

## ACCURACY ANALYSIS OF THE SHORT-TERM (10-YEAR) NATIONAL HEALTH EXPENDITURE PROJECTIONS

This paper updates and examines the accuracy of the National Health Expenditure (NHE) Projections by comparing each set of those projections from 1997 through 2016 (representing a total of 19 distinct projection sets) to the current estimates of historical NHE.<sup>1,2</sup> The report includes analysis of the projection accuracy for growth in total NHE, personal health care (PHC) spending, as well as spending in three of the major health care sectors (hospitals, physicians and clinical services, and prescription drugs).

### KEY FINDINGS (Table 1)

Overall, our projections of national health spending growth have been fairly close to historical estimates of growth for the first 3 projected years. As with any projection, the degree of uncertainty increases with the projection horizon. Over the history of these projections, since 1997, the NHE projections mean error for the first year has been modest, but slightly overstated by 0.3 percentage point. Further, the direction accuracy, that is, did growth accelerate or decelerate, has been correct more than two-thirds of time within the first two projected years of the NHE projection period. The range of the projection error varies, but tends to be larger for the sector estimates, especially for prescription drugs, than for the more aggregated categories like NHE. More detailed findings and most common explanations for these errors are found below.

#### *Total NHE*

- On average, CMS' projections of growth in total NHE have slightly overestimated actual spending growth by 0.3 percentage point in the first projected year (with a range of -0.9 to 1.7 percentage points) since 1997.
- In the second projected year, the NHE growth rate projections had an average differential of 0.3 percentage point with a range of -1.2 to 2.1 percentage points.
- In the third projected year, the growth rate projections differential was 0.4 percentage point with a range of -1.6 to 2.7 percentage points.
- The mean absolute difference between projected and actual NHE growth in the first, second, and third years has been 0.9 percentage point, 0.8 percentage point, and 1.3 percentage points, respectively.

#### *Personal Health Care (PHC)*

- In the first projected year, CMS' projections of PHC spending growth have an average differential of 0.0 percentage point. On a year-to-year basis, the difference between projected and historical growth in PHC has ranged from -1.0 to 1.3 percentage points since 1997.
- The second year of each set of projections also has an average differential of 0.0 percentage point. On a year-to-year basis, the difference between projected and current historical growth rate estimates has ranged from -1.1 to 1.7 percentage points.
- In the third projected year, the growth rate projections have been, on average, slightly overestimated by 0.2 percentage point with a range of -1.9 to 2.2 percentage points.

- In absolute terms, projected PHC growth has varied from actual PHC growth by an average of 0.8 percentage point in the first year, an average of 0.7 percentage point in the second year, and an average of 1.0 percentage point in the third year.

#### *Sector-Specific Projections*

- CMS' hospital spending growth estimates have averaged an underestimation of 0.3 percentage point in the first year, 0.5 percentage point in the second year, and 0.9 percentage point in the third year. The mean absolute difference between projected and actual hospital spending growth has been 1.1 percentage point in the first year, 1.4 percentage points in the second year, and 1.7 percentage points in the third year.
- The projection of spending growth for physician and clinical services has been, on average, overestimated by 0.2 percentage point in the first year and 0.1 percentage point in the second and third year. The mean absolute difference is 1.0 percentage point in the first year, and 1.3 percentage points in the second and third year.
- Projections of prescription drug spending growth have, on average, overestimated actual spending growth by 0.6 percentage point in the first year, 0.8 percentage point in the second year, and 1.0 percentage point in the third year. The mean absolute difference is 2.4 percentage points in the first year, 3.0 percentage points in the second year, and 4.1 percentage points in the third year.

## **MEASUREMENT OF PROJECTION ACCURACY**

In this report, projection accuracy is assessed based on a number of simple statistical measures that compare the projected growth rates from each vintage of the NHE Projections since 1997 (19 sets) to the corresponding current historical NHE estimates for 2016. In addition, the analysis primarily focuses on accuracy in estimating the growth rate the first, second, and third years of the projection period.

The difference between projected and actual growth rates (in percentage points) is described in two ways. The first is the mean difference between the projected and actual spending growth rates. In this measure, the sign is retained on the difference, so it is possible for years of overestimation or underestimation to partially or completely offset one another. The second measure is the mean absolute difference, which describes the magnitude of the average difference between the projected and actual growth rates, regardless of sign. Also highlighted are the ranges in the differences between the projected and actual values by year, the percentage of the nineteen projections sets in which the correct direction of growth was estimated (acceleration/deceleration), and the frequency of over- and under-projections.

The history of annual NHE Projections spans nearly two decades, which influences the breadth of this analysis. Although some short-term and long-term projections of national health spending were published in the early 1990s, the release of short-term NHE projections on an annual basis did not commence until 1997; the current general econometric model framework and methodology have been in place since the 1999 publication.<sup>3</sup>

## **POTENTIAL REASONS WHY PROJECTIONS MAY DIFFER FROM ACTUAL SPENDING ESTIMATES**

Projections are inherently subject to uncertainty. This uncertainty stems from a number of factors that can influence the relationship between the projections and the actual spending outcomes.

First, revisions to the historical NHE series and other exogenous data sources are incorporated each year, reflecting the latest data available at the time of estimation. While revisions are typically minor and reflect updated source data, the largest revisions to the historical NHE data tend to occur following quinquennial comprehensive revisions, or “benchmarks,” where changes in methodology and definitions are incorporated and the full time series (1960 — forward) is open for revision.<sup>4</sup>

One significant change to source data that was incorporated in the 1999 NHE was the adoption of the North American Industrial Classification System (NAICS) in place of the Standard Industrial Classification (SIC) system. This not only resulted in changes in estimates for the National Health Expenditures Accounts, both in definitional boundaries and methodology, but also in the exogenous data from many other government data sources that are used in these projections.<sup>5</sup> The 2014 comprehensive revision (completed in December, 2015) includes the incorporation of newly available source data, methodological and definitional changes, and benchmark estimates from the U.S. Census Bureau’s quinquennial Economic Census.<sup>6</sup>

Another factor related to source data that can contribute to the accuracy of results concerns the changing projections of exogenous data inputs. Exogenously-projected data include the macroeconomic forecasts such as Gross Domestic Product (GDP) or the unemployment rate. However, the most important exogenous variable is that of disposable personal income. This extremely influential parameter plays a major role in the aggregate model, as well as many sector models.<sup>7</sup> With the most recent recession, the exogenous projections that were used for the projections released in 2007 and 2008 did not predict the Great Recession. Therefore, since lower economic growth and income lead to lower use of health services, such as doctor visits and prescription drugs, this was one reason for our recent overestimation of health spending growth, which was most easily seen in the physician and clinical services and prescription drug sectors. Similarly, our overestimation of NHE growth after the recession has been partially driven by an overestimation of the strength of the recovery. Along these lines, medical prices have grown more slowly than anticipated following similarly slow rates of economy-wide inflation after the recession. An article by economists at the Federal Reserve Bank of Chicago highlights the challenges of projecting economic growth and inflation.<sup>8</sup>

The third major factor influencing projection accuracy is related to the NHE Projections model and the methodology by which the projections are generated. Constant changes in data sources and new developments in the health care sector may reduce the ability of a given equation in the NHE Projections model to fit the historical data over time and thus, lead to less accurate projections of spending. As a result, the specification of each equation in the model is reviewed annually for potential improvements in terms of data sources and specification based on the

ability of the given models to fit the historical data and provide a reasonable, technically sound, and more accurate projection.

To capture industry developments not yet incorporated into historical data, adjustments are made to the model's solution (also known as add factors), which are an important input to these projections; while projections can be improved by taking into account important factors that cannot be modeled directly (including the consensus of industry experts), resulting historical health spending estimates may be different because of new adjustments, unforeseen developments in the health sector, or any other factor that did not affect spending in a manner consistent with prior expectations.

Finally, potential differences can arise between projected and actual health spending due to legislative changes that occur after the projections are produced, and thus, could not have been taken into account. Several important legislative changes have occurred during the period in which these projections have been published, including the Balanced Budget Act of 1997 (BBA), Balanced Budget Refinement Act of 1999 (BBRA), Benefits Improvement and Protection Act (BIPA) of 2000, the Medicare Modernization, Prescription Drug, and Improvement Act (MMA) of 2003, the Patient Protection and Affordable Care Act (ACA) of 2010, the Medicare Access and CHIP Reauthorization Act (MACRA) of 2015 and, most recently, the Tax Cuts and Jobs Act of 2017. With the ACA, the projections published before March 2010 did not include the impacts of the coverage expansion. And with the projections published after this date, but before the major coverage expansions began in January 2014, there was tremendous uncertainty about how the reform would be implemented and there were subsequent court decisions like the Supreme Court ruling making the Medicaid expansion optional that greatly influenced the health spending impact of the legislation.<sup>9</sup> Next, the passage of the MACRA affected Medicare payments to physicians and other Medicare payment adjustments. Specifically, the act removed the Sustainable Growth Rate system methodology, which had previously determined payment updates to Medicare fees paid to physicians, and it mandated annual physician payment updates for 2015 and future years that averaged less than 1 percent per year. The current Medicare projections are consistent with this legislation and thus reflect current law. Finally, the enactment of the Tax Cuts and Jobs Act of 2017 effectively repealed the ACA's individual mandate by eliminating the shared-responsibility payment for failure to maintain minimum essential coverage. The effects of the repeal of the mandate have been incorporated into the current projections of spending and enrollment, however, impacts from the tax reform language were not included (but will be in subsequent sets of projections).

## **ANALYSIS AND DISCUSSION OF PROJECTION ACCURACY**

### *NHE and PHC*

Projections of growth in overall NHE have, on average, overestimated actual spending growth by 0.3 percentage point in the first and second projected year and 0.4 percentage point in the third projected year. The mean absolute differences in the first, second, and third years have been 0.9 percentage point, 0.8 percentage point, and 1.3 percentage points, respectively. The direction of growth (in terms of an acceleration or deceleration) from the most recent historical year to the first year of the projection period has been correctly projected in 79 percent (15 out of 19) of

projections while the direction of growth for the second year has been correctly estimated 72 percent (13 out of 18) of the time. The direction of growth in the third year has been correctly estimated 59 percent (10 out of 17) of the time.

For the projection sets analyzed, projected PHC growth has averaged a difference of 0.0 percentage point in years one and two. That difference increases slightly in year three to an average overestimate of 0.2 percentage point. In absolute terms, projected PHC growth has varied from actual growth by an average of 0.8 percentage point in the first year, 0.7 percentage point in the second year, and 1.0 percentage point in the third year. The direction of growth in the first year of the projection period has been correctly estimated in 14 of 19 sets of projections (74 percent) while the second year has been correctly estimated 13 of 18 times (72 percent) and the third year has been correctly estimated 11 of 17 times (65 percent).

### *Hospital*

Unlike the aggregate and other major sector projections, the hospital spending projections have, on average, been underestimated, with a mean difference of 0.3 percentage point below actual growth (with a range of  $-1.8$  to  $2.3$  percentage points) in the first projected year, 0.5 percentage point below actual spending growth in the second year (with a range of  $-2.6$  to  $2.4$  percentage points), and 0.9 percentage point below actual growth in the third year (with a range of  $-2.8$  to  $2.3$  percentage points). The mean absolute difference between projected and actual hospital spending growth has been 1.1 percentage points in the first year, 1.4 percentage points in the second year, and 1.7 percentage points in the third year. The direction of growth has been correct in 13 of 19 sets of projections for the first year, 11 of 18 for the second year, and 11 of 17 for the third year.

The major reasons for differences between projected and historical health spending estimates discussed earlier also apply to the hospital projection. Lagged real disposable income is a key independent variable in our private hospital spending model, and thus the accuracy of the exogenous macroeconomic assumptions and the extent to which eventual spending is consistent with the historical relationship to macroeconomic trends plays a direct role in the accuracy of the hospital projection.<sup>10</sup> Moreover, legislative changes, including the Affordable Care Act, and their estimated impacts on health spending and insurance enrollment have been built into the hospital projection based on current law, assumptions, and leading indicators (as applicable) at the time of estimation; however, the current historical estimates reflect the net impact of such legislation on hospital spending under actual conditions. In addition, annual updates to Medicare and Medicaid payments through regulation can affect spending growth for those payers and by extension, aggregate hospital spending growth. Finally, unpredictable disease-related drivers of hospital use like a strong flu season may result in historical spending estimates coming in higher than what was projected before the disease-related driver was known.

### *Physician and Clinical Services*

Physician and clinical services spending growth has, on average, been overestimated in the first year of the projection period by 0.2 percentage point and by 0.1 percentage point in the second and third projected years. The ranges for those projections are  $-1.9$  to  $3.1$  percentage points in the first year,  $-2.2$  to  $2.7$  percentage points in the second year, and  $-3.1$  to  $2.9$  percentage points

in the third year. In absolute terms, projected growth has varied from actual growth an average of 1.0 percentage point in the first year and 1.3 percentage points in the second and third years. The directions of growth in the first, second, and third years of the projection periods have been correct 14 of 19 times, 14 of 18 times, and 12 of 17 times, respectively.

While overall physician and clinical services spending growth has been slightly overestimated on average, the growth rate for 2015 was underestimated. Underlying this divergence was the major coverage expansions implemented through the Medicaid program and through the Health Insurance Marketplaces under the ACA in 2014. The unprecedented nature of these reforms created considerable uncertainty about their impact on aggregate health spending, spending by source of funds, and spending by sector. For 2015 in particular, overall growth in this sector was stronger than anticipated. Given this substantial market change due to legislation, the ensuing period was slightly less predictable. However, as the major effects of the coverage expansion dampen, and the sector's growth reverts back to being driven by traditional elements, this factor will contribute less to the forecast error over time.

An additional contributor to the slight overestimation of growth on average is the severity of 2007-09 recession and the modest recovery that followed, as described earlier. Similar to other sectors, physician and clinical services spending is projected utilizing the trend in real disposable personal income growth (lagged over several years).<sup>11</sup> Assumed growth in real disposable income, used to develop prior projections, was stronger than what ultimately occurred during and after the recession, contributing to overstated growth in spending for physician and clinical services. In addition, utilization of these services slowed more than was implied by the trend in real disposable income growth after 2006, likely related to the rapid growth in high-deductible health insurance plans in conjunction with higher uninsured rates during and after the recession. These developments have tended to disproportionately depress utilization of physician and clinical services compared to other types of more acute care.<sup>12</sup> These factors together with others that ultimately differed from expectations, such as lower reimbursements to doctors and ensuing lower than expected price growth for the category, have all contributed to the slight overestimation in spending growth in this category.

One reason previous vintages of physician and clinical services spending growth projections have diverged from historical estimates is related to the physician payment updates that were required under current law. Prior to the 2012-22 forecast (and the MACRA legislation to replace the SGR, described above), payment updates were determined based on the SGR formula under current law, but were repeatedly overridden through legislation, ultimately resulting in faster Medicare growth. Because these changes to the payment updates were passed subsequent to the release of annual current-law projections, prior forecasts tended to underestimate Medicare physician expenditure growth in the near term of the projection. Since the current projections reflect legislation passed to replace the SGR system, this factor will contribute less to the average forecast error over time.

### *Prescription Drugs*

The projections of drug spending growth have, on average, overestimated historical spending in the first, second, and third years of the projection period by 0.6, 0.8, and 1.0 percentage point, respectively. The mean absolute difference is 2.4 percentage points in the first year, 3.0

percentage points in the second year, and 4.1 percentage points in the third year. The direction of growth for the first year was correct in 16 of 19 sets of projections, correct for the second year in 14 of 18 sets, and correct for the third year in 12 of 17 sets.

The range of differences between the projected and actual growth rates for prescription drug spending is much larger than the other two major sectors analyzed. In the first year of the projection period, the prescription drug growth projection ranged from 6.3 percentage points below to 6.9 percentage points above the actual spending growth estimate. For the second year of the projection period, the projection range was larger, from 6.3 percentage points below to 5.5 percentage points above the actual spending growth estimate. And for the third year of the projection period, the projection range was even larger, from 9.9 percentage points below to 6.0 percentage points above the actual spending growth estimate.

In addition to the fact that drug sector growth is historically much more volatile than that of any other sector, this wide range between the projected and actual growth rates is due largely to the fact there was an all-time high in growth in 1999 and all-time lows in growth in 2010 and 2012. Although CMS projected double-digit growth of 14.0 percent in 1999, the actual growth rate was 18.4 percent, a rate primarily caused by a large influx of new prescription drugs (like Celebrex and Vioxx) that achieved blockbuster status. Their success was emboldened, in part because these drugs were heavily advertised on television and this advertising proved to be remarkably effective. Because regulations on drug advertising were eased in 1997, there was little experience to draw from on the large effect direct-to-consumer advertising might have on drug spending growth in 1999. In addition, the amount of spending on Hepatitis C drugs after breakthrough drugs were approved in late 2013 were unanticipated by drug industry experts, resulting in a projection of drug spending growth in 2014 and 2015 that was significantly below actual drug spending growth for those years.<sup>13</sup>

On the opposite side, the start of a recession along with a faster-than-predicted increase in the generic dispensing rate caused drug spending to grow at just 2.8 percent in 2008 (versus a prediction of 6.8 percent in the projections released in February 2007). The sluggish nature of the economic recovery along with continued faster-than-expected increases in the generic dispensing rate have been the major factors in our overestimation of drug spending growth since 2009. Few, if any, drug industry experts accurately predicted the magnitude of the shift to generic drugs, going from a generic dispensing rate of 47 percent in 2001 to 85 percent in 2016.<sup>14</sup> In addition to brand-name drugs losing patent protection, the large shift to generics also reflected slower numbers of new drugs approved by the Food and Drug Administration and actions by employers, insurers, and pharmacy benefit members to incentivize the use of generic drugs among enrollees.

## CONCLUSION

Projecting national health expenditure growth rates that reflect millions of individual purchases of health care goods and services is far from a routine exercise. Accurate projections rely not only on an understanding of sophisticated modeling techniques and economic theory, but also on the reliability of the underlying data, the advice of experts in various health care fields, the status of current law at the time the projections are made, and professional judgment.

This report represents a comprehensive and publicly-available analysis on the accuracy of CMS' NHE projections, which was updated in February 2018. It is intended to quantify the accuracy of the agency's projections, as well as to provide background on the inherent uncertainty that is associated with their construction. The Office of the Actuary will continue to update this review on an annual basis in order to foster a better understanding of the future outlook for national health care spending.

<sup>1</sup> The NHE Projections were not constructed in 1998.

<sup>2</sup> The most recent data available for historical health spending is available online at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html>.

<sup>3</sup> Early publications (1991-1995) include S. Sonnefeld, J. Lemieux, and D. McKusick, "Health Spending Through 2030: Three Scenarios," *Health Affairs* Winter 1991: 231- 242; S. Sonnefeld, D. Waldo, J. Lemieux, and D. McKusick, "Projections of National Health Expenditures through the year 2000," *Health Care Financing Review* 13, no. 1 (1991): 1-27; S.T. Burner, D.R. Waldo, and D.R. McKusick, "National Health Expenditures Projections Through 2030," *Health Care Financing Review* 14, no.1(1992): 1-29; L.C. Paringer, "Assessing the Definitions and Projections of National Health Expenditures," Unpublished Draft Preliminary Report Submitted to the Office of Technology Assessment. U.S. Congress. U.S. Congress Office of Technology Assessment, Health Program, 1994; S. Burner, and D. Waldo, "National Health Expenditure Projections, 1994-2005," *Health Care Financing Review* 16, no. 4 (1995): 221-242. For more information on the current methodology, see "NHE Projections Methodology", <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/ProjectionsMethodology.pdf> (accessed 18 May 2017).

<sup>4</sup> "Summary of 2014 Comprehensive Revision to the National Health Expenditure Accounts,"

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

<sup>5</sup> Examples of such sources include data produced by the US Bureau of Labor Statistics and the US Census Bureau. Efforts associated with the SIC-NAICS conversion at these agencies can be found at <http://www.bls.gov/> and <http://www.census.gov/>.

<sup>6</sup> Summary of 2014 Comprehensive Revision to the National Health Expenditure Accounts."

<sup>7</sup> "NHE Projections Methodology," <<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/ProjectionsMethodology.pdf>>.

<sup>8</sup> M. Bassetto, T. Messer, & C. Ostrowski. "Forecasting Inflation and the Great Recession." 2013, [http://www.chicagofed.org/digital\\_assets/publications/economic\\_perspectives/2013/3Q2013\\_part1\\_bassetto\\_messer\\_ostrowski.pdf](http://www.chicagofed.org/digital_assets/publications/economic_perspectives/2013/3Q2013_part1_bassetto_messer_ostrowski.pdf).

<sup>9</sup> In addition, future legislative interventions intended to prevent cuts to the Medicare Physician Fee Schedule mandated by the Sustainable Growth Rate (SGR) formula under current law led to underestimated projections of physician spending. Prior to the 2012-22 projections, health spending projections focused on a current law forecast of national health spending that included adjustments to physician payments under the SGR.

<sup>10</sup> "NHE Projections Methodology."

<sup>11</sup> "NHE Projections Methodology."

<sup>12</sup> Agarwal R, Mazurenko O, Menachemi N. High-deductible health plans reduce health care cost and utilization, including use of needed preventive services. *Health Aff (Millwood)*. 2017;36(10):1762–8

<sup>13</sup> IMS Institute for Healthcare Informatics. "The Global Use of Medicines: Outlook through 2017." November 2013, <http://www.imshealth.com/en/thought-leadership/quintilesims-institute/reports/global-use-of-medicines-outlook-through-2017>. See page 12 where US drug spending was predicted to grow just 2 percent in 2014 and page 27 where Hepatitis C drugs were listed as the 6<sup>th</sup> of 7 possible areas to watch for new drug development.

<sup>14</sup> Quintiles IMS Institute. "Medicines Use and Spending in the U.S.: A Review of 2016 and Outlook to 2021." May 2017, <http://www.imshealth.com/en/thought-leadership/quintilesims-institute/reports/medicines-use-and-spending-in-the-us-review-of-2016-outlook-to-2021>.



**Table 1 - NHE Projection Accuracy for Selected Components and Years  
(2017-2026 Projection Period)**

<i>Year</i>	<i>Category</i>	<i>Mean Error<sup>1</sup></i>	<i>Mean ABS Error<sup>2</sup></i>	<i>Range<sup>3</sup></i>	<i>Direction Accuracy<sup>4</sup></i>	<i>Over-estimated / Under-estimated<sup>5</sup></i>
<b>First Year</b> (obs = 19)	Total NHE	0.3	0.9	-0.9 to 1.7	78.9%	12 / 7
	PHC	0.0	0.8	-1 to 1.3	73.7%	12 / 7
	Hospital	-0.3	1.1	-1.8 to 2.3	68.4%	9 / 10
	Physician	0.2	1.0	-1.9 to 3.1	73.7%	11 / 8
	Drugs	0.6	2.4	-6.3 to 6.9	84.2%	14 / 5
<b>Second Year</b> (obs = 18)	Total NHE	0.3	0.8	-1.2 to 2.1	72.2%	11 / 7
	PHC	0.0	0.7	-1.1 to 1.7	72.2%	10 / 8
	Hospital	-0.5	1.4	-2.6 to 2.4	61.1%	7 / 11
	Physician	0.1	1.3	-2.2 to 2.7	77.8%	8 / 10
	Drugs	0.8	3.0	-6.3 to 5.5	77.8%	10 / 8
<b>Third Year</b> (obs = 17)	Total NHE	0.4	1.3	-1.6 to 2.7	58.8%	11 / 6
	PHC	0.2	1.0	-1.9 to 2.2	64.7%	11 / 6
	Hospital	-0.9	1.7	-2.8 to 2.3	64.7%	6 / 11
	Physician	0.1	1.3	-3.1 to 2.9	70.6%	9 / 8
	Drugs	1.0	4.1	-9.9 to 6	70.6%	13 / 4
<b>Fourth Year</b> (obs = 16)	Total NHE	1.1	1.4	-2.9 to 3.3	25.0%	13 / 3
	PHC	1.1	1.1	-1.7 to 2.8	37.5%	12 / 4
	Hospital	0.2	1.2	-2.7 to 2.7	43.8%	7 / 9
	Physician	1.3	1.4	-1.4 to 3.9	50.0%	13 / 3
	Drugs	2.2	4.2	-7.4 to 7.5	62.5%	12 / 4
<b>Fifth Year</b> (obs = 15)	Total NHE	1.4	1.4	-2 to 3.6	66.7%	12 / 3
	PHC	1.3	1.1	-1.6 to 3.2	60.0%	11 / 4
	Hospital	0.4	1.1	-2.3 to 3.4	60.0%	9 / 6
	Physician	1.4	1.5	-1.6 to 4.3	60.0%	11 / 4
	Drugs	2.9	4.0	-6.4 to 8.5	53.3%	11 / 4

<sup>1</sup> Mean Error measures the average annual difference between the projected growth rate and the most recent published estimates in the National Health Expenditure Accounts for a particular category and year. Since the sign of the error is retained, it is possible that a positive error in projection would be offset by a negative error of the same magnitude in another projection.

<sup>2</sup> Mean Absolute Error measures the average annual difference (in absolute value) between the projected growth rate and the most recent published estimates in the National Health Expenditure Accounts for a particular category and year

<sup>3</sup> Range shows the maximum amount that the projected growth rate was above and below the most recent published estimates in the National Health Expenditure Accounts for a particular category and year.

<sup>4</sup> Direction Accuracy shows how often the direction of projected growth rate for a particular category and year matched the direction of most recent published estimates in the National Health Expenditure Accounts for a same category and year.

<sup>5</sup> Over-estimated / Underestimated compares the projected growth rate and the most recent published estimates in the National Health Expenditure Accounts for a particular category and year and states how often the projection was over the published estimate and then how often the projection was under the published estimate.

SOURCE: Centers for Medicare & Medicaid Services, Office of the Actuary.