

National Health  
Expenditure Accounts:  
Methodology Paper, 2016  
Definitions, Sources, and Methods

## National Health Expenditure Accounts Methodology Paper, 2016

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## Introduction

### *U.S. National Health Expenditure Accounts*

Since 1964, the U.S. Department of Health and Human Services<sup>1</sup> (HHS) has published an annual series of data presenting total national health expenditures. These estimates, termed National Health Expenditure Accounts (NHEA), are compiled with the goal of measuring the total annual dollar amount of health care consumption in the U.S., as well as the dollar amount invested in medical sector structures and equipment and non-commercial research to procure health services in the future.

The NHEA are generally compatible with a production-based accounting structure such as the National Income and Product Accounts (NIPA), but include a more complete picture of the health care sector.<sup>2</sup> Using an expenditures approach to national economic accounting, the NHEA identifies all final consumption of health care goods and services as well as investment in a given year that is purchased or provided by direct or third party payments and programs. Three primary characteristics of the NHEA flow from this framework. First, the NHEA are comprehensive because they contain all of the main components of the health care system within a unified mutually exclusive and exhaustive structure. Second, the NHEA are multidimensional, encompassing not only expenditures for medical goods and services, but also the payers that finance these expenditures. Third, the NHEA are consistent because they apply a common set of definitions that allow comparisons among categories and over time.

Exhibit 1 shows the accounting matrix used in the U.S. to record national health care spending. The most recent comprehensive revision to the NHEA was completed for the 2014 vintage of the NHEA. Please visit the following website for more information regarding these changes:

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/benchmark2014.pdf>

In 2016, \$3.3 trillion was spent on health care in the U.S., 62 percent of which purchased hospital care, physician and clinical services, and retail prescription drugs. Private Health Insurance (PHI) paid for 34 percent; out-of-pocket (OOP) 11 percent; and other third party payers and programs 8 percent. The two largest government health care programs, Medicare and Medicaid, purchased \$1.2 trillion in health care in 2016, accounting for 37 percent of total health care spending. Finally, the Department of Defense (DOD) and the Department of Veterans Affairs (VA) accounted for a combined 3 percent (Hartman et al. 2017).

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<sup>1</sup> The Cabinet-level Department of Health, Education and Welfare was created under President Eisenhower on April 11, 1953. In 1979, the Department of Education Organization Act was signed into law, providing for a separate Department of Education. HEW became the Department of Health and Human Services on May 4, 1980. <http://www.hhs.gov/about/hhshist.html>

<sup>2</sup> For a more complete discussion of a reconciliation between the (NHEA) and the (NIPA) please visit: [http://www.bea.gov/scb/pdf/2010/09%20September/0910\\_healthcare.pdf](http://www.bea.gov/scb/pdf/2010/09%20September/0910_healthcare.pdf)

**Exhibit 1:**  
**National Health Expenditures by Type of Expenditure and Program: Calendar Year 2016**

National Health Expenditures																							
Health Consumption Expenditures																Investment							
Personal Health Care																							
												Administration and Net Cost of Private Health Insurance											
Professional Services																							
Physician, Clinics and Other Professionals												Retail Outlet Sales of Medical Products				Government Administration				Structures & Equipment			
Total National Health Expenditures		Hospital Care	Physician and Clinical Services	Other Professional Services	Dental Services	Other Health, Residential, and Personal Care	Home Health Care	Nursing Care Facilities and Continuing Retirement	Prescription Drugs	Durable Medical Equipment	Other Non-durable Medical Products	State	Federal	Net Cost of Private Health Insurance	Public Health Activities	Research	Structures	Equipment					
Levels in Millions																							
National Health Expenditures	\$3,337,248	\$1,082,479	\$664,882	\$91,980	\$124,373	\$173,486	\$92,364	\$162,685	\$328,588	\$50,952	\$62,201	\$12,297	\$31,537	\$219,817	\$82,187	\$47,670	\$50,475	\$59,273					
Out of pocket	352,537	32,671	58,913	22,854	49,929	6,310	8,052	43,778	45,032	24,848	60,151	—	—	—	—	—	—	—					
Health Insurance	2,486,842	951,115	539,763	61,776	73,975	119,227	81,712	107,333	281,682	25,236	2,050	9,815	29,767	203,391	—	—	—	—					
Private Health Insurance	1,123,372	426,671	287,254	31,576	57,729	13,538	9,641	14,809	142,617	9,932	—	—	—	129,605	—	—	—	—					
Medicare	672,093	267,504	149,964	22,582	511	4,944	37,376	37,477	95,393	7,476	2,050	—	10,494	36,321	—	—	—	—					
Medicaid (Title XIX)	565,550	189,824	72,564	7,263	12,122	98,379	33,981	49,991	33,445	7,653	—	9,666	14,583	36,077	—	—	—	—					
Federal	358,095	123,129	51,114	4,745	8,041	56,455	19,638	28,778	22,137	5,114	—	—	14,583	24,360	—	—	—	—					
State and Local	207,454	66,694	21,451	2,518	4,081	41,924	14,343	21,213	11,308	2,539	—	9,666	—	11,716	—	—	—	—					
Total CHIP (Title XIX and Title XXI)	16,883	4,466	3,911	355	1,829	1,398	62	14	1,750	174	—	148	1,386	1,389	—	—	—	—					
Federal	15,309	3,932	3,562	328	1,680	1,263	54	13	1,673	161	—	—	1,386	1,259	—	—	—	—					
State and Local	1,573	534	349	27	149	136	9	1	77	13	—	148	—	130	—	—	—	—					
Department of Defense	41,496	16,899	15,198	—	1,583	—	—	—	4,913	—	—	—	2,903	—	—	—	—	—					
Department of Veterans' Affairs	67,449	45,752	10,871	—	200	968	652	5,042	3,564	—	—	—	402	—	—	—	—	—					
Other Third Party Payers and Programs	258,263	98,693	66,206	7,350	470	47,950	2,600	11,574	1,873	869	—	2,483	1,770	16,427	—	—	—	—					
Worksite Health Care	6,742	—	—	—	—	6,742	—	—	—	—	—	—	—	—	—	—	—	—					
Other Private Revenues	133,207	58,908	44,059	4,829	85	15,676	1,360	8,289	—	—	—	—	—	—	—	—	—	—					
Indian Health Services	3,937	1,975	1,050	—	214	440	—	—	30	9	—	—	218	—	—	—	—	—					
Workers' Compensation	50,661	16,106	12,887	1,418	—	—	—	—	806	677	—	2,218	122	16,427	—	—	—	—					
General Assistance	6,195	2,869	771	72	136	659	322	403	943	20	—	—	—	—	—	—	—	—					
Maternal/Child Health	4,174	367	209	1,021	34	2,134	—	—	87	68	—	251	3	—	—	—	—	—					
Federal	570	54	63	195	9	199	—	—	32	15	—	—	3	—	—	—	—	—					
State and Local	3,604	313	146	826	25	1,935	—	—	55	53	—	251	—	—	—	—	—	—					
Vocational Rehabilitation	545	134	259	—	—	—	—	—	—	91	—	14	47	—	—	—	—	—					
Federal	420	103	200	—	—	—	—	—	—	70	—	—	47	—	—	—	—	—					
State and Local	125	31	59	—	—	—	—	—	—	21	—	14	—	—	—	—	—	—					
Other Federal Programs	12,397	1,532	5,763	—	—	3,814	—	—	—	—	—	—	1,289	—	—	—	—	—					
SAMHSA	3,657	180	1,133	—	—	2,254	—	—	—	—	—	—	89	—	—	—	—	—					
Other State and Local Programs	31,762	16,621	75	10	—	11,247	918	2,882	7	3	—	—	—	—	—	—	—	—					
School Health	4,984	—	—	—	—	4,984	—	—	—	—	—	—	—	—	—	—	—	—					
Public Health Activity	82,187	—	—	—	—	—	—	—	—	—	—	—	—	—	82,187	—	—	—					
Federal	12,134	—	—	—	—	—	—	—	—	—	—	—	—	—	12,134	—	—	—					
State and Local	70,053	—	—	—	—	—	—	—	—	—	—	—	—	—	70,053	—	—	—					
Investment	157,418	—	—	—	—	—	—	—	—	—	—	—	—	—	—	47,670	50,475	59,273					
Research	47,670	—	—	—	—	—	—	—	—	—	—	—	—	—	—	47,670	—	—					
Private	5,466	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5,466	—	—					
Federal	35,557	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35,557	—	—					
State and Local	6,648	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6,648	—	—					
Structures & Equipment	109,748	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	50,475	59,273					
Private	86,545	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43,475	43,070					
Federal	7,962	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2,233	5,729					
State and Local	15,241	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4,767	10,474					

SOURCE: Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group.

### ***National Health Expenditure Accounts and the Health Economy***

The NHEA represent the economic activity within the health sector, which is currently the largest single share of the economy at 17.9 percent of gross domestic product (GDP). The information contained in the NHEA can be used to study numerous topics related to the health care sector including, but not limited to, changes in the amount and cost of health services purchased and the payers or programs that provide or purchase these services, the economic causal factors at work in the health sector, the impact of policy changes, and comparisons at the international level. A cursory overview of these and other topics related the NHEA follows:

- Health care expenditures as a proportion of GDP. Within the NHEA, the amount of *health care* goods and services produced relative to the amount of *all* goods and services produced represents the share of the nation's total production that is attributed to health care. The amount of economic resources devoted to the production of health care also represents the opportunity cost of health care to society, in that such resources cannot be applied to the production of any other types of goods and services.
- Health care expenditures by payers and programs. The NHEA allows for the identification and comparison of the share and magnitude of various types of health care payers and programs including health insurance (such as private health insurance, Medicare, and Medicaid) consumer out-of-pocket payments, and other direct and third party payers.
- Health care expenditures for various types of goods and services. The NHEA present the amount of annual consumption of health care goods and services in various health care establishments in the U.S and are useful in analyzing the changing mix of medical services and products consumed in the United States.
- Health care reform. The comprehensive and integrated structure of the NHEA creates an ideal tool for evaluating changes to the health care system such as the mix of the insured and uninsured, the distribution of all direct and third party payers and programs, the consumption of health care goods and services, and all other impacts of the Patient Protection and Affordable Care Act of 2010 (ACA).
- Health care expenditures by type of sponsor. The NHEA is aligned to produce estimates of spending by type of sponsor i.e., — businesses, households, governments, and other private revenues. Such estimates, combined with measures of available resources used to pay for health care, can help identify pressure points behind rising health care costs.

#### Selected NHEA Products

- Health care expenditure projections. Historical NHEA trends provide a basis for projections of future health care expenditures. The NHE projections incorporate assumptions about demographic and economic factors, as well as inflation rates and other economic information. By projecting the likely consequences of recent trends and current law, these models provide key information to legislators, research analysts, academic professionals, and the general public so that they may make informed decisions (Keehan et al., 2017).
- Health care expenditures by age and gender. Health spending by age and gender (CMS, 2015) focuses on the different expenditure, use, and financing trends among various age and gender groups.
- Health care expenditures by state. State level health accounts (Lassman, et al., 2017) highlight regional differences in expenditures, service mix, and financing sources over time.

In an economic accounting construct, it is important to thoroughly define the concepts, data sources, and methods used in creating the estimates. This section presents the blueprint for creating NHEA estimates in the U. S. The NHEA is a two-dimensional matrix; along one dimension are health care providers or products that constitute the U.S. health care industry and along another dimension are the payers and programs that purchase or provide this health care. The cost of medical care administered outside the U.S. is not included in the NHEA.

### ***What are National Health Expenditures?***

Expenditures in the NHEA represent aggregate health care spending in the U.S. The NHEA recognize several types of health care spending within this broad aggregate.

- **Personal Health Care** expenditures (PHC) measures the total amount spent to treat individuals with specific medical conditions.
- **Health Consumption Expenditures** (HCE) represents spending for all medical care rendered during the year, and is the sum of PHC, government public health activity, and government administration and the net cost of health insurance.
- **National Health Expenditures** (NHE) equals HCE plus Investment, or the sum of medical sector purchases of structures and equipment and expenditures for noncommercial medical research.
- **Government public health activity** measures spending by governments to organize and deliver health services and to prevent or control health problems.
- **Government administration and the net cost of health insurance** includes the administrative cost of running various government health care programs, and the difference between premiums earned by insurers and the claims or losses incurred for which insurers become liable (the net cost of PHI).
- Finally, the category of **Investment** includes spending for noncommercial biomedical research and expenditures by health care establishments on structures and equipment.

### ***Classification***

In the NHEA, health care spending is classified by type of establishment. Classification systems provided by the federal government are used to catalog the economic activity of these establishments. Goods are classified according to the product codes used by the U. S. Census Bureau. Services are classified by the North American Industry Classification System (NAICS) and include sector 62 Health Care and Social Assistance and any government operations that parallel that sector. The NAICS classifies private sector establishments (for profit and not-for-profit) whose production processes are similar. Each establishment is assigned a code that identifies the specific nature of its operation within the broader industrial classification scheme. For the health care and social assistance sector, the NAICS is structured to capture the continuum of medical and social care. In this fashion, the NAICS structure ranges from medical care facilities providing acute care, such as offices of physicians and hospitals; to non-acute medical care facilities, such as nursing homes, to social assistance facilities providing little or no medical care.

Prior to the introduction of the NAICS, the 1987 version of the Standard Industrial Classification (SIC) system was used for classification purposes in the U. S. Services recognized as health care in the NHEA were those in SIC Major Code 80, the designation for health services. The current NHEA represents a NAICS classification structure that is as consistent as possible with the SIC-based classification structure for health care services in order to maintain continuity of the data series over time. The NHEA realigned data from SIC to NAICS to avoid introducing any changes solely as a result of differences in classification systems.

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## Exhibit 2: North American Industry Classification System for Health Care Services Crosswalk to NHEA

NAICS Structure		NHEA Categories
62	Health Care and Social Assistance	
621	Ambulatory Health Care Services	
6211	Offices of Physicians	Physician and clinical services
6212	Offices of Dentists	Dental Services
6213	Offices of Other Health Practitioners	Other professional services/durable medical equipment
62131	Offices of Chiropractors	Other professional services
62132	Offices of Optometrists	Other professional services/durable medical equipment
62133	Offices of Mental Health Practitioners (except Physicians)	Other professional services
62134	Offices of Physical, Occupational and Speech Therapists, and Audiologists	Other professional services
62139	Offices of All Other Health Practitioners	Other professional services
621391	Offices of Podiatrists	Other professional services
621399	Offices of All Other Miscellaneous Health Practitioners	Other professional services
6214	Outpatient Care Centers	Physician and clinical services
62141	Family Planning Centers	Physician and clinical services
62142	Outpatient Mental Health and Substance Abuse Centers	Physician and clinical services
62149	Other Outpatient Care Centers	Physician and clinical services
621491	HMO Medical Centers	Physician and clinical services
621492	Kidney Dialysis Centers	Physician and clinical services
621493	Freestanding Ambulatory Surgical and Emergency Centers	Physician and clinical services
621498	All Other Outpatient Care Centers	Physician and clinical services
6215	Medical and Diagnostic Laboratories	Physician and clinical services
621511	Medical Laboratories	Physician and clinical services
621512	Diagnostic Imaging Centers	Physician and clinical services
6216	Home Health Care Services	Home health care
6219	Other Ambulatory Health Care Services	Other health, residential, and personal care (partial)
62191	Ambulance Services	Other health, residential, and personal care
62199	All Other Ambulatory Health Care Services	not included in the NHEA
621991	Blood and Organ Banks	not included in the NHEA
621999	All Other Miscellaneous Ambulatory Health Care Services	not included in the NHEA
622	Hospitals	Hospital care
6221	General Medical and Surgical Hospitals	Hospital care
6222	Psychiatric and Substance Abuse Hospitals	Hospital care
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	Hospital care
623	Nursing and Residential Care Facilities	Nursing home and residential care facilities/other health, residential, and personal care
6231	Nursing Care Facilities	Nursing care facilities and continuing care retirement communities
6232	Residential Intellectual and Developmental Disability, Mental Health and Substance Abuse Facilities	Other health, residential, and personal care
62321	Residential Intellectual and Developmental Disability Facilities	Other health, residential, and personal care
62322	Residential Mental Health and Substance Abuse Facilities	Other health, residential, and personal care
6233	Community Care Facilities for the Elderly	Nursing care facilities and continuing care retirement communities (only 623311)
62331	Community Care Facilities for the Elderly	Nursing care facilities and continuing care retirement communities (only 623311)
623312	Homes for the Elderly	not included in the NHEA
6239	Other Residential Care Facilities	not included in the NHEA

## National Health Expenditures: Definitions, Sources, and Methods

### *Personal Health Care, Goods and Services*

Personal Health Care (PHC) comprises all of the medical goods and services that are rendered to treat or prevent a specific disease or condition in a specific person. These include hospital care; professional services; other health, residential, and personal care; home health care; nursing care facilities and continuing care retirement communities; and the retail outlet sales of medical products (Exhibit 3). A summary of the data sources used to estimate each of these goods and services is provided below (Exhibit 4).

**Exhibit 3: Structure of the National Health Expenditure Accounts by goods and services**

<b>N H E</b>	<b>H C E</b>	<b>P H C</b>	-Hospital Care
			-Professional Services
			-Physician and Clinical Services
			-Other Professionals Services
			-Dental Services
			-Other Health, Residential, and Personal Care
			-Home Health Care
			-Nursing Care Facilities and Continuing Care Retirement Communities
			-Retail Outlet Sales of Medical Products
			-Prescription Drugs
			-Durable Medical Equipment
			-Other Non-durable Medical Products
			<b>PHC plus:</b>
			-Administration and the Net Cost of Private Insurance
			-Public Health Activity
			<b>HCE plus:</b>
			-Investment
			-Research
			-Structures
			-Equipment

Source: National Health Statistics Group, Office of the Actuary, Centers for Medicare & Medicaid Services.



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## Exhibit 4: Data Sources used in the NHEA

Service/Good:	Total Spending	PHI	OOP	Other Private	Medicare	Medicaid	Other Third Party Payers and Programs
Hospital Care	AHA and EC	Residual, distributed using the AHA and SAS			Claims Data	CMS-64s	Program or Budget Data
Physician and Clinical Services	SAS and EC	Residual, distributed using the SAS					
Other Professional Services	SAS and EC	Residual, distributed using the SAS					
Dental Services	SAS and EC	Residual, distributed using the SAS					
Other Health, Residential, and Personal Care	SAS, EC, Program or Budget data, and other data	SAS and other data					
Home Health Care	SAS and EC	Residual, distributed using the SAS					
Nursing Care Facilities and Continuing Care Retirement Communities	SAS and EC	Residual, distributed using the SAS					
Prescription Drugs	IMS Health and CRT	Residual, distributed using data from IMS Health		N/A			
Durable Medical Equipment	I-O and EC	PCE, CE, and MEPS				MAX/MSIS	
Other Non-durable Medical Products	Kline & Co and I-O	N/A	N/A	N/A	N/A		

### Key of terms:

AHA = The American Hospital Association's Annual Survey of Hospitals

EC = The U.S. Census Bureau's Economic Census, available for years ending in 2 and 7

Other data = Includes data from the Journal of Emergency Medical Services, Bureau of Labor Statistics, Mercer Survey for onsite health care, and Kaiser Health Research and Educational Trust (HRET) survey of Employer-Sponsored Health Benefits

SAS = The U.S. Census Bureau's Service Annual Survey

IMS Health = IMS Health's National Prescription Audit and Method of Payment Report

CRT = The U.S. Census Bureau's Census of Retail Trade, available for years ending in 2 and 7

I-O = The Bureau of Economic Analysis' Input-Output Accounts, available for years ending in 2 and 7

CE = The Bureau of Labor Statistics' Consumer Expenditure Survey

MEPS = The Agency for Healthcare Quality and Research's Medical Expenditure Panel Survey

PCE = Personal Consumption Expenditures

Kline & Co. = Kline & Co. annual survey of over-the-counter drugs

MAX/MSIS = Medicaid Analytic eXtract system and Medicaid Statistical Information Statistics

Source: The National Health Statistics Group, Office of the Actuary, Centers for Medicare & Medicaid Services

## Medical Services

### Hospital Care

In the NHEA, expenditures for hospital care include revenue received for all services provided in hospitals to patients. Thus, expenditures include revenues received to cover room and board, ancillary services such as operating room fees, inpatient and outpatient care, services of resident physicians, inpatient pharmacy, hospital-based nursing home care, hospital-based home health care and fees for any other services billed by the hospital such as hospice.

Expenditures are estimated separately for federal hospitals and non-federal hospitals. The value of hospital output is measured by total net revenue. This includes net patient revenues (gross charges less contractual adjustments, bad debts, and charity care). It also includes government tax appropriations, non-patient operating revenue such as receipts from cafeterias, gift shops and parking lots, and non-operating revenue, such as interest income, contributions, and grants. Thus, although revenue is measured in accrued terms rather than cash terms, the value is expressed as what the hospital expects to receive, rather than what it charged. Non-patient revenues are included in the NHEA because hospitals take anticipated levels of these revenues into account when setting patient revenue charges.

All hospitals in the U. S. are included in the scope of the NHEA. Expenditures for hospital care are estimated separately for non-federal community hospitals; non-federal, non-community hospitals; and federal hospitals.

Total non-federal community hospitals spending levels are benchmarked to the 2012 American Hospital Association (AHA) annual survey and extrapolated using the growth derived from the aggregate revenue trends in the AHA annual survey, the Service Annual Survey (SAS), and the Quarterly Services Survey (QSS). Total non-federal non-community hospital spending is also benchmarked to the 2012 AHA Annual Survey and is extrapolated using the AHA annual survey for periods where the data are available and the SAS for the most recent year.

Total federal hospital spending is calculated as the sum of expenditures for services provided at Department of Veterans Affairs (VA) hospitals, Department of Defense (DOD) hospitals, Indian Health Service (IHS) hospitals, and other federal hospitals.

### **Professional Services: Physician and Clinical; Dental; and Other Professional Services**

Expenditures reported in the professional services category include services rendered in establishments of health professionals. These establishments include physicians, clinics, dentist, and other medical professionals.

In the NHEA the physicians and clinical services category includes Offices of Physicians [including Doctors of Medicine (M.D.) and Doctors of Osteopathy (D.O.) (NAICS 6211)] and outpatient care centers (NAICS 6214), plus the portion of medical and diagnostic laboratories services that are billed independently by the laboratories (a portion of NAICS 6215). The dental services category is comprised of services provided by Offices of Doctors of Dental Surgery (D.D.S.), Doctors of Dental Medicine (D.M.D.), or Doctors of Dental Science (D.D.Sc.) (NAICS 6212). Finally, the other professional services category includes services provided in offices of other health practitioners (NAICS 6213).

The services of professionals working under salary for a hospital, nursing home, or other type of health care establishment are reported with expenditures for that service. For example, care rendered by hospital residents and interns at a hospital is included in the hospital services estimate and excluded from the professional services estimates; services provided in a nursing home are included with the category nursing care facilities and continuing care retirement communities and excluded from the professional services estimate. In addition, some physicians receive professional fees from arrangements with hospitals, including minimum guaranteed income, percentage of departmental billing, and bonuses. These fees are counted with hospital expenditures, rather than with expenditures for physician services.

The NHEA estimates for professional services through the late 1970s are based primarily on statistics compiled and published by the Internal Revenue Service (IRS). Business receipts (which exclude non-practice income) were summed for sole proprietorships, partnerships, and incorporated practices to form the bulk of the estimate. In the late 1970s, the IRS was forced to reduce the size of the sample of income tax returns used to prepare its Statistics of Income (SOI). The reduced sample size limited the usefulness of the SOI for time-series estimates of health spending. Fortunately, new data sources emerged to supplement the SOI data. Data from the Service Annual Survey (SAS) and Economic Census (EC), compiled by the U.S. Census Bureau, are now used to estimate the year-to-year change in the revenue of these professional services.

The EC, a once-every-five-year census, collects receipt/revenue information from all private service establishments with paid employees, and serves as a benchmark for the SAS, which is a sample survey of service establishments. Non-employer (businesses that have no paid employees and are subject to federal income tax) revenue is estimated using records from the IRS (primarily for sole proprietorship businesses filing IRS Form 1040, Schedule C). The IRS records are edited and published by the U.S. Census Bureau in its Non-employer Statistics series through 2015. (<https://www.census.gov/programs-surveys/nonemployer-statistics.html>). The 2016 non-employer estimates are imputed.

In addition to Census estimates, other sources of information are used to corroborate the physician and clinical services expenditures estimates in the NHEA including, but not limited to data on employment, hours, and earnings in private health establishments (Current Employment Statistics (Bureau of Labor

Statistics (BLS, 1972-2016)) and estimates of price inflation (Consumer Price Index (CPI) and Producer Price Index (PPI) (BLS, 1960-2016)). Indirect measures, such as hospital admissions and inpatient days that require complementary professional services and direct measures of physician office visits from (IMS) are also considered.

An addition is made to physician and clinical service expenditures for the portion of medical laboratory services that are billed to the patient directly from the lab rather than being billed through the physician or clinic (NAICS 6215, medical and diagnostic laboratories). Also, a subtraction is made to physician and clinical service expenditures to remove professional fees paid to physicians by hospitals, since these fees are included in hospital expenditures. Estimates of spending for government run Department of Veterans Affairs (VA), Department of Defense (DOD), and IHS clinics and the Coast Guard Academy Clinic are also added to physician and clinical services expenditures. The SAS does not collect data for government facilities in this category.

Estimates of spending for dental services are based upon IRS data (IRS, 1960-87) and in later years the U.S. Census Bureau SAS and the EC. As the final estimates are prepared, additional information is considered from the American Dental Association (1980-2000) on dental office expenditures, from the Current Employment Statistics (BLS, 1972-2014) on employment, and from the (CPI) (BLS, 1960-2016) on dental expenses. The receipts of dental laboratories (SIC 8072 and NAICS 339119) are not included explicitly, because all billings are assumed to be made through dental offices and are therefore included in expenditure estimates for dental services.

The other professional services category includes spending for health practitioners other than physicians and dentists. Professional services include, but are not limited to, those provided by chiropractors, optometrists, physical, occupational, and speech therapists, podiatrists, and private-duty nurses. These estimates are developed using data from the IRS, the U.S. Census Bureau and the BLS. A portion of optometrist revenue for eyeglasses, contact lenses, and other optical goods are deducted, as that spending is included in durable medical equipment. The percentage of optical goods from optometric offices is estimated using product information from the EC and historical data from the SAS.

### **Other health, residential, and personal care**

The other health, residential, and personal care category includes spending for school health, worksite health care, Medicaid home and community based waivers, some ambulance services, residential mental health and substance abuse facilities, and other types of health care. Generally, these, services are provided in non-traditional settings.

Expenditures for ambulance services are estimated using the SAS as well information from the Journal of Emergency Medical Services. Expenditures for care in residential care facilities are estimated using the SAS, Medicaid data for Intermediate Care Facility services for the Intellectually Disabled (ICFID), information from the Department of Veterans Affairs (VA) for domiciliary care and information from the Substance Abuse and Mental Health Services Administration (SAMHSA).

The worksite healthcare estimate is derived from various data sources. A 1984 survey of employer-sponsored health plans (McDonnell et al., 1987) produced an estimated cost per employee with access to covered services in 1984. The estimate is extrapolated from the 1984 estimated cost per employee using national employment data and the Consumer Price Index (CPI) for medical services and physicians from the BLS, and is further adjusted for changes in use and intensity. Additional information from the Mercer Survey for onsite health care and the Kaiser/HRET survey of employer-sponsored health benefits provides data on the number of employees that are provided worksite health care services.

Expenditures for medical care provided in non-traditional settings includes care provided in community centers, senior citizens centers, schools, and military field stations. One of the largest categories of government spending for this category is home and community-based waiver programs under Medicaid. In these programs, states may apply for waivers to some of the statutory provisions in order to provide care to beneficiaries who would otherwise require long-term inpatient care in a hospital or nursing home. Examples of types of services provided under these waivers include rehabilitation, respite care, and

environmental modifications. This care is frequently delivered in community centers and senior citizens centers and through home visits by various kinds of medical and non-medical personnel.

### Home Health Care

The home health care component of the NHEA measures annual expenditures for medical care services delivered in the home by freestanding home health agencies (HHAs). NAICS 6216 defines home health care providers as private sector establishments primarily engaged in providing skilled nursing services in the home, along with a range of the following: personal care services; homemaker and companion services; physical therapy; medical social services; medications; medical equipment and supplies; counseling; 24-hour home care; occupational and vocational therapy; dietary and nutritional services; speech therapy; audiology; and high-tech care, such as intravenous therapy.

Hospital-based HHAs are classified with hospitals (NAICS 622), and are therefore included with hospital care expenditures. Beginning in 1987 and continuing through 1996, HHAs were classified under the SIC, which defines home health care providers (SIC 8082) as establishments primarily engaged in providing skilled nursing or medical care in the home, under supervision of a physician. This definition is consistent with NAICS 6216.

For employer-based establishments, estimates of freestanding home health spending in 1987, 1992, 1997, 2002, 2007, and 2012 are based on business receipts of private taxable and tax-exempt firms collected in the U.S. Census Bureau's quinquennial EC of Service Industries. Information from the U.S. Census Bureau's SAS is used to interpolate between the EC benchmark years and to extrapolate to later periods. Receipts of non-employer taxable firms are then added to the revenue for employer-based taxable and tax-exempt firms to estimate calendar year expenditures for home health care services.

Government-owned HHAs are not included in the EC of Service industries and are therefore estimated separately and added to the estimates of total employer and non-employer revenue. To estimate revenue for government-owned HHAs, an annual adjustment factor is calculated using a ratio of Medicare reimbursements for government-owned freestanding HHAs to Medicare reimbursements for all privately-owned freestanding HHAs. These Medicare reimbursements by type of agency and type of control are obtained using tabulations from the Medicare Provider Analysis and Review database (MEDPAR). This ratio, multiplied by Census receipts, produces an estimate of revenue for freestanding government facilities. Total home health spending is derived by adding together the receipts for private establishments and the estimated revenue of government facilities.

Freestanding home health expenditures for 1967 through 1987 were primarily based on data available from the Medicare and Medicaid programs.

Analysis of cost report data from agencies that were not part of a hospital or nursing home indicate that agency costs for services, medical equipment, and supplies provided to Medicare patients represented approximately 50 percent of total agency costs. This share was observed in data extracted from cost report files in the mid-1970s (Health Care Financing Administration, 1974-76). Examination of annual data for 1981-84 verified Medicare's 50-percent share (Health Care Financing Administration, 1981-84). Estimates of spending for home health care from 1960 through 1966 were obtained from information reported by a sample of voluntary public health nursing agencies. Data on voluntary public health nursing agency income and expenditures were collected in surveys conducted by the National League for Nursing in 1958, 1963, and 1967. Survey data on total agency income and income from patient fees were weighted to estimate income of all voluntary public health nursing agencies, and then estimated for each non-survey year between 1958 and 1968 (Freeman, 1969).

### Nursing Care Facilities and Continuing Care Retirement Communities

Expenditures reported in this category are for services provided in freestanding nursing homes and continuing care retirement communities. These facilities are defined in the 2007 NAICS as private sector establishments primarily engaged in providing inpatient nursing, rehabilitative, and continuous personal care services to persons requiring nursing care (NAICS 6231) and continuing care retirement communities with on-site nursing care facilities (NAICS 623311). In the 1972 and 1987 SIC, these two

types of establishments were identified together as nursing and personal care facilities (SIC 805). In the NHEA, hospital-based nursing home care is included with hospital care expenditures (NAICS 622).

Estimates of expenditures for care received in freestanding nursing homes for the years 1977, 1982, 1987, 1992, 1997, 2002, 2007, and 2012 are based on business receipts of service establishments collected in the U.S. Census Bureau's quinquennial EC of Service Industries. Information from the U.S. Census Bureau's SAS is used to interpolate between the EC benchmark years and extrapolate to later periods. Estimates of expenditures for care received in state and local government facilities as well as government outlays for care provided in nursing facilities operated by the Department of Veterans Affairs (VA) are added to the private establishment estimates detailed above.

Estimates of freestanding nursing home spending prior to 1977 are based on total nursing home expenditures from the National Center for Health Statistics estimates of average revenue per day for all facilities providing some nursing care. The estimates were interpolated and extrapolated using employee work hours for nursing and personal care facilities (SIC 805) (BLS, 1972-2016) multiplied by the growth in skilled nursing facility input prices (HHS, Centers for Medicare and Medicaid Services (CMS) September 2016).

### Medical Goods

#### Retail Outlet Sales of Medical Products

This class of expenditure is limited to spending for products purchased or leased from retail outlets and through mail order. The value of drugs and other products provided to patients in hospitals (on an inpatient or outpatient basis), nursing homes, and other provider settings, are implicit in estimates of spending for those providers' services. The one exception is for optical goods, which comprise a large portion of optometrist receipts NAICS (62132). Receipts for these products are removed from optometrist's receipts and included in the durable medical equipment (DME) category.

#### Prescription Drugs

Estimates of expenditures for prescription drugs include retail sales of human-use, dosage-form drugs, biological drugs, and diagnostic products that are available only by a prescription. These include retail prescription drug purchases that occur in pharmacies and drug stores (including both chain and independent), supermarkets and other grocery store pharmacies, mail-order and other direct-selling establishments, department stores, warehouse clubs and supercenters, and all other general mass-merchandising establishments.

Drug purchases by consumers from these retail establishments are based on data from the EC (U.S. Census Bureau, 1992, 1997, 2002, 2007, and 2012). Added to the EC data are estimates for government-run mail order facilities, state-specific sales taxes on prescription drugs, and adjusted non-employer drug store receipts. Retail sales that flow through nursing homes and those that are provided directly by institutions are removed. Information from IMS Health Inc. (1992-2016) is used to interpolate between the EC benchmark years and to extrapolate to later periods. Prior to the 1992 EC, prescription drug estimates were developed using domestic drug sales augmented by wholesale and retail markups and by estimates of consumption for various channels of users.

The prescription drug estimates are adjusted to account for manufacturers' rebates that reduce insurers' net payments for drugs. Providers and insurers who are responsible for the purchase of large volumes of drugs have been able to negotiate rebates with manufacturers for the use of specific drugs. Rebates received by providers such as hospitals do not require an adjustment because rebate savings are received directly by hospitals whose revenues are used to measure hospital spending. In retail purchases of prescription drugs, however, the retail outlet is not a party to the rebate transaction that takes place between the insurer who pays the retail outlet and the manufacturer that produces the drug. Because NHEA estimates of prescription drugs are based on retail sales data at the pharmacy level, a reduction to account for rebates must be made to total drug spending and to third party payments to retail pharmacies to avoid over-estimation of prescription drug spending.

### **Other Non-Durable Medical Products**

Other non-durable medical products include non-prescription drugs (products purchased over the counter such as analgesics and cough and allergy medications) and medical sundries (items such as surgical and medical instruments and surgical dressings, and diagnostic products such as needles and thermometers). Estimates of these retail purchases by consumers are based on data from the national Input-Output (I/O) tables produced by the Bureau of Economic Analysis (BEA) (1963, 1967, 1972, 1977, 1982, 1987, 1992, 1997, and 2002). Expenditures for other non-durable medical products for 1960-1996 were interpolated between I/O years and extrapolated to earlier periods using Personal Consumption Expenditures (PCE) data from the National Income and Product Accounts (BEA, 1960-1996). For 1997 forward, the two components comprising the non-durables estimate (non-prescription drugs and medical sundries) are interpolated and extrapolated separately. For non-prescription drugs, data for 1997-2007 are interpolated between I/O years and extrapolated to 2016 using retail sales data (Kline & Company 1960-2016). For medical sundries, data for 1997-2016 are based on personal consumption expenditure data from the National Income and Product Accounts (BEA, 1997-2016).

### **Durable Medical Equipment**

Expenditures in this category represent retail sales of items such as contact lenses, eyeglasses and other ophthalmic products, surgical and orthopedic products, medical equipment rental, oxygen and hearing aids. Durable medical equipment (DME) generally has a useful life of over three years whereas non-durable products last less than three years. The estimate of DME expenditures is based on detailed I/O table final demand data adjusted to meet NHEA definitions (BEA 1963, 1967, 1972, 1982, 1987, 1992, 1997, 2002, and 2007) as well as detailed product data from the U.S. Census Bureau's 2012 EC. In the intervening non-I/O years, total DME expenditures are interpolated and extrapolated using adjusted Personal Consumption Expenditures (PCE) data for therapeutic appliances and equipment.

### ***Personal Health Care, Payers and Programs***

These payers and programs are directly responsible for purchasing or providing medical goods and services that are rendered to treat or prevent a specific disease or condition in a specific person in the U.S. Often several types of payers or programs combine to pay for an individuals' health care. These include out-of-pocket, health insurance, and other third party payers and programs. At the PHC level these estimates do not include government administration and net cost of private health insurance expenditures (Exhibit 5).

**Exhibit 5: Structure of the National Health Expenditure Accounts by Source of Funds**

<b>N H E</b>	<b>H C E</b>	<b>P H C</b>	-Out-of-Pocket
			-Health Insurance
			-Private Health Insurance
			-Medicare
			-Medicaid (Title XIX)
			- Children's Health Insurance Program (Title XIX and Title XXI)
			-Department of Defense
			-Department of Veterans Affairs
			-Other Third Party Payers and Programs
			-Worksite Health Care
			-Other Private Revenues
			-Indian Health Services
			-Workers' Compensation
			-General Assistance
			-Maternal/Child Health
			-Vocational Rehabilitation
			-Other Federal Programs
			-SAMHSA
			-Other State and Local Programs
			-School Health
			<b>PHC plus:</b>
			-Administration and the Net Cost of Private Insurance
			-Public Health Activity
			<b>HCE plus:</b>
			-Investment
			-Research
			-Structures
			-Equipment

Source: National Health Statistics Group, Office of the Actuary, Centers for Medicare & Medicaid Services.

## Out-of-Pocket

Out-of-pocket (OOP) spending for health care consists of direct spending by consumers for health care goods and services. Included in this estimate is the amount paid OOP for services not covered by insurance and the amount of coinsurance or deductibles required by Private Health Insurance (PHI) and public programs such as Medicare and Medicaid (not paid by some other third party), as well as payments covered by health savings accounts (HSAs).

Premium payments for insurance plans such as PHI and Medicare are not included in out-of-pocket spending since the payment by the enrollee is paid to a third party insurer (PHI or Medicare) that is classified in the NHEA as a separate source of funds. Similarly, coinsurance and deductible amounts paid by supplementary Medicare policies on behalf of enrolled Medicare beneficiaries are also excluded from the OOP source of funds category, and are counted as PHI.

For hospitals, physicians and clinics, dental, other professionals, home health, and nursing home services, the SAS provides data on OOP payments along with all other sources of funds. Other sources of data for OOP spending include the Consumer Expenditure Survey (CE) and publications of trade associations such as Visiting Nurses Association (1988) and its predecessor (the Voluntary Public Health Nurses Association), the American Hospital Association (AHA) (1980-2012), the American Medical Association (AMA) (1984-2001), the American Dental Association (ADA) (1980-2000) and various nursing home surveys (National Center for Health Statistics, various years).

In addition, data from surveys of the non-institutional population's health care use and financing patterns, conducted periodically over the past three decades, provided information used to determine the amount of OOP spending. For 1963 and 1970, the Center for Health Administration Studies and the National Opinion Research Center, both at the University of Chicago, surveyed individuals for the purpose of providing "reliable and valid statistics of medical care use and" (Research Triangle Institute, 1987). These studies were followed in 1977 by the National Medical Care Expenditure Survey (National Center for Health Services Research, 1977), in 1980 by the National Medical Care Utilization and Expenditure Survey (National Center for Health Statistics, 1980), and in 1987 by the National Medical Care Expenditure Survey (National Center for Health Services Research, 1987) and in 1996-2008 by data from the Medical Expenditure Panel Survey-Household Component (Agency for Healthcare Research and Quality 1996-2013).

### Health Insurance

This aggregated category includes: Private Health Insurance, Medicare, Medicaid, the Children's Health Insurance Program (CHIP), the Department of Defense (DOD) and the Department of Veterans Affairs (VA). These plans provide enrollees and beneficiaries insurance against medical losses and, in some instances, directly provide medical care.

#### Private Health Insurance

Private Health Insurance (PHI) plans in the NHE include fully-insured and self-insured health plans. Fully-insured plans are health insurance plans where the insurance company takes on all of the risk of insuring the plan's beneficiaries. Self-insured plans are offered by employers and other groups who directly assume the major cost and risk of health insurance for their employees or members, with some self-insured employers or groups bearing the entire risk. Self-insured groups can also insure against large claims by purchasing stop-loss insurance plans. Stop-loss coverage is a form of reinsurance that limits the amount an employer will have to pay for each person's health care (individual limit) or for the total expense of the company (group limit). In addition, some self-insured groups' contract with traditional carriers or third-party administrators for claims processing and other administrative services while other self-insured plans are self-administered.

The different general types of health insurance plans available in the U.S. include; Health Maintenance Organizations (HMO's), Preferred Provider Organizations (PPO's) Point of Service Plans (POS's), Consumer Directed Health Plans (CDHP's), and indemnity plans. An HMO is a prepaid health plan where the enrollee pays a co-payment but must receive care from an approved provider. A PPO is a medical plan where coverage is provided to enrollees through a network of selected health care providers, although in some cases enrollees may go outside the network and pay a larger share of the cost. A POS plan is an "HMO/PPO hybrid" or an "open-ended" HMO. POS plans resemble HMOs for in-network services in that they both require co-payments and a primary care physician or gatekeeper. Services received outside of the network are usually reimbursed on a fee-for-service (FFS) basis. CDHP's consist of (HSAs or HRAs) and/or high deductible health plans, often with higher deductibles and lower premiums than a typical health insurance plan. Indemnity plans primarily consist of "open-network" plans with little to no cost sharing, penalties, or restrictions on medical benefit coverage.

Private health insurance benefits by type of service are estimated using provider survey data in conjunction with source of funding spending from several sources. These sources include the U.S. Census Bureau, the American Medical Association, the American Hospital Association and IMS as well as household data from surveys such as the National Medical Care Expenditure Survey (National Center



for Health Services Research, 1987) and later, the Medical Expenditure Panel Survey-Household Component (Agency for Healthcare Research and Quality, 1996-2016).

### **Medicare**

Medicare is a health insurance program for people age 65 or older, people under the age of 65 with certain disabilities, and people of all ages with end-stage renal disease (ESRD).

Estimates of Medicare spending for PHC are based on information prepared by the CMS Office of the Actuary (OACT) for the Medicare Trustees Report, reports submitted by Medicare contractors, and administrative and statistical records. Medicare is estimated in two pieces, (FFS) and managed care. For each, expenditures are estimated separately by service category and then summed.

#### *Hospital Insurance (HI) and Supplementary Medical Insurance (SMI) Trust Funds*

Annually, in the Medicare Trustees Report, expenditures are reported according to the part of the Medicare trust fund responsible for payment. Hospital insurance (HI), or Part A, expenditures include payments for inpatient hospital services, skilled nursing services, home health care, hospice care, and Part A managed care. HI payments are made by “fiscal intermediaries” on behalf of the Centers for Medicare and Medicaid Services.

Supplementary medical insurance (SMI), or Part B, expenditures include payments for physician services, DME, laboratory tests performed in physician offices and independent laboratories, and other services. These other services may include physician-administered drugs, freestanding ambulatory surgical centers, ambulance transport, and supplies. SMI payments are made by “carriers” on behalf of CMS for the above-mentioned Part B services.

Under SMI, fiscal intermediaries are responsible for reimbursement of institutional services as well. These include outpatient hospital services, home health services, laboratory services performed in hospital outpatient departments, and other services (such as renal dialysis performed in freestanding dialysis facilities, services in outpatient rehabilitation facilities, and services in rural health clinics). Part B expenditures for managed care are reported separately.

Beginning in 2004, a separate Part D account was established within the SMI trust fund that is responsible for payments for prescription drugs.

Because the reporting of expenditures in the Trustees Report by type of benefit (HI or SMI) and type of service is different than the NHE definitions and concepts of services, a series of adjustments to the FFS incurred benefits are necessary to achieve consistency between these two sets of Medicare estimates. An initial conceptual adjustment is made to eliminate small amounts of incurred benefit spending occurring outside the U.S. for Medicare enrollees. The following sections detail how spending by NHE types of services are derived using Trustees Report incurred benefit spending data.

#### *Fee-for-Service Estimates: Parts A & B*

##### *Part A Services*

##### *Hospital Care*

Hospital care is a summation of incurred benefits for inpatient hospital care, outpatient hospital care, and hospital-based hospice, hospital-based nursing home care and hospital-based home health care. Also included in hospital care is the estimated combined billing amounts for services of hospital-based physicians (combined billing was allowed by Medicare for inpatient expenses incurred through fiscal year 1983). Outpatient hospital benefits are adjusted to exclude payments for freestanding ESRD clinics, federally qualified health centers (FQHCs), rural health clinics (RHCs), comprehensive outpatient rehabilitation facilities (CORFs) and community mental health centers (CMHCs) (which are included in the Physicians and Clinical services estimate).

### *Nursing Home and Home Health Care*

Incurring benefits for skilled-nursing facility services and home health care are adjusted to include spending for freestanding facilities only; hospital-based spending for these facilities are included with the hospital estimate. In addition, home health-based hospice spending and skilled nursing facility-based hospice spending are separately estimated and are added to freestanding facility estimates for skilled nursing facilities and home health care to derive total spending for nursing home care and home health care.

### *Part B Services*

Estimates of spending for physician and clinic services, other professional services, non-Part D prescription drugs, and other medical non-durable and durable medical supplier services are extracted from actuarial estimates of incurred benefits for physician and Part B supplier services. Shares of spending for each of these categories are based on proportional distributions of reimbursements by provider specialty and procedure codes obtained from various administrative and statistical records. These shares are then applied to total Part B incurred benefit payments, which produce estimates of spending for NHE-based categories.

### *Physicians and Clinics*

Expenditures for physician services include the physician and laboratory services portions of incurred benefits for Physicians and Part B Supplier services. Expenditures for clinics include payments to freestanding ESRD clinics, federally qualified health centers (FQHCs), rural health clinics (RHCs), comprehensive outpatient rehabilitation facilities (CORFs) and community mental health centers (CMHCs). In addition, expenditures for physician-administered drugs are included with physician services.

### *Other Part B Services*

The supplier share of incurred benefits for physician and Part B supplier services is subdivided into further categories based on provider specialty designations. These NHE categories include other professionals, ambulance services, dental services, DME, prescription drugs, and other non-durables.

The category of other professional services includes payments for the services of other health professionals, such as podiatry, chiropractic services, optometry, physical and occupational therapy, and nurse practitioner services. Ambulance services are classified in other health, residential, and personal care beginning in NHE 2009 and are the only services included within this Medicare category. Dental service expenditures are separately estimated using the portion of expenditures attributable to oral surgery, as traditional Medicare does not cover regular dental services.

Expenditures for DME include payments for the retail purchase or rental of DME from Medicare Part B suppliers and payments for oxygen and oxygen-related equipment (Note: these do not include expenditures associated with a provider's purchase or rental of items, such as for a hospital or physician's office).

The DME share is further subdivided into prescription drugs and other non-durables based on billing data using CMS's Healthcare Common Procedure Coding System. The prescription drugs included in this category represent drugs billed by pharmacy suppliers that are administered through DME (such as respiratory drugs administered through a nebulizer), drugs billed by pharmacy suppliers that are self-administered (such as immunosuppressive drugs and oral anti-cancer drugs), and other separately billable Part B drugs. Pharmacy supply and dispensing fees are also included in the Part B prescription drug category of the NHE.

The Medicare FFS prescription drug estimates include calendar year incurred benefit spending for Part B and Part D drugs. Expenditures for Part D drugs are separately estimated, and are discussed in more detail in the next section.

### *Part D*

With the implementation of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA), a separate Part D account was established within the SMI trust fund. This portion of the SMI trust fund pays for prescription drugs. Beginning with NHE 2004, Part D benefits are allocated to the NHEA category, retail prescription drugs. In 2004 and 2005, expenditures represent transitional assistance benefits only, and for 2006 forward, expenditures represent the full prescription drug benefit.

Calendar year incurred Part D expenditures are estimated using data prepared for the annual Medicare Trustees Report, which examines monthly plan payment reports, plan bid data, year-end reconciliation reports, and treasury financial statements. Data for the Trustees Report is prepared for Total Part D expenditures, expenditures for stand-alone prescription drug plans (PDPs), and expenditures for Medicare Advantage prescription drug plans (MA-PDs). Part D data for PDPs and MA-PDs are divided into expenditures for benefits and for administration. Part D expenditures for PDPs are included in Medicare fee-for-service estimates, while for MA-PDs, expenditures are included in the Medicare managed care estimates of prescription drugs and administration.

In the NHE, Part D expenditures for Medicare employer-subsidized plans are subtracted from Medicare expenditures, and are included in the PHI estimates, as these subsidies are provided to private businesses to help pay for coverage of their retired Medicare-eligible employees.

### *Managed Care Estimates (known as Part C or Medicare Advantage)*

Annually, the Medicare Trustees Report reports total Medicare payments to managed care plans for services covered by the HI (Part A) and SMI (Part B) programs. All Medicare managed care enrollees receive coverage for a standard package of benefits, but they may also be covered for a wide variety of additional services such as routine physicals, preventive care, and prescription drugs.

The Medicare managed care program, otherwise known as “Medicare Advantage”, makes capitated payments on behalf of Medicare to managed care organizations to care for beneficiaries enrolled in the managed care option. For most types of plans, beneficiaries enrolled in managed care are limited in their choice of health care providers. Submission of FFS claims on behalf of enrolled beneficiaries is not permitted. Instead, health care providers are paid by a private health care organization (such as a HMO or PPOs), which are paid a monthly rate. The monthly payment made by CMS on behalf of each plan enrollee is based on a plan’s bid and is adjusted for the enrollee’s demographic characteristics, health status, and county-of residence. In the NHE estimates, Medicare managed care payments are allocated to both services and administrative expenses.

Comprehensive statistics on specific services used by managed care enrollees are not reported to CMS. Therefore, service distributions of Medicare capitated payments are estimated using data from Bid Pricing Tools (BPTs) (which began in 2006). Prior to the BPTs, Medicare capitated payments were estimated using data from Adjusted Community Rating (ACR) proposals. These proposals were submitted for approval of the monthly premiums that the plan intends to charge and the services it intends to deliver to Medicare enrollees for the upcoming year. These types of forms are the only available source from which to obtain estimates of managed care expenditures by type of service.

### **Medicaid**

Medicaid is a joint state and federal insurance program that is available only to certain low-income individuals and families who fit into an eligibility group that is recognized by federal and state law.

Medicaid estimates are based primarily on financial information reports filed by the State Medicaid agencies on Form CMS-64. These state level reports provide total program net expenditures by Medicaid program category including program administration and premiums. Prior to the availability of the Quarterly Expense Report (Form CMS-64) in 1979, State statistical reports (Form CMS-2082) were used to develop service distributions. Several types of adjustments to reported program data are necessary to fit the estimates into the framework of the NHEA. The first series of adjustments are related to FFS payments and are necessary to create Medicaid estimates that are consistent with the NHEA service and product classification structure.

First, Medicaid expenditures, reported by State by Medicaid program categories on Form CMS-64, are mapped to NHEA service categories by State. Total Medicaid hospital spending is the sum of eleven types of program payments to include (inpatient hospital – regular, inpatient hospital – disproportionate share (DSH), inpatient hospital – supplemental, inpatient hospital –graduate medical education, mental health facility services – regular, mental health facility – DSH, outpatient hospital services- regular, outpatient hospital services – supplemental, emergency hospital services, health information technology incentive payments, and critical access hospitals). All program categories are assigned to NHEA service categories in this fashion. Adjustments are made for prior period payments.

Second, an estimate of hospital-based nursing home expenditures is added to hospital care expenditures and subtracted from nursing home care expenditures.

Third, an estimate of hospital-based home health care spending is added to hospital care expenditures and subtracted from home health care expenditures.

Fourth, an estimate of Medicaid buy-ins to Medicare is deducted to avoid double counting when the programs are presented together in the NHEA.

Finally, a DME estimate is developed from the Medicaid Analytic eXtract (MAX) — a set of person-level data files on Medicaid including payments by service. The DME amount is removed from other services payments included in the other health, residential, and personal care NHEA category.

The second series of adjustments create NHEA service distributions for capitated and other insurance premium payments recorded on the Form CMS-64. Medicaid premiums payments are reduced by administrative costs and then allocated to NHEA service categories historically based on the distribution of FFS spending for selected services in the state. Adjustments to these service distributions are made in more recent years to account for states that have a large percentage of spending from managed care. We used other sources of Medicaid spending to supplement the CMS-64s including data from the AHA, MEPS, MAX, and Medicaid Drug Rebate System as well as historic spending patterns. In certain states, additional adjustments are made to account for specific services or products that are carved out of the premium. These carve-outs typically occur for prescription drugs and dental services.

The third stage of the Medicaid estimating procedure is to sum the FFS and insurance portions of the Medicaid service estimates together the 50 states and the District of Columbia together to get national estimates.

To accurately measure state contributions to Medicaid expenditures, further adjustments are made to state Medicaid payments to account for the diversion of some Medicaid funds to states' general revenue funds for use in other state programs. States have used two devices—disproportionate share hospital (DSH) and upper payment limit payments—for this purpose. States accomplished this by working with nursing homes and hospitals to set higher reimbursement rates than usual for the service provided or make extra DSH payments to hospitals serving a disproportionate share of low-income residents.

### **Children's Health Insurance Program (Title XIX and Title XXI)**

The Children's Health Insurance Program (CHIP) is a joint federal/State program that provides health insurance for children in families that do not have health insurance coverage and are not eligible for Medicaid. CHIP was created in 1997 with the enactment of the Balanced Budget Act of 1997 (BBA97) with the explicit goal of reducing the number of children without health insurance (P.L.105-33). The BBA97 gave states the option to set up new independent health insurance programs for children, to expand existing state Medicaid programs to insure children who were eligible for health insurance coverage under CHIP eligibility standards, or to use a combination of CHIP programs and Medicaid expansions. The Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA or Public Law 111-3) reauthorized CHIP through FY 2013. The Affordable Care Act of 2010 further maintained the CHIP eligibility in place as of enactment through 2019 and funding through October 1, 2015. The Medicare Access and CHIP Reauthorization Act (MACRA) extended CHIP funding through FY 2017.

In the NHEA, estimates of CHIP spending are developed using data from Form CMS-21 for Title XXI programs and Form CMS-64 for Title XIX programs. Service distributions are derived from program

payment data reported on these forms and are crosswalked to NHEA service categories in the same fashion as the Medicaid estimates.

### Department of Defense

The Department of Defense (DOD) health care program, TRICARE, covers members of the uniformed services, their families and their survivors, as well as retired members and their families<sup>3</sup>. Adjustments are made to remove items outside of the scope of the NHEA including spending levels for Non-DOD beneficiaries.

Estimates of the DOD health care costs (DOD, 1981-2016) are based on DOD's FY 2018 President's Budget Submission. Also included are the DOD's projected receipts to the Defense Health Program from the DOD Medicare Eligible Retiree Health Care Fund. This fund pays for health care costs of Medicare eligible retirees, retirees' family members, and survivors.

In addition, unpublished data provided by the DOD (DOD, 2006-2016) are used to estimate hospital, clinics and dental care spending for active personnel. Finally, data for the non-active duty populations are provided directly by the program administrators (DOD, 1980-2016), including data for separate hospital, physician and drug categories. All DOD health care spending data is converted from a federal fiscal year basis to a calendar year basis.

### Department of Veterans Affairs

The Department of Veterans Affairs (VA) estimates of health expenditures are prepared using unpublished expenditure data supplied by the VA (*Allocation Resource Center*, 1999-2016) supplemented with data from the budget appendix of the U.S. Government (Executive Office of the President, 1968-2018), Monthly Treasury Statements of Receipts and Outlays of the U.S. Government (U.S. Department of the Treasury, Financial Management Service, 1960-2016), and VA *Annual Reports and Congressional Submissions*. In addition, administrators of the Civilian Health and Medical Program of the Veterans Administration provide unpublished data on expenditures specific to this program (VA Health Administration Center, 1960-2016).

### Other Third Party Payers and Programs

#### Worksite Health Care

Worksite health care represents expenditures for PHC directly provided by employers for their employees. This includes services such as those provided at an on-site health unit, such as the administration of flu shots and blood tests, or more extensive medical care such as onsite physician or hospital services. The estimate is extrapolated using national employment data and the Consumer Price Index (CPI) for medical services and physicians from the BLS and is adjusted for changes in use and intensity. Additionally data from the Mercer Survey for onsite health care and the Kaiser/HRET survey of employer-sponsored health benefits are used to estimate number of employees that are provided worksite health care services.

#### Other Private Revenues

The most common source of other private revenues is philanthropy. Philanthropic support may be direct from individuals or may be obtained through philanthropic fund-raising organizations such as the United Way, or other foundations or corporations. Philanthropic revenues may be spent directly for patient care or may be held in an endowment fund to produce income to cover current expenses. For institutions such as hospitals, nursing homes and HHAs, other private funds also include income from the operation of gift shops, cafeterias, parking lots, educational programs, and investment income.

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<sup>3</sup> The medical care program for the families of active-duty members and retirees of the uniformed services used to be a separate program, Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). This program has been subsumed under TRICARE.

For hospitals, estimates of other private revenues are based on data gathered by the AHA in its annual survey of all hospitals. Estimates of other private revenues, including philanthropy, for other services are based on information from the U.S. Census Bureau' Services Annual Survey, trade associations, and person surveys such as the National Medical Care Expenditure Survey (NMCES), the National Medical Care Utilization and Expenditure Survey (NMCUES), and the National Medical Expenditure Survey (NMES).

### Indian Health Services

The Indian Health Service (IHS), an agency within the Department of Health and Human Services, is responsible for providing federal health services to American Indians and Alaska Natives. The provision of health services to members of federally-recognized tribes grew out of the special government-to-government relationship between the federal government and Indian tribes. This relationship, established in 1787, is based on Article I, Section 8 of the Constitution, and has been given form and substance by numerous treaties, laws, Supreme Court decisions, and Executive Orders. The IHS is the principal federal health care provider and health advocate for Native American people, and its goal is to raise their health status to the highest possible level. The IHS provides a comprehensive health service delivery system for approximately 2.2 million American Indians and Alaska Natives who belong to 567 federally recognized tribes in 36 states.

The NHE estimate of IHS spending is based on data from the Appendix to the Budget of the United States (Executive Office of the President, 1960-2017). The IHS Budget justification document is also used to estimate the goods and services distributions of IHS spending.

### Workers' Compensation

Workers compensation includes expenditures for medical benefits that are paid for by federal and state and local workers compensation programs. The U.S. Department of Labor, Office of Workers' Compensation Programs administers compensation programs which provide benefits to federal workers or their dependents that are injured at work or acquire an occupational disease. Estimates for these programs are based on the U.S. budget appendix (Executive Office of the President, 1960-2016) and information from the U.S. Department of Labor.

Non-federal workers' compensation programs are financed almost exclusively by employers. Premiums paid are based on industry classification and the occupational classification of their workers. Most large employers are also experience-rated.

All non-federal workers' compensation programs are designed and administered by the state. Generally state laws require that all non-federal employers purchase insurance, either from commercial (private) insurers or from publicly operated state funds, or prove that they have the financial ability to carry their own risk.

Estimates by state are based on an annual report by the National Academy of Social Insurance (NASI). This is the only source of comprehensive national data on workers compensation benefits and costs. NASI began reporting these estimates after SSA discontinued them in 1995 (1993 was the last year of data estimated by SSA). Previously, workers' compensation estimates were published annually in the *Social Security Bulletin*.

### General Assistance

General assistance (GA) expenditures in the NHEA include two types of programs: General assistance programs that are often modeled after Medicaid, and State Pharmaceutical Assistance Programs that provide low-income and medically needy senior citizens and individuals with disabilities financial assistance for prescription drugs.

General assistance refers to direct payments or payments to vendors to or on behalf of needy persons who do not qualify for federally financed assistance programs. It is provided by state and local government jurisdictions, and is not financed in whole or part by federal funds. General assistance may be administered by the state welfare agency, a local agency, or a local agency under state supervision.

Eligibility requirements and payment levels of general assistance programs vary greatly from state to state and often within a state. State Pharmaceutical Assistance Program (SPAP) data are collected separately from other general assistance data.

General assistance and SPAP data are collected directly from the pertinent state or county agencies, as no national clearinghouse for these data exists.

### **Maternal and Child Health**

The Maternal and Child Health program is a joint Federal and state program that seeks to improve the health and wellbeing of women (particularly mothers) and children. The program is administered by the Department of Health and Human Services, under the Health Resources and Services Administration (HRSA) through the Maternal and Child Health Bureau (MCHB) and seeks to improve access to quality care especially for individuals with low income, reduce infant mortality, provide comprehensive prenatal and postnatal care for women, increase health assessments, diagnostic, and treatment services and provide for other special health care needs.

Maternal and Child health funds are distributed to grantees from 59 states and jurisdictions. States and jurisdictions must match every four dollars of federal money that they receive with at least three dollars of state and/or local money (i.e., non-federal dollars.)

Data for federal Maternal and Child Health spending is obtained directly from the Maternal and Child Health Bureau. The federal portion is based mainly on Maternal and Child Health block grant data by state, Special Projects of Regional and National Significance projects, Community Integrated Service Systems (CISS) projects, and some research/training amounts. The state and local spending estimate is based on Public Health Foundation data (FYs1980-1989) and data from the Maternal and Child Health Bureau website (FYs1997-2015).<sup>4</sup>

### **Vocational Rehabilitation**

The vocational rehabilitation program provides funds from the federal and state and local government for the rehabilitation of individuals with physical and mental impairments. Only PHC goods and services financed by the program are included in the health accounts. Data for the program is obtained from the U.S. federal budget (Executive Office of the President, 1960-2016) and from vocational rehabilitation state grant data from the Department of Education (DOE). State and local spending data is provided by the federal DOE.

### **Other Federal Programs**

This category includes federal general hospital/medical expenditures, Office of Economic Opportunity (O.E.O), Non-XIX federal, and PCIP (pre-existing conditions insurance plans).

To be included in the NHEA, a program must have provision of care or treatment of disease as its primary focus. For this reason, nutrition, sanitation, and anti-pollution programs are excluded. Another example of this is "Meals on Wheels", which is excluded from the NHEA because it is viewed as a nutrition program rather than a health service program.

Federal general hospital and medical expenditures captures federal health care funds and grants budgeted to various federal agencies.

The Office of Economic Opportunity and Non-XIX Federal are both programs that no longer exist. Expenditures by OEO were tracked from 1965 to 1973, while Non-XIX Federal payments were from 1960 to 1971.

Pre-existing conditions insurance plans (2010 – 2014) were created under the ACA to provide a health coverage option for U.S. citizens and legal residents that have been without health coverage for at least

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<sup>4</sup> Additional information available at <https://mchb.tvisdata.hrsa.gov/>

six months, have a pre-existing condition, or have been denied health coverage because of their health condition.

Estimates of federal program expenditures are based, in part, on data reported by the budget offices of federal agencies. Several differences exist between spending definitions in the federal budget and those used in the conceptual framework of the NHEA. Expenditures for education and training of health professionals (including direct support of health professional schools and student assistance through loans and scholarships) are not included in the NHEA. Payments made by government agencies for employee health insurance are included with PHI expenditures, rather than government expenditures.

### **Substance Abuse and Mental Health Services Administration**

Substance Abuse and Mental Health Services Administration (SAMHSA) provides grants or outlays for program areas such as: Substance Abuse Treatment Capacity, Mental Health System Transformation, Strategic Prevention Framework, Co-Occurring Disorders, Seclusion & Restraint (elimination of), Older Adults, and HIV/AIDS & Hepatitis. These funds are used in part to purchase or provide personal health care services. The source for this information is the SAMHSA budget, monthly treasury statements from the Department of the Treasury, and the U.S. federal budget (Executive Office of the President, 1960-2016).

### **Other State and Local Programs**

Other state and local programs include: temporary disability insurance, state and local subsidies to providers, and Non-XIX state and local.

In general, all spending by state and local governments that is not reimbursed by the federal government (through benefit payments or grants-in-aid) nor by patients or their agents is treated as state and local expenditures. State and local spending is net of federal reimbursements and grants-in-aid for various programs. As with federal expenditures, payment for employee health insurance by state and local governments is included under PHI expenditures.

Temporary disability insurance includes medical care benefits provided to workers as a result of temporary non-occupational disability or short-term sickness. This benefit is currently offered solely in the state of New York.

State and local subsidies are payments by the state and local government to hospitals, home health agencies, and other facilities owned by the state.

For 1960-1971, this category also included Non-XIX state and local funding.

Data covering state and local programs come from a variety of sources. State agencies that operate general assistance programs supply information on state-specific programs. The U.S. Census Bureau collects data on state and local health and hospital expenditures, through its quinquennial census and intercensal sample surveys.

### **School Health**

School health includes all PHC expenditures for students in primary and secondary public and private schools. This may include school nursing services, hearing and vision tests, as well as more comprehensive clinical services. The data sources used for this estimate include information from the Department of Education and the “*National Public Education Financial Survey*” conducted by the U.S. Census Bureau.

### ***Health Consumption Expenditures (includes Personal Health Care Expenditures)***

Health consumption expenditures include all personal health care spending, government administration and the net cost of private health insurance, and public health activities. Premiums for third party payers and programs equal personal health care plus all applicable net cost and administrative costs.



### Government Administration and the Net Cost of Private Health Insurance

This category includes the administrative costs of health care programs such as Medicare and Medicaid as well as the net cost of PHI. Net cost is the difference between private health insurance expenditures and benefits incurred and includes administrative costs, additions to reserves, rate credits and dividends, premium taxes and fees, and net underwriting gains or losses. Net cost is estimated separately for various types of insurers. These costs are added to the benefits paid to account for the total cost of providing the benefits to the enrollee or beneficiary of the plan.

#### Health insurance

This aggregated category is defined to include several specific insurance plans; PHI, Medicare, Medicaid, Children's Health Insurance Program (CHIP), Department of Defense (DOD), and Department of Veterans Affairs (VA). These plans provide enrollees and beneficiaries insurance against medical losses as well as provide health care directly. Health insurance at the Health Consumption Expenditures level includes the PHC benefits plus the administration and net cost of providing insurance.

#### *Private Health Insurance Net Cost*

PHI expenditures are estimated as the sum of benefits and the net cost of PHI. Aggregate PHI spending is an estimate of total premium revenues, including payments made by employers on behalf of employees for health insurance, as well as the employee share of the employer-sponsored health insurance, the medical portion of accident (property and casualty) insurance, and direct purchased health insurance. The net cost of insurance is the difference between benefits and total PHI expenditures. This difference includes administrative costs, and in some cases, additions to reserves, rate credits and dividends, premium taxes and fees, and net underwriting gains or losses. This difference is estimated separately for various types of insurers.

To develop estimates of the net cost of PHI, data from A.M. Best, Inc. (A.M. Best 2001-2016) is used to estimate total premiums and benefits paid for insurance plans, including indemnity, managed care, and property and casualty insurers. Additionally, estimates of self-insured plans and prepaid plans are developed using data from the MEPS-Insurance Component (MEPS-IC) (Agency for Healthcare Research and Quality, 1996-2006 and 2008-2016) and a variety of sources including the Survey of Health Insurance Plans conducted by Health Care Financing Administration (HCFA) (McDonnell et al., 1987) for earlier years. Estimates of the medical portion of property and casualty premiums and benefits are developed using annual data for premiums earned and direct losses incurred published by A.M. Best (A.M. Best 2001-2016). Taken together, these data provide an estimate of the relationship between PHI expenditures and benefits, called the net cost ratio in the NHE.

For years prior to 1996, the net cost ratio was developed using a number of health insurance industry sources. This method measured PHI expenditures and incurred benefits directly from the principal payment source. Data for the Blue Cross and Blue Shield plans were used to estimate the net cost of plans marketed by its members (National Association of Blue Cross and Blue Shield plans, 1960-2005). Annual data on PHI spending and benefits published by the National Underwriter Company were used to develop estimates for commercial carriers through 1995 (National Underwriter Company, 1960-96). Estimates for prepaid plans in later years were developed using data from the Group Health Association of America which later became American Association of Health Plans.

To produce a net cost level and total PHI expenditure level, the net cost ratio is applied to an estimate of PHI benefits by type of service for all years back to 1960. The PHI benefit level is estimated using provider survey data in conjunction with source of funding spending from several sources. These sources include the U.S. Census Bureau, the AMA, the AHA and IMS as well as household data from surveys such as the National Medical Care Expenditure Survey (National Center for Health Services Research, 1987) and later, the MEPS-Household Component (Agency for Healthcare Research and Quality, 1996-2014).

Numerous other data sources are used to compare the estimates of private health insurance spending and benefits including data from the Employer Costs for Employee Compensation survey (BLS, 1980-

2014), the Consumer Expenditure Survey (CE) (BLS, 1984 – 2014), A.M. Best (2016), the MEPS-IC (1996-2006 and 2008-2015), Mercer/Foster Higgins (2015), and Kaiser/HRET (1992-2015).

### *Medicare*

The Medicare program contains administrative costs borne by the federal government to pay for salaries and expenses related to the federal management of Medicare as well as the net cost of insurance for the private plans administering the Medicare Advantage program and Part D. The net cost of health insurance expenditures are estimated separately for private plans that offer Part D benefits and for private plans that provide insurance for enrollees in the Medicare Advantage program. The net cost of health insurance expenditures, including margins, for these private plans are added to the estimates of general administrative costs of the federal government.

Medicare outlays for administrative expenses are obtained from Department of the Treasury reports submitted to OACT, as reported annually in the Trustees Report. Administrative costs for HI (Part A) and SMI (Parts B and D) represent general administrative costs of the federal government.

The estimates of the net cost of insurance for Medicare Advantage were estimated using data from the Two-Year Lookback Form beginning in NHE 2008. The Two-Year Lookback Form provides data on the actual distribution of benefit versus non-benefit spending, and data was available for 2005, 2007, and 2008. For 2006, the administration percentage was estimated by calculating an average of the percentage difference between actual and projected expenditures for the three years in which Lookback data was available. For years prior to 2005, no Lookback data is available and the administrative portion of Medicare managed care spending was estimated using data from the ACR proposals. Beginning in NHE 2009, the Two-Year Lookback Form was discontinued. Therefore, estimates of actual benefit versus non-benefit expenditures for 2009-2016 were obtained from data included on plans' Bid Pricing Tool forms,

For estimates of Part D administration, data is obtained from the PDE file and represents estimates of general administration of federal government and the net cost of insurance for private plans. Additionally, estimates of the net cost of health insurance for Part D are calculated separately for stand-alone prescription drug plans (PDPs) and for Medicare Advantage prescription drug plans (MA-PD's)

### *Medicaid*

Medicaid administration costs and the net cost of PHI cover the federal and state and local salaries and expenses of the program as well as the net cost of PHI for the private plans that insure Medicaid enrollees. Medicaid administrative costs are estimated using CMS Medicaid program data. The net cost of PHI is prepared using total premiums paid from the CMS-64 and unique net cost ratios developed from the PHI data sources. These estimates of private insurers' net costs are deducted from Medicaid premium payments and added to the Medicaid administrative cost estimates to derive Medicaid expenditures at the health consumption expenditure level. Medicaid premium payments that are reduced by the net cost of PHI are allocated to NHEA service categories based on the distribution of FFS spending for selected services in the state. In certain states, adjustments are made to account for specific services or products that are carved out or not offered with the premium. These carve-outs typically occur for prescription drugs and dental services.

### *Children's Health Insurance Program (Title XIX and Title XXI)*

Administration and net cost of private insurance for Children's Health Insurance Program (CHIP) covers all of the federal and state and local salaries and expenses of the program as well as net costs of the private plans that insure CHIP enrollees. These expenditures, when added to the PHC expenditures for CHIP, equal the health consumption expenditures level for this program and are estimated using program.

### *Department of Defense and the Department of Veterans Affairs*

Administration estimates of the Department of Defense (DOD) and the Department of Veterans Affairs (VA) cover all of the federal salaries and expenses related to the health programs, including the

administrative cost of providing care directly to some beneficiaries. These expenditures, when added to the PHC expenditures, equal the health consumption expenditures level for these programs and are estimated using program data as well as information from the U.S. federal budget (Executive Office of the President, 1960-2016).

### *Other Third Party Payers and Programs*

The other third party payers and programs that have administrative costs and/or net cost of PHI include IHS, workers compensation, MCH, vocational rehabilitation, other federal programs, and SAMHSA. The estimates of the net cost of PHI or direct administrative costs are estimated using a variety of sources including administrative or budget data as well as trade groups and other miscellaneous sources.

### **Public Health Activity**

In addition to funding the care of individual citizens, government is involved in organizing and delivering publicly provided health services such as epidemiological surveillance, inoculations, immunization/vaccination services, disease prevention programs, the operation of public health laboratories, and other such functions. In the NHEA, spending for these activities is reported in government public health activity. Funding for health research and government purchases of medical structures and equipment are reported in their respective categories. Government spending for public works, environmental functions (air and water pollution abatement, sanitation and sewage treatment, water supplies, and so on), emergency planning and other such functions are not included.

Most federal government public health activity emanates from the HHS. The Food and Drug Administration and the Centers for Disease Control and Prevention (CDC) account for the great majority of federal spending in the area. Since the 9/11 attacks, substantial public health funding has come from two other sources: The Public Health and Social Services Emergency Fund, a part of the HHS Departmental Management Budget, and the Department of Homeland Security.

State and local government public health activity expenditures are primarily for the operation of state and local health departments. Federal payments to state and local governments are deducted to avoid double counting, as are expenditures made through the MCH Program and the Crippled Children's Program. Disbursements made by state and local government departments for environmental functions (water and sewer authorities, for example) are not included.

There are two basic data sources used in estimation of government public health activity. Federal spending is taken from annual budget documents prepared by the various agencies and summarized in the budget of the U.S. (Executive Office of the President, 1960-2016). State and local government spending is estimated using data from the quinquennial (5-year) Census of Governments (U.S. Census Bureau, 1957, 1962, 1967, 1972, 1977, 1982, 1987, 1992, 1997, 2002, and 2007) and from its annual survey of state and local government finances [U.S. Census Bureau, 1960-2015]; the latter surveys all state governments and a sample of local government units drawn from the 5-year census. Estimates for 2016 is extrapolated using the prior year's growth rate. These state fiscal year estimates are then converted to calendar year estimates.

### ***National Health Expenditures (includes Health Consumption Expenditures)***

NHE includes health consumption expenditures as well as investment in the medical sector for future consumption. Investment includes non-commercial research as well as purchases of medical structures and equipment.

### **Investment**

#### **Non-Commercial Research**

Non-commercial research in the NHEA includes research spending of non-profit institutions and government entities. Research and development (R&D) expenditures by drug and medical supply and equipment manufacturers are not included in the NHEA, as these expenditures are treated as

intermediate purchases under the definitions of national income accounting; that is, the value of that research is deemed to be recouped through product sales.

Estimates of noncommercial research for 1960-1991 are based on data provided by the National Institutes for Health (NIH), the federal agency that funds a significant portion of research (NIH, 1995). Training and capital acquisition are excluded, but general support is included. The data are reported by source of funds and by performer, although the latter disaggregation is not shown in the NHEA. The data are reported by NIH on a variety of timeframes (federal fiscal years, June fiscal years, and calendar years) and are converted to calendar years where necessary.

For 1991 forward, actual outlay data for NIH (net of capital-related expenditures) published annually in the U.S. budget appendix (Executive Office of the President, 1960-2016) was used to create estimates of federal noncommercial research. Outlays for research by other federal agencies were calculated as a percentage of NIH outlays based on their relationship in expenditures for total research (both health-related and non-health-related). The latter data are published annually by the National Science Foundation (NSF) (*Federal Funds for Research and Development: various Fiscal Years*).

To create state/local research estimates, NSF data on non-federal spending in academic institutions was used. Beginning with 1992, state/local funded research performed by non-academic non-profits was also calculated from special surveys conducted by the NSF (*Higher Education Research and Development: Fiscal Years 2014-2016*). Private research estimates starting in 1992 were also based on the same NSF sources used for state and local research funding. Financial data (from IRS Form 990) of non-profit research health entities (Urban Institute's National Center for Charitable Statistics)<sup>5</sup> was also used to develop the private portion of this estimate. National Taxonomy of Exempt Entities -Core Codes Classification System is utilized to summarize and develop annual trends of receipts from non-profit companies classified as medical research to extrapolate from 1998 (the last year of data available from NSF surveys) to current year. Estimates for private research from 1960-1991 were based on data from the H. Hughes Medical Institute, National Health Council information on voluntary health agencies' support of medical research<sup>6</sup>, and the Foundation Center<sup>7</sup>.

### Structures

The structures component of the NHEA is defined as the value of new construction put in place by the medical sector. This measure of the medical sector investment includes establishments engaged in providing health care, but does not include retail establishments that sell non-durable or durable medical goods. The construction measure includes new buildings; additions, alterations, and major replacements; mechanical and electric installations; and site preparation. Maintenance and repairs are excluded. Non-structural equipment such as X-ray machines and beds are included in equipment.

The value of new construction put in place includes the cost of materials and labor, contractor profit, the cost of architectural and engineering work, those overhead and administrative costs chargeable to the project on the owner's books, and interest and taxes paid during construction. For 1993-2015, the primary data source for the private structures estimates is the Annual Capital Expenditures Survey, conducted by the Census Bureau. The 2016 structures estimate is based on data from the Census Bureau. The private structures estimates for preceding years (1960-1992) were prepared by extrapolating the 1993 values back by a time series developed using data published by the Census Bureau (1964-1992) and the BEA (1960-1964). For public structures, data from the BEA are used to derive these estimates for 1960-2016.

### Equipment

The equipment component of the NHEA is comprised of the value of new capital equipment (including software) purchased or put in place by the medical sector during the year. This measure of medical sector investment includes establishments engaged in providing health care, but does not include retail

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<sup>5</sup> Additional information available at <http://nccs.urban.org/database/index.cfm>

<sup>6</sup> Available at <http://www.nationalhealthcouncil.org/>

<sup>7</sup> Foundation Giving Trends (2003), The Foundation Center. <http://foundationcenter.org/>

establishments that sell non-durable or *durable* medical goods. The capital equipment purchased or put in place includes all capital equipment purchased by medical establishments and is not limited to specific medical equipment or devices. For 1993-2015, the primary data source for the private equipment estimates is the Annual Capital Expenditures Survey. The 2016 private equipment estimate is based on data from the Census Bureau. The private equipment estimates for preceding years (1960-1992) were prepared by extrapolating the 1993 values back by a time series developed using data published by the Census Bureau. The public equipment estimates are based on data from the BEA (1960-2016).

## National Health Expenditure Accounts by Type of Sponsor

### Introduction

The NHEA structure provides estimates of both the sources of payment and financiers of health care. The sources of payment in the NHEA include the payers and programs that directly pay for health care. These payers and programs are the entities that are responsible for paying for the health care bill and are usually third party insurers. These payers and programs are broadly classified as PHI, Out-of-pocket, specific government programs such as Medicare and Medicaid, and other payers such as Department of Veterans Affairs (VA), Department of Defense (DOD) and Maternal and Child Health (MCH), among others. Additionally, other private revenues, which is a small portion of expenditures, is also estimated and includes; philanthropic giving and revenues received by some health care providers for non-health activities, such as the operation of cafeterias, gift shops, and educational programs.

Health spending by source of financing, or **sponsor**, provides estimates of spending by the businesses, households, other private funds and governments that are responsible for financing, or sponsoring, health care payments. The difference between payers and sponsor can be illustrated using PHI as an example. Although private health insurers pay claims on behalf of individuals covered by health insurance policies, premiums are often financed, or sponsored, by a combination of employers (private businesses, federal government, and state/local governments), households (as employees or purchased directly by individuals in the form of individually purchased policies), and government (such as the Medicare Retiree Drug Subsidy (RDS) payments to private and state and local employers).

Exhibit 6 provides a crosswalk of national health expenditure by payers and by sponsors.

### Exhibit 6. Crosswalk of National Health Expenditure Payers to Business, Household, and Government Sponsors

Sponsor	Business, Household, and Other Private			Government	
	Private Business	Household	Other Private	Federal	State and Local
<b>Payers</b>					
Out-of-pocket		X			
Private Health Insurance	X	X		X	X
Other Private Revenues <sup>1</sup>			X		
Medicare	X	X		X	X
Medicaid				X	X
Other Payers <sup>2</sup>	X			X	X

<sup>1</sup> Includes Philanthropy, Private Research, Private Structures and Equipment, and Other Non-Patient revenues.

<sup>2</sup> Includes DOD, VA, CHIP, Worksite Health Care, IHS, Workers' Compensation, general assistance, MCH, vocational rehabilitation, SAMHSA, school health, public health activities, federal and state and local research, and structures and equipment and other federal and state and local programs.

### ***NHEA Expenditure Crosswalk to the Sponsor***

#### **Out-of-Pocket**

Out-of-pocket funding is defined as direct spending by consumers for all health care goods and services. This includes the amount paid OOP for services not covered by insurance; the amount of coinsurance and deductibles required by PHI; and by public programs such as Medicare and Medicaid (and not paid by some other third party); and payments from health and flexible savings accounts. The definition and estimates for OOP spending is the same in the traditional source of funds estimates and in the sponsor analysis, where it is included with spending by the households. Cost-sharing subsidies for eligible individuals in the Marketplace are excluded from the out-of-pocket spending.

#### **Private Health Insurance**

Private health insurance (PHI) expenditures in the sponsor analysis are disaggregated into employers sponsored insurance and directly purchased insurance. These expenditures are then further allocated into the sponsors that finance these expenditures which include households, private business and governments.

#### **Employer-sponsored insurance: Employer and Employee share**

Employer-sponsored insurance (ESI) includes premiums paid by employers and/or employees for health insurance plans offered by the employer, whether or not the employer actually contributes to the health plan. Union health insurance plans are also considered to be employer-sponsored plans. The primary data source for estimating employer-sponsored health insurance is the MEPS-IC sponsored by the Agency for Healthcare Research and Quality (1996-2006 and 2008-2016). The MEPS-IC contains estimates of employer and employee sponsored premiums for active employees, COBRA<sup>8</sup>, and retirees of non-federal sponsors (private businesses and state/local governments). The federal estimates of ESI premiums paid by federal employers/employees and retirees are provided by the U.S. Office of Personnel Management (OPM, 1987-2016).

##### *Employer share*

The employer share of premiums paid by private businesses (for 2003-2014) and by state/local governments (for 2003-2014) is based on MEPS-IC data while the employer share of premiums paid for by the federal government is based on data provided by OPM. The 2016 state/local government employer estimates are based on ECEC data. For earlier years (1987-2002) and for 2007, the employer share of premiums is based on the annual growth rates from the Employer Cost for Employee Compensation (ECEC) component of the Bureau of Labor Statistic's National Compensation Survey (1980-2016). The Retiree Drug Subsidy is based on data from the Medicare Trustee Report, Table IV.B10.

##### *Employee share*

Employer-sponsored PHI premiums paid by active employees, retirees, and former employees who are covered by COBRA are captured in the sponsor estimates as household spending. The estimates of employee contributions for those with ESI through a private business (2003-2016) or state/local government (2003-2016) were produced using MEPS-IC data; employee contributions for ESI through the federal government were based on data from OPM. The 2015 state/local government employee estimates are based on ECEC data. For the earlier period (1987-2002), and in 2007, PHI premiums paid by retirees are based on the annual growth rate from the Bureau of Labor Statistic's Consumer Expenditure integrated survey (CE) (BLS, 1987-2016) and the ECEC data. For 2007, premiums paid by private and state and local employees are estimated using MEPS-IC data projected using the 2009 Kaiser/HRET Annual Employer Health Benefits Survey combined with the historical relationship between employee/retiree paid and employer-paid share of employer-sponsored health insurance (Kaiser, 1992-2016).

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<sup>8</sup> In general, COBRA requires certain employers to continue to offer former employees and their dependents health insurance coverage at a cost of 102 percent of the employer premium for a period of 18 months.

### Direct purchased insurance

Direct purchased insurance includes premiums paid by individuals for policies that are not available through their employer or a Union based plan. This includes Medigap policies, Marketplace plans, and other directly-purchased health insurance. Also included are premiums paid for the medical portion of property and casualty insurance-policies. The main data source used in estimating direct purchased insurance premiums is Bureau of Labor Statistic's CE data (1987-2012), the National Association of Insurance Commissioners (2013-2015), and CMS data (2014-2016). From a sponsor perspective, all direct purchased insurance is considered household spending with the exception of the COBRA subsidy paid by the federal government, which is based on data from the IRS, and health insurance premium tax credits and cost-sharing subsidies from Marketplace plans.<sup>9</sup>

### Medicare

Medicare is one of the major government health care programs in the U.S. and covers people aged 65 and over, people under the age of 65 with certain disabilities, and people of all ages with end-stage renal disease (ESRD). The Medicare program is financed by several different mechanisms. The Hospital Insurance (HI) Trust Fund is primarily financed through Federal Insurance Contributions Act (FICA) taxes on covered payroll, plus interest income, taxation of benefits, voluntary premiums and other revenues. The Supplementary Medical Insurance (SMI) Trust Fund is financed through general revenues, premiums (Part B, Part D, and Medicare Premium Buy-in Programs by Medicaid), state phase-down payments, and interest income.

In the sponsor analysis, an increase in the assets of the Medicare HI Trust Fund allow for immediate reductions in current federal general funding obligations for Medicare. These surpluses are recorded as special interest-bearing treasury obligations and are combined with all other general revenue. The surplus is reported as an offset to the difference between program outlays and the dedicated financing sources of Medicare since, in essence, the surplus decreases the amount of general revenues necessary to pay for health care.

Medicare spending is disaggregated to reflect these different financing sources in the sponsor analysis. The HI payroll taxes paid by employers (private, federal, and state and local employers), along with one-half of the self-employed payroll taxes, are assigned to businesses and federal and state/local governments. The employees' share of HI payroll taxes, together with the other half of the self-employed payroll taxes, HI taxation of benefits, and SMI premiums, considered to the household spending (Social Security Administration (1987-2016) and HHS (August 2016))

Estimates for the Medicare Premium Buy-in program (payments made by state Medicaid programs for Medicare Part A and Part B premiums for eligible individuals) and receipts from states for phased-down Medicaid contribution for Part D are allocated to state and local governments. Additionally, the federal Medicaid program pays for Medicare premiums as part of the buy-in program. The remaining Medicare expenditures are roughly equal to trust fund interest income and federal general revenue contributions to Medicare and are included in the federal government category.

### Medicaid

Medicaid is a combined federal and state program for the poor and medically indigent. Estimates of spending are reflected in both federal and state spending from a sponsor perspective.

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<sup>9</sup> As part of the American Recovery and Reinvestment Act of 2009 (ARRA) persons that lost their jobs involuntarily had a temporary reduction in their COBRA premiums. The period of coverage was initially for 9 months and then extended to 15 months as the result of the COBRA coverage Extension Act of 2009. If a person or family member was involuntarily terminated during the period from September 1, 2008 to May 31, 2010 the household may be eligible to pay a reduced premium. Eligible individuals pay only 35 percent of the COBRA premium under their plan for up to 15 months. Data for the estimates of the amount of COBRA subsidy was estimates data from the U.S. Department of the Treasury: Interim Report to The Congress on COBRA Premium Assistance. June 2010

### **Other Health Insurance and Third Party Payers and Programs**

In the sponsor estimates federal programs and payments including DOD, VA, IHS, SAMSHA, other federal programs, federal public health activities, the federal share of MCH, vocational rehabilitation, CHIP, Workers' Compensation, and federal investment in research, and structures and equipment are included as federal spending. General assistance, school health, state public health activities, other state and local programs, the state shares of MCH and CHIP, vocational rehabilitation, and state and local investment in research, and structures and equipment are included as state and local spending in the sponsor estimates.

Worksite health care, state and local workers' compensation, temporary disability insurance, and private business investment in research, structures, and equipment are classified into the private business sponsor category.<sup>10</sup>

### ***Business, Household, Other Private Revenues, and Government***

The crosswalk between the NHEA payers and programs and the underlying sponsors provides the information needed to identify spending by businesses, households, other private revenues, and governments. Below are the definitions for each of these sponsor categories.

#### **Private Business**

Private business spending represents health care expenditures by employers on behalf of their employees, including the employer contribution for employer-sponsored health insurance premiums, and Medicare HI trust fund payroll taxes (including half of total self-employed payroll taxes). The business's portion of payroll taxes is included in the private business sector because they are dedicated taxes that are earmarked for health care spending. In addition, private business includes payments for state workers compensation, temporary disability insurance, and worksite health care. Excluded from private business spending are Medicare Retiree Drug Subsidy (RDS) payments to private employer plans beginning in 2010, small business tax credits beginning in 2010, and payments for the Early Retirement Reinsurance Program (ERRP) for the period 2010-2011.

#### **Households**

Household spending represents expenditures by individuals to provide or purchase health care for themselves or family members. Household spending includes the employee share of employer-sponsored health insurance premiums and Medicare HI trust fund payroll taxes (including half of the total self-employed payroll taxes, and taxes paid on social security benefits). The household portion of payroll taxes is included with the household sector because they are dedicated taxes earmarked for health care spending. Premiums paid to the Medicare HI and SMI Trust Funds, the pre-existing conditions insurance plans (PCIP), and the Basic Health Program (BHP), are also included with households. Additionally, the medical portion of property and casualty insurance (automobile, homeowners multi-peril, or other liability insurance) is included with households.

Out-of-pocket spending for co-payments, deductibles, and services not covered by health insurance are also allocated to the household. Excluded from household spending are health insurance premium tax credits, cost-sharing subsidies from Marketplace plans, COBRA subsidies, and Medicaid buy-ins for the Medicare premiums of people eligible for both Medicaid and Medicare (dual eligibles).

#### **Other Private Revenues**

Other private revenues include all other private sponsors of health care other than private business and households. The most common source of other private funds is philanthropy. Philanthropic support may be direct from individuals or may be obtained through philanthropic fund-raising organizations such as the United Way. Support may also be obtained from foundations or corporations. Philanthropic revenues may be spent directly for patient care or may be held in an endowment fund to produce income to cover

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<sup>10</sup> A small expenditure for workers' compensation covering federal employees is the financial responsibility of the federal government as an employer. In both the NHE source of funding and sponsor presentation, workers' compensation for federal employers is in the federal category.



current expenses. For institutions such as hospitals, nursing homes and HHAs, other private funds also include income from the operation of gift shops, cafeterias, parking lots, educational programs, and investment income. Also included in this category are private investment in research, structures, and equipment.

### **Federal Government**

The federal government finances many federal health care programs from general revenues, most notably Medicare spending not paid for by other sponsors or dedicated payroll taxes. Also, as an employer, the federal government pays employer-sponsored health insurance premiums and Medicare HI Trust Fund payroll taxes for federal employees. The federal government sponsor estimate also includes the federal share of the Medicaid program, the federal portion of Medicare Premium Buy-in Programs by Medicaid, Medicare RDS payments beginning in 2006, payments for DOD, VA, IHS, SAMHSA, other federal programs, public health activities, the federal share of MCH, vocational rehabilitation, CHIP, Workers' Compensation, COBRA subsidy payments, small business tax credits, ERRP payments, BHP payments, health insurance premium tax credits and cost-sharing subsidies from Marketplace plans, and federal investment in research, structures and equipment. Excluded from federal government spending are PCIP premiums, Medicare SMI premiums, and Part D state phase-down payments to Medicare.

### **State and Local Government**

State and local governments finance health care programs and also pay for health insurance coverage for state and local government employees. This estimate includes the employer contribution for employer-sponsored health insurance premiums and Medicare HI Trust Fund payroll taxes for state employees. The state and local government's portion of payroll taxes are included with the state and local government sector because they are dedicated taxes earmarked for health care spending. Also included is the state share of the Medicaid program, the state portion of Medicare Premium Buy-in Programs by Medicaid, receipts from states for phased-down Medicaid contributions for Medicare Part D, BHP payments, other state and local programs such as general assistance, school health, MCH, vocational rehabilitation, CHIP, public health activities, other state and local programs, and state and local investment in research, structures and equipment. Excluded from state and local government spending are ERRP payments and Medicare RDS payments to state and local government employer plans.

## **Health Insurance Enrollment and the Uninsured**

The enrollment estimates in the NHEA cover total PHI (including direct and employer-sponsored plans), Medicare, Medicaid, CHIP, and other public programs, as well as an estimate of the uninsured. These estimates of enrollment are generally for a specific point in time (Medicaid is a person-year estimate, which is essentially a proxy for a point-in-time estimate). Estimates of total PHI enrollment are available for 1960-2016, Medicaid, Medicare, and CHIP for the length of their respective programs, and all other estimates (including the more detailed estimates of direct-purchased and employer-sponsored insurance) for 1987-2016.

### ***Total Private Health Insurance Enrollment***

Total PHI enrollment consists of enrollment in employer-sponsored health insurance plans and direct purchased plans (group and non-group) including Marketplace and Medigap policies. The enrollment estimates are not mutually exclusive and cannot be summed within PHI as individuals can be enrolled in multiple types of plans. For 1987-2009, total PHI estimates were developed from the State Health Access Data Assistance Center's (SHADAC) enhanced Current Population Survey (CPS) coverage estimates adjusted by the Office of the Actuary to reflect the over count of individually-purchased health insurance enrollment in the CPS. Enrollment for 2010 to 2016 was estimated using the sum of the individual and employer insurance estimates adjusted to account for the overlap of health insurance coverage. The 1960-1986 estimates are based on data from the NHIS, Health Insurance Association of America and analysis performed by Marjorie Carroll and Ross H. Arnett, III.

### **Employer Sponsored Insurance**

Employer sponsored insurance (ESI) is purchased through an employer, union, or by a self-employed individual. Enrollment for 1996-2009 was estimated using the levels from the enhanced CPS (SHADAC), while the enrollment for 2010 through 2013 was estimated using data from NHIS, 2014 - 2016 enrollment was estimated using data from CPS. For 1987-1995, ESI enrollment was estimated using the growth in the number policies for employer-purchased health insurance from the CE applied to the enhanced CPS (SHADAC) levels in 1996.

### **Direct Purchased Insurance**

**Medigap:** These plans are standardized health insurance plans that are sold by private insurance companies to Medicare beneficiaries to fill the "gaps" in Medicare coverage. These plans are available to people age 65 or older and to some individuals under age 65 with certain disabilities, and people of all ages with end-stage renal disease (ESRD). Data from the Medicare Current Beneficiary Survey (MCBS) Access and Cost files was used to estimate the levels for the period 1992-2013. Data from the National Association of Insurance Commissioners estimates were used to estimate 2014 -2016. The number of covered individuals for the period 1987-1991 was estimated using the growth from the number policies for individually-purchased health insurance from the (CE applied to MCBS levels in 1991).

**Marketplace:** Under the Affordable Care Act, health insurance coverage was expanded through private insurers allowing individuals to purchase from both federal and state-run health insurance Marketplaces. Marketplace average monthly enrollment was estimated using program data from CMS.

**Other Direct Purchase:** This category includes insurance purchased on the private market that is not associated with an employer or a Medigap plan. Examples of direct purchased insurance include group plans purchased through AARP or other associations and non-group plans. Estimate for 2014 – 2016 were derived from CMS data. For 1996-2013, enrollment was estimated using the levels from the MEPS-HC survey, while 1987-1995 was estimated using the growth in the number of covered lives for individually-purchased health insurance from the CE applied to the MEPS-HC level in 1995.

### **Medicare**

Medicare is a health insurance program for people age 65 or older, people under age 65 with certain disabilities, and people of all ages with ESRD. Medicare enrollment is developed using data from the Medicare Enrollment Database. This data represents all areas, and unduplicated enrollment in Part A and/or Part B. An adjustment is made to create U.S. only enrollment figures by removing enrollment for U.S. territories.

### **Medicaid**

Medicaid is a health insurance programs for certain low-income individuals and families who fit into an eligibility group that is recognized by federal and state law. The enrollment estimates for Medicaid from 1999 to 2004 are from the Medicaid Statistical Information System (MSIS); the 2005-2012 estimates were developed using MAX data and 2013 through 2016 estimates were projected by the CMS Office of the Actuary (OACT). Medicaid new adult group enrollment estimates from 2014-2016 were developed using the form CMS-64 (<https://www.medicaid.gov/medicaid/program-information/medicaid-and-chip-enrollment-data/enrollment-mbes/index.html>). Estimates for 1966-1974 were developed using data from the Institute for Medicaid Management, while estimates for 1975-1998 were developed using the Medicaid Statistical Reports (HCFA-2082).

### **Children's Health Insurance Program (CHIP)**

The Children's Health Insurance Program (CHIP) is a joint federal/State program that provides health insurance for children in families that do not have health insurance coverage and are not eligible for Medicaid. The enrollment estimates are obtained through the Statistical Enrollment Data System (SEDS) using forms CMS-21E, CMS-64.21E, and CMS-64.EC.

### ***Other Public***

Other public programs include health insurance coverage provided by the Department of Veterans Affairs (VA) and the Department of Defense (DOD). Enrollment for other public programs for 1987-2011 was estimated using the levels from the enhanced CPS (SHADAC) and for 2012 through 2016 estimates were extrapolated using the CPS.

### ***Uninsured***

Persons not covered by health insurance (including individuals using the Indian Health Service in order to be consistent with CPS definitions) are considered uninsured. The number of uninsured for 1987-2009 was estimated using the levels from the enhanced CPS (SHADAC), adjusted for an estimate of the Medicaid undercount, and for 2010 to 2016, estimates were extrapolated using growth from National Health Interview Survey (NHIS).

## **Deflating National Health Expenditures**

Health care spending has grown more rapidly than spending in most other sectors of the economy in recent U.S. history. Increased spending reflects increases in technological developments, changes in the age and sex composition of the population, changes in the intensity and quantity of health care services delivered per person, and price inflation for medical goods and services. Deflating health care spending separates the effects of price growth from growth attributable to all other factors. The dollar value of these estimates of real health care expenditures is determined by the index chosen to remove price growth from spending.

One approach to deflating health spending is to remove the effects of economy-wide inflation alone. Prior to the NHE 2011, this was the method used to deflate health spending for the NHEA. The most appropriate deflator for economy-wide prices for this purpose is the price index for Gross Domestic Product (GDP), as measured by the Bureau of Economic Analysis (BEA). The GDP Deflator is the most comprehensive measure of price inflation for the economy as a whole. This measure eliminates economy-wide inflation, a cause of growth over which the health sector has little control.

An alternative approach to removing the effects of price growth from health spending for the NHEA is to deflate health care expenditures by a measure of medical specific price inflation. For PHC spending, this involves directly deflating expenditures by price indexes associated with the services and goods provided; for non-PHC spending this involves deflating by composite indexes matching the components of spending for each category. The resulting measure of “real” growth associated with this approach reflects growth in non-price factors, which can result from technological developments, changes in the age and sex composition of the population, or any changes in the intensity and quantity of health care services delivered per person. Also, this residual includes the net effect of any error in the measurement of medical prices or medical expenditures.

The goal of deflating spending at the NHE level is to isolate price changes so that “real NHE” spending can be determined. Thus, it is critical that the measure used to deflate spending at the NHE level accurately reflect price changes only, and not capture any of the biases that can occur when aggregating individual indexes. The chain-weight method used in the NHE deflator attempts to control for any aggregation bias by using a Fisher Ideal formulation. The Fisher Ideal index formulation reflects the geometric mean of a Laspeyres index, which uses a prior period quantity weights, and a Paasche index, which uses the current period quantity weights. Chain-weighted inflation measures would give a lower inflation rate than standard inflation rates if substitutions were made over time to purchase less of the goods that were experiencing faster price growth.

The PHC deflator is calculated as a chain-weighted price index for the various goods and services that account for PHC spending in the NHE. Exhibit 7 provides the detailed price series that are used for each

category of spending.<sup>11</sup> Unlike the 2010 method, which used an implicit deflator approach, the current PHC deflator relies on a chain-weighted approach.

In order to estimate a non-PHC deflator, a chain-weighted price index of the subcomponents of non-PHC has been developed. This index weights together the detailed price series for each non-PHC component, at the maximum level of detail available. Exhibit 8 provides the major non-PHC expenditure categories and their respective deflators.

The price indexes developed by the CMS Office of the Actuary (OACT) are a more appropriate measure of the medical price inflation associated with expenditures reported in the NHE than two other available indexes—the Bureau of Labor Statistics (BLS) Medical Care Consumer Price Index (CPI) for all urban consumers and the BEA medical care component of the personal consumption expenditure fixed-weight price index.

For example, the medical care component of the CPI is weighted based on consumer OOP expenditures, Medicare Part B payments, and PHI payments to providers for medical benefits. Without consideration of all types of payers and programs, certain health care services are assigned weights that under- or over-represent their shares if all payers and programs expenditures were considered. For example, hospital services represents only 22 percent of medical care consumption spending in the CPI from 2007-2008, while overall hospital spending represents 36 percent of PHC spending in the NHEA over the same period. Therefore, hospital care is under-valued for deflating overall PHC. Additionally, the medical care component of the personal consumption fixed-weight price index includes only portions of public expenditures when its weights are determined because care provided by government facilities is not included in the Personal Consumption Expenditures (PCE).

The BLS Producer Price Index (PPI) is a third measure of price inflation. The PPI measures transaction prices or net prices received by producers for their output. Receipts include those from both public and private sources. However, most PPIs for the health service industry begin in 1994 or later and therefore lack a sufficient time series to span the entire history of the NHEA.

### ***Deflators Used in the Personal Health Care Price Index***

Exhibit 7 lists the price series assigned to each component of PHC expenditures used in the NHE 2016 estimates.

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<sup>11</sup> Additional information available at: <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/NHE-Deflator.pdf>

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### Exhibit 7: Price Proxies for the Personal Health Care expenditure Price Index

Industry/Commodity or Service	Price proxy (NHE 16)
<b>Personal Health Care</b>	
<b>Hospital Care</b>	PPI, hospitals
<b>Physician and Clinical Services</b>	Composite Index: PPI, offices of physicians and PPI, medical and diagnostic laboratories
<b>Other Professional Services</b>	CPI, services by other medical professionals
<b>Dental Services</b>	CPI, dental services
<b>Other Health, Residential, and Personal Care</b>	Composite Index: <ul style="list-style-type: none"> <li>• CPI physician services (used for other health care)</li> <li>• CPI care of invalids and elderly at home (used for home and community-based waivers),</li> <li>• CPI All Items (used for ambulance services)</li> <li>• PPI residential mental retardation facilities(used for residential facilities)</li> </ul>
<b>Home Health Care</b>	PPI, home health care services
<b>Nursing Care Facilities and Continuing Care Retirement Communities</b>	PPI, nursing care facilities
<b>Prescription Drugs</b>	CPI, prescription drugs
<b>Other Non-durable Medical Products</b>	CPI, non-prescription drugs
<b>Durable Medical Equipment</b>	Composite Index: CPI, eyeglasses and eye care and CPI, medical equipment and supplies

Notes: Data for the PPI and CPI are available from the U.S. Department of Labor, BLS, <http://www.bls.gov>. All indexes are scaled to 100.0 in 2009.

### Deflators Used in the Non-Personal Health Care Price Index

Exhibit 8 lists the price series assigned to each component of non-PHC expenditures used in the NHE 2016 estimates.

### Exhibit 8: Price proxies for the non-Personal Health Care Expenditure Price Index

Industry/Commodity or Service	Price proxy (NHE 16)
<b>Non Personal health care</b>	
<b>Government Administration</b>	Composite index of wages, benefits, professional fees, claims/FI services, office rent, and other expenses for six government programs
<b>Net Cost of Insurance</b>	Composite index of compensation, capital, taxes and fees, reserves/gains/losses, and other expenses for four classes of insurance
<b>Government Public Health Activities</b>	Composite index of federal, state, and local government consumption
<b>Research</b>	NIH Biomedical Research and Development Price Index
<b>Structures &amp; Equipment</b>	Composite Index of BEA Price indexes for private fixed investment in structures by type and private fixed investment in equipment and software by type

Note: Details are provided below.

Unlike the PHC deflator where typically one price series is used to represent the pure price change associated with a constant product, the non-PHC categories are typically deflated by an input price index that represents the price increases associated with the expenses underlying the production of these categories (the notable exceptions are non-commercial research and structures and equipment).<sup>12</sup>

Because of the unique nature of the non-PHC categories, published price series are not typically available for these categories, or those that are available may not adequately capture the concepts appropriate for the given non-PHC category. Instead, alternative data sources are used to decompose these expenses into the key underlying inputs, such as compensation or capital costs, and then publicly available price series are used to deflate those input expenses. A brief description of each price deflator follows:

### **Government Administration**

Government administrative costs are deflated using a composite input price index that chain-weights together price indexes for wages and salaries, benefits, professional fees, claims processing services, office rent and other expenses. The input weights reflect six sub-categories of government administrative costs: Medicare, Department of Defense (DOD), Department of Veterans Affairs (VA), Medicaid, Children's Health Insurance Program (CHIP) and other third party payers. The weights are determined using data from the Medicare Trustees Report, Medicaid administrative data, and congressional justifications. The price series for each of the categories represent appropriate proxies for price change, such as federal civilian pay, employment cost indexes for state and local government workers and other relevant occupations and appropriate PPI and CPI.

### **Net Cost of Health Insurance**

The net cost of health insurance is deflated using a chain-weighted composite index of input costs and price proxies engineered to directly measure the price growth associated with the difference between health insurance expenditures and benefits incurred. This difference includes cost growth for administrative services, taxes and fees, changes to reserves, and net underwriting gains or losses. These costs are added to the benefits paid to account for the total cost of providing health care benefits to the enrollee or beneficiary of the plan. The types of PHI for which net cost is estimated include: fully insured group/commercial insurance, direct purchased or non-group insurance, self-insured insurance, and the health portion of property and casualty insurance. Also included in the net cost of insurance are Medicare Advantage and stand-alone Medicare Part D plans, Medicaid managed care plans, CHIP managed care plans, the majority of worker's compensation insurance, and, beginning in 2010, the pre-existing condition insurance plan (PCIP).

For each type of insurance, estimates are developed for five general components of net cost that sum to the total net cost of health insurance. These components include: compensation of the employees that are administering the insurance, capital costs, taxes and fees, other costs (such as rent, advertising, certain commissions, etc.), and, in some cases, changes to reserves and underwriting gains or losses. A blended index of price proxies, typically ECIs, PPIs, or deflators produced as part of the GDP accounts, are weighted together by the respective input costs for three of these general components. All changes in taxes and or change to reserves or underwriting gains or losses are treated as price changes. These various price changes are then combined to create a composite net cost of health insurance input price deflator.

### **Government Public Health Activities**

Public health spending in the NHEA is deflated using a composite index that chain-weights together price indexes for state and local and federal public health, with state and local expenditures accounting for roughly 80 percent of the index. State and local public health expenditures are deflated using the price index for gross state and local government consumption expenditure (GCE) for health from the National

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<sup>12</sup> The input price indexes serve as a proxy for the output price increase associated with the production of these services since a specific output price index is unavailable. This approach implicitly assumes that changes in productivity (and in some cases margins) average to roughly zero such that the input price equals the output price.

Income and Product Accounts produced by the BEA. Federal public health expenditures are deflated using an input cost index that weights together the input costs of Health Resources and Services Administration, Food and Drug Administration, and CDC and appropriate price proxies from the BLS. Together these three organizations account for over 75% of federal public health spending.

### Structures & Equipment

Investment in structures and equipment is deflated using a composite index that chain-weights together detailed price indexes associated with private fixed investment in structures and equipment, by detailed asset category. The detailed nominal investment levels by asset category serve as the weights to aggregate up to the composite chain-weighted price index for structures and equipment. These detailed asset distributions are obtained primarily using data from the BEA's Capital Flow Table and Fixed Asset Accounts. Five categories of detailed investment in structures are derived using this methodology: hospital and institutional, office buildings, industrial, electric light and power, and other buildings. Twenty-two categories of detailed investment in equipment are derived as well. Additionally, appropriate price indexes for investment in structures and equipment are selected for each of these categories. The price indexes are from BEA's *Table 5.4.4. Price Indexes for Private Fixed Investment in Structures by Type*; from *Table 5.5.4. Price Indexes for Private Fixed Investment in Equipment by Type*; and from *Table 5.6.4 Price Indexes for Private Fixed Investments in Intellectual Property Products by Type*.

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