

# **Center for Sustainable Health Spending Data Brief**

## **A Ten Year Projection of the Prescription Drug Share of National Health Expenditures Including Non- Retail**

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Original publication date: October 2014

Updated August 2015 (Addendum)

Updated May 2017 (Addendum II)

## Background

The [October 2014 forecast](#) of national health expenditures (NHE) by the Centers for Medicare and Medicaid Services (CMS) shows prescription drug spending making up roughly 9.5 percent of total health spending each year from 2013 through 2023. In these data, spending on prescription drugs is limited to retail purchases from various outlets including chain stores, food stores, independent pharmacies, and mail service. A more complete picture of spending on pharmaceuticals would include drugs that are administered during encounters with health care providers (hospitals, physicians, nursing homes, home health visits) and charged to patients as part of the provider bill. This non-retail segment is included in the CMS forecast of NHE but is counted as spending on the provider administering the drugs. Thus it is not directly visible as spending on prescription drugs.

Using data from the IMS Institute for Healthcare Informatics, we showed, in a [previous study](#), a remarkably stable relationship between retail and non-retail drug spending between 2008 and 2013. In each year, the share of NHE accounted for by non-retail drugs was equal to about 0.40 times the share accounted for by retail drugs. If this pattern were to continue, and be applied to the CMS ten year forecast of retail drug spending, the share of NHE accounted for by non-retail prescription drugs would be roughly constant at about 3.8 percent, bringing the total prescription drug share to about 13.3 percent.

In this study we seek to determine whether this pattern is likely to continue and, if not, how it is likely to change. Results are summarized in a ten year forecast of non-retail prescription drug spending as a share of NHE that can be combined with the CMS forecast to produce total prescription drug spending as a share of NHE.

The ten-year projections developed in this study were originally released in October 2014. We later updated the estimates and projections of total spending on prescription drugs to incorporate new CMS estimates and projection of NHE; these updated figures are provided in the Addendum to this report.

## Data and Approach

Our approach to developing a ten year forecast of total prescription spending starts with the CMS forecast of the retail component which we take as a given. We then project the ratio of non-retail to retail spending and apply it to the CMS forecast. In order to project this ratio, we examine the relationship between non-retail and retail spending separately for traditional drugs (which are mainly retail and for which spending has grown slowly) and specialty drugs (which are mainly non-retail and for which spending has grown rapidly).<sup>1</sup> In conducting this analysis, we employ the IMS data described in the previous study.

## Trends in the Non-Retail Share of Spending on Traditional and Specialty Drugs

As noted above, the ratio of non-retail to retail spending on prescription drugs was roughly 0.40 each year between 2008 and 2013.<sup>2</sup> This ratio is equivalent to a non-retail share of total prescription drug spending

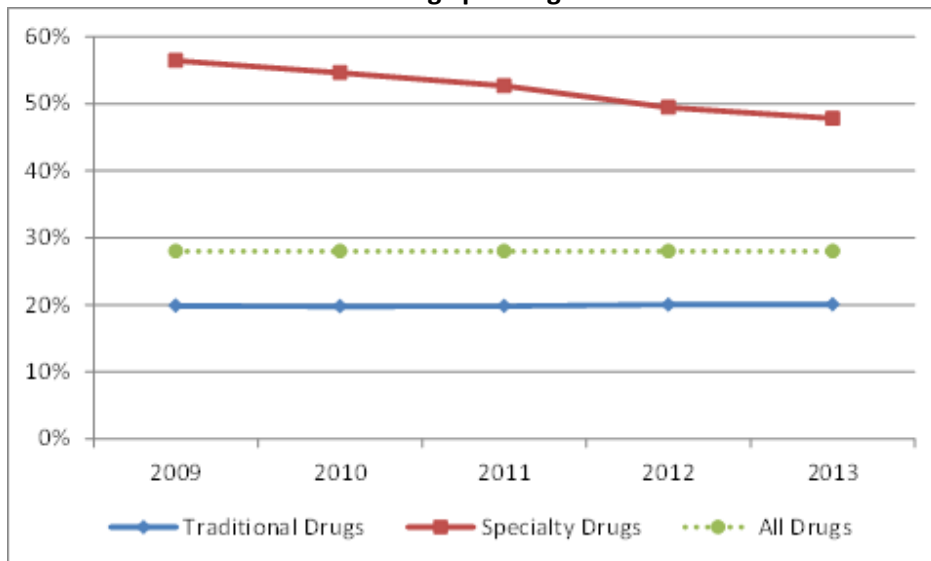
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<sup>1</sup> We employ the IMS definition of specialty drugs which characterizes them as “being typically high-cost, scientifically engineered drugs used to treat complex chronic conditions that require special storage, handling, and administration, and involve a significant degree of patient education, monitoring, and management.” [http://www.imshealth.com/imshealth/Global/Content/Corporate/Press%20Room/IMS\\_Health\\_in\\_the\\_News/Pharm\\_aVOICE\\_2\\_2014\\_SpecialtyDrugs.PDF](http://www.imshealth.com/imshealth/Global/Content/Corporate/Press%20Room/IMS_Health_in_the_News/Pharm_aVOICE_2_2014_SpecialtyDrugs.PDF)

<sup>2</sup> The ratio actually declined slightly from 0.40 in 2009 to 0.39 in 2013. Data were not available prior to 2008 so we could not determine how long this stability has existed.

of 28 percent.<sup>3</sup> The chart below plots this non-retail share from 2009 through 2013 and also provides a breakout for traditional drugs and specialty drugs.<sup>4</sup> For traditional drugs, the non-retail share of spending has remained essentially constant at 20 percent.<sup>5</sup> However, for specialty drugs, this share has declined steadily over time, falling from 56 percent in 2009 to 48 percent in 2013.

**Exhibit 1: Non-Retail Shares of Drug Spending**



Source: Author's calculations from unpublished IMS data

One of the puzzling aspects of the data shown in exhibit 1 is that the non-retail share of overall drug spending has remained constant despite the fact that it is a weighted average of one component that is falling (specialty) and one that is constant (traditional). If the weights did not change over time, the non-retail share of overall drug spending would also be declining. However, between 2009 and 2013 the average annual rate of growth in spending on specialty drugs (9.2 percent) has far exceeded that on traditional drugs (0.7 percent). As a result, the specialty drug share of total drug spending has increased from 23 percent to 30 percent over this period (Exhibit 2). Since the weights in the weighted average are the shares of total drug spending, the weights assigned to the specialty drug component have increased and this is what has kept the weighted average from falling.

Because the growth in spending on traditional drugs has been slow, and the non-retail share has been quite steady, it is useful to focus attention initially on specialty drugs. The most important question is whether or not the recent historical decline in the non-retail share of spending on specialty drugs is likely to continue.

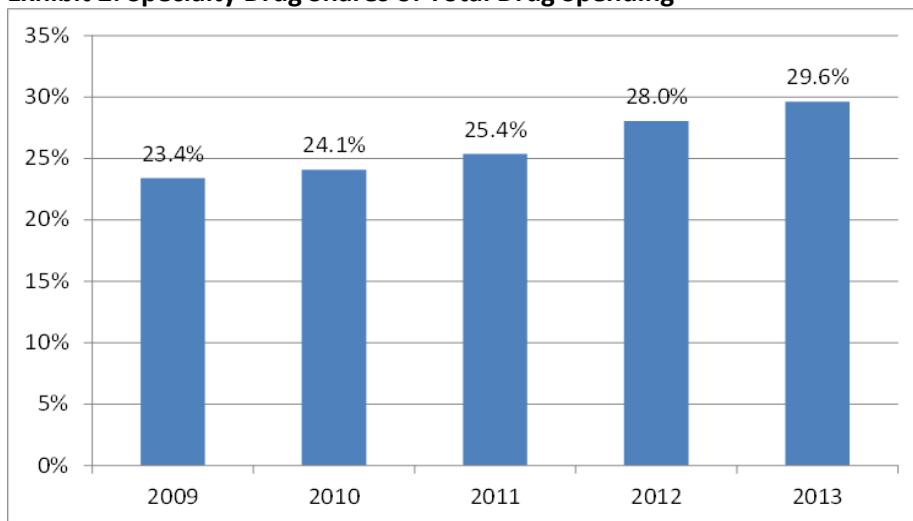
<sup>3</sup> We use the 2013 ratio of 0.39 to compute this percentage.

<sup>4</sup> Specialty drugs are defined as “being typically high-cost, scientifically engineered drugs used to treat complex chronic conditions that require special storage, handling, and administration, and involve a significant degree of patient education, monitoring, and management.”

[http://www.imshealth.com/imshealth/Global/Content/Corporate/Press%20Room/IMS Health in the News/PharmaVOICE\\_2\\_2014\\_SpecialtyDrugs.PDF](http://www.imshealth.com/imshealth/Global/Content/Corporate/Press%20Room/IMS_Health_in_the_News/PharmaVOICE_2_2014_SpecialtyDrugs.PDF)

<sup>5</sup> There is actually a small upward trend from 19.9 percent in 2009 to 20.1 percent in 2013.

**Exhibit 2: Specialty Drug Shares of Total Drug Spending**

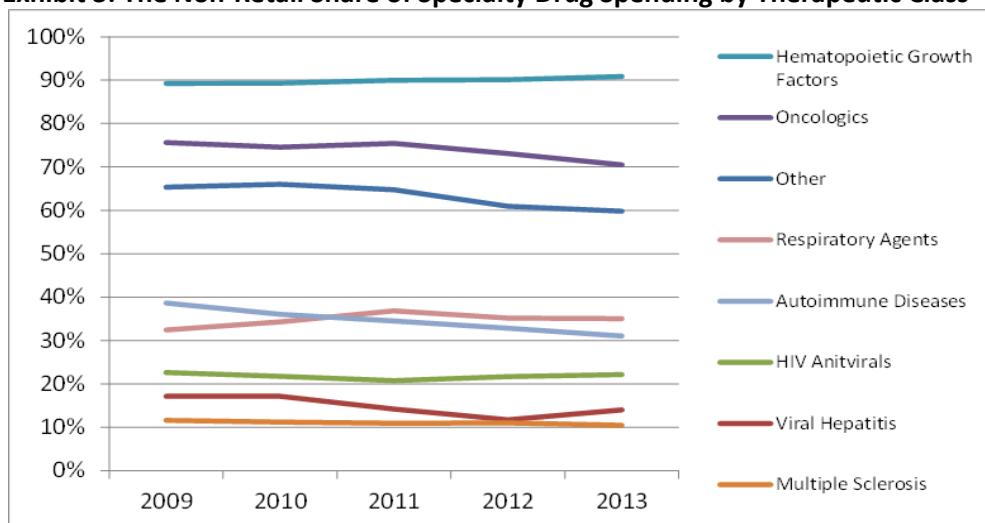


Source: Author’s calculations from unpublished IMS data

### Historical Patterns in the Non-Retail Share of Specialty Drug Spending by Therapeutic Class

Exhibit 1 shows a steady decline in the non-retail share of specialty drug spending. In order to determine whether this pattern is likely to continue, it is first useful to look more closely at what has been driving this recent decline. Exhibit 3 displays the non-retail shares of specialty drug spending by therapeutic class for each year from 2009 through 2013. There is wide variation ranging from hematopoietic growth factor drugs which are over 90 percent non-retail to multiple sclerosis drugs which are only 10 percent non-retail. The non-retail percentages show some decline over time for oncologics, autoimmune diseases, and “other”. These three therapeutic classes account for nearly 70 percent of all specialty drug spending, so they help explain some of the decline in the non-retail share of specialty drug spending over this period.<sup>6</sup>

**Exhibit 3: The Non-Retail Share of Specialty Drug Spending by Therapeutic Class**



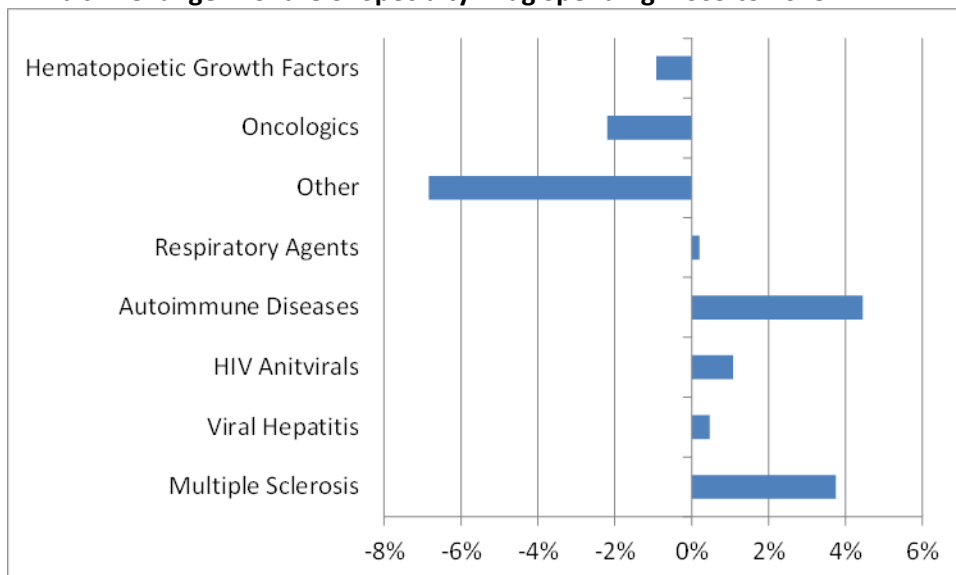
Source: Author’s calculations from unpublished IMS data

<sup>6</sup> In 2013, oncologics accounted for 29 percent of specialty drug spending while “other” and autoimmune diseases accounted for 22 percent and 18 percent respectively.

A second reason why the non-retail share has been falling over time is that most growth has occurred in those therapeutic classes that have smaller non-retail spending shares. This is shown in Exhibit 4 where the therapeutic classes are presented in the same order as Exhibit 3, and thus ranked in descending order in terms of the non-retail percent. The bars show the change between 2009 and 2013 in the share of specialty drug spending attributable to each therapeutic class. It is striking that the top three therapeutic classes (in terms of non-retail concentration) show a declining share of specialty drug spending while the bottom five show an increasing share.

In summary, the downward trend in the non-retail share of spending on specialty drugs shown in Exhibit 1 can be attributed both to a downward trend within some of the larger therapeutic classes (oncologics and other) and a shift in spending toward therapeutic classes for which non-retail spending is relatively low (autoimmune diseases and multiple sclerosis).

**Exhibit 4: Change in Share of Specialty Drug Spending: 2009 to 2013**



Source: Author's calculations from unpublished IMS data

## The Non-Retail Share of the *Increase* in Specialty Drug Spending

Another potentially useful statistic is the non-retail share of the increase in prescription drug spending. In this section we examine this statistic for specialty drugs. Between 2009 and 2013, the average annual increase in total (retail and non-retail) specialty drug spending was about 7.4 million dollars. Non-retail spending accounted for only 2.0 million dollars, or 27 percent, of this growth. The problem of forecasting the future non-retail share of specialty drug spending can be reduced to forecasting the non-retail share of future increases in such spending. A simple approach is to start with the historical average of 27 percent and then see if there is any information suggesting that this trend is likely to be higher or lower over the next ten years.

Over the 2009 to 2013 time period, the annual non-retail share of the increase in specialty drug spending was about 30 percent except for the 2012 when it was only 17 percent. If 2012 was an anomaly, then perhaps the 27 percent figure is too low. However, the introduction of the hepatitis C drug Sovaldi in December 2013 suggests that, at least in the near term, 27 percent could be too high. Spending on this specialty drug has been reported to be 5.1 billion dollars for the first half of 2014 and spending could

reach 10 billion dollars for the year.<sup>7</sup> While spending on other hepatitis C drugs will decline in 2014, the offset should be relatively small.<sup>8</sup> As a result, the increase in specialty drug spending in 2014 should be at more than twice its normal rate. Sovaldi is predominately a retail drug with a non-retail share of about 12 percent and, therefore, the non-retail share of the increase in specialty drug spending in 2014 is likely to be substantially smaller than 27 percent.<sup>9</sup> For purposes of a ten year forecast, it seems reasonable to use the 27 percent figure but to characterize this as more likely to be biased upward than downward.<sup>10</sup>

## The Non-Retail Share of the *Increase* in Traditional Drug Spending

The non-retail share of spending on traditional drugs has been relatively constant at about 20 percent over the 2009 to 2013 time period. However, the non-retail share of the spending *increase* over this time period was actually about 27 percent, the same as for specialty drugs. Because the increase in spending was so small over this time period, it did little to raise the overall average.<sup>11</sup> The volatility in the historical pattern makes it particularly difficult to predict whether this 27 percent share is likely to apply to future increases in traditional drug spending. First, spending on traditional drugs actually declined in 2012 (by over 10 billion dollars) and this was highly concentrated in the retail sector.<sup>12</sup> In the remaining years when spending increased, the non-retail share of the increase ran between 18 percent and 23 percent. Given this uncertainty, our forecast uses the historical average of 27 percent, the same figure as with specialty drugs. And, similar to specialty drugs, it could be viewed as a somewhat high estimate.

## Adjusting the CMS Ten Year Forecast to Include Non-Retail Spending

Under the assumptions outlined above, our forecast specifies that 27 percent of the increase in total prescription drug spending (retail plus non-retail) will be non-retail. An equivalent specification is that the ratio of the increase in non-retail spending to the increase in retail spending is equal to 0.37.<sup>13</sup>

We begin with the CMS forecast of retail prescription drug spending released in September 2014. In 2013, this forecast shows 272 billion dollars which is 9.4 percent of NHE.<sup>14</sup> The ratio of non-retail to retail spending appropriate for application to the CMS forecast for 2013 is 0.40.<sup>15</sup> Thus, we estimate about 109 billion dollars in non-retail spending in 2013, or about 3.7 percent of NHE. This brings total prescription drug spending in 2013 to 381 billion dollars or 13.1 percent of NHE. For subsequent years, we use the CMS forecast for retail prescription drug spending and estimate the year to year increase in non-retail as 0.37 times the CMS forecasted increase in retail.

<sup>7</sup> [http://www.nytimes.com/2014/07/24/business/sales-of-hepatitis-c-drug-sovaldi-soar.html?\\_r=0](http://www.nytimes.com/2014/07/24/business/sales-of-hepatitis-c-drug-sovaldi-soar.html?_r=0)

<sup>8</sup> For example, the hepatitis C drug Incivek is being taken off the market due to Sovaldi. However, its U.S. sales were less than one-quarter of a billion dollars in 2013 according to unpublished IMS data.

<sup>9</sup> The 12 percent figure is based upon unpublished IMS data through July 2014.

<sup>10</sup> It seems clear that the non-retail share of increased spending will be well below 27 percent in 2014 so even if it reverts back to 27 percent in subsequent years, the ten year average would be below 27 percent.

<sup>11</sup> The increase was only about 7 billion dollars or 3 percent of traditional drug spending in 2009.

<sup>12</sup> About 85 percent of the decline was retail.

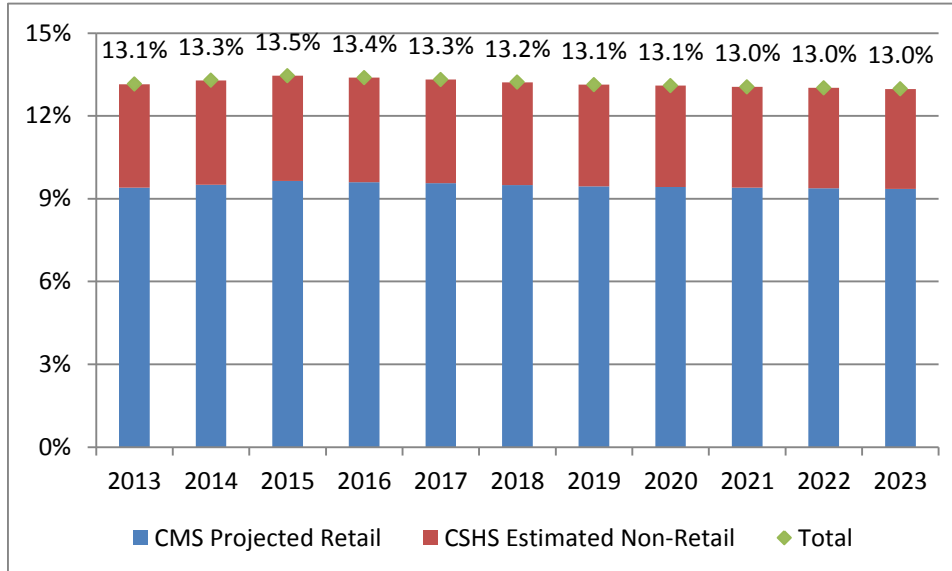
<sup>13</sup> Computed as  $0.27 / (1 - 0.27)$ .

<sup>14</sup> The previous CMS forecast for 2013 was \$10 billion lower, accounting for 9.0% of NHE. This is the forecast used in our previous study and is the source of the differences in the 2013 estimates between that study and this one.

<sup>15</sup> There is a small amount of retail drug spending that is not recognized in the CMS data. We adjust the non-retail to retail ratio up a small amount so this unrecognized retail spending is captured in our non-retail figure. Thus, to be precise, our non-retail estimate actually includes a bit of retail and this is done to reach an accurate total amount. This is explained in our earlier study.

Results are shown in Exhibit 5. Spending on prescription drugs, including both retail and non-retail, rises from 13.1 percent of NHE in 2013 to 13.5 percent in 2015 and then slowly declines to 13.0 percent in 2023. The increase in this statistic in 2014 and 2015 is a direct reflection of the increase in the retail prescription drug spending share of NHE forecasted by CMS (rising from 9.4 percent in 2013 to 9.6 percent in 2015). CMS attributes high growth in prescription drug spending in 2014 and 2015 to expanded coverage under the Affordable Care Act, and also to spending on hepatitis C.

**Exhibit 5: Prescription Drug Share of National Health Expenditures - 2013 to 2023**



Source: Retail share is from October 2014 CMS Office of the Actuary forecast. Non-retail share is CSHS projection.

## Summary and Conclusions

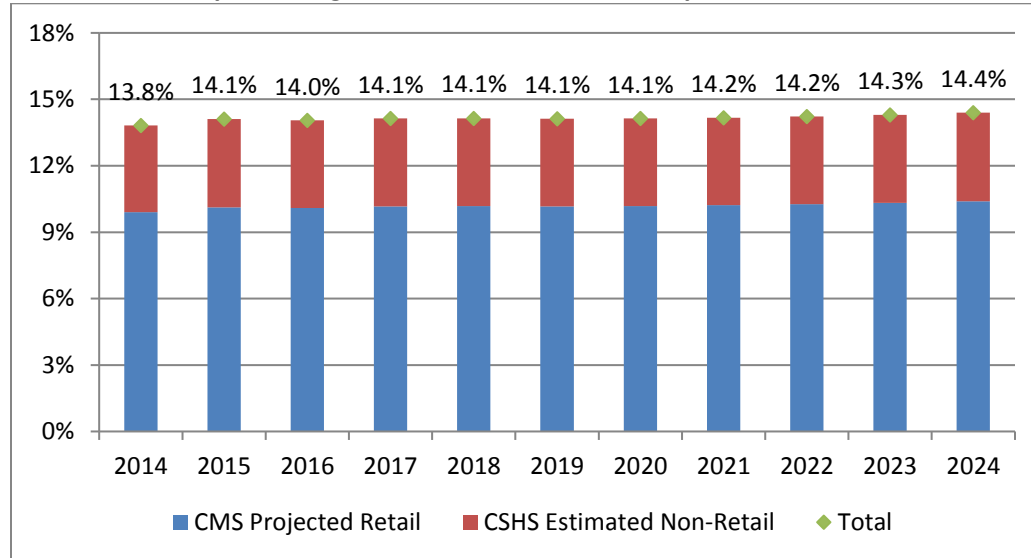
Given the CMS ten year forecast of NHE and its retail prescription drug component, our research suggests that the total prescription drug spending share of NHE will remain around 13 percent over the next ten years. Perhaps the most interesting detailed finding is that the non-retail share of the *growth* in spending on prescription drugs between 2009 and 2013 has been the same (27 percent) for both traditional and specialty drugs. This is surprising because overall spending for specialty drugs has a much higher retail share (around 50 percent) while overall spending for traditional drugs has a significantly lower non-retail share (20 percent). We assume this 27 percent share will continue throughout the ten year period, though we suspect it could be smaller in the very near term. It should be emphasized that we have adopted the CMS forecast for retail prescription drug spending. The accuracy of our forecast of these overall percentages will tie closely to the accuracy of the CMS forecast.

*NOTES: The primary author of this report was Dr. Charles Roehrig, Director of the Altarum Center for Sustainable Health Spending. Funding was provided by the Pharmaceutical Research and Manufacturers of America.*

## Addendum: Update using July 2015 CMS estimates and forecasts

In July 2015, CMS released new [10-year projections of NHE](#), including projections of retail prescription drug spending. In this addendum to our report, we provide an update to our 10-year projections of the total prescription drug spending share of NHE by applying the methodology described in the report to these CMS projections. The updated figures for 2014 through 2024 are shown in Exhibit 6.

**Exhibit 6: Prescription Drug Share of National Health Expenditures - 2014 to 2024**

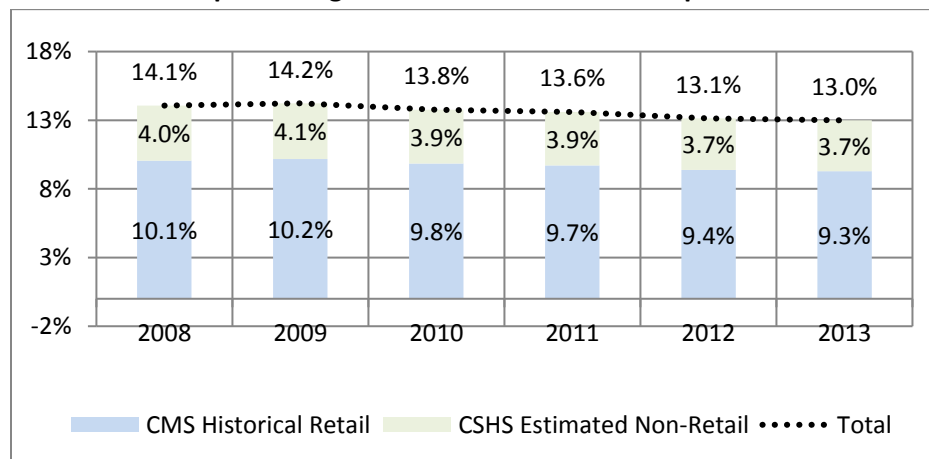


Source: Retail share is from July 2015 CMS Office of the Actuary NHE forecast. Non-retail share is CSHS projection.

A comparison of Exhibits 5 and 6 shows that CMS’s projections of the retail prescription drug share of NHE increased between the projections released in 2014 and those released in 2015. The total share of prescription drug spending in 2014 has increased from 13.3% to 13.8%. By 2023, the projected share has increased from 13.0% to 14.3%.

We have also updated our historical estimates using the [CMS NHE estimates](#) released in December 2014 and the methodology from our [previous study](#). Results are shown in Exhibit 7.

**Exhibit 7: Prescription Drug Share of National Health Expenditures - 2008 to 2013**



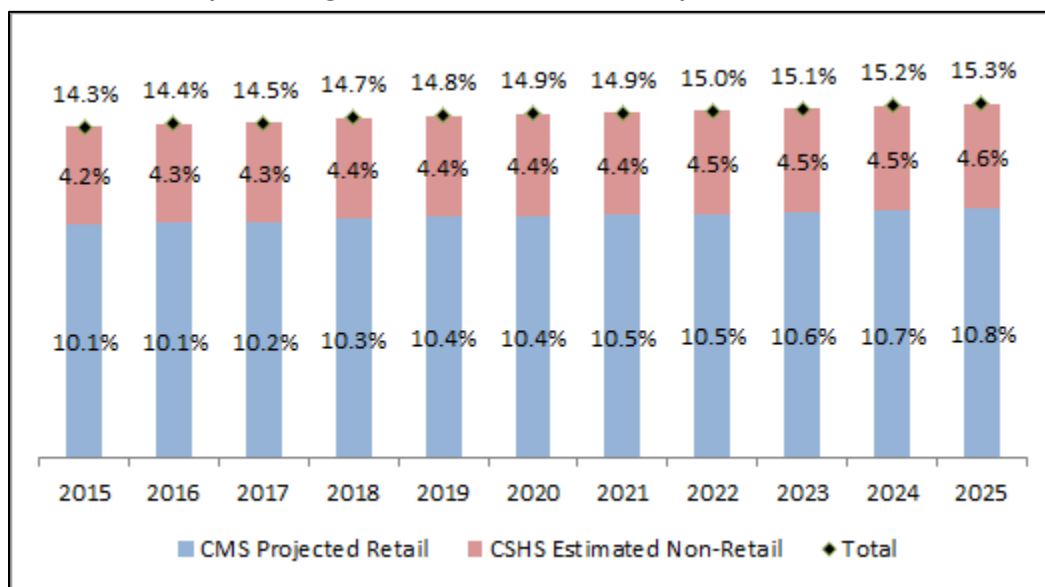
Source: Retail share is from December 2014 CMS NHE and non-retail shares are CSHS estimates.



## Addendum II: Update using February 2017 CMS estimates and forecasts

In February 2017, CMS released new 10-year projections of NHE, including projections of retail prescription drug spending. In this addendum to our report, we provide an update to our 10-year projections of the total prescription drug spending share of NHE by adding a non-retail estimate to these CMS projections. The results for 2015 through 2025 are shown in Exhibit 8.

**Exhibit 8: Prescription Drug Share of National Health Expenditures - 2015 to 2025**



Source: Retail share is from February 2017 CMS Office of the Actuary NHE forecast (2015 is CMS historical). Non-retail share is CSHS estimate.

CMS’s projections of the retail prescription drug share of NHE have been revised upward as shown in Exhibit 9. For example, the CMS projection for the retail prescription drug share of NHE in 2023 was 9.6 percent in the 2014 release, growing to 10.3 percent in the 2015 release and 10.6 percent in the 2017 release. As discussed below, the calculation of the non-retail component has also been revised from previous estimates to account for a small amount of retail spending that is counted as non-retail in the health accounts. The inclusion of this retail spending in the non-retail component pushes the non-retail prescription drug share of NHE up by about 0.3 percentage points (for example, from 3.9 percent to 4.2 percent in 2015).

**Exhibit 9: CMS Projection Revisions**

| CMS Projection Year | 2015  | 2023  |
|---------------------|-------|-------|
| 2017 Projections    | 10.1% | 10.6% |
| 2015 Projections    | 10.1% | 10.3% |
| 2014 Projections    | 9.6%  | 9.4%  |

**Retail and non-retail channels.** Exhibit 10 shows how prescription drug sales are distributed among the various retail and non-retail channels (non-retail channels are labeled institutional channels in the exhibit per IMS terminology). The largest retail channel is chain stores but their share has been falling over time.

Mail service is the channel that has been growing, reaching 32.6% in 2016. As of 2016, about half of non-retail sales are through clinics and this share has been growing rapidly while the non-federal hospital and long term care shares have declined. This trend has been consistent and, therefore, it is highly probable that well more than half of non-retail sales will be to clinics in the projection years.

In the national health accounts, non-retail prescription drug costs are included in health care services spending. Non-retail sales to hospitals will be included in hospital spending in the national health accounts. Non-retail sales to clinics, the largest category, are included in the physician and clinical services component of health accounts (Non-retail sales to clinics that are owned and operated by hospitals are counted as sales to hospitals in the IMS data). Retail sales to long term care facilities will be included as nursing home revenues and sales to home health care will be included as home health care revenues. Sales to federal facilities, HMOs, and Miscellaneous (this includes prisons) are likely split between hospitals and clinics. In 2016, when these categories are split between hospitals and clinics using the non-federal hospital and clinic proportions, the following shares result for non-retail prescription drug spending across the national health account categories:<sup>16</sup>

- Hospitals: 29.5%
- Physician and Clinical Services: 54.3%
- Nursing Homes 13.1%
- Home Health 3.1%

**Exhibit 10: Distribution of Prescription Drug Sales Across Channels**

|                               | 2012   | 2013   | 2014   | 2015   | 2016   |
|-------------------------------|--------|--------|--------|--------|--------|
| <b>Total Spending</b>         |        |        |        |        |        |
| <b>Retail Channels</b>        | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Chain Stores                  | 46.8%  | 45.7%  | 44.6%  | 42.7%  | 42.8%  |
| Mail Service                  | 26.8%  | 27.7%  | 30.1%  | 32.0%  | 32.6%  |
| Independent                   | 16.1%  | 15.6%  | 15.4%  | 15.6%  | 15.4%  |
| Food Stores                   | 10.4%  | 11.0%  | 9.8%   | 9.8%   | 9.1%   |
| <b>Institutional Channels</b> | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Clinics                       | 43.7%  | 45.1%  | 45.8%  | 47.5%  | 49.5%  |
| Non-Federal Hospitals         | 31.1%  | 30.2%  | 28.4%  | 27.9%  | 26.9%  |
| Long Term Care                | 15.4%  | 15.0%  | 15.3%  | 14.1%  | 13.1%  |
| Federal Facilities            | 3.1%   | 3.3%   | 3.7%   | 4.1%   | 4.1%   |
| Home Health Care              | 3.0%   | 3.0%   | 3.2%   | 3.2%   | 3.1%   |
| HMO                           | 2.8%   | 2.5%   | 2.6%   | 2.2%   | 2.3%   |
| Misc                          | 1.0%   | 1.0%   | 0.9%   | 1.0%   | 1.0%   |

Source: CSHS calculations based upon Medicines Use and Spending in the U.S., IMS, April 2017, page 41

<sup>16</sup> For federal facilities, HMOs, and miscellaneous, 35% of the share was allocated to hospitals and 65% to clinics based upon the relative shares of non-federal hospitals and clinics in 2016 in exhibit 10.

**CSHS methods for estimating non-retail shares of NHE.** The estimates of non-retail prescription drug spending as a share of NHE shown in Exhibit 8 based upon IMS data on invoice spending by dispensing location shown in exhibit 11. The retail share of total spending has been stable from 2012 through 2016. Therefore, the 2016 share is assumed to hold for 2017 through 2025.

**Exhibit 11: Retail Share of Prescription Drug Sales**

|      | retail | non-retail | retail share |
|------|--------|------------|--------------|
| 2012 | 227.4  | 90.4       | 0.72         |
| 2013 | 237.2  | 94.3       | 0.72         |
| 2014 | 272.9  | 105.6      | 0.72         |
| 2015 | 307.1  | 118.2      | 0.72         |
| 2016 | 322.7  | 127.3      | 0.72         |

Source: CSHS calculations based upon *Medicines Use and Spending in the U.S.*, IMS, April 2017, page 41

These shares must be adjusted slightly before they are properly applied to the health account retail estimates. Retail prescription drug spending in the national health accounts does not include purchases from retail pharmacies owned by physician practices and hospitals. Instead, these costs are counted in the physician, hospital, and long term care sectors respectively (that is, they are included in the non-retail component). A government study estimated that about 10.7 billion dollars of retail pharmacy spending fell into this category in 2007. The amount reported as retail spending that year was 236 billion.<sup>17</sup>

It is difficult to determine if sales of drugs to institution-owned retail pharmacies are counted as institutional or retail in the IMS data but there likely a mixture of both.<sup>18</sup> Assuming that half is counted as retail, this difference in accounting would cause IMS retail spending to be about 2% higher than NHE retail spending. Therefore, to convert the IMS shares to be applicable to NHE, the retail share should be reduced by about 2 percent. This brings the share in 2015 to 70.3 percent and this is used for the remaining years in the forecast. If retail is 70.3 percent of the total, then the ratio of non-retail to retail is  $(1/.703 - 1) = .423$ . For each year from 2015 through 2025 in exhibit 8, the non-retail prescription drug spending share of NHE is calculated as .423 times the retail share.<sup>19</sup>

This method results in a slightly higher non-retail to retail ratio than what was used in the past year estimates (exhibits 5, 6, and 7) because it correctly shifts the reduction in retail spending into the non-retail category. The previous approach included the reduction in retail (reducing the denominator in the non-retail to retail ratio) but did not shift this excluded retail into the numerator. While this was technically accurate (it kept the numerator more purely non-retail), it led to an understatement of the total retail plus non-retail. With the new method, the total is tracked accurately and it is understood that the non-retail category includes a bit retail spending associated with hospital and physician owned retail pharmacies. The method for developing projections also differs slightly from what was used previously. Given the stability over time in non-retail shares shown in exhibit 10, this update assumes no trend in the share during the projection period whereas the previous method allowed for a small downward trend.

<sup>17</sup>“Reconciling Medical Expenditure Estimates from the MEPS and NHEA, 2007”, Bernard et. al, *Medicare & Medicaid Research Review* 2012: Volume 2, Number 4.

<sup>18</sup> Personal communication from Michael Kleinrock at IMS, May 16, 2014.