



# Getting Warmer: Health Expenditure Trends and Health System Reform

## Summary

National Health Expenditure (NHE) growth slowed both in terms of average annual increases and as a proportion of gross domestic product between 2000 and 2020. The first decade of the 2000's saw NHE as a percentage of GDP increase 4.1 percentage points while the period from 2010 through 2020 saw an increase of just 0.6 percentage points. Over the same two time spans average annual per capita NHE growth decreased by 2 percentage points from 5.7 percent to 3.7 percent.

These slower growth trends were also reflected in the ten-year NHE projections updated annually by the Centers for Medicare and Medicaid Services Office of the Actuary (OACT). Since the initial 2010 vintage projection of NHE spending (*i.e.*, 2010 to 2020), all subsequent projections for this period have been revised downward with the most recent 2019 projection estimating total NHE 11.6 percent below 2010 estimates. The divergence between estimated versus actual spending has occurred across major service categories and both public and private payers.

Several factors have contributed to this slower growth. OACT reports cite the impact of macroeconomic forces such as the "Great Recession" from 2007 to 2009, policy changes like the passage of Medicare Part D and the Patient Protection and Affordable Care Act (Affordable Care Act or ACA), and unexpected changes in the health care industry such as the rapid expansion in the use of generic drugs. Another factor impacting slower NHE growth has been unexpected changes in hospital care and physician services. Specifically, an increase in the use of non-physicians (*i.e.*, nurse practitioners, physician assistants) in the context of primary care and lower than expected hospital inpatient utilization, including changing clinical care practices shifting some inpatient services to ambulatory care.

While it is hard to quantify with precision, these unexpected changes in hospital and physician services align well with the policy goals of many ACA policy reforms. Efforts designed to reduce hospital readmissions, encourage the use of provider care teams, and encourage the broader adoption of value-based payment (VBP) arrangements (pioneered in the Medicare Shared Savings Program (MSSP)) and related models developed by the Center for Medicare and Medicaid Innovation (CMMI). The payment transformation developments are clearly a positive contributing factor and have the potential to pay larger dividends as more of the system transitions away from fee-for-service over the next decade.

At their core, VBP arrangements realign incentives to create greater efficiencies and care coordination, which helps eliminate excessive and repetitive low value care. Several of the Medicare VBP experiments have clearly showed gross savings and improved practice patterns. The focus on care redesign has also established new clinical pathways for more effective and cost-

efficient care, becoming the standard for providers treating patients inside and outside of these models.

## Introduction

The passage of the Affordable Care Act in 2010 spurred a decade of payment reform efforts intended to shift the health care system from volume driven Fee-For-Service payments to alternative payment models (APMs) with reimbursement linked to quality and outcomes. A principal goal of these efforts was to encourage the most efficient use of health care resources and control the growth of health care costs. While bending the cost curve has been the *raison d'être* for many health policymakers for decades, accurately measuring the impact of any single reform effort has been challenging to say the least.

The ACA was a massive piece of legislation that impacted several parts of the health care system simultaneously. It was implemented on the heels of one of the deepest recessions in the nation's history and was followed by another major piece of health care legislation in 2015 titled the Medicare Access and CHIP Reauthorization Act (MACRA). In short, measuring the impact of the last decade of reform efforts is a far cry from the randomized control trials used to prove the efficacy of a new drug or procedure. Overlapping model interventions, changes in existing payment policies, broad macroeconomic forces, improvements in the standards of care, and a host of other factors affect the ability to make causal inferences in this space.

This paper focuses on long-term trends in health care spending from 2000 to 2020. In short, it seeks to answer the question of when it comes to bending the cost curve, is the system getting warmer or colder? While the impacts of individual reform effort may be impossible to fully quantify, the broader direction of health care spending offers a useful, though blunt, barometer for the cumulative impacts of these changes. The NHE trends over the past decade suggest a systemic slow-down in both projected and actual health spending. Furthermore, we believe that payment reform efforts have been a contributing factor to this slowdown. While maybe not taking the most direct route, the system is indeed getting warmer to reducing the rate of growth of national health care spending.

## Analysis Approach

We examined the 10-year projected estimates and actual historical national health expenditure data produced by OACT from 2000-2019. The annual NHE estimates generated by OACT represent the federal governments best forecast for the next decade of health expenditures based on prior expenditure patterns and anticipated changes in prices, utilization, population size, and a range of larger economic factors. These projections are stratified by payer type (Medicare, Medicaid, private insurance, out-of-pocket, and other private revenues) and by service category (hospital care, physician and clinical services, prescription drugs, dental, equipment investments, etc.).

This analysis uses the 2019 NHE data set (the most recently available data set at the time of this writing) to calculate the actual spending – or the most updated estimates – for payer and service category levels from 2000 through 2020. We then requested the historical NHE projection vintages from CMS for every year from 2000-2018 as well as the population estimates used for each vintage to compare how NHE projections have changed over time on an aggregate and per-capita basis. For simplicity, tables and graphs of NHE from the 2019 data set are presented in five-year increments (2000, 2005, 2010, 2015, 2020). To analyze changes in NHE forecasts, projection vintages are split into two ten-year periods, 2000 to 2010, and 2010 to 2020. Projections for each

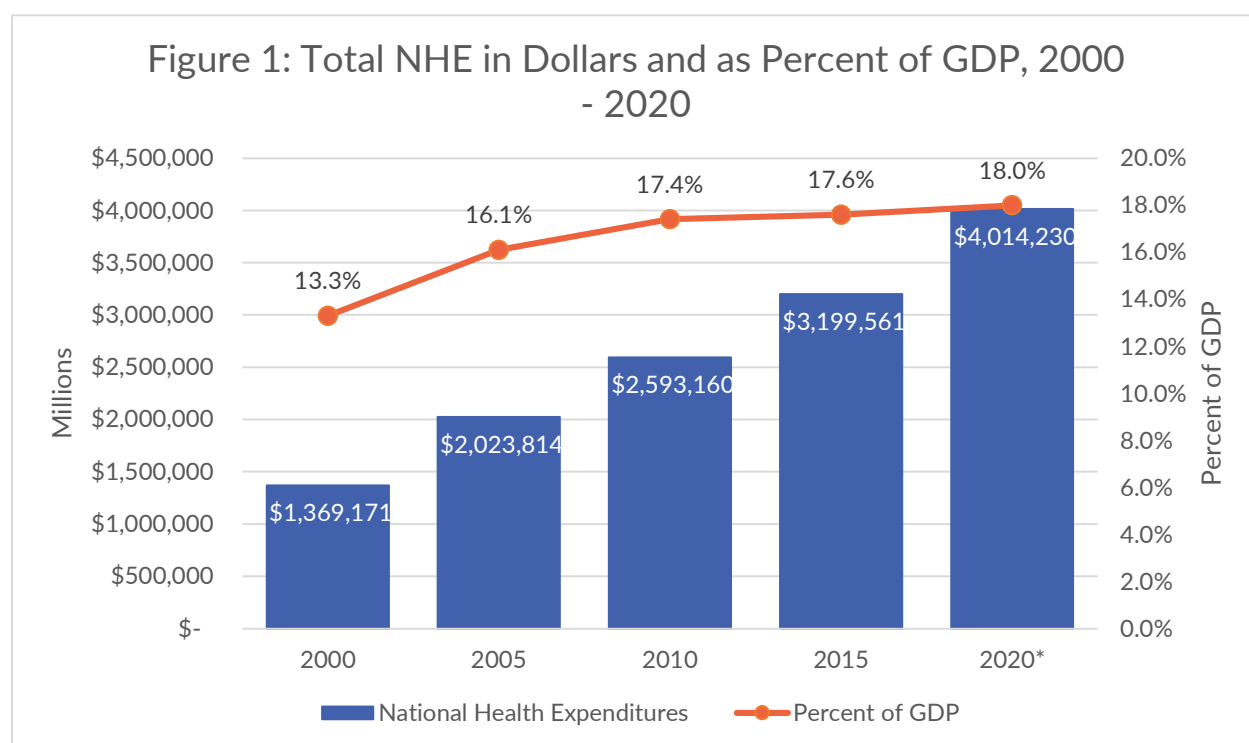
period were then analyzed in three-year increments (2000, 2003, 2006, 2009, and 2010, 2013, 2016, 2019) with the year 2000 and 2010 projections serving as the baseline forecast for their respective decades.

It is worth noting that the data sets used for this analysis are based on 2019 estimates of 2020 spending and do not yet reflect the impact of the COVID-19 pandemic on 2020 NHE. For this analysis, we believe it is reasonable to use the projected 2020 data as a proxy for the general direction of NHE trends prior to the pandemic. The pandemic is expected to have a uniquely large impact on NHE in comparison to previous economic shocks due to the combination of macroeconomic impacts from business closures, and health sector specific impacts due to utilization changes in elective services, increased use of intensive care, added costs of personal protective equipment, and federal emergency aid efforts. It will likely take a few years for the full scope of this impact to be reflected in NHE data.

## Results

### Total NHE and Share of GDP

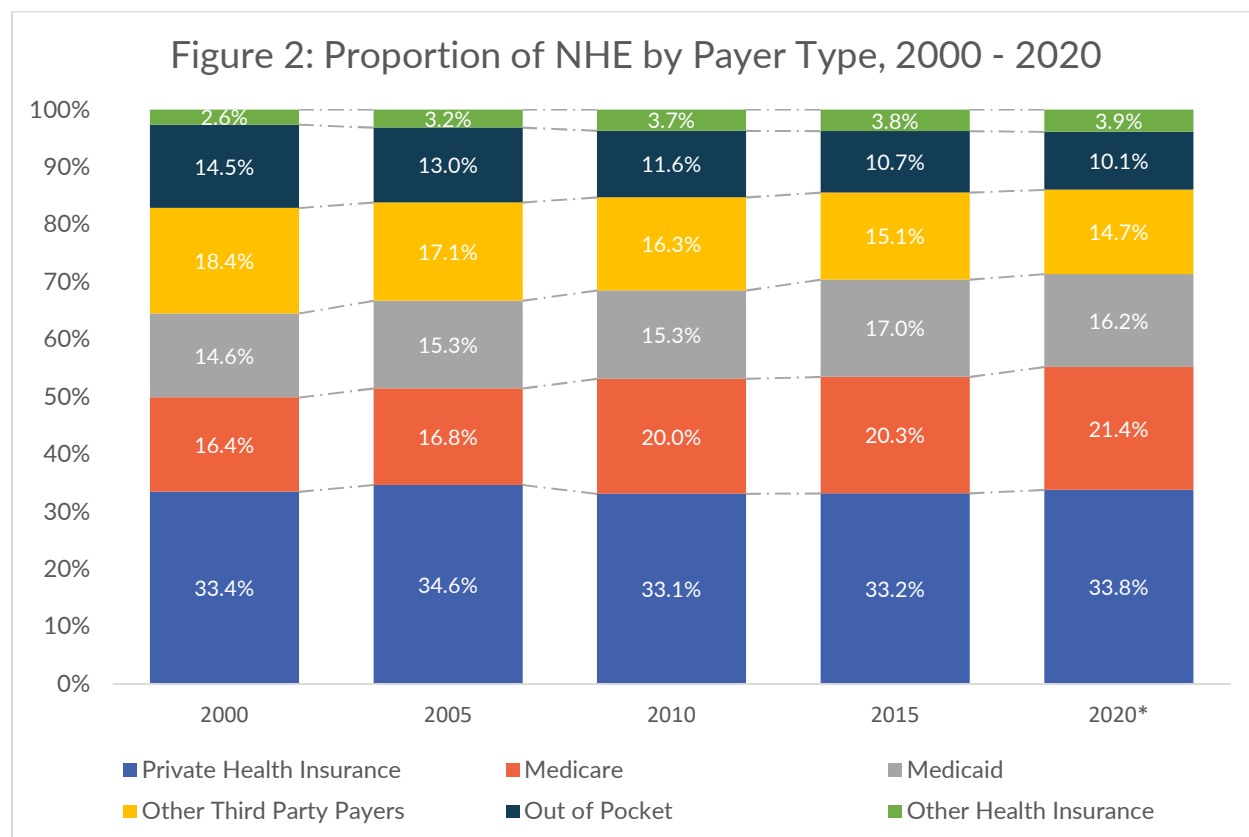
NHE increased steadily over the past two decades, however, the growth of NHE as a proportion of GDP has slowed considerably over the last decade (Figure 1). Total health expenditures have increased by an average of \$132 million per year over the past twenty years increasing from \$1.4 trillion in 2000 to \$4 trillion in 2020. Between 2000 and 2010, NHE as a percentage of GDP increased 4.1 percentage points from 13.3 percent to 17.4 percent while the period from 2010 through 2020 saw an increase of just 0.6 percentage points (17.4 percent to 18 percent).



\*Estimate based on 2019 NHE projections.

## Proportion of NHE by Payer Type and Spending Category

From 2000 to 2020, private health insurance, Medicare, Medicaid, and out of pocket spending has consistently accounted for more than 75 percent of national health spending (Figure 2)<sup>1</sup>. The private health insurance share of NHE has remained steady at 33 to 34 percent while the Medicare share increased by 5 percentage points (16.4 to 21.4 percent) and Medicaid grew by 1.6 percentage points (14.6 to 16.2 percent). Out of pocket spending has decreased steadily from 14.5 percent in 2000 to 10.1 percent in 2020.



\*Estimate based on 2019 NHE projections.

<sup>1</sup> The 'other third-party payers and programs' category includes worksite health care, Indian Health Services, workers' compensation, general assistance programs, the Health Resources & Services Administration Maternal and Child Health program, vocational rehabilitation, Substance Abuse and Mental Health Services Administration grants or outlays for certain programs, school health, other federal programs, other state and local programs, and other private revenues.

The 'other health insurance' category includes health-related spending for the Children's Health Insurance Program (CHIP) titles XIX and XXI, the Department of Defense, and the Department of Veteran's Affairs.

Between 2000 and 2020, three spending categories (i.e., hospital care, physician and clinical services, and prescription drugs) have consistently accounted for roughly 60 percent of all NHE (Table 1). Hospital expenditures accounted for over 30 percent of spending, physician and clinical services for approximately 20 percent, and prescription drugs accounting for roughly 10 percent.

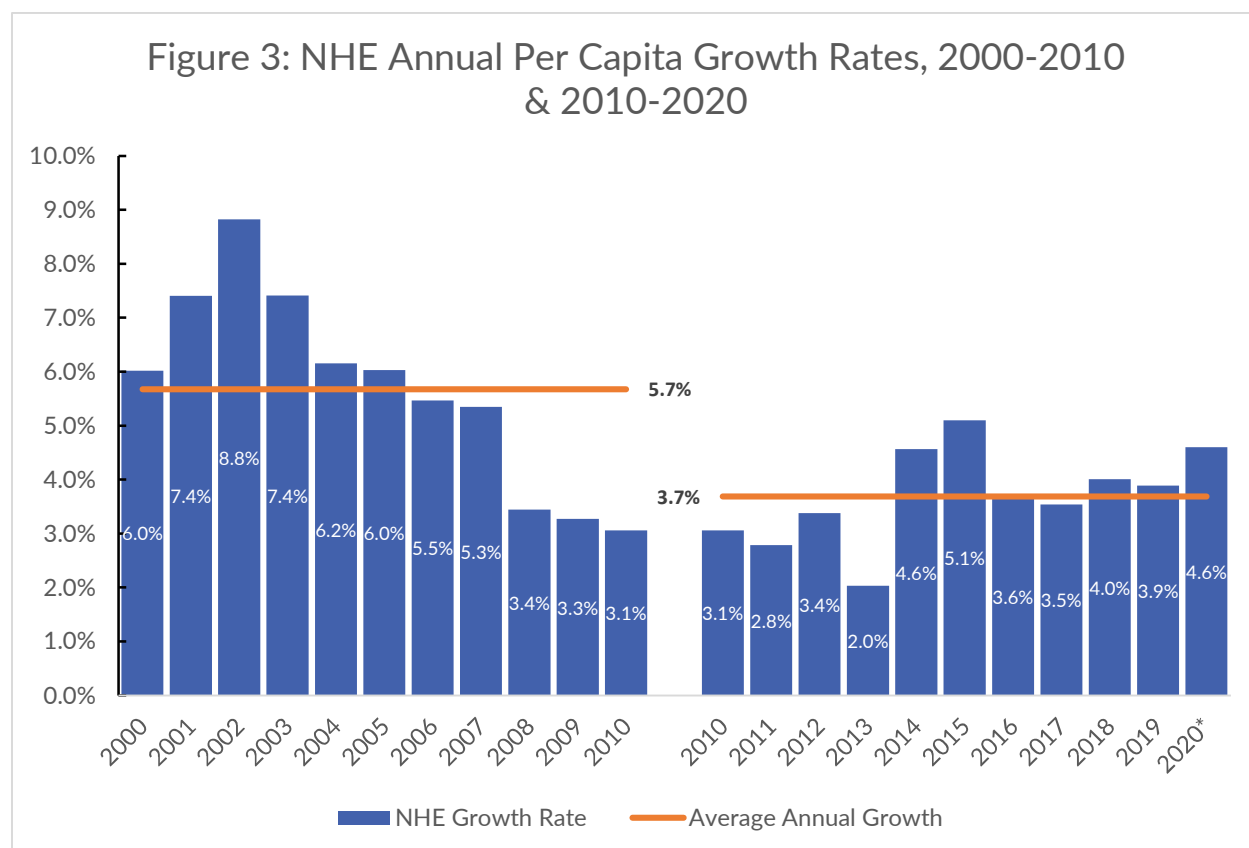
**Table 1: Proportion of NHE by Spending Category, 2000 – 2020**

Spending Category	2000	2005	2010	2015	2020*
<b>Hospital Expenditures</b>	30.3%	30.1%	31.7%	32.3%	32.8%
<b>Physician and Clinical Expenditures</b>	21.0%	20.4%	19.8%	19.7%	19.8%
<b>Prescription Drug Expenditures</b>	8.8%	10.1%	9.6%	9.9%	8.9%
<b>Net Cost of Health Insurance Expenditures</b>	4.7%	6.1%	5.9%	6.5%	7.4%
<b>Other Health, Residential, and Personal Care Expenditures</b>	4.7%	4.7%	5.0%	5.1%	5.2%
<b>Nursing Care Facilities and Continuing Care Retirement Communities</b>	6.2%	5.5%	5.4%	4.9%	4.6%
<b>Dental Services Expenditures</b>	4.5%	4.3%	4.1%	3.7%	3.7%
<b>Home Health Care Expenditures</b>	2.4%	2.4%	2.8%	2.8%	2.9%
<b>Other Professional Services Expenditures</b>	2.7%	2.6%	2.7%	2.7%	2.9%
<b>Public Health Activity</b>	3.1%	2.8%	2.9%	2.7%	2.5%
<b>Non-Durable Medical Products Expenditures</b>	2.3%	2.0%	2.0%	1.9%	1.8%
<b>Equipment Expenditures</b>	2.4%	2.1%	1.8%	1.8%	1.8%
<b>Durable Medical Equipment Expenditures</b>	1.8%	1.6%	1.5%	1.5%	1.5%
<b>Structures Expenditures</b>	1.9%	1.8%	1.8%	1.6%	1.5%
<b>Research</b>	1.9%	2.0%	1.9%	1.4%	1.5%
<b>Government Administration Expenditures</b>	1.2%	1.4%	1.2%	1.3%	1.3%

\*Estimate based on 2019 NHE projections.

## NHE Average Annual Growth Rates

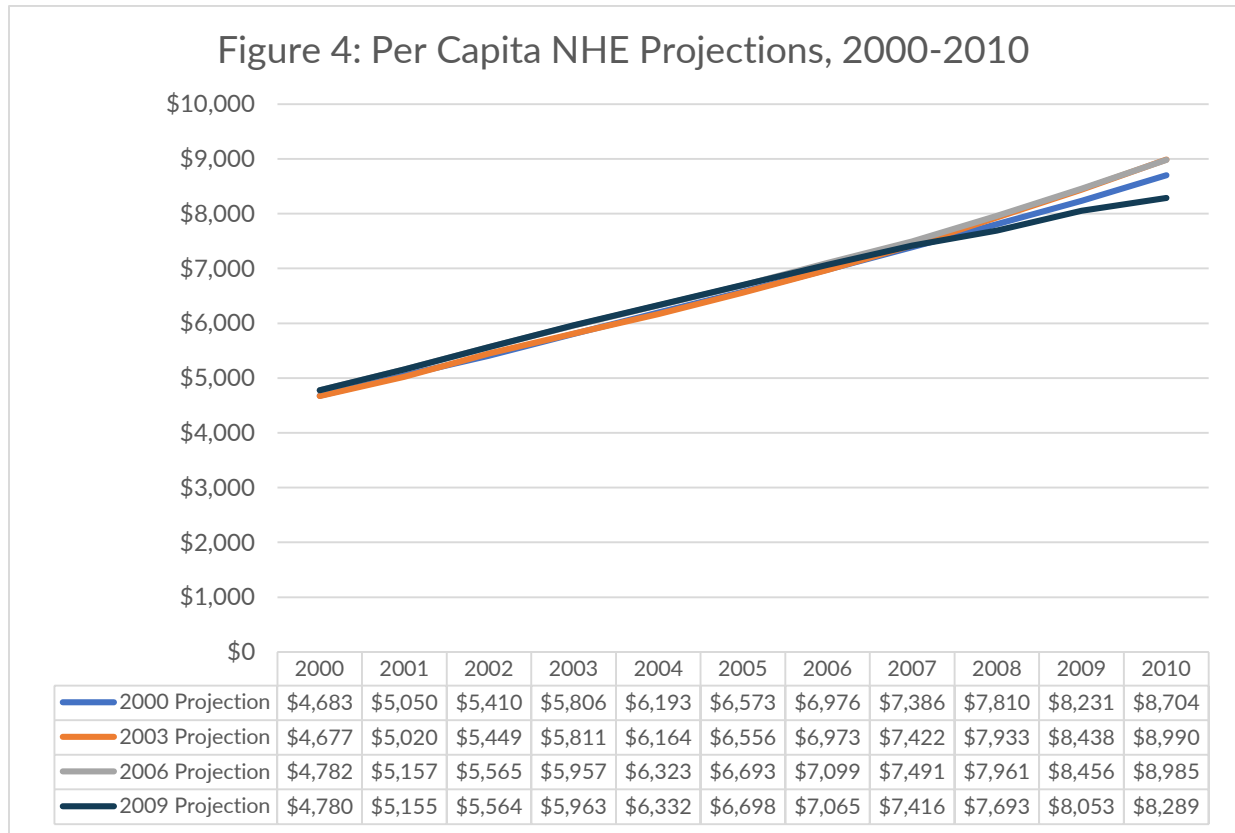
The annual growth in NHE from 2000 to 2020 peaked in 2002 at 8.8 percent and hit a nadir in 2013 at 2.0 percent (Figure 3). Average growth over the decade spanning 2000 to 2010 was 5.7 percent, 2 percentage points higher than the 2010 to 2020 period which saw average growth of 3.7 percent.



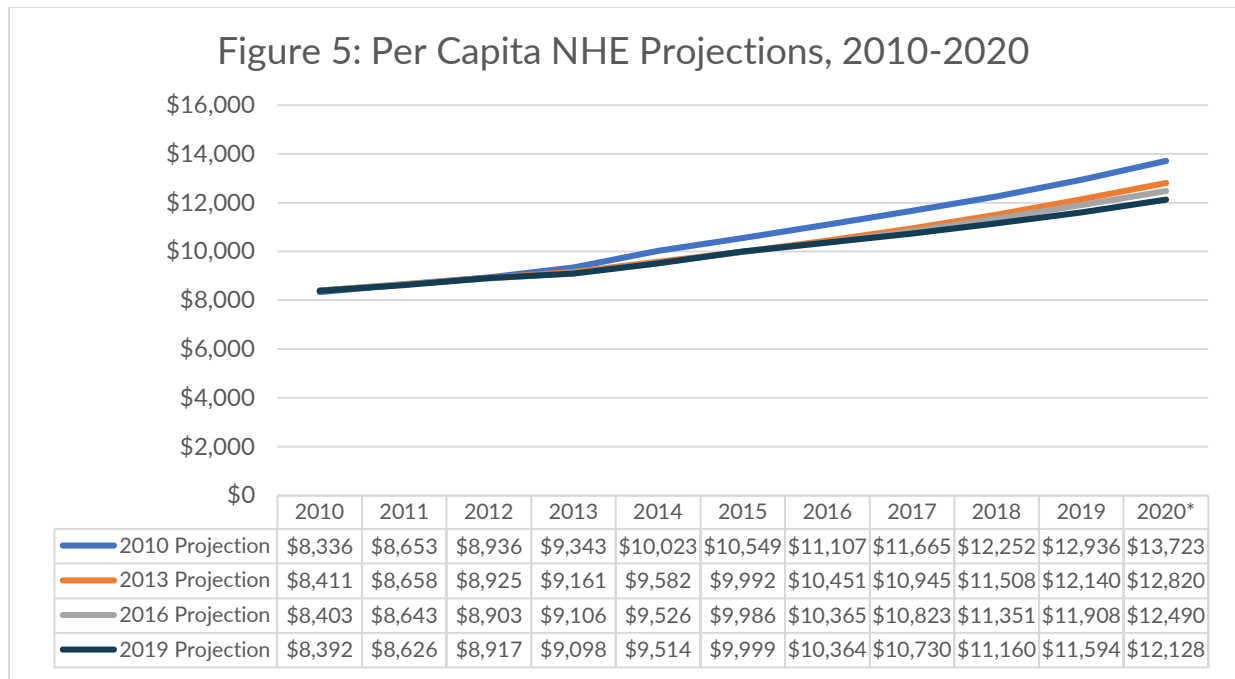
\*Estimate based on 2019 NHE projections.

## Per Capita NHE Projections

NHE projections were relatively consistent over the first decade of the 2000's. The 2000 vintage NHE projections estimated that NHE would reach \$8,704 per person by 2010. Later revisions in 2003 and 2006 increased that estimate over \$8,900 before the 2009 projection downgraded the forecast to \$8,289, roughly 5 percent below the initial forecast from 2000 (Figure 4).



In comparison, NHE projections for the second decade of the 2000's consistently overestimated spending. The 2010 vintage NHE projections estimated that NHE would reach \$13,723 per person by 2020. Later projections from 2013, 2016, and 2019 consistently decreased projected 2010 per capita spending, which in 2019 was estimated to be \$12,128 or 11.6 percent below the initial forecast from 2010 (Figure 5).

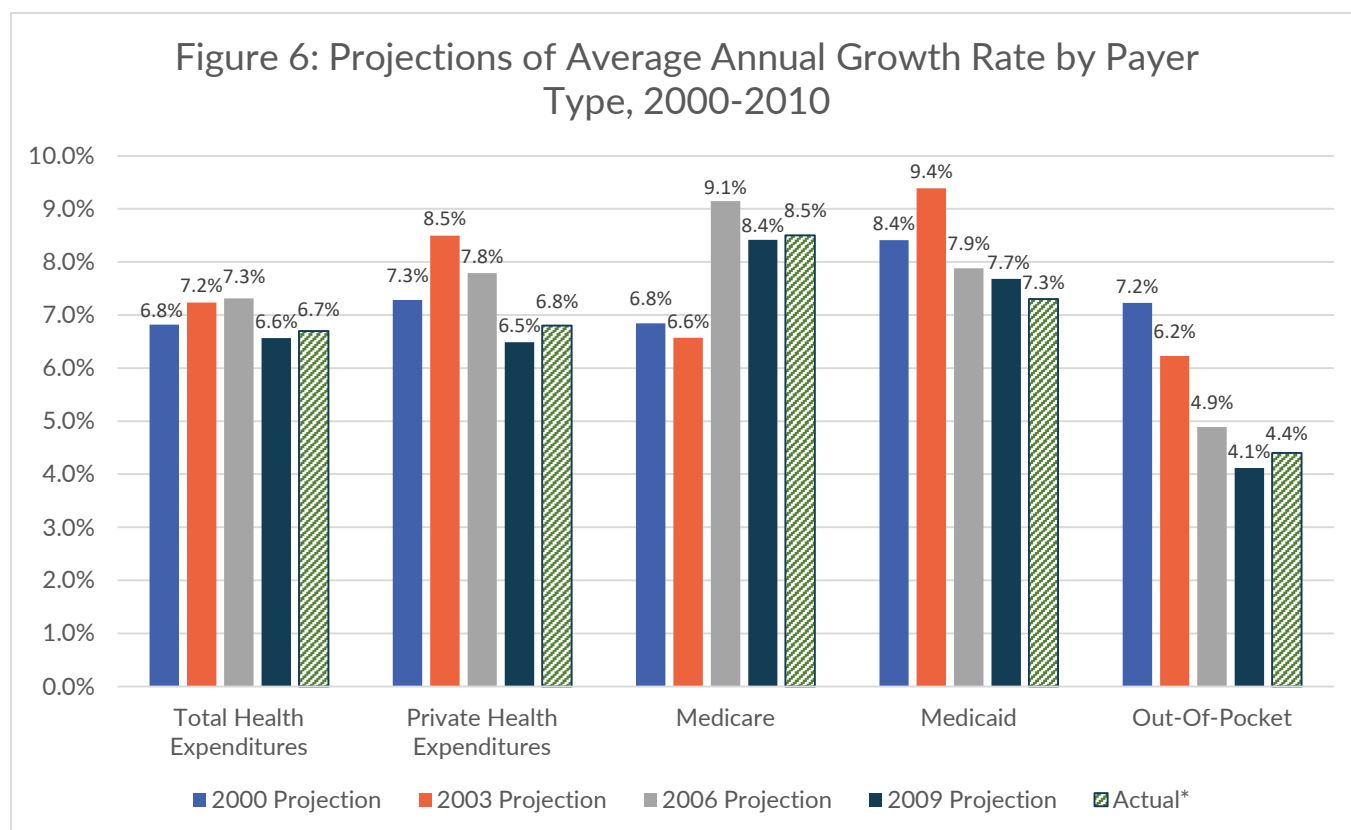


\*Estimate based on 2019 NHE projections.



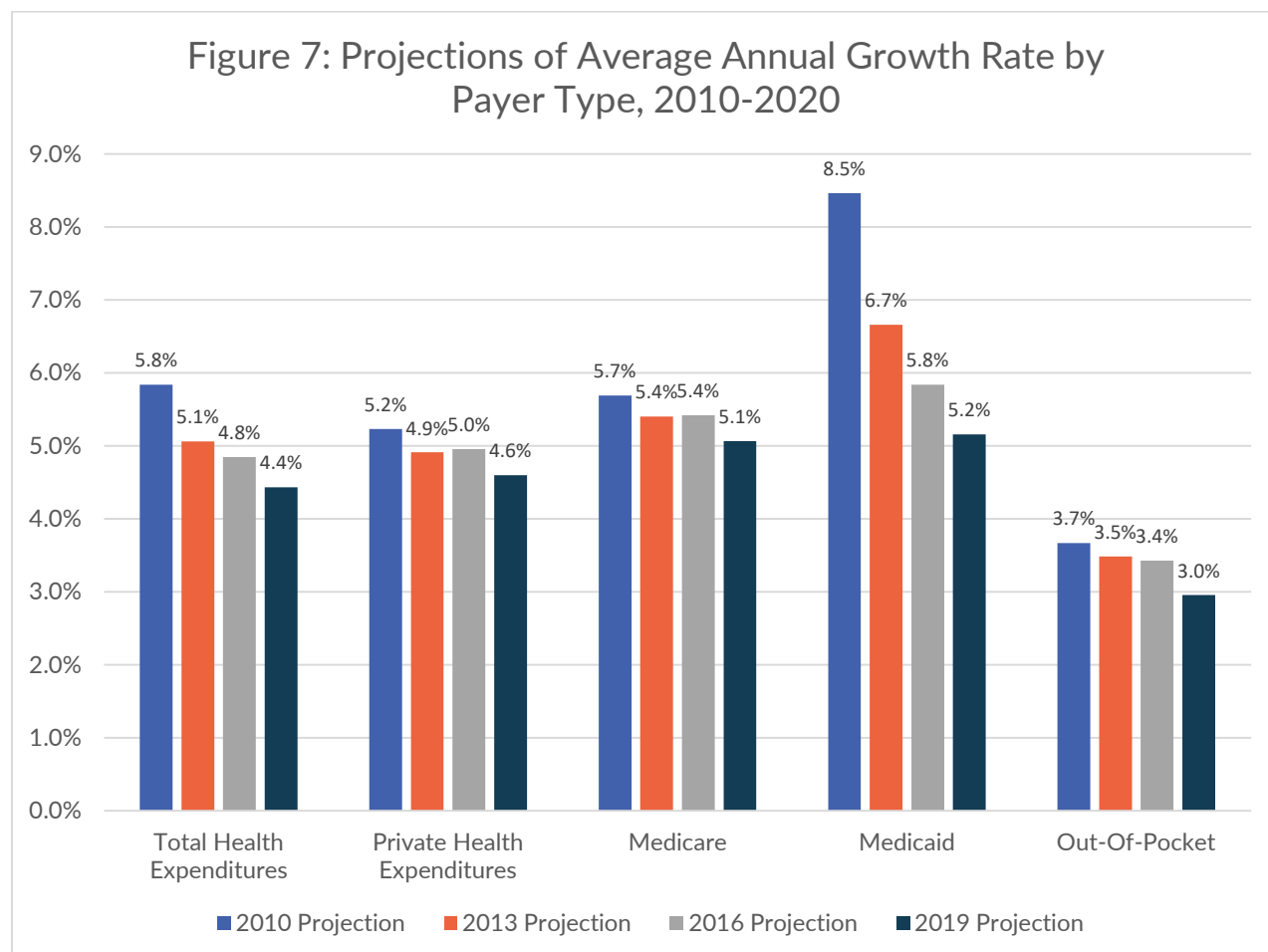
## NHE Projections by Payer Type

During the period of 2000 through 2009, the baseline 2000 vintage forecast projected an average annual growth rate across all payers of 6.8 percent, just 0.1 percentage points off the actual growth rate of 6.7 percent (Figure 6). Medicare had the highest average annual growth rate across all payer types; actual Medicare spending grew at an average of 8.5 percent, higher than the 6.8 percent projected in baseline forecast, but lower than the 9.1 percent projected in the 2006 vintage forecast. Medicaid and private health expenditures both grew around 7 percent per year, a lower rate than originally projected in the 2000 forecast. The average growth in out-of-pocket costs decreased over time from a projected 7.2 percent growth rate in the baseline forecast to an actual growth rate of 4.4 percent.



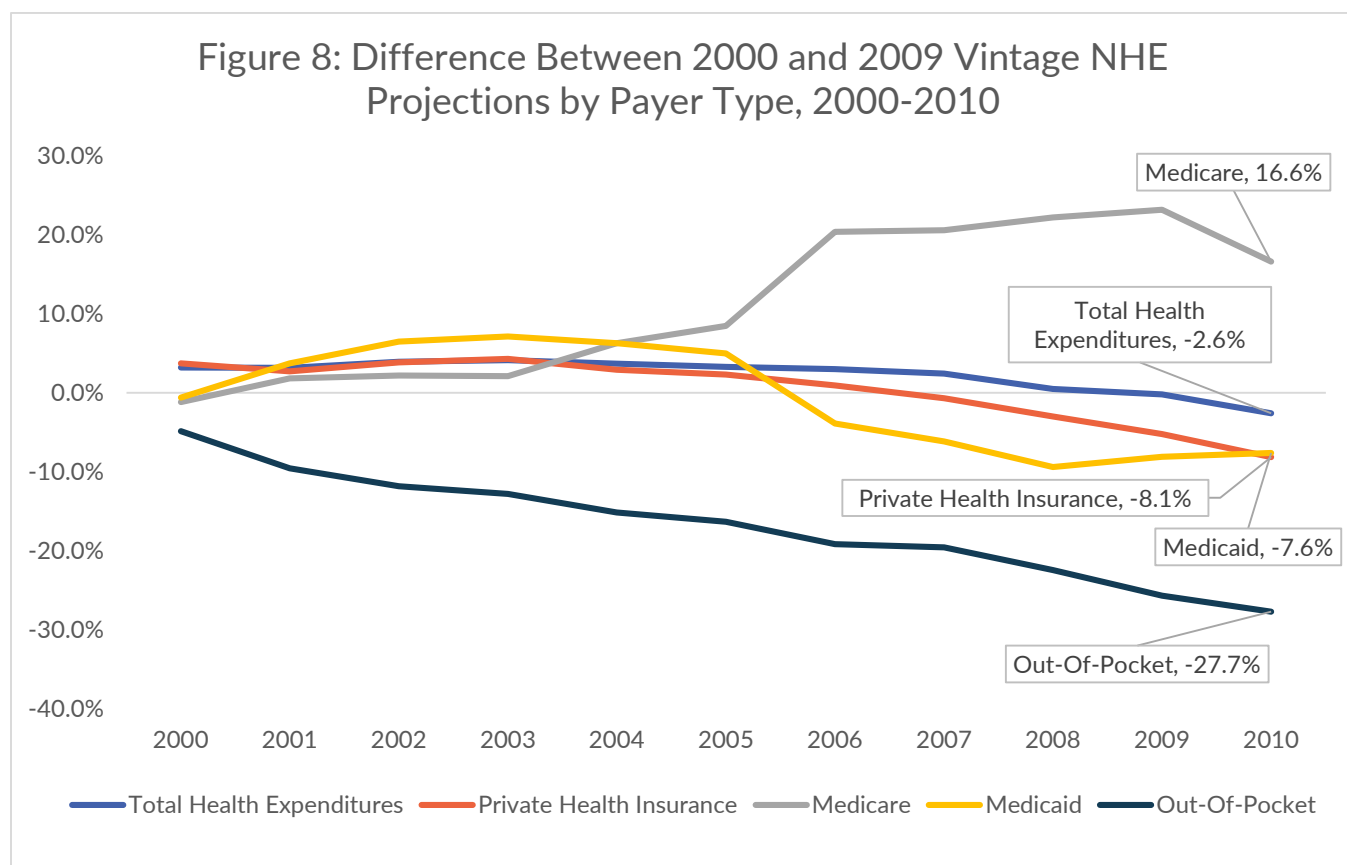
\*Based on 2019 NHE Data

From 2010-2020, the baseline 2010 vintage forecast projected average annual growth rates across all payers would be 5.8 percent, 1.4 percentage points higher than the most recent 2019 vintage forecast projection of 4.4 percent (Figure 7). A similar decrease in the expected average annual growth rate from the 2010 baseline to 2019 vintage predictions is seen across the board for all payer types individually. Medicaid had the greatest change dropping from a projected 8.5 percent annual growth rate at baseline to 5.2 percent annual growth rate in the 2019 projection. Private health expenditures, Medicare, and out-of-pocket expenditures all saw decreases of between 0.6 to 0.7 percentage points.

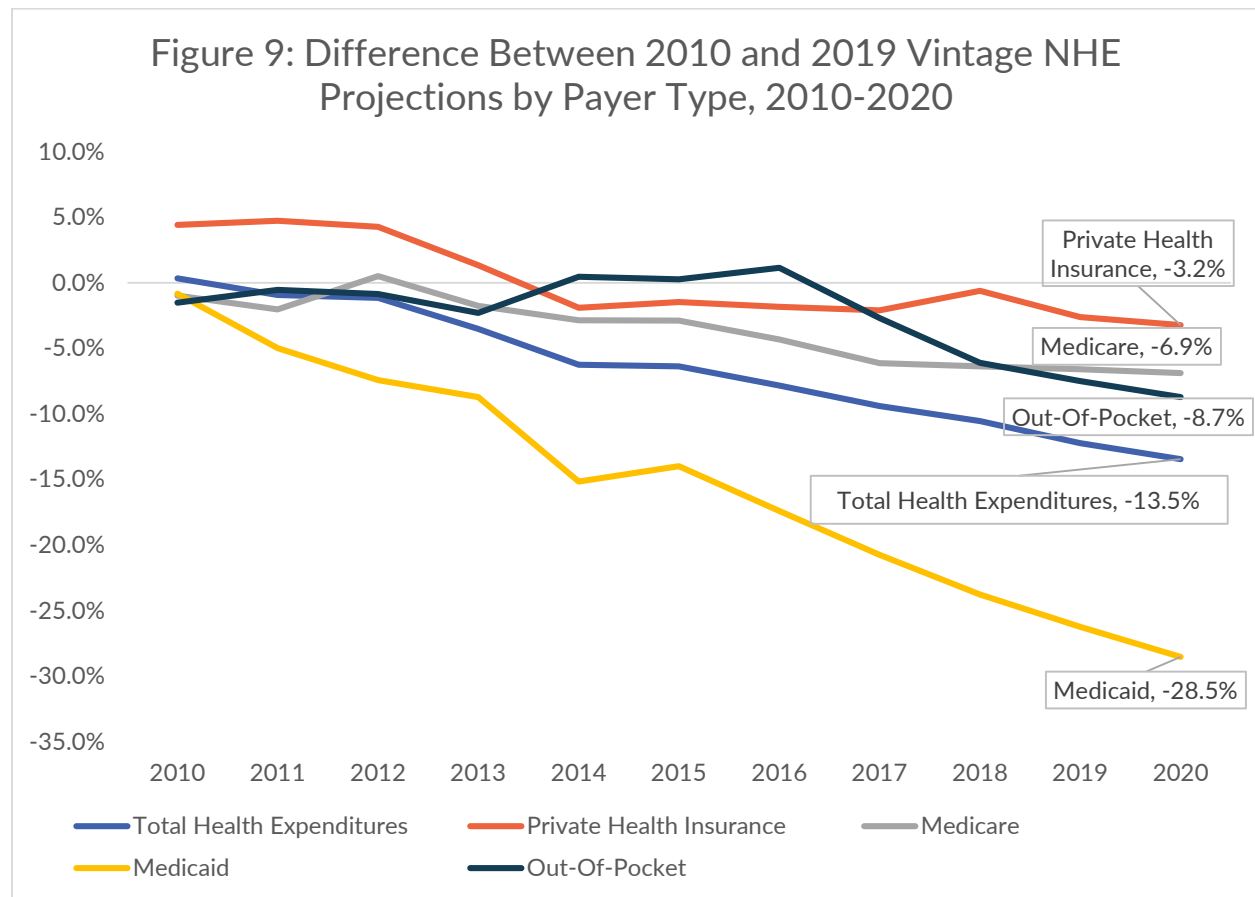


## Percent Change in Projected NHE by Payer Type (Select Vintages)

The annual change between the baseline 2000 vintage projection and the 2009 vintage projection for NHE from 2000 to 2010 highlights the variation in over and underestimates by payer type. By 2010, the total health expenditures in the 2009 forecast were 2.6 percent lower than the baseline forecast (Figure 8). At the payer level in 2010, Medicare experienced the largest rate of growth in forecasted spending with a 16.6 percent increase compared to the baseline period. Out-of-pocket expenditures had the greatest percentage decrease in projected spend between the two forecasts, as seen by the -27.7 percent reduction in spend in 2010. Private health insurance and Medicaid both saw a decline in projected spend, falling at -8.1 percent and -7.6 percent in 2010, respectively.



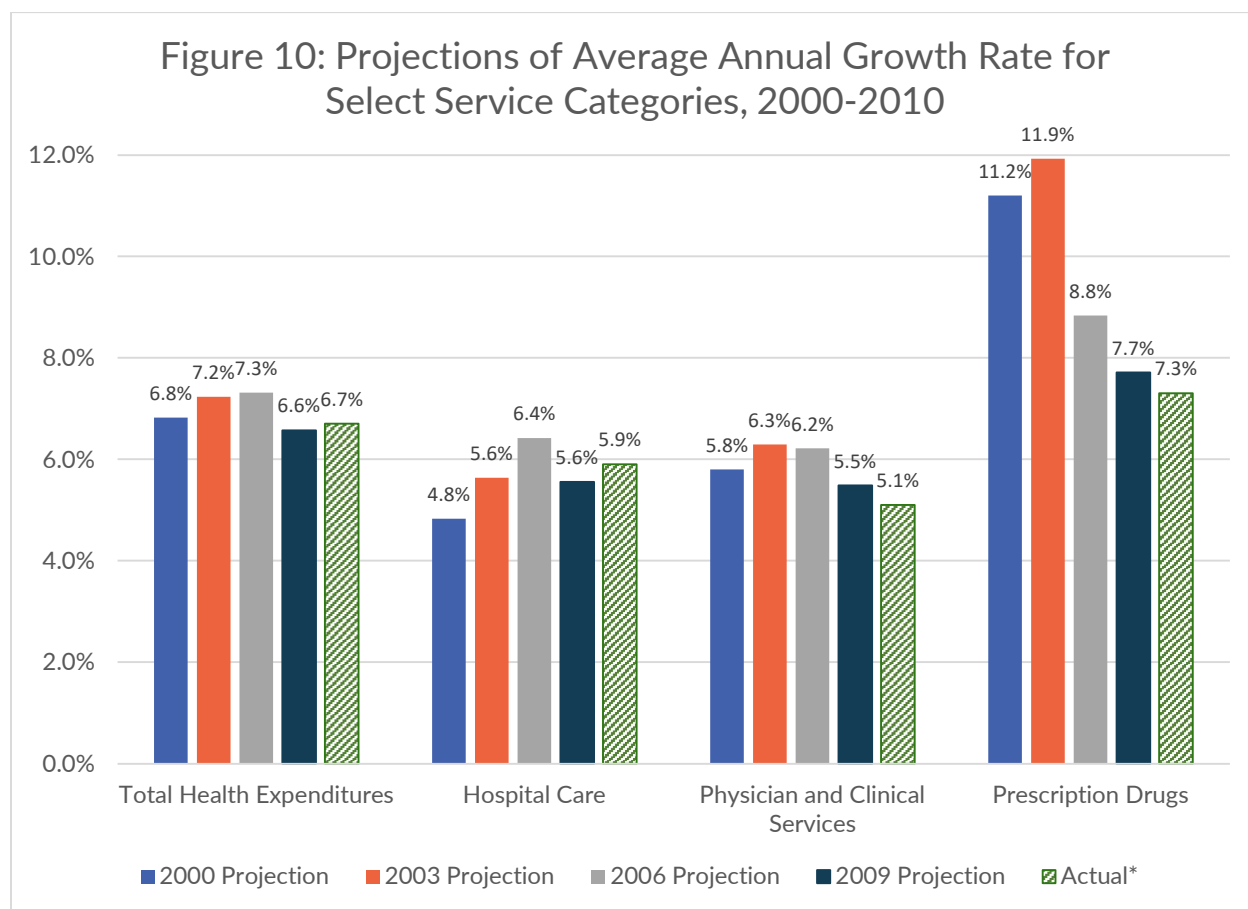
In the decade from 2010-2020, the 2019 vintage projection was consistently lower than the baseline 2010 vintage projection across all payer types. Medicaid experienced the most noticeable decrease with a -28.5 percent change between the two projections in 2020 (Figure 9). Medicare spending in the 2019 projections exceeds the 2010 baseline projections for the first four years of the decade before falling to 6.9 percent below baseline estimates by 2020. Similar downward trends can be observed for private health insurance and out-of-pocket spending which fall to 3.2 percent and 8.7 percent below baseline projections by 2020.



## NHE Projections by Service Category (Select Vintages)

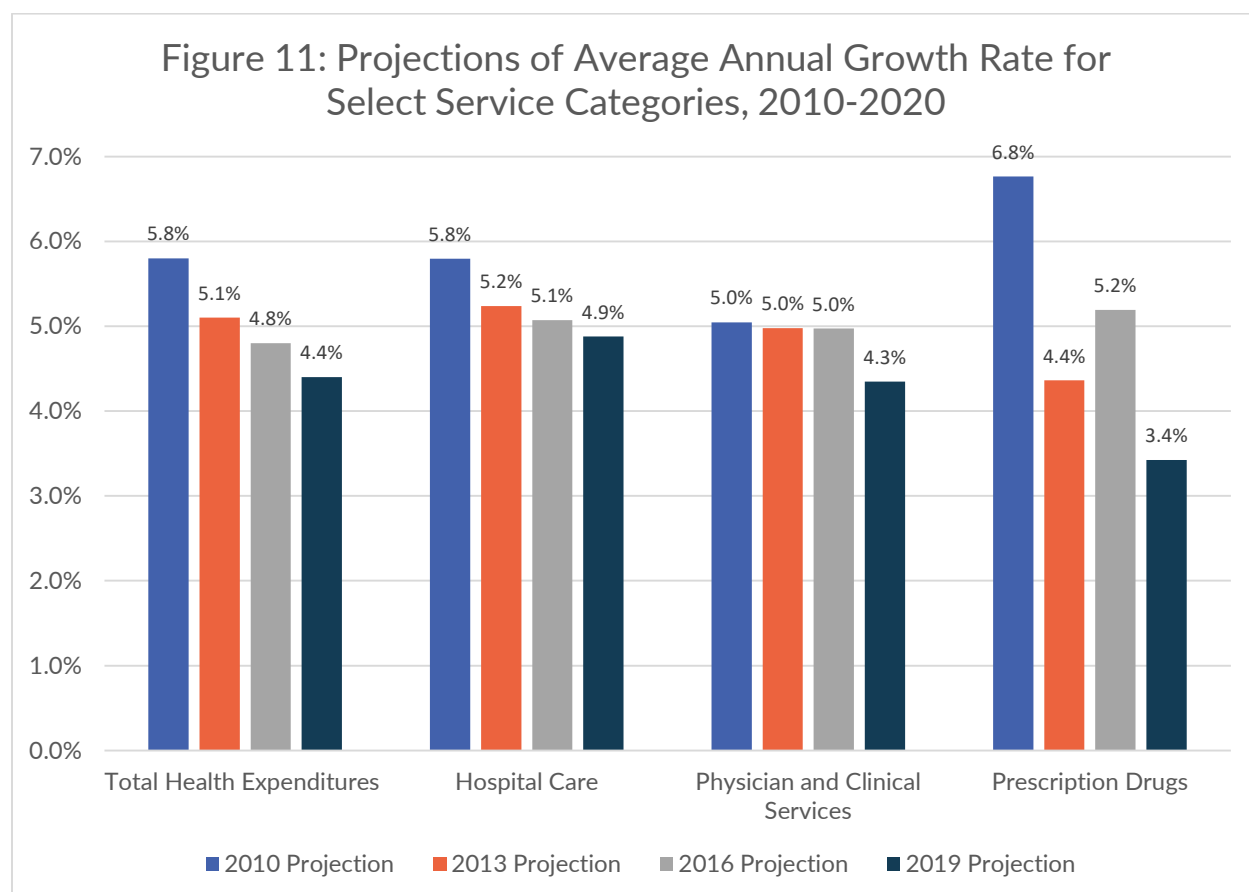
The following charts focus on trends for the top three NHE spending categories, hospital care, physician and clinical services, and prescription drugs.

The baseline 2000 vintage projection for NHE estimated an average annual growth rate of 6.8 percent across all services for the period from 2000 to 2010 (Figure 10). This estimate was 0.1 percentage points higher than the actual growth rate of 6.7 percent. The actual average annual growth rate for prescription drugs was 7.3 percent, 3.9 percentage points lower than the baseline 2000 projections. Physician and clinical services spending growth was also lower than the baseline 2000 projection at 5.1 percent compared to 5.8 percent. Average hospital spending growth during this period was 5.9 percent, which is 1.1 percentage points higher than the baseline 2000 projection.



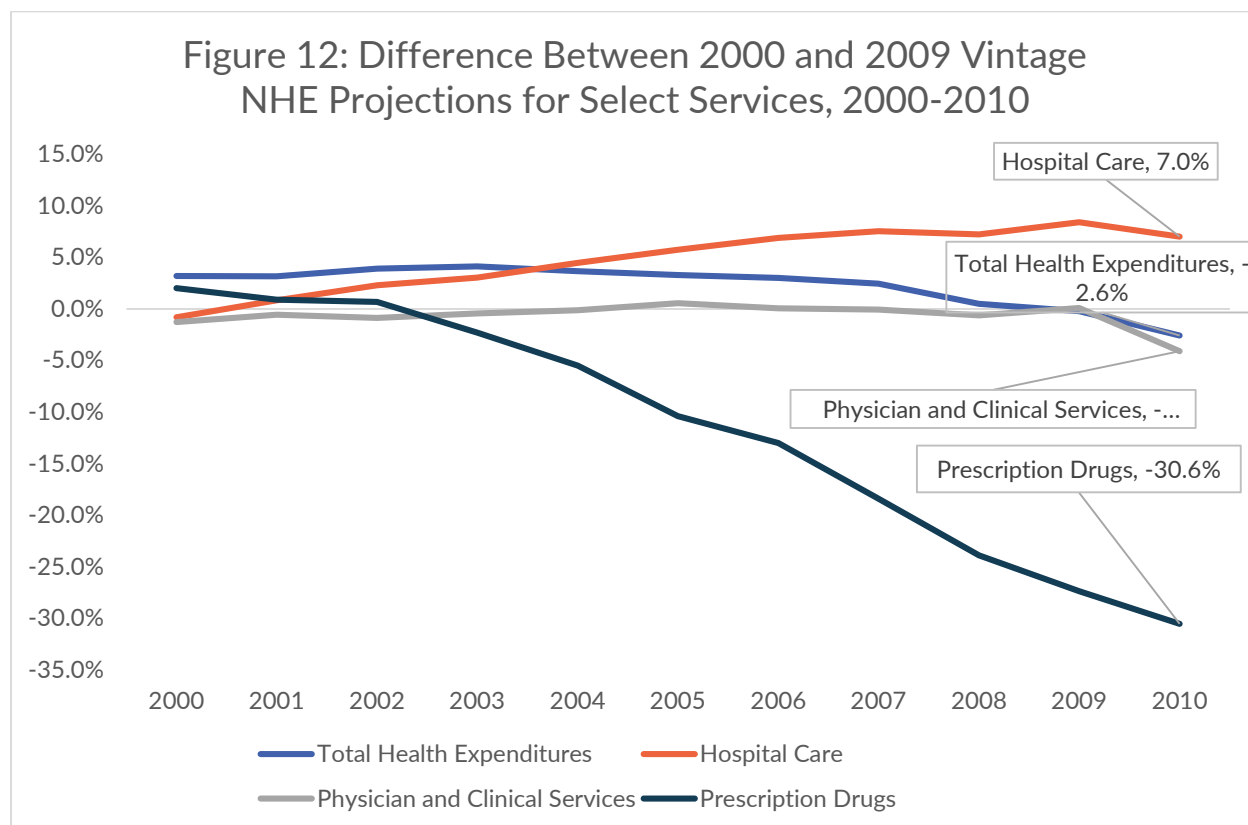
\*Based on 2019 NHE Data

The baseline 2010 vintage NHE projection estimated an average annual growth rate of 5.8 percent across all services for the period from 2010 to 2020. By the 2019 vintage projection, this estimate decreased by 1.4 percentage points to an average growth rate of 4.4 percent (Figure 11). Under the 2019 vintage projection the average annual growth rate for prescription drugs was 3.4 percent, 3.4 percentage points lower than the baseline 2010 projection of 6.8 percent. Similarly, the 2019 projected growth rate for physician and clinical services was 0.7 percentage points below the baseline 2010 forecast, 4.3 percent compared to 5.0 percent. Hospital spending decreased by 0.9 percentage points compared to the 2010 baseline projections, 4.9 percent vs. 5.8 percent.

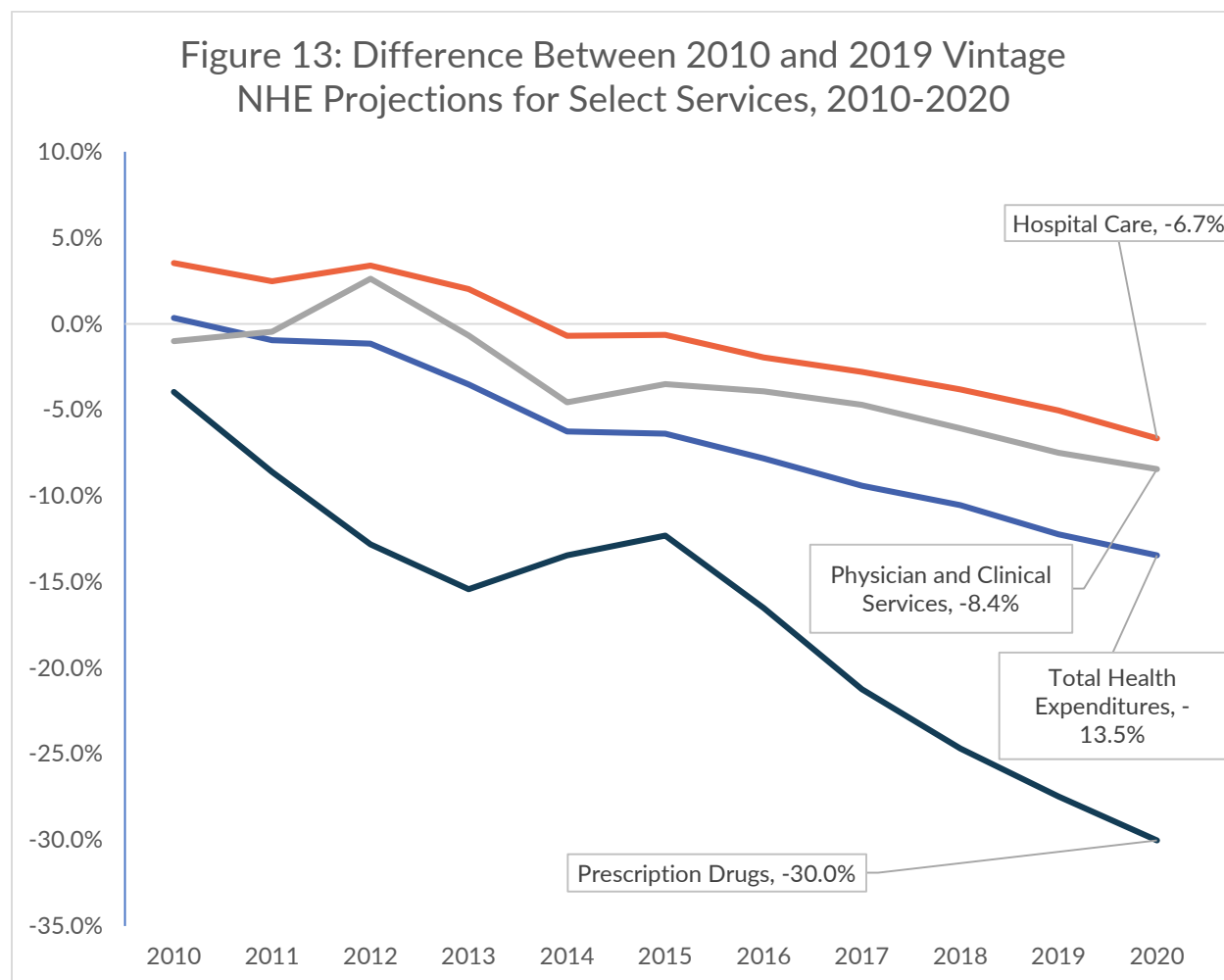


## Percent Change in Projected NHE by Service Category (Select Vintages)

During the first decade of the 21<sup>st</sup> century, the baseline 2000 vintage projection consistently underestimated hospital spending compared to the later 2009 projection. By 2010, hospital spending was 7 percent higher compared to the baseline estimates. Physician and clinical services and prescription drug spending forecasts decreased over the same timeframe. The 2009 projection for physician and clinical care was 4.1 percent below and prescription drug spending was a surprising 30.6 percent below the 2000 baseline estimate.



During the 2010 to 2020 period, the baseline 2010 vintage projections tended to overestimate spending across all three service categories when compared to the 2019 projection. Projected hospital spending decreased by 6.7 percent. Physician and clinical services and prescription drug spending forecasts saw even steeper declines of 8.4 percent and 30 percent, respectively.





## Discussion

In the wake of the 2007 Great Recession, there was a widely held expectation that health spending would rebound to levels more akin to those seen during the pre-recession period. The passage of the ACA in 2010 was expected to have the aggregate impact of further boosting spending due to increases in the insured proportion of the population seeking care. When expenditure growth did not rebound as strongly as expected in the early 2010s, initial explanations tended to focus on the slow economic recovery as the primary factor. Yet, despite several years of strong economic growth and near full employment, projected NHE continued to overestimate actual expenditures though the 2019 vintage projection (the most recent available data at the time of this analysis). The factors behind the difference between expected vs. actual spending merit further exploration.

OACT estimates of NHE rely on multiple data sources including macroeconomic data and demographic information from the Social Security administration, projections of public insurance program enrollment and spending, and trends from historical health spending data. There are several factors that can impact the accuracy of the national health expenditure projections. In a 2019 report, OACT cites four categories of particular interest for this analysis: 1) assumptions, 2) changes in law, 3) historical data revisions, and 4) unforeseen developments in the health care industry.<sup>2</sup>

1. **Assumptions:** NHE projections are based on a set of assumptions about factors that impact the pricing and utilization of services. OACT divides these factors into exogenous assumptions – such as macroeconomic changes in overall economic growth – and endogenous factors – such as high-cost advances in medical technology. The primary exogenous factor impacting NHE projections of health spending growth is the forecast for real disposable personal income (DPI). Consequently, unexpected economic shocks like the 2007 Great Recession significantly lowered health care spending compared to pre-2007 projections.

### Timeline of Events Impacting NHE

- ▼ **December 2003** The Medicare Prescription Drug, Improvement, and Modernization Act (MMA) is signed into law, creating Medicare Part D
- ▼ **January 2006** Medicare Part D goes into effect
- ▼ **December 2007 – June 2009** the Great Recession
- ▼ **March 2010** The Patient Protection and Affordable Care Act (ACA) is signed into law
- ▼ **June 2012** The U.S. Supreme Court finds the ACA's Medicaid expansion unconstitutionally coercive of states, making Medicaid expansion optional for states
- ▼ **January 2014** The ACA is fully implemented
- ▼ **April 2015** The Medicare Access and CHIP Reauthorization Act is signed into law, repealing the Sustainable Growth Rate formula, and creating the Quality Payment Program
- ▼ **January 2017** MACRA goes into effect
- ▼ **December 2017** The ACA individual mandate penalty is repealed
- ▼ **January 2019** Repeal of the ACA's individual mandate penalty goes into effect

<sup>2</sup> The Centers for Medicare and Medicaid Services. (November 2020). Analysis of national health expenditure projections accuracy. Retrieved from <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/ProjectionAccuracy.pdf>

There were several notable endogenous factors impacting NHE projections over the past 20 years. In the early 21<sup>st</sup> century, prescription drug spending was expected to grow rapidly due to a host of new drugs under development and a limited outlook for generic drugs. The failure of several of these new drugs combined with a broad expansion in the use of generics resulted in large overestimates of drug spending. After the passage of the ACA, early NHE projections anticipate a rapid expansion in demand for services driven by a newly insured population through the marketplace exchanges and Medicaid expansion in several states. While the insured population did increase, the rate of uptake among the exchanges and state implementation of the Medicaid expansion was lower than projected.

2. Changes in Law: NHE projections are based on the current law at the time a given projection vintage is generated. New legislation and related policy changes can dramatically alter federal and state programs and regulations resulting in impacts to health expenditures. One noteworthy example of a law change in the early 2000's is the passage of the 2004 Medicare Prescription Drug, Improvement, and Modernization Act creating Medicare Part D and resulting in a sharp increase in Medicare expenditures.

Similarly, the 2010 vintage NHE projections increased to account for the passage of the ACA. Later in the decade Medicaid projections were revised downward in the wake of the 2012 Supreme Court decision that found the ACA's Medicaid expansion component unconstitutionally coercive of state authority – effectively making Medicaid expansion optional. Similarly, private insurance projections were impacted by the early rollout and uptake issues in the ACA Marketplace. The ACA also implemented a host of payment policy reforms including the Hospital Readmission Reduction Program and Medicare Shared Savings Program. It also created the Center for Medicare and Medicaid Innovation resulting in additional variables impacting the health care market.

Finally, the 2015 Medicare Access and CHIP Reauthorization Act eliminated the Medicare Sustainable Growth Rate methodology related to Medicare physician payments and made several changes to Medicare Fee-For-Service reimbursement intended to incentivize APM adoption which began impacting providers in 2017.

3. Historical Data Revisions: OACT makes periodic revisions to NHE projections to incorporate updated data sources and account for methodological improvements. Often the effects of these adjustments are minor, but some can have larger impacts. A change in the 2019 methodology for accounting for higher prescription drug rebates resulted in a material decrease in historical prescription drug spending estimates. Additionally, OACT made downward revisions to 2017 and 2018 Medicaid spending projections to account for larger than expected recovery payments from Medicaid managed care organizations.
4. Unforeseen Developments in the Health Care Industry: The health care landscape is dynamic and unexpected shifts in patient behavior or practice patterns can greatly impact national health expenditures overtime. A notable example is the larger than projected decrease in health insurance enrollment in the wake of the elimination of the individual mandate penalty under the ACA in 2017.

On the health care service side, OACT observed a lower-than-expected rate of growth in hospital spending largely attributed to a decrease in inpatient admissions due to CMS payment reform efforts that resulted in slower growth in the volume and intensity of services delivered to Medicare beneficiaries and spillover effects for the wider market. In the physician and clinician sector, NHE projections did not account for the workforce changes in clinic settings where there was a shift to using more non-physicians (nurse practitioners, physician assistants) in the context of primary care teams. These changes were a likely driver of the slower than expected price growth and increased productivity within the physician and clinical services category.

While it is difficult to evaluate the impact of any one contributing factor, the overall direction of change to flatten the cost curve is clear and significant. The country is spending less on health care than expected. Over the last decade, there has been a steady decrease to the projected NHE across all payers and major service categories. These changes are driven by a range of macroeconomic and policy factors, but also by unexpected changes in practice patterns, workforce utilization, and pricing. There is ample evidence that these unforeseen changes were not purely happenstance but rather the result of concerted efforts by providers, CMS, and public payers to reform health care payment and delivery in ways that constrained the rate of growth of NHE.<sup>3,4,5</sup>

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<sup>3</sup> Altarum Center for Value in Health Care. (2019). Insights from monthly national health spending data through January 2019. *Health Sector Economic Indicators*. Retrieved from [https://altarum.org/sites/default/files/uploaded-publication-files/SHSS-Spending-Brief\\_April\\_2019.pdf](https://altarum.org/sites/default/files/uploaded-publication-files/SHSS-Spending-Brief_April_2019.pdf)

<sup>4</sup> Department of Health and Human Services Office of Inspector General. (2017). Medicare Shared Savings Program accountable care organizations have shown potential for reducing spending and improving quality. Retrieved from <https://oig.hhs.gov/oei/reports/oei-02-15-00450.pdf>

<sup>5</sup> Hussey, P. S., Liu, J. L., & White, C. (2017). The Medicare Access and CHIP Reauthorization Act: Effects on Medicare payment policy and spending. *Health Affairs*, 36(4). doi: 10.1377/hlthaff.2016.0559