Centers for Medicare & Medicaid Services’ Spending Projections for Dental Care Less Accurate Than for Other Health Care Spending Components

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Key Messages
- Centers for Medicare & Medicaid Services’ projections for health care spending growth tended to overestimate actual growth in spending during the period 1999 to 2012. The accuracy of spending growth projections also decreased with the projection horizon.
- Centers for Medicare & Medicaid Services’ spending projections for dental care appear to be more accurate than projections for prescription drug expenditures, but not as accurate as projections for other components of health care.

Introduction

Every year since 1997, the Office of the Actuary in the Centers for Medicare & Medicaid Services (CMS) has projected health care spending over an 11-year term for several categories in the National Health Expenditure Accounts (NHEA).

CMS recently analyzed the accuracy of its national health expenditure projections for the period 1997 to 2009.1 Included in the analysis were aggregate health care expenditures and expenditures for hospital services, physician and clinical services, and prescription drugs. In the report, the authors stated they intended the results to quantify the accuracy of the agency’s projections, as well as to provide background on the inherent uncertainty associated with those projections. CMS did not include spending for dental care in its accuracy analysis.

In this research brief, we update CMS’s accuracy analysis by focusing on the period 1999 to 2012. We include dental expenditure in our analysis, and we compare the accuracy of
CMS’s dental expenditure projections with the accuracy of expenditure projections for personal health care, hospital services, physician and clinical services, and prescription drugs. We also discuss CMS’s latest spending projections for dental care for the period 2013 to 2023.

Data & Methods

In this analysis, we used historical and projected National Health Expenditures (NHEs) produced by the CMS Office of the Actuary. We examined the accuracy of the NHE projections by comparing the 12 distinct projection sets from 1999 to 2012 to actual spending in corresponding years. We examined the accuracy of projections for total NHEs, personal health care (PHC), hospital services, physician and clinical services, dental services, and prescription drugs. In order to maintain consistency with CMS’s accuracy analysis, we focused our analysis on the accuracy of the projected growth rate for the first, second, and third years of the projection period.

We examined NHEA data for the categories listed above and for specific years, and we measured projection accuracy using five indicators:

(1) mean error, which measures the average annual difference between the projected growth rate and the most recently published estimates of historical spending;

(2) mean absolute error, which measures the average annual difference in absolute value between the projected growth rate and the most recently published estimates of historical spending;

(3) range, which shows the maximum variation between the projected growth rate and the most recently published estimates of historical spending;

(4) direction accuracy, which shows how often the direction of the projected growth rate matched the direction of the most recently published estimates of historical spending; and

(5) overestimated/underestimated, which shows how often the projected growth rate both exceeded and fell short of the most recently published estimates of historical spending.

These are the same measures used in the CMS accuracy analysis. The detailed methodology is described in that document.

For our discussion of current expenditure projections, we used the CMS NHE projections for the period 2013 to 2023, which were released in September 2014. More information about projection methodology and model specification is available from CMS.

Results

Table 1 summarizes the accuracy of NHE projections during the 1999 to 2012 timeframe. On average, NHE projections for growth in health care spending tended to overestimate actual spending growth during that period. This can be seen in the mostly positive values for mean error and in the entries for overestimated/underestimated projections.

The accuracy of the projected spending growth rate generally decreased with the projection horizon for each component of health care spending. This can be seen in increasing values for mean error and mean absolute error, and in increases in range over the 3-year time period.

Projection accuracy appears to be greater for the broadest categories of health care expenditure (i.e., total NHE and PHC) than for individual sectors. Of the individual sectors, projections for prescription drug expenditure appear to be the least accurate. This can
be seen in the relatively large values of mean error and mean ABS error, and in the relatively large intervals for the range. Spending projections for dental care appear to be more accurate than projections for prescription drug expenditure, but not as accurate as projections for the remaining components of health care.

Figure 1 shows recent trends in annual growth rates for gross domestic product (GDP), NHE, and dental expenditures, and the latest CMS projections for the years 2013 to 2023. Blue shaded areas of the figure represent U.S. recession periods (March 2001 to November 2001, and December 2007 to June 2009). During the last two economic recessions, declines in annual growth rates for dental expenditure followed declines in GDP, while growth rates for NHE increased or declined at a much slower rate. Looking forward, dental expenditure is projected to grow faster than GDP from 2015 to 2023, excluding the year 2017.

### Table 1: Accuracy of NHE Projection Data (1999-2012) for Selected Components and Years

<table>
<thead>
<tr>
<th>Component</th>
<th>Year</th>
<th>Mean error</th>
<th>Mean ABS error</th>
<th>Range</th>
<th>Direction accuracy</th>
<th>Over-estimated/under-estimated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total NHE</td>
<td>1st year</td>
<td>.4</td>
<td>.8</td>
<td>-1.3 to 1.9</td>
<td>45.5%</td>
<td>9 / 3</td>
</tr>
<tr>
<td></td>
<td>2nd year</td>
<td>.6</td>
<td>1.2</td>
<td>-1.6 to 2.9</td>
<td>60.0%</td>
<td>8 / 3</td>
</tr>
<tr>
<td></td>
<td>3rd year</td>
<td>1.5</td>
<td>1.6</td>
<td>-0.5 to 3.4</td>
<td>55.6%</td>
<td>9 / 1</td>
</tr>
<tr>
<td>PHC</td>
<td>1st year</td>
<td>.3</td>
<td>.6</td>
<td>-1.1 to 1.5</td>
<td>63.6%</td>
<td>8 / 4</td>
</tr>
<tr>
<td></td>
<td>2nd year</td>
<td>.6</td>
<td>.8</td>
<td>-1.1 to 2.0</td>
<td>80.0%</td>
<td>8 / 3</td>
</tr>
<tr>
<td></td>
<td>3rd year</td>
<td>1.4</td>
<td>1.4</td>
<td>-0.0 to 3.1</td>
<td>55.6%</td>
<td>9 / 1</td>
</tr>
<tr>
<td>Hospital</td>
<td>1st year</td>
<td>-.5</td>
<td>1.2</td>
<td>-2.7 to 1.2</td>
<td>45.5%</td>
<td>4 / 8</td>
</tr>
<tr>
<td></td>
<td>2nd year</td>
<td>-.3</td>
<td>1.2</td>
<td>-2.8 to 1.9</td>
<td>60.0%</td>
<td>6 / 5</td>
</tr>
<tr>
<td></td>
<td>3rd year</td>
<td>.4</td>
<td>1.4</td>
<td>-1.4 to 2.3</td>
<td>66.7%</td>
<td>6 / 4</td>
</tr>
<tr>
<td>Physician</td>
<td>1st year</td>
<td>.3</td>
<td>1.1</td>
<td>-1.1 to 2.6</td>
<td>36.4%</td>
<td>6 / 6</td>
</tr>
<tr>
<td></td>
<td>2nd year</td>
<td>.3</td>
<td>1.2</td>
<td>-3.8 to 2.6</td>
<td>60.0%</td>
<td>7 / 4</td>
</tr>
<tr>
<td></td>
<td>3rd year</td>
<td>1.4</td>
<td>1.5</td>
<td>-3.3 to 3.5</td>
<td>77.8%</td>
<td>9 / 1</td>
</tr>
<tr>
<td>Dental</td>
<td>1st year</td>
<td>.3</td>
<td>1.3</td>
<td>-2.8 to 2.8</td>
<td>63.6%</td>
<td>8 / 4</td>
</tr>
<tr>
<td></td>
<td>2nd year</td>
<td>1.0</td>
<td>1.7</td>
<td>-1.9 to 5.5</td>
<td>80.0%</td>
<td>8 / 3</td>
</tr>
<tr>
<td></td>
<td>3rd year</td>
<td>1.8</td>
<td>2.2</td>
<td>-1.7 to 6.3</td>
<td>66.7%</td>
<td>8 / 2</td>
</tr>
<tr>
<td>Drugs</td>
<td>1st year</td>
<td>2.2</td>
<td>2.7</td>
<td>-1.6 to 5.2</td>
<td>72.7%</td>
<td>9 / 3</td>
</tr>
<tr>
<td></td>
<td>2nd year</td>
<td>3.2</td>
<td>3.2</td>
<td>.2 to 6.0</td>
<td>70.0%</td>
<td>11 / 0</td>
</tr>
<tr>
<td></td>
<td>3rd year</td>
<td>4.2</td>
<td>4.2</td>
<td>1.5 to 7.2</td>
<td>88.9%</td>
<td>10 / 0</td>
</tr>
</tbody>
</table>

**Source:** Author analysis of CMS data. **Note:** See Data & Methods section for a description of measures.
Figure 1: Annual Growth Rates for Gross Domestic Product, National Health Expenditures, and Dental Expenditures, 2000-2023

Source: Centers for Medicare & Medicaid Services. Note: Numbers for 2013-23 are projections.
Discussion

This report presents the first analysis of CMS’s short-term (1- to 3-year) growth projections from 1999 through 2012. It also presents the first accuracy analysis of dental expenditure projections. According to the results, the accuracy of dental expenditure projections surpassed the accuracy of projections for prescription drug expenditure, but was less accurate than projections for other components of health care. It should be noted that the period of time covered by these projections included two economic recessions, the second representing the most significant downturn in the U.S. economy since the Great Depression.

The latest CMS projections indicated that growth in national health spending for 2013 was expected to remain low (3.6%) as a result of the sluggish economic recovery. However, the combined effects of coverage expansion under the Affordable Care Act, faster economic growth, and population aging were expected to fuel growth in health care spending in 2014 and thereafter (5.6% in 2014 and 6% per year for the period 2015 to 2023). Dental spending was also expected to grow over the next decade, but at a slower pace than spending on hospital services, physician care, and other health services. Projected growth in dental spending for 2013 was just 1.9%, a rate of growth lower than any other health expenditure category. However, dental spending was expected to increase at 3.1% in 2014 and at 5.7% per year for the period 2015 to 2023. The increased rate of growth beyond 2015 was not discussed in the CMS report, leaving the driver of this accelerated growth unclear.

An analysis presented in an earlier Health Policy Institute research brief suggests that CMS’s projections may be overly optimistic. According to the brief’s authors, sluggish growth in per-capita dental spending is expected for the period 2010 to 2020 (between 0.22 % per year and 1.25% per year under various scenarios), and dentists may face a challenging economic environment during this period of time.

One advantage of the CMS health care expenditure projection models is that they are evaluated each year. As a result, potential improvements to data sources and specifications are explored annually in an effort to increase projection accuracy. Including dental expenditures in future accuracy analyses conducted by CMS also would provide useful feedback regarding projection accuracy. With the health care and dental care sectors entering a period of major transition, policy makers and researchers should benefit from such refinements.
References


Suggested Citation