

# Age and Gender Estimates in the National Health Expenditure Accounts: Definitions, Sources, and Methods, 2014

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## Introduction

Health spending is estimated by age and gender and presented by type of service (and health care goods) and source of funds for males and females in various age groups for the even years from 2002 - 2014. These estimates are linked to the National Health Expenditure Accounts and use the same categories and definitions.<sup>1</sup> Thus, our age and gender estimates are on an establishment basis, grouping services together according to place of service, rather than according to type of service. For example, hospital-based nursing homes are shown in our hospital category; only freestanding nursing homes are shown in the nursing home category.

Age and gender estimates are shown for personal health care (PHC), rather than national health expenditures (NHE), because data is not available to break out the non-PHC categories by age and/or gender group. PHC expenditures include spending for hospital care, physician and clinical services, dental care, other professional services, home health care, nursing care facilities and continuing care retirement communities, other health residential and personal care, and retail sales of medical products (such as prescription drugs or over-the-counter medicines sold in pharmacies or eyeglasses sold in optical goods stores). Included in NHE but not PHC are estimates of spending for public health programs, government administration and the net cost of private health insurance, and investment.

We disaggregate PHC by gender into the following five age categories: 0-18, 19-44, 45-64, 65-84, and 85 and over. Analysis are also provided for three broader age groupings: children (age 0-18), working-age adults (age 19-64), and the elderly (age 65 and over). We produced estimates of health spending by age and gender for selected years including 2002, 2004, 2006, 2008, 2010, 2012, and 2014. Previous estimates are also available for 1987, 1996, 1999, 2002, and 2004 but only by age-group with the exception of 2004 where the estimates are also available by gender. However, the previous estimates are not directly comparable with the current estimates, as they have not been controlled to the recent historical national health expenditure estimates and do not reflect the statistical and methodological improvements that are included in the later estimates.<sup>2,3</sup>

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<sup>1</sup> For a complete methodology of the historical national health expenditure accounts, <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html>

<sup>2</sup> For additional information on 2009 revisions, please refer to: <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/benchmark2009.pdf>.

<sup>3</sup> For additional information on 2014 revisions, please refer to: <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/benchmark2014.pdf>.

## Data Sources

Since no single source of comprehensive health spending by age and gender exists, we used several sources and methods to develop these estimates. The table below lists the data sources that we used to create these estimates.

<b>Data Source</b>	<b>Years Used</b>	<b>Reference</b>
Current Population Survey	2002-2014	<a href="http://www.census.gov/cps/data/cpstablecreator.html">http://www.census.gov/cps/data/cpstablecreator.html</a>
Medicaid Analytic eXtract (MAX) data	2002-2014	<a href="http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MAXGeneralInformation.html">http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MAXGeneralInformation.html</a>
Medical Expenditure Panel Survey (MEPS)	2000-2013	<a href="http://meps.ahrq.gov/">http://meps.ahrq.gov/</a>
Medicare Current Beneficiary Survey (MCBS)	2002-2013	<a href="https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/MCBS-Public-Use-File/index.html">https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/MCBS-Public-Use-File/index.html</a>
Monthly Membership Report (MMR)	2007-2014	<a href="http://www.cms.gov/Research-Statistics-Data-and-Systems/CMS-Information-Technology/mapdhelpdesk/downloads/PCUG_v5_3_111710_Appendices_With_Cover_Final.pdf">http://www.cms.gov/Research-Statistics-Data-and-Systems/CMS-Information-Technology/mapdhelpdesk/downloads/PCUG_v5_3_111710_Appendices_With_Cover_Final.pdf</a>
National Ambulatory Medical Care Survey (NAMCS)	2002-2014	<a href="http://www.cdc.gov/nchs/ahcd.htm">http://www.cdc.gov/nchs/ahcd.htm</a>
National Claims History Files (NCH)	2002-2014	<a href="http://www.cms.gov/FilesForOrderGenInfo/">http://www.cms.gov/FilesForOrderGenInfo/</a>
National Hospital Ambulatory Medical Care Survey (NHAMCS)	2001-2014	<a href="http://www.cdc.gov/nchs/ahcd.htm">http://www.cdc.gov/nchs/ahcd.htm</a>
National Hospital Discharge Survey (NHDS)	2001-2010	<a href="http://www.cdc.gov/nchs/nhds.htm">http://www.cdc.gov/nchs/nhds.htm</a>
National Intercensal Estimates	2002-2010	<a href="https://www.census.gov/programs-surveys/popest/data/datasets.All.html">https://www.census.gov/programs-surveys/popest/data/datasets.All.html</a>
Prescription Drug Event File	2006-2014	<a href="http://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/downloads/GuidePartDDataRequests.pdf">http://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/downloads/GuidePartDDataRequests.pdf</a>
Truven Health Analytics - Marketscan Commercial Claims Databases	2002-2014	<a href="http://truvenhealthanalytics.com/Your-Healthcare-Focus/Analytic-Research/Marketscan-Research-Databases">http://truvenhealthanalytics.com/Your-Healthcare-Focus/Analytic-Research/Marketscan-Research-Databases</a>

## General Methods

For Medicare, Medicaid, and the Children's Health Insurance Program (CHIP) we use administrative data to develop health spending estimates by age and gender. The Medicare estimates are based on data from the National Claims History Files, Monthly Membership Report, and Prescription Drug Event Files while the Medicaid and CHIP estimates are based on data from the Medicaid Analytic eXtract System (MAX) and imputed for states without MAX data in 2014. We develop all other age/gender-based spending estimates for the remaining payers of PHC goods and services using one of two methods.

The first method derives spending by age and gender by multiplying (i) cost per use data for the non-institutional population from the Medical Expenditure Panel Survey (MEPS) by the (ii) utilization counts by age and gender from provider surveys, such as the National Ambulatory Medical Care Survey, which include both the institutional and non-institutional population. In the MEPS, source of funds data are aligned by primary payer and include all secondary sources of payments. For example, if a MEPS respondent had a doctor visit that cost \$50, private health insurance may cover \$40 with the remainder out-of-pocket. In this example, we recorded \$40 as private health insurance (the primary payer) and \$10 as out-of-pocket spending (secondary payer). In this manner we aggregated all spending data for each payer, while also recording the number of visits/use for each primary payer. Recording payment data separately for primary and secondary payers allows us to calculate the average payment per visit/use for each payer -- total payments by source of funds (primary and secondary) divided by the number of visits (on a primary payer basis). We then multiply the average payment per use by age, gender and source of funds with the utilization data from provider surveys which include use by both institutionalized and non-institutionalized individuals. This method implicitly assumes that the cost per use/visit for an institutionalized individual is the same as for a non-institutionalized individual, but captures the higher utilization expected from the institutional population.

When no provider survey was available, a second method was used to calculate health spending by age and gender. For home health, other professional services, dental services, non-durables, and durable medical equipment, we computed total health spending by age and gender by combining MEPS data for the non-institutionalized population with independently derived estimates of spending for the institutional population, and then controlling these estimates to the overall PHC totals. For the estimates of spending for the institutional population we identified four distinct populations: Medicare beneficiaries enrolled in an institutional setting, Non-Dual Medicaid beneficiaries enrolled in an institutional setting, federal prisoners, and the disabled population in an institutional setting not yet eligible to enroll in Medicare. We then used the population counts and multiplied them by spending estimates created from MCBS or MEPS.

For the nursing care facilities and continuing care retirement communities category, we supplemented the Medicare, Medicaid, and CHIP program spending estimates by age and gender with data from the MCBS for the over-65 population for all remaining payers. For the under-65 population, we relied on MarketScan data from Truven for the remaining payers. These distributions were controlled to the PHC expenditure levels.

In some instances, source data and methodological constraints required us to average the resulting health spending estimates by age or gender over several years to reflect more reasonable trends over time and within age and gender groups. Where possible, we compared

our estimates to other service specific health spending by age and/or gender estimates to ensure reasonableness.

Medicare Current Beneficiary Survey (MCBS) data was used to supplement the MEPS data for the population age 65 and over; and Truven data was used to supplement MEPS data for the population under 65. These data sets were particularly useful for the inpatient hospital and prescription drug components, where the higher sample sizes in MCBS enabled us to improve upon the reliability of the MEPS data. We use MEPS as a primary data source rather than MCBS because we need to have a consistent data source for all age groups, not just the elderly. The final step for both methods was to scale aggregate spending levels to match the control totals in the national health expenditure accounts by type of service and source of funding.

As a final check for reasonableness, we compared the NHE by age and gender estimates to other published studies. For most types of service, we were able to compare our age and gender distributions with the age and gender distributions provided in the published MEPS results. Definitional differences, most specifically the exclusion of the institutionalized population in MEPS, accounted for most of the discrepancies in these series.<sup>4</sup>

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<sup>4</sup> For a more complete description of these definitional differences, see Bernard, D. et al.: “Reconciling Medical Expenditure Estimates from the MEPS and the NHE, 2012.” Rockville (MD): Agency for Healthcare Research and Quality (Web Only) Available from: [https://meps.ahrq.gov/mepsweb/data\\_stats/Pub\\_ProdResults\\_Details.jsp?pt=Working+Paper&opt=2&id=1236](https://meps.ahrq.gov/mepsweb/data_stats/Pub_ProdResults_Details.jsp?pt=Working+Paper&opt=2&id=1236).