross-sectional survey reports must be combined into one longitudinal file, creating one record for each hospital. During this process, a certain amount of editing is performed on classification codes to assure consistent reporting across time by individual hospitals. Second, revenues are imputed to each hospital on the basis of reported (or estimated) expenses. Expenses are inflated to revenues using aggregate revenue-to-expense ratios provided by the AHA. Community hospitals are differentiated by state and by broad type of control (nonprofit or other), and noncommunity hospitals are differentiated by type of service and by type of control. Third, individual hospitals' imputed accounting year revenues are apportioned among calendar years. For community hospitals, expenditure patterns from the AHA's National Hospital Panel Survey are used to make that split; noncommunity hospitals are assumed to spend one-twelfth of fiscal year revenues in each month of that year (American Hospital Association 1963–90). At this stage, imputations are made to account for missing periods or overlapping periods in a hospital's report stream. Overlapping periods arise primarily from mergers and sales of hospitals and the associated changes in reporting period. Fourth, aggregate community and noncommunity hospital data are extrapolated through 1996, using patterns of acceleration and deceleration observed in the AHA National Hospital Panel Survey data. The extrapolation is prepared by graphically analyzing annual survey revenues and panel survey revenues for total nonfederal hospitals and nonfederal community hospitals to estimate the most recent year's growth rate. Since 1987 the panel survey and the annual survey have been tracking very closely, so for more recent years the panel survey growth has been assumed to represent the annual survey growth. The estimates for federal hospitals are shown in table 7.5.

7.2.3 National Income and Product Accounts

The NIPA are a comprehensive set of accounts measuring the production and distribution of goods and services produced in the United States

Table 7.5 NHA Federal Hospitals (billions of dollars)

	1992	1993	1994	1995	1996
Federal hospitals	20.7	22.0	22.7	23.2	24.1
VA hospitals	10.8	11.6	12.4	12.7	13.5
DOD hospitals	8.9	9.3	9.1	9.3	9.2
Indian Health Service	0.6	0.7	0.7	0.8	0.8
Other hospitals[a]	0.4	0.4	0.4	0.4	0.5

[a]Data for the NIH Clinical Center and the Hansen's disease hospital are from budget documents. Data for federal prison hospitals are from the Department of Justice.

and the generation and distribution of income from this production. The geographic coverage of the United States is the fifty states plus the District of Columbia. Gross domestic product (GDP), which is the primary aggregate of these accounts, is the market value of the goods and services produced by labor and property located in the United States.

GDP is measured as the sum of final expenditures—consumer spending, private investment, net exports, and government consumption and investment. Consumer spending, or personal consumption expenditures (PCE), is the value of goods and services purchased by persons resident in the United States and includes goods and services produced by nonprofit institutions serving households, such as nonprofit hospitals. Private investment, or gross private domestic investment, is the value of fixed assets purchased by private businesses, including nonprofit institutions, and residential dwellings purchased by owner-occupants, and the change in inventories of private businesses. Net exports is exports minus imports. Government consumption expenditures and gross investment is the value of purchases of goods and services and structures from business and the rest of the world by general government agencies, including the compensation of employees and consumption of fixed capital, which represents the value of the current services of fixed assets of general government, less general government sales (primarily tuition payments and charges for medical care).

For hospitals, PCE includes expenditures by households at for-profit and government hospitals and current expenditures by nonprofit hospitals. Gross private domestic investment includes construction of new hospitals and purchases of hospital durable equipment. Government gross investment consists of expenditures for the same types of fixed assets by government hospitals. Government consumption expenditures consist of current expenditures by government hospitals reduced by receipts from the public by these hospitals, which are included in PCE. Thus, total GDP includes all receipts by private for-profit hospitals and consumption expenditures and investment by nonprofit and government hospitals. This section discusses only the PCE and government consumption expenditures estimates.

The reconciliation of investment in structures and equipment by private or government hospitals will not be covered in this paper.

NIPA Hospitals: Estimating Procedure, Data Sources, and Present Estimates

BEA's published estimates for hospitals, as well as for every other expenditure component of GDP, are benchmarked roughly every five years to the latest input-output table. Estimates between and beyond input-output estimates are interpolations and extrapolations, using various indicator series. In most cases, the input-output estimates are derived from data from the quinquennial economic censuses, conducted by the Bureau of the Census. The most recent benchmark input-output table incorporated into the NIPA is the 1987 table; some preliminary data from the 1992 Economic Censuses were also incorporated into the NIPA at the time of the comprehensive NIPA revision released in January 1996. The 1992 input-output table, which was published by BEA in November 1997, incorporates final and more comprehensive data from the 1992 Economic Censuses, which will be incorporated into the NIPA most likely in 1999.

Annual revisions, such as the one released in July 1997, incorporated source data for 1993 forward that had become available since the previous year's annual or comprehensive revision, as well as changes in methodology. BEA's usual procedure for an annual revision is to revise only the past three years and to incorporate new source data on a "best-change" basis beginning with the year subject to revision. For example, the July 1997 revisions were made to the period beginning with 1993. Thus, for any new source data available for prior years, BEA applied the new 1992–93 change to the published 1992 estimates to derive the revised estimates for 1993 forward. This approach provides estimates of changes, but not necessarily levels, that are based on the best available source data. At the time of the next comprehensive revision, the best level data for earlier periods will be fully incorporated.

Personal Consumption Expenditures for Hospitals

In NIPA table 2.4, BEA publishes an annual aggregate series of Personal Consumption Expenditures (PCE) for Hospitals (line 51) and three component series: Nonprofit Hospitals (line 52), Proprietary Hospitals (line 53), and Government Hospitals (line 54). (The estimates used in this paper appear in the August 1997 *Survey of Current Business.*)

Private Nonprofit Hospitals. Expenditures (PCE) for nonprofit private hospitals are measured as their current operating expenses, including consumption of fixed capital (depreciation) and excluding purchases of fixed assets. In addition, these expenses are net of receipts from sales of meals and beverages. Source data for annual estimates are total expenses for non-

Table 7.6 **Derivation of PCE for Nonprofit Hospitals (billions of dollars)**

	1992	1993	1994	1995	1996
AHA expenses, FY basis	186.9	199.9	206.8	212.0	220.5
Adjusted expenses, CY basis	190.6	202.2	208.7	214.6	223.3
Plus depreciation adjustment	2.7	2.8	2.8	2.9	2.9
Minus redefinitions	3.1	3.3	3.5	3.7	3.8
Minus purchases by government	3.2	3.1	3.1	3.2	3.2
Minus Medicaid donation	0.6	0.5	0.5	0.5	0.6
Equals extrapolator from 1987	186.5	198.0	204.4	210.2	218.7
Published NIPA PCE (best change from 1987)[a]	183.6	193.9	200.2	207.9	217.3

[a]Beginning with 1993, also includes small BEA adjustments for consistency with related source data.

government not-for-profit short-term and long-term hospitals from the annual AHA *Hospital Statistics* plus a BEA estimate for nonregistered (noncovered) hospitals. As shown in table 7.6, this total is adjusted by BEA to a calendar year basis using a ratio derived from the monthly AHA National Hospital Panel Survey. The calendar year total is then multiplied by a fixed ratio (1.0026) to agree with the corresponding benchmark total from the 1987 Census of Service Industries. This adjusted expense series is subject to several further adjustments. An estimate for the difference between current replacement cost[5] and the historical cost depreciation already included in the AHA expense data is added. Based on the 1987 input-output table, redefinitions, which cover nursing home services, home health care services, research, and medical equipment rental included in the 1987 CSI benchmark data, are subtracted, as are government purchases from private hospitals, which are based on estimates of the disposition of private hospital services from the 1987 input-output table. (The appendix discusses secondary products and redefinitions.) The AHA expense data include the net cost of the Medicaid donation, so a deduction is made for 1991–96 in deriving the PCE estimate.

Proprietary Hospitals. PCE for proprietary hospitals is measured as their current receipts. Primary source data for annual estimates are total expenses for investor-owned (for-profit) short-term and long-term hospitals from the annual AHA *Hospital Statistics.* Revenue is not available for all proprietary hospitals and it contains components not included in receipts, such as contributions, so it is not used. As shown in table 7.7, these ex-

5. This capital consumption adjustment is based on the nonprofit institution estimates of consumption of fixed capital from BEA's capital stock statistics.

Table 7.7 Derivation of PCE for Proprietary Hospitals (billions of dollars)

	1992	1993	1994	1995	1996
AHA expenses, FY basis	26.9	27.3	28.2	30.6	n.a.
Adjusted receipts, CY basis	30.7	31.3	32.8	35.2	36.6
Plus sales tax	0.1	0.1	0.1	0.1	0.1
Minus redefinitions	0.2	0.2	0.2	0.2	0.2
Minus purchases by government	0.5	0.5	0.6	0.6	0.6
Equals extrapolator from 1987	30.1	30.7	32.1	34.5	35.9
Published NIPA PCE	30.1	30.7	32.1	34.5	37.1

Note: n.a. = not available.

pense data are adjusted by a BEA estimate for nonregistered (noncovered) hospitals and converted to a calendar year basis using a ratio derived from the AHA National Hospital Panel Survey. Calendar year expenses are expanded to agree with expense data from the 1987 CSI and then adjusted to a receipts estimate using a ratio (1.1096) from the 1977 CSI. Estimates of sales tax are added and redefinitions and government purchases from private hospitals are deducted based on data from the 1987 input-output table. The most recent estimate from the annual AHA survey is for 1995; the 1996 estimate is based on a BEA projection, using monthly expense data from the AHA Panel Survey.

Government Hospitals. PCE for government hospitals (NIPA table 2.4, line 54) is measured as sales by all government hospitals to households. The series is calculated in two parts—sales by federal government hospitals and sales by state and local government hospitals. Federal government sales are derived from federal budget detail. State and local government sales are the sum of sales of state hospitals and sales of local government hospitals and include medical vendor payments (Medicaid) to hospitals and government payments for hospital services on behalf of indigents. Sales estimates for state and local government hospitals are derived from the Census of Governments (COG) Compendium of Government Finances or from the Annual Survey of Governmental Finance, and are adjusted from a fiscal year to a calendar year basis. Data for medical vendor payments collected in the COG do not include Medicaid expenditures to state and local government health facilities, so BEA makes a grossing adjustment; in other words, they adjust for the difference between total Medicaid expenditures from HCFA and the Census total for medical vendor payments. Unlike the PCE estimates for private hospitals, BEA does not presently make a redefinition adjustment (nursing home, home health, cafeteria) for state and local government hospitals, but will consider making such a change in methodology in the next comprehensive benchmark re-

Table 7.8 Components of PCE for Government Hospitals (billions of dollars)

	1992	1993	1994	1995	1996
Government hospitals	55.1	61.1	65.8	68.2	70.7
Federal hospital sales	0.4	0.6	1.2	1.0	1.3
S&L hospital sales	54.8	60.6	64.6	67.3	69.5
State hospital sales	19.9	22.2	23.5	24.1	24.4
Hospital charges	13.5	14.6	15.2	15.7	15.9
Medical vendor payment (Medicaid)	6.5	7.6	8.2	8.4	8.5
Local hospital sales	34.8	38.4	41.1	43.2	45.0
Hospital charges	26.2	28.2	29.9	31.4	32.8
Medical vendor payment (Medicaid)	8.6	10.2	11.2	11.7	12.2

vision. The components of PCE for government hospitals are shown in table 7.8.

Government Consumption Expenditures

In addition to sales of government hospital services that appear in PCE, transactions in government hospital services appear in the government sector of the NIPA in two forms, as parts of government consumption expenditures and gross investment in GDP, and as parts of government receipts and current expenditures, such as contributions for social insurance, transfer payments, and grants-in-aid to state and local governments. This paper will discuss only government consumption expenditures.

Government consumption expenditures are defined as expenditures by government agencies, except government enterprises, for the services of government employees, for goods and services purchased from private businesses and the rest of the world, and for consumption of government fixed capital. The expenditures are recorded net of sales (primarily to persons), which are included in PCE. Consequently, the output of government hospitals, as well as all other government agencies not classified as enterprises, is measured as current expenditures, the same definition used for the output of nonprofit institutions serving households. (No attempt is made to estimate the market value of the services provided by either type of institution.)

Table 7.9 shows the NIPA estimates for government hospital expenditures. The estimates for federal hospitals cover only DOD and VA hospitals and are derived from U.S. budget data. The estimates for state and local government hospitals combine the government consumption expenditures with sales from PCE to produce total expenditures for state and local government hospitals in GDP.

Federal Hospitals. Although government consumption expenditures for veterans hospitals, military hospitals, and other federal hospitals (Indian Health Service hospitals, NIH Clinical Center, federal prison hospitals,

Hansen's Disease hospital) are not broken out in NIPA calculations, underlying budget detail for veterans and military hospitals is available. Estimates of the consumption of fixed capital should be added to these figures. Expenditures for other federal hospitals appear to be about $1 billion, based on NHA estimates. In the NIPA, these expenditures are an integral part of the broader expenditure categories.

For veterans hospitals, the derivation of the estimate is shown in table 7.10. The NIPA estimate for VA hospitals is the "subtotal" line on a calendar year basis—it excludes nursing homes, contracts and grants, and education and training. The VA expenditures covered 172 VA hospitals and 128 VA nursing homes in 1993.

For military hospitals, the Defense Health Program covered 132 military hospitals/medical centers and 520 clinics in 1994. Consistent data for the Defense Health Program were not published in the U.S. budget prior to the fiscal year 1993 actual estimates. As shown in table 7.11, net outlays

Table 7.9 **NIPA Government Hospital Expenditures (billions of dollars)**

	1992	1993	1994	1995	1996
NIPA government hospitals	n.a.	82.2	89.0	91.2	95.6
Federal hospitals	n.a.	19.9	21.1	21.4	23.2
Defense health	n.a.	8.4	9.2	9.3	10.0
VA hospitals	10.8	11.5	11.9	12.0	13.2
State and local government hospitals	62.1	65.3	67.9	69.8	72.4

Note: n.a. = not available.

Table 7.10 **U.S. Budget, Department of Veterans Affairs, Veterans Health Administration, Medical Care (billions of dollars)**

	1992	1993	1994	1995	1996
FY (actual) basis					
Hospitals	6.6	6.9	7.2	6.8	7.1
Outpatient	3.3	3.6	3.9	4.2	5.2
Miscellaneous[a]	0.7	0.7	0.8	0.7	0.8
Subtotal	10.7	11.3	12.0	11.7	13.1
Education and training	0.8	0.8	0.8	0.9	0.0
Nursing homes	1.0	1.1	1.1	2.7	2.4
Contracts and grants	0.5	0.6	0.7	0.0	0.0
Investment	0.7	0.7	0.7	0.8	0.8
Total outlays	13.6	14.5	15.3	16.1	16.3
Net outlays, FY basis	13.6	14.3	15.1	15.9	16.0
VA hospitals, excluding nursing homes, research, investment, CY basis	10.8	11.5	11.9	12.0	13.2

Note: Net outlays are total outlays net of offsetting collections.

[a]Includes CHAMPVA.

Table 7.11 U.S. Budget, Department of Defense-Military, Defense Health Program (billions of dollars)

	1992	1993	1994	1995	1996
FY (actual) basis					
Operation and maintenance	n.a.	9.3	9.4	9.6	9.9
Procurement	n.a.	0.2	0.3	0.3	0.4
Total	n.a.	9.4	9.6	10.0	10.3
Net outlays	n.a.	8.2	9.2	9.2	9.9
Defense health, CY basis	n.a.	8.4	9.2	9.3	10.0

Note: n.a. = not available.

for the Defense Health Program rose from $8.4 billion in 1993 to $10 billion in 1996.

State and Local Government Hospitals. The primary source data for state and local government expenditures are the COG and the Annual Survey of Government Finances (GF), which provide estimates of expenses and receipts of state and local government hospitals, other than for compensation of employees; HCFA data on medical vendor payments, which are not included in the COG/GF sales data because they are treated as intragovernmental expenditures on behalf of indigents (Medicaid); tabulations of wages and salaries of state and local government employees covered by state unemployment insurance from the Bureau of Labor Statistics (BLS); BEA's estimates of consumption of fixed capital; and the Census Bureau's annual survey, *Public Employment.*

Consumption expenditures by state and local government hospitals are derived from COG/GF data on current expenditures less compensation of employees and transfer payments. State and local government hospital sales (charges) are calculated as receipts for hospital admissions from the COG/GF data on current charges and miscellaneous general revenue data plus medical vendor payments. Wages and salaries of state and local government hospital employees are estimated as an allocation of BLS data on wages and salaries, based on data on hospitals from *Public Employment.* The BLS data do not cover interns and student nurses employed by hospitals, so BEA makes an adjustment to cover them based on employment data from the annual Bureau of Census report *County Business Patterns.* The supplements component of compensation of employees is prepared in a similar way, using the same allocations as for wages and salaries. Lastly, the consumption of fixed capital is added. The estimates are shown in table 7.12. In the NIPA tables, consumption expenditures are published in NIPA table 3.17; sales for both hospitals and other health services are shown combined in NIPA table 3.9.

Table 7.12 **State and Local Government Hospitals—Total NIPA Consumption Expenditures (billions of dollars)**

	1992	1993	1994	1995	1996
Total NIPA consumption expenditures	62.1	65.3	67.9	69.8	72.4
Compensation	37.8	38.7	39.9	40.3	41.3
Consumption of fixed capital	2.4	2.5	2.5	2.6	2.7
Other consumption	21.9	24.1	25.5	26.9	28.4
Minus sales (PCE)	54.8	60.6	64.6	67.3	69.5
Equals consumption expenditures	7.3	4.7	3.3	2.6	3.0

Other NIPA-Related Hospital Care Estimates

GDP by Industry. Gross product, or gross product originating (GPO) by industry, is the contribution of each private industry and government to the nation's output, or GDP. An industry's GPO, often referred to as its "value added," is equal to its gross output minus its intermediate inputs. Estimates of GPO are published by BEA annually in the *Survey of Current Business,* most recently in the November 1997 issue. There is limited industry detail available in this series; separate industry detail is shown only for the health services industry (SIC 80) as a whole.

Benchmark Input-Output Accounts. These accounts are prepared every five years by BEA to coincide with the availability of the quinquennial economic censuses. The input-output accounts show the production of commodities by each industry, the commodity composition of GDP, and the industry distribution of value added. The benchmark input-output estimates of GDP and its commodity composition are incorporated into the NIPA estimates at the time of a comprehensive revision. The most recent benchmark input-output table, covering 1992, was published in the November and December 1997 issues of the *Survey of Current Business.*

7.2.4 Review of Primary Data Sources

In order to reconcile the NHA and NIPA estimates and to develop estimates for hospital production and hospital services, we identified differences in the four primary data sources: the AHA annual survey; the federal budget (for federal hospitals); the Census of Governments (for state and local government hospitals); and the Census of Service Industries.

The AHA Annual Survey

The AHA annual survey has about a 10 percent nonresponse rate (in terms of number of nonresponding hospitals). The AHA adjustment for unreported expenses is based primarily on reports of similar hospitals. The AHA annual survey also includes expenses for nursing homes (including

institutions for the mentally retarded) and home health establishments owned by hospitals. If in the preparation of the NHA, the AHA hospital data are added to nursing home and home health data from the Census of Service Industries, which generally are based on separate reports for each establishment, the resulting totals will double-count data for these hospital-owned nursing home and home health establishments. Such an actual or potential double-count could be eliminated by benchmarking the NHA hospital estimates to the Census of Service Industries data.

U.S. Budget

As previously noted, the published NIPA estimates do not provide separate data on consumption expenditures by federal government hospitals. The U.S. budget includes data on outlays for the Defense Health Program (beginning with fiscal year 1993) and on veterans hospitals and nursing homes. For this paper, these data were used to separately identify for the NIPA estimates the current expenditures for these federal hospitals beginning with 1993. To prepare estimates for all federal hospitals and to extend the defense data back beyond 1993, additional work will be needed. Also, additional work is needed to provide improved estimates of the consumption of fixed capital for the fixed assets of these hospitals.

Census of Governments

The Census of Governments (COG) is a survey of the revenue and expenditures of government units: federal, state, local (county, municipal, township, special districts). The information is on a fiscal year basis, which varies from government unit to unit. Expenditures are organized by functional categories, including hospitals, which include expenditures for hospital facilities directly operated by state and local governments. For the NIPA, these hospitals should be compared to the coverage of privately owned hospitals in the Census of Service Industries to eliminate any duplication, particularly given conversions or acquisitions by for-profit hospitals.

Census of Service Industries

The Census of Service Industries (CSI) is an establishment survey that provides comprehensive data on hospitals, nursing homes, home health care, and other health care providers. The census collects data on receipts from nursing home and home health services within hospital establishments and data on other types of revenue (contract research, cafeteria, merchandise, government appropriations, contributions and gifts, investment income, rents). It also collects data on expenses for hospitals owned by nonprofit institutions and by governments. The extent of the data permits combination to measure hospital expenditures using different definitions. The Census of Service Industries receipts/revenues data and the

sources of receipts/revenues data for 1992 are shown in table 7.13. Data from the CSI on private hospitals are used to benchmark the NIPA, but not the NHA; data from the CSI on government hospitals are not used in either the NIPA or the NHA. BEA has done an initial study of the CSI universe coverage for nonprofit private hospitals by comparing the CSI to publicly available lists and found several inconsistencies. BEA will pursue this further as part of the reconciliation project.

Table 7.14 shows a comparison of major types of hospital expenditures for three of the four primary data sources discussed above. (The U.S. budget is omitted because we have not yet obtained fiscal year 1992 figures from the underlying budget documents.) The comparison of the expenses data shows that the AHA survey data are low relative to the CSI expense data even though the AHA survey includes some nursing home, home health, and homes for the mentally retarded not included in the CSI hospital data. (The calendar year/fiscal year difference is about 1 percent based on the fiscal year/calendar year conversion for PCE nonprofit private hospital expenses, so this difference is not substantive.) This apparent inconsistency in the two data sources should be further explored by HCFA and BEA.

For state and local government hospitals, the COG and CSI estimates are within $1 billion. (Both sources exclude an estimate for depreciation, which was $2.4 billion for 1992.) However, the equivalent NIPA estimate is about $4 billion higher. This difference may in part reflect the NIPA procedure that allocates Medicaid payments between hospital and other health care. There are data from HCFA on these payments that might be used to evaluate the allocation.

7.2.5 Sources of Differences

As previously noted, NHA hospital care estimates are higher than the NIPA estimates for hospital expenditures by about $13–14 billion for 1993–95. The NHA estimates for private hospitals are higher, the NHA estimates for state and local government hospitals are lower, and the estimates for federal hospitals are about the same.

The NHA use the AHA annual survey as their data source for private and state and local government hospitals. The PCE estimate for private hospitals uses the AHA annual survey at aggregate level, but benchmarks the data on the CSI, although the current benchmark is for 1987. PCE will be benchmarked on the 1992 CSI in 1999, which should increase PCE for private hospitals by $1 billion for 1992–96.

The AHA annual survey has about a 10 percent nonresponse rate in terms of number of hospitals, and covers fewer hospitals than the CSI. The CSI has a smaller nonresponse rate and, unlike the AHA, has some up-to-date information on nonrespondents. However, although the CSI is based on a complete universe mailing list, it appears to have classification problems between private nonprofit and government hospitals. HCFA and

Table 7.13 **1992 Census of Service Industries, Sources of Receipts or Revenues (billions of dollars)**

	Proprietary	Nonprofit	Private	Government	Federal	S&L	Total
Expenses[a]	n.a.	194.4	n.a.	74.5	19.9	54.6	n.a.
Revenue[b]	n.a.	203.4	234.4	76.4	20.0	56.3	310.8
Receipts[c]	31.1	196.3	227.4	74.8	n.a.	n.a.	302.2
Hospital services	30.6	189.6	220.2	40.8			261.0
Nursing home services	0.1	1.0	1.1	0.8			1.9
Home health services	0.1	1.5	1.6	0.3			1.9
Contract research	0.0	0.4	0.4	0.0			0.4
Cafeteria	0.1	1.0	1.1	0.2			1.3
Merchandise	0.0	0.1	0.2	0.1			0.3
Other services	0.2	2.6	2.8	0.6			3.4
Other receipts	0.0	0.1	0.1	0.0			0.1
Government appropriations				32.0			32.0
Government contributions	n.a.	1.0	n.a.	0.5			1.5
Private contributions	n.a.	0.8	n.a.	0.1			0.9
Other tax-exempt revenue	n.a.	2.2	n.a.	0.5			2.7
Investment income	n.a.	2.7	n.a.	0.5			3.2
Rents	n.a.	0.3	n.a.	0.0			0.3
Total revenue/receipts	31.1	203.4	234.4	76.4			310.8

Source: 1992 Census of Service Industries, Subject Series 4 (Sources of receipts or revenues, tables 47–48) and Subject Series 5 (Miscellaneous subjects, tables 1a, 1b, and 21).

Note: n.a. = not available.

[a]Expenses include employee compensation, contracted or purchased services and supplies, interest, rent, and depreciation.

[b]Revenues of nonprofit and government hospitals are on an accrual basis and include interest, rent, dividends, grants and contributions; they exclude sales taxes.

[c]Receipts of proprietary hospitals are on an accrual basis and exclude sales taxes, interest, rent, dividends, grants, and contributions. The difference between revenues and receipts is that revenues include and receipts exclude interest, rent, dividends, grants, and contributions.

Table 7.14 **Comparison of Primary Data Source Estimates for 1992 (billions of dollars)**

	CSI CY Expenses	AHA FY Expenses	AHA/CSI (%)	CSI CY Receipts	CSI CY Revenue	COG FY Expenditure
Private		213.4		227.4		
For-profit		26.6		31.1		
Nonprofit	194.4	186.4	96	196.3	203.4	
Government	74.5	69.5		74.5	76.4	64.7
S&L government	54.6	51.3	94		56.3	55.7
Federal government	19.9	18.2	92		20.0	9.0
Total		282.5		302.2		

BEA should determine the nonresponse adjustments for each survey and compare the relative growth rates of the reporting and nonreporting components of the universe estimates. They should also work with the Census Bureau to improve the coverage of the CSI data.

The AHA annual survey includes some nursing home and home health facilities and "hospitals" for the mentally retarded. Relative to the NIPA estimates, this causes the AHA-based estimates to result in higher estimates of hospital expenses and revenues. It raises a double-counting issue in the NHA, which combine AHA hospital data with nursing home data from the CSI (i.e., the CSI conceptually covers the same nursing home and "hospitals" for the mentally retarded). We don't know how much this amounts to in the AHA data, but a comparison of the $3.7 billion of secondary production of nursing home and home health services from the CSI with the estimate of nursing home and home health in-hospital services in the 1996 NHA of $7.9 billion for 1992 suggests that the difference may not be minor. Some of this difference may be due to the broader definition of nursing home and home health services used by HCFA in creating NHA estimates. Rather than including only the value of the nursing home unit services, HCFA attempted to capture the value of all services provided to a nursing unit or nursing facility patient by including an estimate for ancillary services (e.g., physical, speech, and respiratory therapy) that would be supplied by other hospital cost centers.

The ratios of AHA fiscal year expenses for 1992 to CSI calendar year expenses for 1992 for nonprofit, state and local government, and federal government hospitals are 96 percent, 94 percent, and 92 percent, respectively. These comments should not be taken to imply that the AHA annual survey data are not useful. They provide useful and timely data on hospital expenses and revenues.

The NIPA estimate for state and local government hospitals is $62.1 billion for 1992. The COG fiscal year estimate is $55.7 billion for 1992 and the CSI estimate is $55.6 billion for expenses and $56.4 billion for revenue for 1992. The COG and CSI exclude a $2.4 billion adjustment for depreciation, but that still leaves us about $4 billion short. This shortfall may or may not be related to the NHA estimate being lower than the NIPA estimate for state and local government hospitals. It may be related to the BEA split in Medicaid expenditures going to state and local government hospitals. The difference between the BEA estimate and the source data is an unresolved issue.

The NHA include estimates for hospitals in U.S. territories and Puerto Rico and the NIPA do not. These amount to $1.6 billion in 1995.

Table 7.15 **NHA and NIPA Physician Expenditures, 1992–96 (billions of dollars)**

	1992	1993	1994	1995	1996
NHA Physician Services	175.9	183.6	190.4	196.4	202.1
NIPA Physician Services (PCE)	167.2	172.5	180.0	191.4	196.5
NHA less NIPA	8.7	11.1	10.4	5.0	5.6
Of which					
Osteopaths and laboratories	10.5	10.9	11.1	11.3	11.5
PCE coverage adjustment	−4.1	−4.2	−4.3	−4.6	−4.6

7.3 Physician Services

7.3.1 Summary

The NHA and NIPA estimates of PCE for physician services (table 7.15) differ in definition. The NHA include, and PCE exclude, osteopaths and medical laboratories that bill independently for their services in the estimates of expenditures for physician services. In the NHA, estimates of tax-exempt physician services (clinics) are valued by revenues; in the NIPA, these are valued by expenses. In addition, the PCE estimates include a coverage adjustment to the CSI data for misreporting in the tax-return data used by the Census Bureau for small firms; the NHA estimates do not include a similar adjustment. Most of the difference between the estimates is due to the inclusion of osteopaths and laboratories in the NHA estimates and the coverage adjustment in the PCE estimates. Government expenditures for physician services such as the public health services are not included in this paper.

7.3.2 NHA Physician Services

Definitions

In the NHA, physician services are expenditures for services rendered by a doctor of medicine (M.D.) or by a doctor of osteopathy (D.O.) in an office or clinic (including ambulatory surgical centers and freestanding emergency medical centers). The establishments are classified in SIC 801, offices and clinics of doctors of medicine; SIC 803, doctors of osteopathy; and a portion of SIC 8071, medical laboratories that directly bill patients for their services. Physician services also include services rendered by an M.D. or a D.O. in hospitals, if the physician bills independently for those services. Expenditures for services provided in staff-model and group-model HMO facilities are included in physician services.

Professional fees received by physicians from hospitals are subtracted from the NHA estimates of spending for physician services. Hospitals' professional fee arrangements with physicians include minimum guaranteed income, percentage of departmental billings, and bonuses. These fees

are included in hospital expenditures because they are paid from revenues received by hospitals based on services performed at the facility. They are deducted from physician receipts to avoid double-counting.

The services of physicians working under salary for a hospital, nursing home, or some other type of health care establishment are included in the expenditures for the service offered by the establishment. The compensation of physicians serving in field facilities of the armed forces are included in "other personal health care" in the NHA. The compensation of physicians working for government agencies such as the Centers for Disease Control or a state health department are included in Government Public Health Activity in the NHA.

Scope

All physician services rendered in the United States are included in the scope of the NHA. Physician services rendered in outlying territories are not included in the scope of the NHA. The sole exception is that estimates of professional fees in the outlying territories, embedded in the source data for those estimates, are currently within the scope of the NHA. (This exception should be corrected in the next comprehensive benchmark of the NHA.)

Valuation

The value of physician services is measured by receipts for taxable establishments and by revenues for tax-exempt establishments.

Data Sources

Physician services are benchmarked on the quinquennial Census of Service Industries data on the receipts of taxable firms and on the revenues of tax exempt firms, and Services Annual Survey (SAS) data are used for the annual estimates. (In census years, SAS equals CSI.) Compensation of government physicians is from budget data.

The following data sources are used to verify the reasonableness of physician services expenditures estimates: data on employment, average weekly hours, and average hourly earnings in nongovernment health establishments from the Current Employment Statistics (Bureau of Labor Statistics 1972–96); estimates of price change provided by the Consumer Price Index (Bureau of Labor Statistics 1960–96); and indirect measures of professional services, such as hospital admissions, inpatient days, and so forth (American Hospital Association 1980–1996).

Methodology

The CSI and SAS data on receipts and revenues are modified by adding an estimate of the revenue of independently billing laboratories and subtracting an estimate of the professional fees paid by hospitals to physi-

Table 7.16 Derivation of NHA Physician Services (billions of dollars)

	1992	1993	1994	1995	1996
Physician taxable receipts[a]	151.8	156.3	161.1	164.6	168.8
Revenues of tax-exempt physician clinics	16.5	19.0	20.6	22.7	23.7
Osteopaths and laboratories	10.5	10.9	11.1	11.3	11.5
Less hospital professional fees	2.9	2.7	2.4	2.2	1.9
Equals NHA physician services	175.9	183.6	190.4	196.4	202.1

[a]HCFA estimated the breakouts of taxable and nontaxable receipts for 1993 and 1994 from aggregate data provided by the Census Bureau.

cians. The CSI and SAS data on receipts and revenues of taxable and nontaxable firms in SIC 801 and 803 do not capture the cost of services in medical laboratories that bill patients independently of these establishments. The adjustment for independently billing medical laboratories is constructed using Medicare program data and data on medical laboratories (SIC 8071) receipts from the SAS. HCFA has requested that Census include questions in the CSI and SAS for medical labs that would provide direct data for this adjustment.

The CSI and SAS data on the receipts and revenues of taxable and nontaxable firms in SIC 801 and 803 include professional fees paid by hospitals to physicians. The adjustment to remove professional fees is constructed using data on professional fees from the AHA's Annual Survey on hospital expenses (these data are not currently being collected, HCFA estimated 1995 and 1996) and American Medical Association data on financial arrangements with hospitals. HCFA's estimates include professional fees for hospitals in U.S. territories. These fees will be eliminated in the next benchmark revision to the National Health Accounts. The derivation of NHA physician services is summarized in table 7.16.

7.3.3 NIPA Physician Services

Personal Consumption Expenditures (PCE) for Physicians

In NIPA table 2.4, BEA publishes annual estimates of personal consumption expenditures (PCE) for physician services (line 47). The current PCE estimates are benchmarked to the 1987 input-output table estimates. The PCE physician services estimates are on a "best change" basis. PCE for physician services in taxable establishments is measured by their current receipts. In addition, taxable receipts are adjusted in the PCE estimates for coverage, using a ratio of 1.027, a measure of underreporting in the tax-return data for small firms. PCE for physician services in tax-exempt establishments is measured by current expenses. The sum of taxable receipts adjusted for coverage and tax-exempt expenses is adjusted by subtracting physicians' hospital professional fees (from the NHA physi-

Table 7.17 Derivation of PCE Physician Services (billions of dollars)

	1992	1993	1994	1995	1996
Physician taxable receipts	151.8	154.8	160.8	170.3	172.9
Coverage adjustment	4.1	4.2	4.3	4.6	4.6
Expenses of tax-exempt physician clinics	16.0	18.5	20.1	22.0	24.5
Physicians and clinics	171.9	177.5	185.2	196.9	202.1
Less hospital professional fees	4.0	4.2	4.4	4.6	4.8
Less government purchases	0.9	0.9	0.9	1.0	1.0
Equals PCE physician services	167.2	172.5	180.0	191.4	196.5

cian estimate). Adjustments for capital consumption, sales tax, and exports are made, but these are small. Finally, direct government purchases of physician services are excluded. The estimates of direct government purchases of physician services are based on the NHA physician services. The derivation of PCE physician services is summarized in table 7.17.

Government Expenditures for Physician Services

Governments are involved in two basic types of transactions with private sector physicians. First, governments transfer funds to households that are used to purchase the services of physicians. Second, governments purchase the services of private physicians directly. The first type of transaction, the transfer payment, is financing of purchases that appear in PCE. The second type, direct purchases, is included in the government consumption expenditures. Because PCE and government consumption are both components of GDP, an adjustment is made to PCE to exclude direct government purchases so as not to double-count the same purchases.

In addition, government employs physicians in work that is not part of another production component of GDP, such as physicians employed at CDC or in state public health departments. Expenditures for these activities are included in government consumption expenditures and are not estimated separately. More work will be needed to reconcile these government consumption expenditures. Finally, some expenditures are included in PCE for "other professional services" (NIPA table 2.4, line 49) for sales of government physician services to the public. This will be clarified at a later stage of the reconciliation project.

7.3.4 Reconciliation—NHA Physician Services/ NIPA Physician Services

The differences shown in table 7.18 result from differences in definition between the NHA and the NIPA, from differences in adjustments made to source data, or from differences in the timing of the introduction of source data. The differences shown for the PCE coverage adjustment, expenses or revenues of tax-exempt clinics, government purchases, and os-

Table 7.18 **Reconciliation of Physician Services, NHA less NIPA PCE (billions of dollars)**

	1992	1993	1994	1995	1996
Physician receipts	0.0	1.5	0.3	−5.7	−4.2
PCA coverage adjustment	−4.1	−4.2	−4.3	−4.6	−4.6
Expenses of tax-exempt physician clinics	0.5	0.5	0.5	0.7	−0.8
Less hospital professional fees	1.0	1.5	2.0	2.4	2.8
Less government purchases	0.9	0.9	0.9	1.0	1.0
Osteopaths and laboratories	10.5	10.9	11.1	11.3	11.5
NHA less NIPA	8.7	11.1	10.4	5.0	5.6

teopaths and laboratories are differences of definition that will remain after the two series are benchmarked. Some of these differences in definition will be examined as the reconciliation project progresses. The NHA estimates of osteopaths and independently billing laboratories in physician services can be compared with the NIPA components of other professional services when the reconciliation of other professional services is prepared. The differences in taxable physicians receipts for 1995–96 result from the timing of revisions and should be substantially reduced after the regular annual NIPA revision in July 1998.

Other differences between the NHA and the NIPA also need to be investigated. The NIPA estimates of government expenditures for physician services need to be reconciled with the NHA estimates of government public health activity when that portion of the reconciliation is prepared. The differences due to the coverage adjustment in the NIPA should be examined to determine if a similar adjustment is appropriate in the NHA. Finally, any differences in source data should be examined to ensure consistency between the series after the next benchmark revisions.

Appendix

Treatment of Secondary Products

The section analyzing differences between the NIPA and NHA estimates of hospital services noted that one source of the difference was the definition of hospital services. In the NIPA, adjustments are made to the PCE estimates for private hospitals to exclude secondary production, or activities, by hospitals. The benchmark PCE estimates are from BEA's input-output (I-O) accounts and reflect the "redefinition" of secondary production in some industries to other industries. Redefinition results in the shift of outputs and their related inputs to the industries in which these activities are primary activities. In general, redefinitions are used only when the

inputs related to the secondary activity are very different from those required for the industry's primary activity. For example, nursing home services would have a different mix of inputs (doctors, nurses, custodial staff, equipment) than hospital services.

For hospital services, the following secondary products are the major activities redefined, based on types of revenue/receipts data reported for private hospitals in the CSI: nursing home services, home health care services, meals and beverages (cafeterias), and merchandise sales and rentals. As shown in table 7A.1, redefinitions in 1992, based on the benchmark I-O tables and 1992 CSI, were about $4 billion. It should be noted that the redefinitions for nursing homes and home health care services affect only the commodity distribution of health expenditures in PCE, as the amounts redefined will be included in the NIPA data for nursing homes and so forth. For cafeterias, however, these receipts are included with the PCE category for food consumed away from home. (In the reconciliation project it was discovered that about $1 billion in similar receipts from sales of meals and beverages and other merchandise by government hospitals was not being redefined from receipts by hospitals to PCE for food consumed away from home.)

In the NHA, there are no redefinitions of secondary products reported in the AHA survey, and as noted earlier, this approach appears to account for a substantial part of the difference between the NHA and NIPA estimates of hospital services. For the 1996 accounts, the revenues for nursing home and home health services included in the estimates for hospital services were split out for the first time, as shown in table 7A.2.

Table 7A.1 **PCE Private Hospital Redefinitions by Type of Commodity, 1992 (billions of dollars)**

	Benchmark I-O Estimates
Total redefinitions	4.0
Nursing homes	1.1
Home health care	1.6
Cafeterias	1.2
Merchandise sales and rentals	0.1

Table 7A.2 **Expenditures for Nursing Home and Home Health Care Included in NHA Hospital Care (billions of dollars)**

	1992	1993	1994	1995	1996
Nursing homes	5.1	6.0	6.7	7.9	9.0
Home health	2.8	3.7	4.8	6.2	7.8
Total	7.9	9.7	11.6	14.1	16.8

The large differences between the PCE redefinitions and the NHA measures of hospital nursing home and home health services ($3.1 billion versus $7.9 billion in 1992) may reflect one or more of the following. The CSI hospital data may not have included the additional receipts because the hospitals filed separate nursing home or home health establishment reports in the Census. The NHA data are derived from Medicare expense reports and may reflect expenses not reported on the AHA reports, just as they might not have been included in the CSI reports. The differences may also reflect differences in the hospital establishments covered by the AHA data, the CSI data for hospitals, and the Medicare expense reports. Such coverage differences should be investigated and consistency between the reports improved.

Regardless of the explanation for the differences between the various estimates of secondary products noted above, HCFA should reexamine its classification concepts with regard to secondary production and whether receipts from sales of non-health-related goods and services should be included. BEA should reexamine the consistency of its use of redefinitions in both private and government hospitals. Both agencies also should look into related classification issues, such as emergency room services provided at freestanding treatment centers, which are now classified as physician services. Should they be redefined as hospital services? The classification of outpatient surgery at doctors' offices also should be examined.

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Comment

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Estimates of health spending are used by health policy analysts, health economists, and health services researchers for a variety of purposes including tracking levels of health spending, identifying trends in spending over time, and estimating microsimulation models of the impact of policy changes on health expenditures. Analysts and researchers have easy access to estimates of health spending from both the National Health Accounts (NHA) and the National Income and Product Accounts (NIPA). Most policy analysts and researchers turn first to the NHA due to greater familiarity with the NHA estimates, although the NIPA estimates are sometimes available earlier and could be useful for answering some of their questions.

The methodology behind the NHA and NIPA estimates and the fine distinctions between the accounts are not clear to some of the analysts and researchers who use them. One set of estimates may be more appropriate for a particular question, so it is important for analysts and researchers to understand how the NHA and NIPA differ. This paper lays out the differences very clearly to help users of the accounts make better choices and to understand the implications of their choice for their analysis. In this paper, the authors take the two largest categories of health spending, physician and hospital spending, and describe in detail how the NHA and NIPA estimates for these spending categories were constructed. For each set of accounts, the authors describe the philosophy or approach of the accounts, how the accounts define expenditures for these two categories, the data used, and the adjustments made to the data.

A couple of years ago Joe Newhouse and I looked at the correlation between the annual NHA and NIPA estimates of total real per capita

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spending for the period 1975–1993. We found the estimates to be quite similar: The correlation was 0.99. However, when one moves a level below total health spending and looks at components of health spending, such as hospital or physician expenditures, the differences between the NHA and NIPA estimates can be larger due to different estimation approaches for the two accounts. For example, for the period 1992–96, the difference between the NHA and NIPA estimates of annual physician spending was as high as 6 percent in a given year.

If one focuses on the estimates of hospital spending, the biggest difference between the NHA and the NIPA seems to be the treatment of nonprofit hospitals. The NHA use revenue of nonprofit hospitals as the measure of spending associated with these facilities and include as revenue all nonoperating income such as contributions, investment income, and contract research. The NHA also include as nonprofit hospital spending revenue from secondary products such as cafeteria products, merchandise sales and rentals, home health services, nursing home services, home health clubs, and wellness center services. On the other hand, the NIPA use a more narrow definition of hospital spending. The NIPA reclassify secondary services produced by hospitals into other nonhospital categories and use current operating expenditures as the measure of spending for nonprofit hospitals. The NIPA use this approach because the NIPA consider nonprofit hospitals to be nonmarket producers since receipts do not usually cover operating expenses and nonprofit hospitals rely to some extent on investment income from endowments, contributions, and other sources. As a result of these differences in definition and measurement used by the two sets of accounts, one would get a very different picture of nonprofit hospital spending if using the NHA versus the NIPA.

Changes in the behavior of nonprofit hospitals in recent years highlight the differences in methodology between the two accounts. In the past, charitable contributions and direct public appropriations were an important component of nonprofit hospital revenue. In recent years, there has been some evidence that nonprofit hospitals have begun behaving like for-profit hospitals in response to increasing competitive pressure in the market. Work by Frank and Salkever (2000) and by Sloan et al. (1990) has suggested that charitable contributions have declined as a proportion of revenue and that many nonprofit hospitals are looking beyond traditional inpatient services for other revenue producers. Many nonprofit hospitals are setting up for-profit subsidiaries and expanding into less traditional services like home health, wellness centers, health clubs, and other products. Also, a number of nonprofit hospitals are carrying large fund balances and earning a great deal of money by investing those balances.

How these changes in nonprofit hospital behavior would be reflected in the two sets of accounts has implications for which set of accounts an analyst would select to answer a particular question. For example, returns

on fund balances, which are not something that one would normally consider hospital "output," would appear as revenue (and thus as hospital expenditure or output) in the NHA. As a result, the NIPA might be a better source if one wished to look at productivity or output. The NHA would capture most revenue for nontraditional product lines while the NIPA would not. Consequently, the NHA might be a better source if one were interested in revenue streams for nonprofit hospitals or a broader look at nonprofit hospital activity.

This example of the differences in the estimates of nonprofit hospital spending highlights the importance of thinking carefully about the question one needs to answer and which set of accounts is best structured to answer that question. To do this, one needs to be clear about the differences in methodologies used by the NHA and NIPA. This paper does an excellent job at explaining these differences.

This paper is part of a larger and very important effort by the Bureau of Economic Analysis (BEA) and the Health Care Financing Administration (HCFA) to reconcile and improve the NHA and the NIPA. I would encourage the BEA and the HCFA to think about how to disseminate this information to policy analysts and researchers to make the accounts more user-friendly. I would also encourage the publication of side-by-side annual reconciliations of these two accounts if possible.

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