

Rx Price Watch Report

**Trends in Retail Prices of
Brand Name Prescription Drugs
Widely Used by Older Americans:
2017 Year-End Update**

Stephen W. Schondelmeyer
PRIME Institute, University of Minnesota

Leigh Purvis
AARP Public Policy Institute



**Public Policy
Institute**

AARP's Public Policy Institute informs and stimulates public debate on the issues we face as we age. Through research, analysis, and dialogue with the nation's leading experts, PPI promotes development of sound, creative policies to address our common need for economic security, health care, and quality of life.

The views expressed herein are for information, debate, and discussion, and do not necessarily represent official policies of AARP.

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Executive Summary

Retail prices for widely used brand name prescription drugs increased substantially faster than general inflation in every year from 2006 to 2017. Between 2016 and 2017, retail prices for 267 brand name prescription drugs widely used by older Americans, including Medicare beneficiaries, increased by an average of 8.4 percent. In contrast, the general inflation rate was 2.1 percent over the same period. Brand name drug prices have routinely increased much faster than general inflation over the past 14 years—the entire period during which the AARP Public Policy Institute has been publishing this report series.

Increases in the retail price of brand name prescription drugs have a corresponding impact on the cost of therapy for the individual and for all other payers. In 2017, the average cost of therapy for a brand name prescription drug, based on the market basket in this study, was almost \$6,800 per year. On average, older Americans take 4.5 prescription drugs every month. Consequently, an older adult who uses brand name prescription drugs is likely to have experienced an average annual retail cost of drug therapy of more than \$30,000 in 2017. This amount exceeds the median annual income for individual Medicare beneficiaries of \$26,200.

Notably, the average annual cost of drug therapy for one brand name drug used on a chronic basis would have been more than \$4,600 lower in 2017 (\$2,178 v. \$6,798) had their retail price changes been limited to the rate of general inflation between 2006 and 2017.

If recent trends in brand name drug price increases continue unabated, the cost of drugs will prompt increasing numbers of older Americans to stop taking necessary medications. This will lead to poorer health outcomes and higher health care costs in the future.

OVERVIEW OF FINDINGS

- Between 2016 and 2017, retail prices for 267 widely used brand name prescription drugs increased by 8.4 percent after five straight years of double-digit average annual price increases.
- Brand name drug prices increased four times faster than general inflation in 2017 (8.4 percent v. 2.1 percent).
- The average annual cost for one brand name medication used on a chronic basis was almost \$6,800 in 2017, almost \$1,000 higher than the average annual cost of therapy in 2015.
 - For the average older American taking 4.5 prescription drugs per month, the annual cost of therapy would have been more than \$30,000 for 2017—more than three and a half times the cost seen 12 years earlier.
- The average annual cost for one brand name medication used on a chronic basis would have been \$2,178 in 2017—more than two-thirds lower—if the retail price changes for these products had been limited to general inflation between 2006 and 2017.
 - For the average older American taking 4.5 prescription drugs per month, this would translate into an annual cost of therapy that is almost \$21,000 less than the actual average cost of therapy in 2017 (\$9,801 v. \$30,591).
- Between January 2006 and December 2017, retail prices for 113 chronic-use brand name drugs that had been on the market since the beginning of the study increased cumulatively by an average of 214.0 percent.
 - The cumulative general inflation rate in the US economy was 25.1 percent during the same 12-year period.
- Retail prices increased in 2017 for 87 percent (231 of 267) of the widely used brand name prescription drug products in the study's

market basket. All but 5 of these retail price increases exceeded the rate of general inflation in 2017.

— More than half (148 of 267) brand name drug products had a retail price increase of between 5.0 percent and 9.9 percent in 2017, a shift from prior years when many manufacturers increased the prices of their products by 10 percent or more. This change coincided with the introduction of new federal and state legislation that would require drug companies to explain price increases that exceed 10 percent over a 12-month period.

- Retail prices increased faster than the rate of general inflation (2.1 percent) in 2017 for all but 2 of the 35 drug manufacturers with at least two brand name drug products in the study's market basket, suggesting that brand name drug price trends in this report are an industry-wide phenomenon.
- Twenty-nine of the drug manufacturers—including the “All Others” category—had a weighted average annual brand name drug price increase at the retail level of more than 4.2 percent in 2017, or more than twice the rate of general inflation.
- All but 4 of the 49 therapeutic categories of brand name drug products had average annual retail price increases that exceeded the rate of general inflation (2.1 percent) in 2017.

BRAND NAME PRESCRIPTION DRUG PRICE INCREASES AFFECT INDIVIDUAL CONSUMERS AND BOTH PRIVATE AND PUBLIC INSURANCE PROGRAMS

This report shows that average annual increases in the retail prices of widely used brand name prescription drugs have consistently exceeded the general inflation rate. While the average annual increase was somewhat slower in 2017, it was still four times greater than the rate of general inflation.

Brand name drug price increases translate into higher out-of-pocket costs, especially for consumers who pay a percentage of drug costs (coinsurance) rather than a fixed dollar amount (copayment). Higher prices can also be passed along to consumers in the form of higher cost sharing, deductibles, and premiums.

Prescription drug price increases also affect taxpayer-funded programs like Medicare and Medicaid. For example, the Medicare Payment Advisory Commission (MedPAC) recently noted that drug price increases are a major factor driving Medicare Part D spending growth. Higher government spending driven by large price increases will affect all Americans in the form of higher taxes, cuts to public programs, or both.

The current Administration has prioritized reducing prescription drug prices, including releasing its *Blueprint to Lower Drug Prices and Reduce Out-of-Pocket Costs* and strongly criticizing drug manufacturers that substantially increase their prices. In response, a small number of drug manufacturers voluntarily reduced some of their prices or instituted six-month price freezes. It is unclear how long such behavior will continue.

Policy makers interested in slowing brand name drug price increases should focus on changes that produce long-term, sustainable effects. While policy options should encourage meaningful pharmaceutical innovation, such options should be balanced with the need for improved health and the financial security of consumers and taxpayer-funded programs like Medicare and Medicaid.

This report is the latest in the AARP Public Policy Institute's *Rx Price Watch* series. Separate reports analyze price changes for widely used generic and specialty drug products. The series also analyzes the price changes for an overall market basket (i.e., brand name, generic, and specialty drug products combined) to reflect the overall market impact of drug price changes.

Introduction

AARP's Public Policy Institute finds that average retail price increases for brand name prescription drugs widely used by older Americans, including Medicare beneficiaries, far outstripped the price increases for other consumer goods and services between 2006 and 2017. Brand name drug prices have routinely increased much faster than general inflation over the past 14 years—the entire period since the beginning of our report series on prescription drug prices in 2004.¹ Between 2016 and 2017, the average annual increase in retail prices² for 267 brand name prescription drugs widely used by older Americans³ was 8.4 percent—after 5 straight years of double-digit average annual price increases. In contrast, the rate of general inflation in the US economy was 2.1 percent in 2017.

Increases in the retail price of brand name prescription drugs have a corresponding impact on the cost of drug therapy for individual consumers and for all types of payers. In 2017,

the annual retail cost of drug therapy for a brand name prescription drug, based on the market basket in this study, averaged almost \$6,800 per year. Older Americans receive an average of 54.5 prescriptions every year—or 4.5 prescriptions per month.⁴ Consequently, older adults who use brand name prescription drugs are likely to have experienced an average annual retail cost of drug therapy totaling almost \$31,000 in 2017. This annual retail cost of brand name prescription drugs exceeds the median annual income for a Medicare beneficiary (\$26,200) by more than 20 percent.⁵

Notably, the average annual cost of drug therapy for 1 brand name drug used on a chronic basis would have been more than \$4,600 lower in 2017 (i.e., \$2,178 v. \$6,798) if the retail price changes had been limited to the rate of general inflation between 2006 and 2017. For the average older American taking 4.5 prescription drugs per month, this would translate into an annual cost

- 1 The AARP Public Policy Institute in its Rx Price Watch series provides reports with separate analyses of the price changes for three different segments of the pharmaceutical market: brand name, generic, and specialty drug products. These three market baskets are important because a different mix of drug manufacturers typically makes the drug products in each segment and each of these segments is subject to unique market dynamics, pricing, and related behaviors. In addition, the Rx Price Watch series also reports the price change for an overall market basket (i.e., brand name, generic, and specialty drug products combined) to reflect the overall market impact of drug price changes. Some critics have argued that the brand name price index report alone overstates the effect of drug price changes on the overall prescription drug market. Those critics argue that an overall measure should include the effect of generic prescription drug price competition and the impact of generic substitution. This is precisely why the AARP Rx Price Watch series of reports also provides an overall market basket (including brand name, generic, and specialty drug products) to examine the price change impact for the overall prescription drug market. While this overall perspective is useful for those interested in understanding the industrial economics of the entire prescription drug market, consumers have proven to be considerably more interested in the price trend for the specific products that they are taking as an individual rather than all drug products on the market. In addition, separate analyses of the different market segments (i.e., brand name, generic, and specialty drug products) is important because they represent unique and distinct segments in the prescription drug market, and they provide an indication of policy changes that may be warranted in the various market segments. Previous reports from this series are on the AARP website at http://www.aarp.org/health/medicare-insurance/info-04-2009/rx_watchdog.html and <http://www.aarp.org/rxpricewatch>.
- 2 The retail prices used in this report are derived from Truven Health's MarketScan® Commercial Database and MarketScan® Medicare Supplemental Database (Truven Health MarketScan® Research Databases). The prices reflect the total price for a specific prescription that a pharmacy benefit manager (PBM) bills to a specific health plan for consumers enrolled in employer-sponsored or government-sponsored (i.e., Medicare or Medicaid) health plans and not simply the out-of-pocket cost (such as the copay) that a consumer would pay at the pharmacy. These amounts may or may not reflect what the PBM paid the pharmacy or the usual and customary price that a pharmacy would charge a cash-pay consumer for the same prescription.
- 3 The current brand name drug market basket originally included 268 widely used brand name drugs. However, fluticasone propionate powder, a corticosteroid used in compounding, had insufficient retail price data in 2017 and was dropped from this analysis.
- 4 Medicare Part D enrollees take an average of 54.5 prescriptions per year or 4.5 prescription drugs per month. Medicare Payment Advisory Commission (MedPAC), *June 2018 Report to the Congress: Medicare and the Health Care Delivery System* (MedPAC, Washington, DC, June 2018).
- 5 The median annual income for Medicare beneficiaries was \$26,200 in 2016. G. Jacobson, S. Griffin, T. Neuman, and K. Smith, *Income and Assets of Medicare Beneficiaries, 2016–2035* (Kaiser Family Foundation, Washington DC, April 2017).

of therapy of \$9,801, which is almost \$21,000 less than the actual average cost of therapy in 2017 (\$30,591).

Prescription drug price increases affect all types of payers, including individuals, employers, private insurers, and taxpayer-funded programs such as Medicare and Medicaid. For example, the Medicare Payment Advisory Commission (MedPAC) recently noted that drug price increases are a major factor driving Medicare Part D spending growth.⁶ These spending increases, driven by high and growing drug prices, will affect all Americans in some way. Those with private health insurance will pay more in cost sharing and higher premiums for their health care coverage.⁷ In addition, increased government spending on prescription drugs will ultimately

lead to higher taxes and/or cuts to public programs.

This report presents annual and 12-year cumulative price changes through the end of 2017. The first set of findings shows *annual* rates of change in retail prices for widely used brand name drugs from 2006 through 2017, using both rolling average and point-to-point methods (see Appendix A). The point-to-point method examines the distribution of price changes and differences in average percent changes in retail prices for individual drug products, specific manufacturers, and specific therapeutic categories. The second set of findings summarizes the *cumulative* impact of retail price changes for brand name drugs across the entire 12-year period from 2006 through 2017.

6 MedPAC, *June 2018 Report to the Congress*.

7 D. I. Auerbach and A. L. Kellermann, "A Decade of Health Care Cost Growth Has Wiped Out Real Income Gains for an Average U.S. Family," *Health Affairs* 30, no. 9 (2011): 1630–36; Consumer Reports, "Is There a Cure for High Drug Prices?" July 29, 2016. <https://www.consumerreports.org/drugs/cure-for-high-drug-prices/>

Findings

I. BRAND NAME PRICE TRENDS FOR MOST WIDELY USED PRESCRIPTION DRUGS

The annual percent change in retail prices for brand name prescription drugs has consistently increased substantially faster than general inflation.

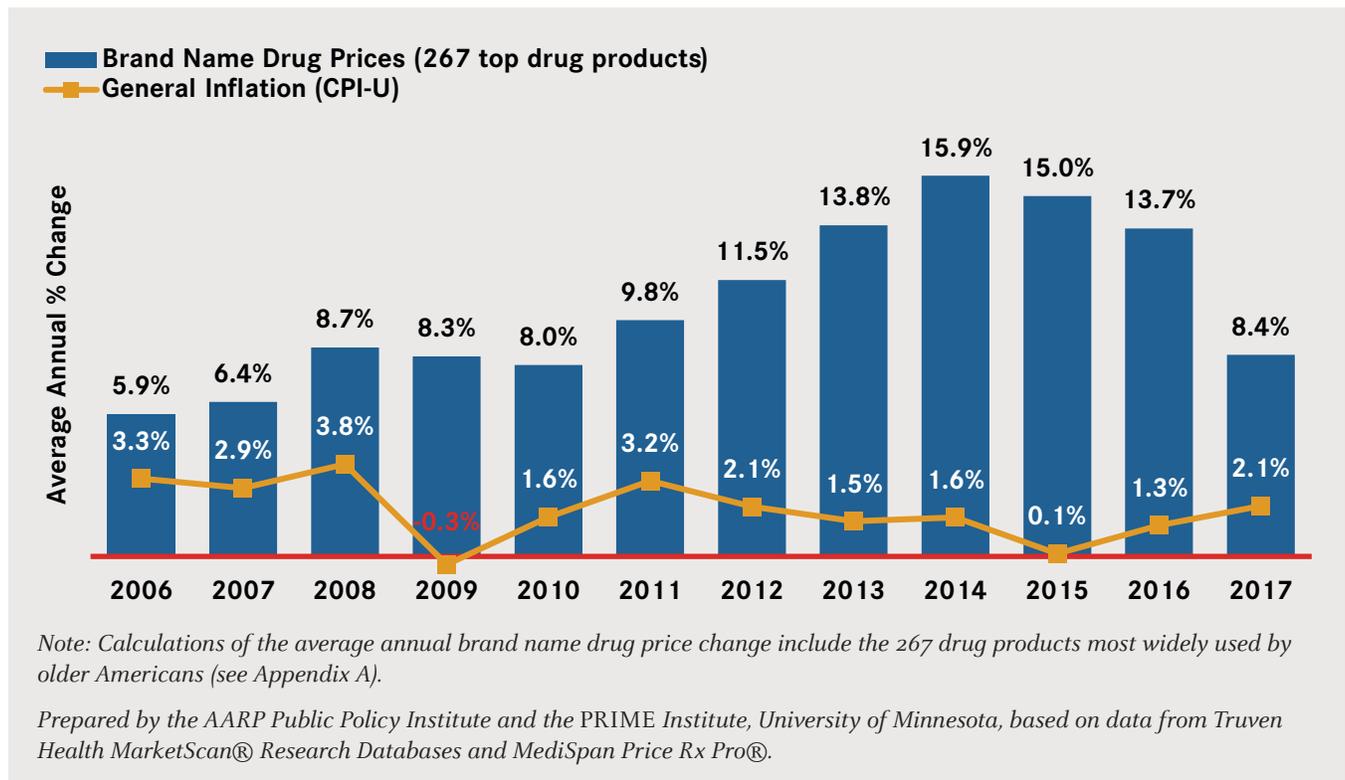
- Retail prices for the 267 brand name drug products^{8,9} most widely used by older

Americans rose 8.4 percent in 2017 compared with 2016 prices (Figure 1).¹⁰

- While the average annual price increase for these brand name prescription drug products was lower in 2017 than in prior years, it was still four times higher than the rate of general inflation (8.4 percent v. 2.1 percent).

FIGURE 1

Average Annual Brand Name Drug Prices Continue to Grow Substantially Faster than General Inflation in 2017



- 8 The current brand name drug market basket originally included 268 widely used brand name drugs. However, fluticasone propionate powder, a corticosteroid used in compounding, had insufficient retail price data in 2017 and was dropped from this analysis.
- 9 Some critics of the Rx Price Watch reports have suggested that this analysis should exclude brand name drug products in our market basket that subsequently face generic competition because they may be skewing the results upward. Appendix B provides an analysis of the chronic-use brand name drug products that face generic competition (100 drug products) and chronic-use brand name drug products that do not face generic competition (114 drug products). In 2017, the average annual price increase for the chronic brand name prescription drug products with generic competition was 7.2 percent while the average annual price increase for the brand name prescription drug products with no generic competition was 7.3 percent. Notably, the average annual price increase for the acute-use brand name prescription drug products was much higher than the average annual price increase for chronic-use brand name prescription drug products in 2017 (18.3 percent v. 7.3 percent, respectively). (See Appendix B).
- 10 When measured as a 12-month rolling average and weighted by actual 2014 retail prescription sales to older Americans ages 50 and above, including Medicare beneficiaries.

- Average annual retail prices for brand name prescriptions increased by double-digit percentages every year from 2012 through 2016.
- Notably, sizable brand name prescription drug price increases have continued despite widespread public scrutiny and criticism of drug pricing practices.¹¹

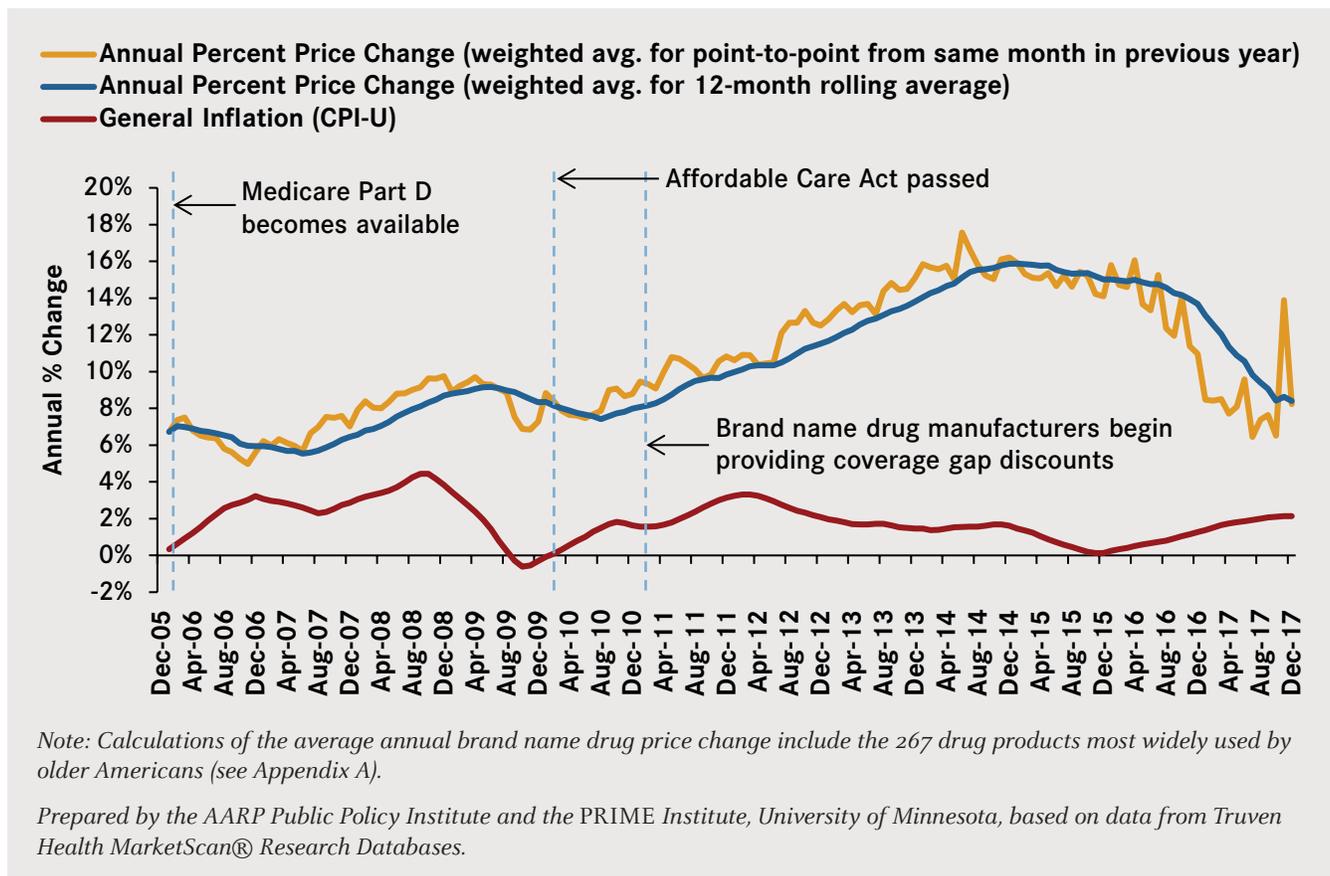
The annual retail price change for brand name drug products reported in Figure 1 averages annual point-to-point price changes for each month in the preceding 12-month period (referred to as a *rolling average* change), smoothing over the entire year the annual change in brand name drug price that occurs for a single month (referred to as an annual *point-to-point* change).

Figure 2 shows the percent change in brand name drug prices for each month compared with the same month in the previous year. This trend is

presented alongside the 12-month rolling average to allow more detailed examination of the rate and timing of brand name drug price changes over the entire study period. This analysis reveals three broad trends that have been present since the implementation of Medicare Part D in 2006:

- The retail price of brand name drug products has steadily and substantially increased since 2006.
- Brand name drug price increases at the retail level have been substantially higher than the rate of general inflation.
- The gap between the rate of brand name drug price change and the rate of change in general inflation has fluctuated considerably between 2006 and 2017, ranging from a less than 2-fold difference in 2006 to a more than 120-fold difference in 2015.

FIGURE 2
Rolling Average and Point-to-Point Changes in Retail Prices for Most Widely Used Brand Name Prescription Drugs Were Well above Inflation from 2006 to 2017



11 E. Mershon, "Everyone Seems to Want Lower Drug Prices. 5 Reasons Why That Hasn't Happened," *Stat News*, January 26, 2018.

The cost of brand name drug therapy reached almost \$6,800 per drug per year in 2017.

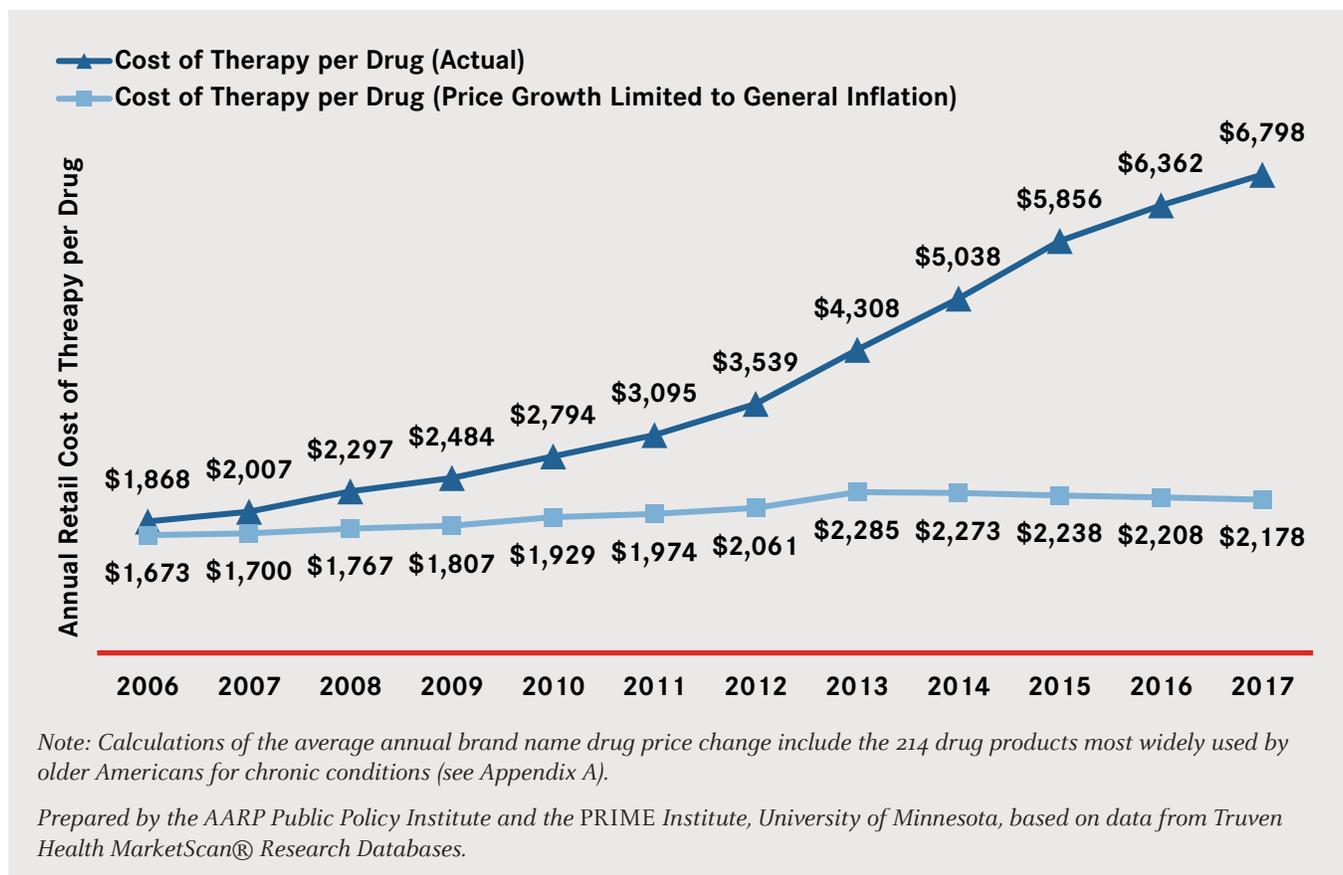
Figure 3 presents the retail price for widely used brand name drugs indicated for treating chronic conditions when the price is expressed as an average annual cost of therapy per drug.

- The average cost of chronic therapy was almost \$6,800 per drug per year for brand name prescriptions at the retail level in 2017.
 - This average annual cost (\$6,798) of brand name prescriptions was more than three and a half times higher than the average annual cost (\$1,868) in 2006, the year Medicare implemented the Part D program.

Older Americans receive an average of 54.5 prescriptions per year—or 4.5 prescription drugs per month.¹² If they used brand name drugs to treat their chronic conditions, they would have experienced an average annual retail cost for drug therapy of \$30,591 for their medications in 2017.

Notably, the average annual cost of therapy per drug for these same brand name drug products would have been \$2,178—more than \$4,600 lower—in 2017 if their retail price changes had been limited to the rate of general inflation between 2006 and 2017.¹³ For older Americans using brand name drugs to treat their chronic conditions, this would have amounted to a difference of \$20,790 (\$9,801 v. \$30,591) in their average annual retail cost of therapy in 2017.

FIGURE 3
The Average Annual Cost of Brand Name Drugs Would Be Substantially Lower if Retail Price Changes Were Limited to General Inflation



12 Medicare Part D enrollees receive an average of 4.5 prescription drugs per month (or 54.5 prescriptions per year). MedPAC, June 2018 Report to the Congress.

13 There is no clear rationale for prescription drug price increases given that launch prices ostensibly reflect the costs associated with developing the drug and future research costs. A. Kesselheim, J. Avorn, and A. Sarpatwari, “The High Cost of Prescription Drugs in the United States: Origins and Prospects for Reform,” *Journal of the American Medical Association* 316, no. 8 (2016): 858-71.

II. 12-YEAR CUMULATIVE RETAIL PRICE CHANGES FOR MOST WIDELY USED BRAND NAME PRESCRIPTION DRUGS, 2006 TO 2017

This AARP report tracked brand name drug prices at the retail level for the 12-year period from December 31, 2005, to December 31, 2017. Fifty-three percent (142 of 267)¹⁴ of the widely used drugs in the original brand name market basket were on the market for the entire 12-year period (i.e., the end of 2005 through the end of 2017). Eighty percent (113 of 142) of those drug products treat chronic conditions and were used to analyze 12-year price trends among widely used brand name drug products.

Cumulatively, the average retail price for these 113 widely used brand name drug products increased 214.0 percent over 12 years, compared with a 25.1 percent increase for general inflation in the same period. This means that brand name drug prices went up more than 8.5 times the rate of general inflation during this 12-year period.¹⁵

Ninety-four percent (133 out of 142) of brand name drug products have more than doubled in price while being on the market for the entire 12-year study period.

The 12-year cumulative change in annual brand name drug cost of therapy is substantial.

Of the brand name drug products in the AARP market basket that have been on the market since the end of 2005, 80 percent (113 of 142) treat chronic conditions.¹⁶ The remaining 29 drug products treat acute or intermittent conditions.

The average annual retail cost of drug therapy for brand name drug products used to treat chronic conditions was \$5,526 in 2017, which is an increase of \$3,797 over the 2006 annual cost of \$1,729.

More than 70 percent (81 of 113) of the brand name drugs used for chronic conditions that have been on the market since the end of 2005 had

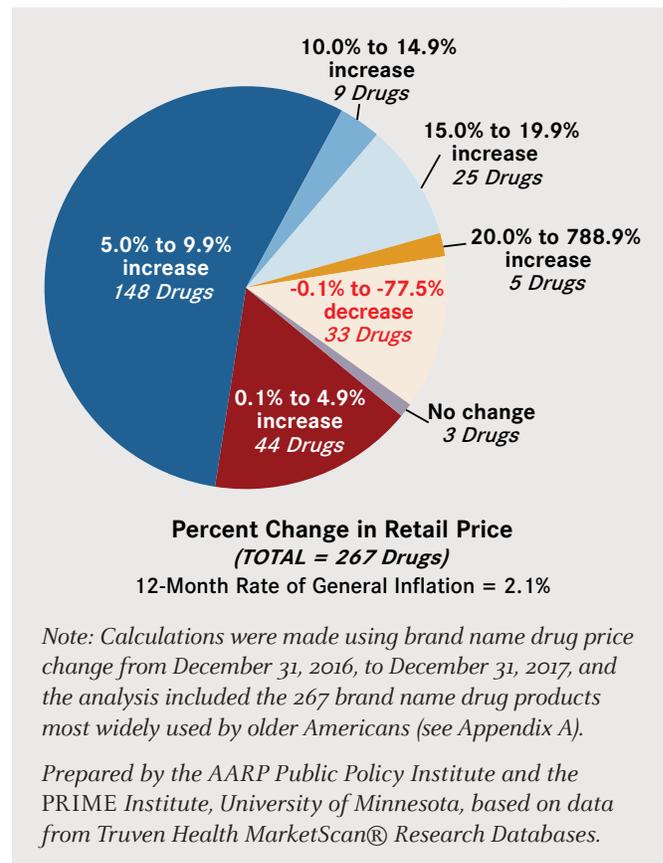
annual cost increases of more than \$2,000 during the 12-year period ending in 2017.

Patients with chronic conditions typically face part of all of the costs associated with their prescription drugs every year for the rest of their lives.

III. A WIDE RANGE OF BRAND NAME DRUG PRICE INCREASES OCCURRED IN 2017

Retail prices for 87 percent (231 of 267) of the most widely used brand name prescription drug products had price increases in 2017 (Figure 4). All but 5 of these price increases were greater than the rate of general inflation (2.1 percent) in 2017.

FIGURE 4
Retail Prices Increased by More than 5 percent in 2017 for More than Two-Thirds of the Most Widely Used Brand Name Drugs



14 The current brand name drug market basket originally included 268 widely used brand name drugs. However, fluticasone propionate powder, a corticosteroid used in compounding, had insufficient retail price data in 2017 and was dropped from this analysis.

15 The average 12-year cumulative growth rate in retail prices for the 143 brand name drug products (both chronic and acute use) that were on the market for the entire 12 years was 243.0 percent, somewhat higher than the cumulative price increase of 214.0 percent seen after removal of drug products used for acute conditions. This difference is due to numerous acute-use drug products that experienced remarkably high retail price increases between December 2005 and December 2017 (see Appendix B).

16 The drug products in our study market basket were classified based on whether the primary indication for use was for a chronic condition or an acute (or intermittent) condition. Eighty percent (113) of the 142 market basket drug products that have been on the market for the 12-year period since the end of 2005 were determined to treat chronic conditions.

More than one-half (148 of 267) of the brand name drug products had a retail price increase of between 5.0 percent and 9.9 percent in 2017. This proportion is slightly lower than in the past few years when many manufacturers increased the prices of their products by 10 percent or more. This change coincided with the introduction of new federal and state legislation that would require drug companies to explain price increases that exceed 10 percent over a 12-month period.¹⁷

In 2017, 39 of 267 brand name drug products had annual retail price increases of more than 10.0 percent—or almost five times the rate of inflation:

- Nine increased by 10.0 percent to 14.9 percent;
- Twenty-five increased by 15.0 percent to 19.9 percent; and
- Five increased by 20.0 percent to as much as 788.9 percent.

Thirty-three brand name drug products had retail price *decreases* ranging from 0.1 percent to 77.5 percent between 2016 and 2017. More than 90 percent of these products (30 of 33) had a retail price decrease of between 0.1 percent and 2.1 percent. In other words, only three brand name drug products had a retail price decrease of more than 2.1 percent in 2017.

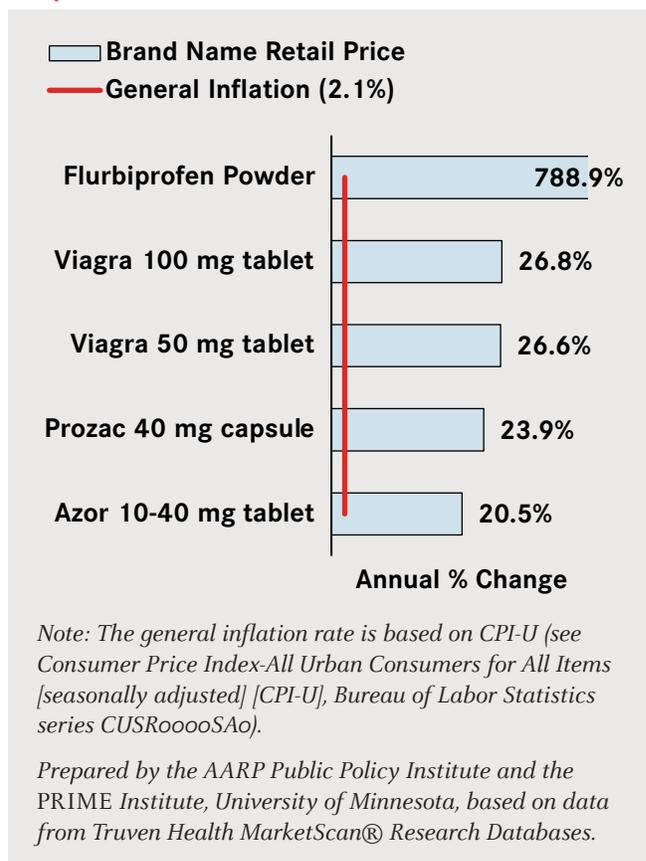
Five of the 267 widely used brand name drug products had retail price increases of more than 20 percent in 2017 (Figure 5). One brand name drug product (flurbiprofen powder, a nonsteroidal anti-inflammatory agent used in compounding) had a price increase of 788.9 percent in 2017 when compared with 2016.

Notably, all five of the brand name drug products with the highest retail price increases in 2017 have generic equivalents.

IV. RETAIL PRICE CHANGES FOR MOST WIDELY USED BRAND NAME PRESCRIPTION DRUGS BY MANUFACTURER

Thirty-five drug manufacturers had at least 2 drug products in the study’s market basket of 267 widely used brand name drugs. Another 13 drug manufacturers with only 1 brand name

FIGURE 5
Five Widely Used Brand Name Drugs Had One-Year Retail Price Increases of More than 20 percent in 2017



drug product in the market basket were grouped into the “All Others” category.

The average annual increase in retail price across all but two drug manufacturer categories exceeded the general inflation rate in 2017 (Figure 6), suggesting that overall brand name drug price trends in this report are an industry-wide phenomenon.

- Twenty-nine of the drug manufacturers—including the “All Others” category—had a weighted average annual brand name drug price increase at the retail level of more than 4.2 percent in 2017, or more than twice the rate of general inflation (2.1 percent).
 - These 29 drug manufacturers represent 81 percent (216 of 267) of the brand name drug products in the market basket in 2017.
- Five drug manufacturers had weighted average brand name drug price increases of more than

17 A. Weintraub, “The Call for Drug-Price Transparency Is Growing Louder—But Will It Matter?” *Forbes*, March 30, 2018.

10.5 percent in 2017, or more than 5 times the rate of general inflation (2.1 percent) in 2017.

- One drug manufacturer—PCCA, a compounding manufacturer—had a weighted average annual brand name drug retail price increase of 269.2 percent in 2017, which is more than 125 times the rate of general inflation.
- One drug manufacturer—Genzyme—had a weighted average brand name drug price decrease of 1.9 percent in 2017.

V. RETAIL PRICE CHANGES FOR MOST WIDELY USED BRAND NAME PRESCRIPTION DRUGS BY THERAPEUTIC CATEGORY

In 2017, brand name drug prices at the retail level increased by 4.2 percent or more—more than twice the rate of general inflation (2.1 percent)—for 39 of the 49 therapeutic categories examined in this study. All but 4 of the therapeutic categories had average annual price increases that substantially exceeded the general inflation rate (2.1 percent) in 2017 (Figure 7).

- Sixteen therapeutic categories had average annual price increases that were 8.4 percent—four times the rate of general inflation—or more in 2017.
 - The therapeutic category with the highest brand name drug price increase—compounding ingredients—had an average annual retail price increase of 230.8 percent in 2017.

Two therapeutic categories—sedative/hypnotics and phosphate-removing agents—had a weighted average brand name drug price decrease in 2017.

These findings suggest that consumers who are unwilling or unable to switch from one brand name drug to another in the same therapeutic category may face substantial increases in their drug costs.

FIGURE 6
Retail Prices for Widely Used Brand Name Drug Products Increased by More than General Inflation for All but Two Drug Manufacturers in 2017

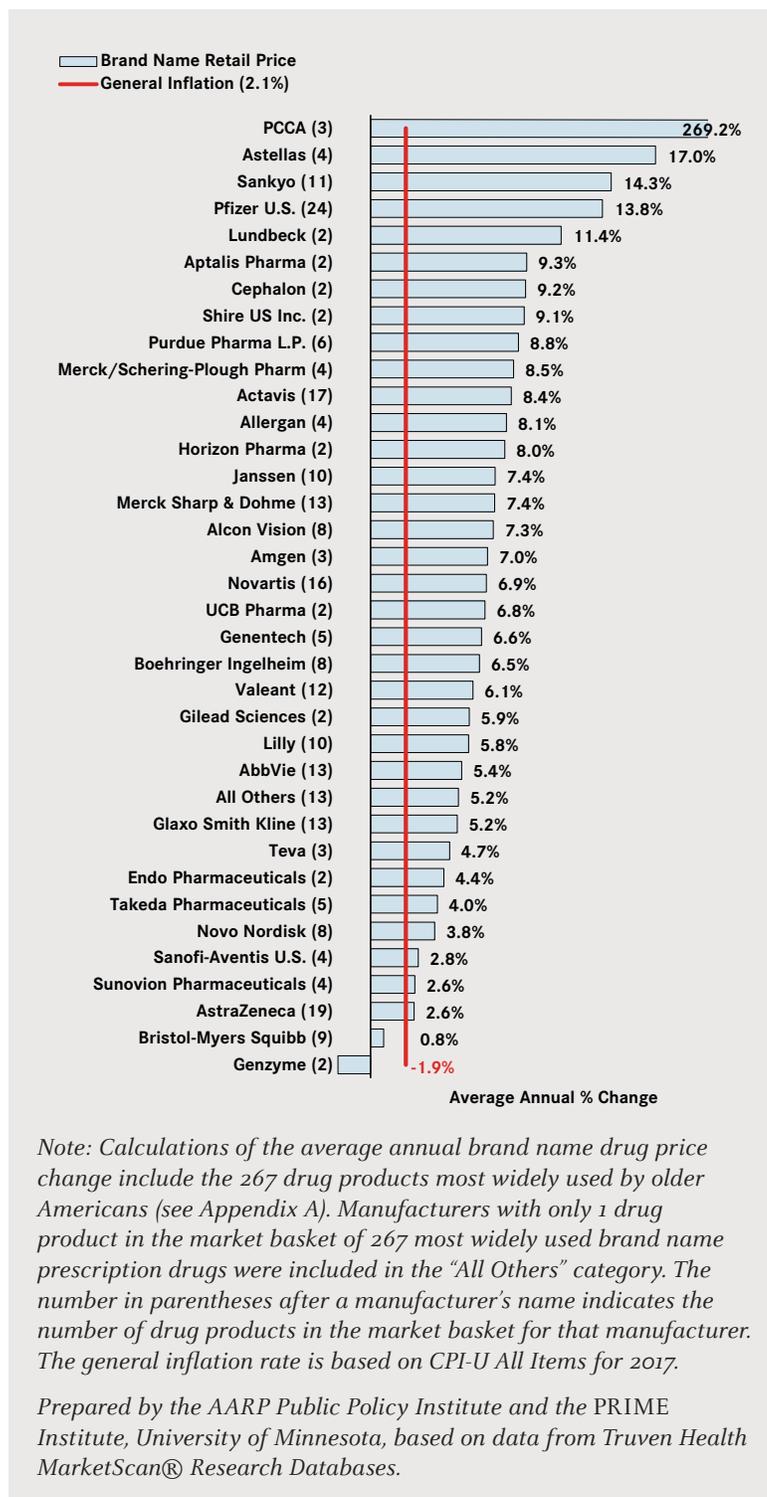
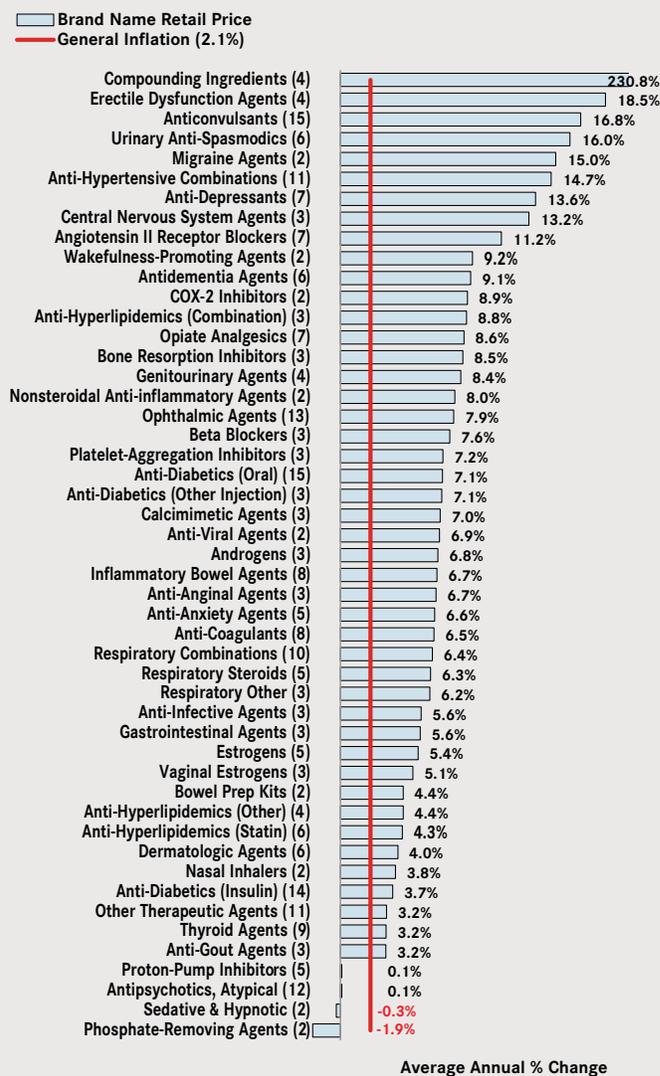


FIGURE 7
All but Four Therapeutic Categories for Brand Name Drugs Had Retail Price Increases That Exceeded the Rate of General Inflation in 2017



Note: Calculations of the average annual brand name drug price change include the 267 drug products most widely used by older Americans (see Appendix A). Therapeutic categories with only 1 drug product in the market basket of 267 most widely used brand name prescription drugs were grouped together in the “Other Therapeutic Agents” category. The number in parentheses after a therapeutic category indicates the number of drug products in the market basket for that therapeutic category. The general inflation rate is based on the CPI-U for 2017.

Prepared by the AARP Public Policy Institute and the PRIME Institute, University of Minnesota, based on data from Truven Health MarketScan® Research Databases.

Concluding Observations

Retail prices increased substantially in 2017 for brand name prescription drugs used by older Americans. Average annual increases in the retail prices of widely used brand name prescription drugs have consistently and greatly exceeded the rate of general inflation (8.4 percent compared with 2.1 percent).

Brand name drug prices increased at double-digit rates for five years in a row (i.e., 2012 to 2016) reaching a peak level of 15.9 percent in 2014. For over a decade, brand name drug prices have exceeded the general inflation rate by 2-fold to more than 100-fold. These levels of brand name price increases are not sustainable.

The average annual cost of drug therapy for each brand name prescription used by older Americans was \$6,798 in 2017. For the average elderly person who uses 4.5 prescription drugs, that leads to an annual drug therapy cost of approximately \$30,591. The annual drug therapy cost for older Americans now exceeds the median annual income of Medicare beneficiaries (\$26,200) by more than 20 percent. Drug therapy is not affordable when its cost exceeds the patient’s entire income.

Notably, the average annual cost of drug therapy for each brand name prescription would have been more than two-thirds lower in 2017 (\$2,178 v. \$6,798) had retail price changes been limited to the rate of general inflation.

Brand name drug prices at the retail level have a direct impact on the costs borne by individual consumers and by all other payer types. Brand name drug price increases often result in higher out-of-pocket costs for beneficiaries

at the pharmacy, especially for those who pay a percentage of drug costs rather than a fixed copayment. Higher brand name drug prices may also be passed along to consumers in the form of higher premiums, deductibles, and other forms of cost sharing.¹⁸

If recent trends in brand name drug prices and related price increases continue unabated, the cost of drugs will prompt increasing numbers of older Americans to stop taking necessary medications due to affordability concerns.¹⁹ Continued excessive brand name drug price increases will also lead to increased cost sharing and premiums, which could ultimately make health care coverage unaffordable and lead to poorer health outcomes and to higher health care costs in the future.²⁰ In addition, increased government spending on prescription drugs will ultimately lead to higher taxes and/or cuts to public programs.

The current Administration has prioritized reducing prescription drug prices, including releasing its *Blueprint to Lower Drug Prices and Reduce Out-of-Pocket Costs* and strongly criticizing drug manufacturers that substantially increase their prices. In response, a small number of drug manufacturers voluntarily reduced some of their prices or instituted six-month price freezes. The less than ten drug manufacturers making pledges are a small fraction of the more than 1,000 drug manufacturers currently marketing products in the U.S.²¹ These recent manufacturer pricing announcements occurred after the involved companies had already taken substantial price increases earlier in 2018.²² It is unclear how long such pricing pledges will continue since

manufacturers made similar pledges in the 1990s and early 2000s that were relatively short-lived and subsequently disappeared.²³

Policy makers who are interested in long-term, meaningful changes in brand name drug prices must pursue options that go beyond voluntary and temporary pledges from drug manufacturers. Current market forces do not adequately protect against excessive brand name drug prices and price increases, and the resulting growth in pharmaceutical expenditures is not sustainable. While policy options should encourage meaningful pharmaceutical innovation, such options should be balanced with the impact that drug prices and expenditures have on consumers and other payers.

Current pricing practices for brand name pharmaceuticals are a threat to the health and financial security of individual consumers and to taxpayer-funded programs like Medicare and Medicaid. Brand name prescription drugs can provide substantial health benefits including improved health outcomes; however, these benefits are only available to those who can afford to use them.

18 Auerbach and Kellermann, “A Decade of Health Care Cost Growth”; Consumer Reports, “Is There a Cure?”

19 H. Naci, S. B. Soumerai, D. Ross-Degnan, F. Zhang, B. A. Briesacher, J. H. Gurwitz, and J. M. Madden, “Medication Affordability Gains Following Medicare Part D Are Eroding among Elderly with Multiple Chronic Conditions,” *Health Affairs* 33, no. 8 (2014): 1435–43; S. B. Dusetzina and N. L. Keating, “Mind the Gap: Why Closing the Doughnut Hole Is Insufficient for Increasing Medicare Beneficiary Access to Oral Chemotherapy,” *Journal of Clinical Oncology* 34, no. 4 (2016): 375–80.

20 Z. A. Marcum, M. A. Sevick, and S. M. Handler, “Medication Nonadherence: A Diagnosable and Treatable Medical Condition,” *Journal of the American Medical Association* 309, no. 20 (2013): 2105–06; A.O. Iuga and M.J. McGuire, “Adherence and Health Care Costs,” *Risk Management and Healthcare Policy* 7 (2014): 35–44.

21 According to the 2007 Economic Census, there were an estimated 1,552 companies in the U.S. that develop, manufacture and market drug and biological products. See, J. Karamehic, O Ridic, G Ridic, T. Jukic, J Coric, D Subasic, M. Panjeta, A. Saban, L. Zunic, I. Masic, “Financial Aspects and the Future of the Pharmaceutical Industry in the United States of America” *Mater Sociomed.* 2013 Dec; 25(4): 286–290.

22 S. Karlin-Smith, S. Owerhohle, and A. Restuccia, “How Drug Companies Are Beating Trump at His Own Game,” *Politico*, August 3, 2018.

23 J. Hancock and S. J. Tribble, “Deja Voodoo: Pharma’s Promises to Curb Drug Prices Have Been Heard Before,” *Kaiser Health News*, July 25, 2018.

Appendix A

Detailed Methodology and Description of Retail Price Data

This appendix describes in detail how brand name, generic, and specialty drugs are defined in this study; how the study identified the market basket (i.e., sample) of drugs; how it measured prices; and how it calculated weighted average price changes. In addition, the appendix describes methods and assumptions used to determine prices and price changes by drug manufacturer and by therapeutic category.

OVERVIEW

AARP's Public Policy Institute has been publishing a series of reports that track price changes for the prescription drug products most widely used by older Americans, with annual and quarterly results reaching as far back as 2000. Since 2008, these reports have focused on price changes for three market baskets—brand, generic, and specialty drugs. In addition, a combined market basket (i.e., brand, generic, and specialty) has been added to the series, which is useful to view the price change trend across all types of outpatient prescription drugs in the US market. While this overall perspective is useful for those interested in understanding the industrial economics of the entire prescription drug market, consumers have proven to be considerably more interested in the price trend for the specific

products that they are taking as individuals rather than all drug products on the market.

The AARP Public Policy Institute and the University of Minnesota's *PRIME* Institute originally collaborated to report an index of manufacturers' drug price changes based on the Wholesale Acquisition Cost (WAC) from the Medi-Span Price-Chek PC database.²⁴ In 2009, AARP and the *PRIME* Institute created an additional drug price index based on actual retail prices²⁵ from Truven Health's MarketScan® Commercial Database and MarketScan® Medicare Supplemental Database (Truven Health MarketScan® Research Databases).²⁶ Thus, the report series uses the same market basket of brand name prescription drugs widely used by older Americans to examine both manufacturer-level prices and retail-level prices in the market. The addition of retail-level prices allows the AARP Public Policy Institute to assess what prices payers (i.e., insurers, consumers, or government programs) are paying and whether rebates and other types of discounts have been passed along to payers and their covered members.

Recently, the AARP Public Policy Institute and the University of Minnesota's *PRIME* Institute collaborated to develop a new market basket of

24 Medi-Span is a private organization that collects price and other clinical and drug-related data directly from drug manufacturers and wholesalers. Price-Chek PC (now Price Rx Pro®) is a product of Medi-Span (Indianapolis, IN), a division of Wolters Kluwer Health Inc., and uses data from Medi-Span's Master Drug Database (MDDB®). This commercial drug database has been published for more than 35 years. See <http://www.medispan.com>.

25 The retail prices used in this report series reflect the total price for a specific prescription that a PBM bills to a specific health plan for consumers enrolled in employer-sponsored or government-sponsored (i.e., Medicare or Medicaid) health plans and not simply the out-of-pocket cost (such as the copay) that a consumer would pay at the pharmacy. These amounts may or may not reflect what the PBM paid the pharmacy or the usual and customary price that a pharmacy would charge a cash-pay consumer for the same prescription.

26 The Truven Health MarketScan® Research Databases, a family of databases, contain individual-level health care claims, lab test results, and hospital discharge information from large employers, managed care organizations, hospitals, Medicare, and Medicaid programs. Truven Health constructs the MarketScan® Research Databases by collecting data from employers, health plans, and state Medicaid agencies and placing them into databases. Erica Danielson, "White Paper: Health Research Data for the Real World: The MarketScan® Databases," White Paper, Truven Health Analytics, Ann Arbor, MI, January 2014.

widely used prescription drugs based on 2014 data provided by the Truven Health MarketScan® Research Databases and a large Medicare Part D plan provider. UnitedHealthcare provides Medicare Part D coverage and is the organization that insures the AARP Medicare Rx plans. This Medicare Part D plan provider supplied data for all prescriptions provided to its Medicare Part D enrollees in 2014. This *Rx Price Watch* report used the 2014 market basket.²⁷ As in the past, the series will include separate data sets, analyses, and reports for brand name, generic, and specialty drugs, as well as the overall combined market basket.

DEFINING BRAND, GENERIC, AND SPECIALTY PHARMACEUTICALS

A brand name drug is defined as a product marketed by the original holder of a new drug application (NDA, or related licensees) or a biological license application (BLA; or related licensees) for a given drug entity. A generic drug is defined as any drug product marketed by an entity other than the NDA or BLA holder or the related licensees.

The market conditions and pricing behavior for brand name and generic drugs are quite different. For example, brand name drugs have a monopoly based on patents and other forms of exclusivity for a number of years after market entry,²⁸ and they do not experience typical price competition from therapeutically equivalent (i.e., AB-rated generic equivalents) drug products that can be routinely and directly substituted at the pharmacy level. On the other hand, generic drug products typically face price competition from the time the generic first enters the market, when there are two or more therapeutically equivalent drug products (as evaluated by the Food and Drug Administration [FDA] and reported in the Orange Book), including the brand name product. However, certain generic drugs—that is, those for which the generic manufacturer files a paragraph IV certification of patent non-infringement—may receive 180 days of exclusivity as the sole generic

after this first generic drug product is approved. In cases in which there is only one generic drug product on the market, the level of economic competition may be somewhat limited until other economically independent generic marketers enter the market.

Specialty pharmaceuticals are drugs that treat complex, chronic conditions and that often require special administration, handling, and care management. Specialty drugs have been the fastest-growing group of new drug products over the next decade. This important group of drugs and biologicals is not precisely defined, but it includes products based on one or more of the following: (1) how they are made, (2) how they are approved by the FDA, (3) conditions they treat, (4) how they are used or administered, (5) their cost, and (6) other special features. The operational definition of specialty drugs for this study is further described in a later section on the methodology.

CREATING THE MARKET BASKET OF DRUGS

The AARP Public Policy Institute has been reporting prescription drug product price changes since 2004. The original reports were based on a market basket of retail and mail-order prescriptions provided to about 2 million people ages 50 and older who used the AARP Pharmacy Service in 2003. Following the implementation of the Medicare Part D program, we chose to develop a new market basket of drugs using 2006 data provided by UnitedHealthcare (formerly called PacifiCare), which is also the organization that insures the AARP Medicare Part D plans. All AARP price trend reports published between 2007 and 2012 used this market basket.

Subsequently, we updated the AARP market baskets again using 2011 data provided by Truven Health MarketScan® Research Databases and the same Medicare Part D plan provider that was used for the 2006 market basket. We weighted the data from the Medicare Part D plan provider

27 The US Food & Drug Administration approved 113 new drugs and biological products between 2015 and 2017. These products are not included in our current market basket but will be included in future market baskets if they meet our inclusion criteria. US Food & Drug Administration, *New Drugs at FDA: CDER's New Molecular Entities and New Therapeutic Biological Products*, accessed September 1, 2018. <https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DrugInnovation/default.htm>.

28 The average market exclusivity period for a brand name drug is almost 13 years. Henry Grabowski, Genia Long, and Richard Mortimer, "Brief Report: Recent Trends in Brand-Name and Generic Drug Competition," *Journal of Medical Economics* 17, no. 3 (2014): 207–14.

by Part D enrollment and the Truven Health MarketScan® data by the 50-plus population less Part D enrollment, based on data from the Centers for Medicare and Medicaid Services and the US Census. We then merged the weighted data to develop and rank a weighted master list by prescription volume and sales at the National Drug Code (NDC) level for the new AARP market baskets.

This process was repeated using 2014 data provided by the same data sources. The 2014 market basket is the basis of this report and the 2015 through 2017 *Rx Price Watch* reports.

Our selection of the market basket of drugs to track in the price index was a multistep process. First, prescriptions covered and adjudicated by the commercial entities included in the merged data set were grouped by NDC number. The NDC is a number that refers to a specific drug product presentation with a unique combination of active chemical ingredient, strength, dosage form, package type and size, and manufacturer (e.g., Nexium [esomeprazole magnesium] 40 mg, capsule, bottle of 30, AstraZeneca). As a result, some drug entities (i.e., molecules) could appear more than once among the widely used drug products (e.g., when there are different strengths, such as Lipitor 10 mg, Lipitor 20 mg, and Lipitor 40 mg). For each NDC, we calculated total sales revenue from adjudicated prescription claims, including the patient cost-sharing amount, as well as the total prescriptions dispensed, the total units supplied, and the total days of therapy provided during 2014.

The next step involved merging the use and expenditure data from the Truven Health MarketScan® Research Databases and the Medicare Part D plan provider by NDC code and then linking the data with descriptive information from Medi-Span's Price Rx Pro® drug database,²⁹ using the NDC number as the key linking variable. The descriptive data from Price Rx Pro included drug product information such as brand name, generic name, manufacturer, patent status, package size, route of administration, usual dose, therapeutic category, usual duration, and each price history.

All NDCs were classified by the patent status of the drug product presentation—that is, patented brand name (i.e., brand single source [SS]), off-patent brand name (i.e., brand multiple source [BMS] or innovator multiple source [IMS]), and off-patent generic (i.e., generic multiple source [GMS] or non-innovator multiple source [NMS]). We then grouped all NDC numbers by the Generic Product Indicator (GPI) code into GPI-patent status groups using the GPI code from Price Rx Pro®. The GPI combines drug products into a common group when they have the same active ingredients, dosage form, and strength—a single GPI includes the NDCs for any package type and size and from all manufacturers. When patent status is combined with the GPI categories, each GPI will typically be either a single source GPI (GPI-brand single source) or a multiple source GPI with both a GPI-brand multiple source group and a GPI-generic multiple source group.

The next step involved summing the total expenditures, number of prescriptions dispensed, and days of therapy provided across all NDCs within each GPI-patent status group. The NDCs within each GPI-patent status group were then rank ordered based on total annual expenditure for each NDC. The designated “representative NDC” was the NDC that had the highest level of expenditure within each GPI-patent status group. If the NDC with the greatest expenditure level was inactive, then the NDC with the next highest level of expenditure became the representative NDC.

This analysis excluded less than 0.5 percent of the expenditures and the prescriptions because they were for nondrug items. These nondrug items included devices, medical and diabetic supplies, syringes, compounding service fees, and other professional services. After exclusion of nondrug items, the 2014 data set contained 36,866 NDCs grouped into 6,085 GPI-patent status categories.

We then coded all GPIs to distinguish the specialty prescription drugs from other regular, or traditional, prescription drugs. The definition of specialty prescription drugs used here is a prescription drug that is (1) administered by injection, such as intravenous, intramuscular,

29 Price Rx Pro® is a product of Medi-Span (Indianapolis, IN), a division of Wolters Kluwer Health, Inc., and is based on data from Medi-Span's MDDB®.

sub-cutaneous, or other injection site (not including insulin); (2) a drug product approved by the FDA through a BLA (biological license application); (3) any drug product that has a total average prescription cost greater than \$1,000 per prescription; or (4) any drug product that has a total average cost greater than \$33 per day of therapy. The drug products meeting this definition were considered “specialty drugs” and all other prescription drugs were considered “regular,” “traditional,” or “nonspecialty” drugs. Throughout this report, references to the market basket of drugs refer to the regular (nonspecialty) drugs unless otherwise indicated. Only specialty drugs provided through a Medicare Part D program or under a prescription drug benefit program are included. The specialty drugs provided under Medicare Part B, or under a commercial health plan and administered in a clinic or physician’s office and billed as a medical claim, are not included in this data set or this analysis.

All NDCs were classified by the patent status of the drug product presentation—that is, patented brand name (or SS), off-patent brand name (or IMS), or off-patent generic (NMS). We classified both the regular and the specialty drug data sets by patent status.

We sorted the list of all GPI-patent status groups in the merged data set for 2014 by three criteria: (1) total prescription expenditures, (2) number of prescriptions dispensed, and (3) days of therapy provided. The top 500 GPI-patent status categories were identified for each of these three criteria. Because some GPI-patent status groups appeared in more than one of these top 500 lists, the combined list of all GPI-patent status groups totaled 627. There were 268 brand name GPI-patent status groups³⁰ (i.e., both brand single source and brand multiple source) and 399 generic GPI-patent status groups. Also, 101 GPI-patent status groups in this combined top 500 list were classified as specialty drugs.

The three market baskets (brand name, generic, and specialty drugs) combined accounted for

83.0 percent of all prescription drug expenditures and 82.8 percent of all prescriptions dispensed to those over age 50 in 2014.

MONITORING RETAIL DRUG PRICES

The original Rx Watchdog reports were based on market baskets of drugs constructed using data from a Medicare Part D plan provider for 2006 and manufacturer drug price changes measured using WAC data from the Medi-Span Price-Chek PC database. The AARP Public Policy Institute and the University of Minnesota’s *PRIME* Institute collaborated to develop a new retail drug price index known as the *Rx Price Watch* reports, based on retail-level prescription prices from the Truven Health MarketScan® Research Databases. This retail price index allows the AARP Public Policy Institute to assess retail prices actually paid by consumers or insurers and to determine whether the rebates and discounts sometimes given to payers are being passed along to consumers.

Retail Data Description

The Truven Health MarketScan® Research Databases comprise 12 fully integrated claims databases, and contain the largest collection of privately and publicly insured, de-identified patient data in the United States.³¹ The warehouse features an opportunity sample from multiple sources (employers, states, health plans), more than 20 billion patient records, and 196 million covered lives since 1995.³² The data used in the *Rx Price Watch* analyses are drawn from the Truven Health MarketScan® Commercial Claims and Encounters Database (Commercial Database) and the Truven Health MarketScan® Supplemental and Coordination of Benefits Database (Medicare Supplemental Database).

The Truven Health MarketScan® Commercial Database consists of employer- and health plan-sourced data containing medical and drug data for several million individuals annually. It encompasses employees, their spouses, and dependents covered by employer-sponsored private health insurance. Health care for these

30 The current brand name drug market basket originally included 268 widely used brand name drugs. However, fluticasone propionate powder, a corticosteroid used in compounding, had insufficient retail price data in 2017 and was dropped from this analysis.

31 Danielson, “White Paper.”

32 Danielson, “White Paper.”

individuals is available under a variety of fee-for-service (FFS), fully capitated, and partially capitated health plans. These include preferred provider organizations (PPOs) and exclusive provider organizations (EPOs), point of service (POS) plans, indemnity plans, health maintenance organizations (HMOs), and consumer-directed health plans.³³

The Truven Health MarketScan® Medicare Supplemental Database is composed of data from retirees with Medicare supplemental insurance sponsored by employers or unions. In 2010, 14 percent of the 46.5 million Medicare beneficiaries received their drug benefits through a retiree coverage plan.³⁴ The Truven Health MarketScan® Medicare Supplemental Database includes the Medicare-covered portion of payment, the employer-paid portion, and any patient out-of-pocket expenses. The database provides detailed cost and use data for health care services performed in both inpatient and outpatient settings.

The retail price data drawn from the Truven Health MarketScan® Commercial Database and Truven Health MarketScan® Medicare Supplemental Database had to meet several conditions in order to be included in the analysis:

1. Claimant must be age 50 or older
2. Claim must have a value of greater than zero in the following fields:
 - a. Total payment amount
 - b. Metric quantity
 - c. Ingredient cost
 - d. Days' supply
 - e. Average wholesale price
3. Payment amount cannot be less than 100 percent of the ingredient cost
4. Claim must come from a noncapitated health plan.

Truven Health Analytics then combined the two databases and provided the AARP Public Policy Institute with data sets that included the monthly median (as well as the 25th and 75th percentile) retail price from January 2005 through December 2017 for all of the drug

products in the *Rx Price Watch* market baskets. We then compiled the monthly median retail prices in spreadsheets designed to track price changes for each of the drug products in the AARP market baskets.

CALCULATING ANNUAL PRICE CHANGES FOR EACH DRUG

This *Rx Price Watch* report calculates average retail price changes for drug products in the following ways:

- The *annual point-to-point* percent change in retail price is the percent change in price for a given month compared with the same month in the previous year (e.g., January 2017 v. January 2016, February 2017 v. February 2016).
- The 12-month *rolling average* percent change in retail price is the average of the point-to-point changes over the preceding 12 months. For example, the average annual retail price changes for 2017 refer to the average of the annual point-to-point price changes for each of the 12 months from January 2017 through December 2017 compared with the same months in 2016.

We calculated average annual price changes for each drug product for each month and year that the drug was on the market from 2006 to 2017. The first step was to calculate the annual point-to-point percent change for each month by comparing the price in a specific month with the same month in the previous year (e.g., January 2017 v. January 2016, February 2017 v. February 2016). The next step was to calculate the average of these annual point-to-point changes for the 12 months in each calendar year. For example, average annual price changes for 2017 refer to the average of the annual point-to-point price for each of the 12 months in 2017. This 12-month rolling average tends to be a more conservative estimate of price changes than the point-to-point method (i.e., a simple percentage change for a single month from the same month in the previous year), and it accounts for seasonal variations in drug manufacturers' pricing policies.

33 Danielson, "White Paper."

34 Danielson, "White Paper."

Table A-1 shows how 12-month rolling average price changes are calculated. Suppose, for example, that drug A had the following pattern of price changes in 2017 when compared with the same month in 2016:

In this example, the retail price of drug A was 2 percent higher than the price for the same months in the previous year, for the period from January through April 2017. A price hike in May increased the percentage difference to 3 percent for each of the subsequent months in 2017. The 12-month average of these price differences is

$(2.0 + 2.0 + 2.0 + 2.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0)/12$, or 2.67 percent.³⁵

CALCULATING AGGREGATE AVERAGE PRICE CHANGES ACROSS MULTIPLE DRUGS

To aggregate price changes for multiple drugs, we calculated a weighted average of price changes by weighting each drug's annual price change (calculated from the Truven Health MarketScan® Commercial Database and the Truven Health MarketScan® Medicare Supplemental Database, as shown in the hypothetical example in Table A-1) by its share of total 2014 prescription sales within its given market basket (i.e., brand name, generic, specialty, or combined). As an example, Table A-2 shows that the sample from which drug A was drawn has 10 drugs (we chose this small sample size to simplify this illustrative example). The second column of Table A-2 gives the average annual price change for each of these drugs, denoted as drugs A through J. A straight (or unweighted) average, which adds up individual values and divides by the number of drugs, would result in an average annual price change of 4.76 percent for the drugs in this hypothetical sample. Assuming the hypothetical changes in the dollar cost of therapy for these drugs, shown in the third column, the straight average change in the annual cost of therapy would be \$236.13.

A *straight* average, however, does not account for the actual impact of price changes because it does not account for each product's "weight" (or share) within the sample (i.e., it gives equal weight to price changes of both commonly used drugs and drugs that are used less frequently). As a result,

it does not accurately capture the average impact of price changes in the marketplace. In Table A-2, drugs with low price increases in percentage terms (drugs E and J) account for a small share (7 percent) of total 2014 sales for the specific group of drugs analyzed. By contrast, drugs with the highest percentage changes (drugs B, D, and I) account for a much larger share (37 percent) of sales. To reflect the relative importance of each drug's price change in the market basket of products, we weighted each annual price change by the drug's share of total 2014 sales. In this simple example, the *weighted* average price increase in 2017 is the sum of

(Unweighted average price change for drug A × drug A's share of total sales) +
 (Unweighted average price change for drug B × drug B's share of total sales) +
 (Unweighted average price change for drug C × drug C's share of total sales) +
 ... + (Unweighted average price change for drug J × drug J's share of total sales),

or

$(2.67 \times 0.15) + (10.0 \times 0.14) + (2.67 \times 0.07) + \dots + (1.0 \times 0.02)$.

The results of this calculation are in the fifth column of Table A-2, which shows that the weighted annual average price change for the drugs is 5.22 percent, or approximately one-half a percentage point higher than the unweighted average of 4.76 percent. The weighted dollar change in the annual cost of therapy would be \$251.07, compared with the unweighted average dollar change of \$236.13.

CALCULATING AVERAGE PRICE CHANGES ACROSS MULTIPLE DRUGS FOR YEARS BEFORE 2014

The process for aggregating price changes for multiple drugs pre-2014 is similar to that for 2014. Average price changes for 2006 through 2013 were derived by first calculating the rolling average annual price change for each drug (as shown in Table A-1), then weighting each drug's price change by its share of total sales in the sample. The weights used for all years in this study are

35 If the drug was introduced to the market in July of the previous year, then the price change for the given year is averaged using only the six months that the product was on the market in the previous year (i.e., July through December).

TABLE A-1

Average Annual Percent Change in Price for Hypothetical Prescription Drug A, 2017

Jan 16- Jan 17	Feb 16- Feb 17	Mar 16- Mar 17	Apr 16- Apr 17	May 16- May 17	Jun 16- Jun 17	Jul 16- Jul 17	Aug 16- Aug 17	Sep 16- Sep 17	Oct 16- Oct 17	Nov 16- Nov 17	Dec 16- Dec 17	Average
2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.67

TABLE A-2

Average Changes in Price and Cost of Therapy for 10 Hypothetical Prescription Drugs, 2017

Drug Name	Unweighted Average Annual Price Change (%)	Unweighted Average Change in Cost of Therapy (\$/year)	Share of Total Sales (%)	Weighted Average Annual Price Change (%)	Weighted Average Change in Cost of Therapy (\$/year)
A	2.67%	\$623.48	15%	0.40%	\$93.52
B	10.00%	\$108.68	14%	1.40%	\$15.22
C	2.67%	\$433.68	7%	0.19%	\$30.36
D	8.00%	\$ 54.08	10%	0.80%	\$ 5.41
E	1.50%	\$162.76	5%	0.08%	\$ 8.14
F	4.33%	\$ 54.08	14%	0.61%	\$ 7.57
G	6.40%	\$216.84	2%	0.13%	\$ 4.34
H	3.25%	\$433.68	18%	0.59%	\$78.06
I	7.80%	\$ 27.04	13%	1.01%	\$ 3.52
J	1.00%	\$247.00	2%	0.02%	\$ 4.94
TOTAL	4.76%	\$236.13	100%	5.22%	\$251.07

from 2014 sales from the Medicare Part D plans of a Medicare Part D plan provider, including the AARP plans, as well as from the Truven Health MarketScan® Commercial Database, and the Truven Health MarketScan® Medicare Supplemental Database. The 2014 weights keep the market basket constant over time so that the change in prices would be a function of price changes alone and not a function of changes in market basket utilization or mix.

However, some drugs that were in the 2014 sample were not on the market in all earlier years. We dropped these drug products from the analysis in the month before they entered the market and for all previous months, and recalculated the weights of the products present in the market prior to 2014 to reflect their relative share of the total sales as adjusted to reflect only drugs on the market during that period.

For example, suppose that drugs I and J in Table A-2 were not on the market in 2011. Furthermore, assume that total drug spending in 2014 was \$100,000. To capture the loss of drugs I and J from the analysis for 2011, the weights are

redistributed across the drugs that remain in the analysis (drugs A through H); the new weights are still based on their 2014 sales but as a share of total sales for the smaller number of drugs in the analysis for the year. In this example, the total 2014 sales of drugs on the market in 2011 would be \$85,000 without drugs I and J. Drug A's \$15,000 in sales, which represented 15 percent of sales for all 10 drugs, rises to 18 percent of sales when I and J are excluded. This weight, along with the analogous weights for drugs B through H, was used to derive the weighted average price change for 2011 (see Table A-3).

Weighting the previous years' price changes by 2014 sales potentially creates a bias relative to using each specific year's sales as the basis for assigning weights for that year. Using 2014 sales gives more weight to drugs that, relative to other drugs, had high rates of sales growth in 2014 or earlier years compared with the year analyzed. In general, however, newer drugs initially have higher rates of sales growth, but relatively lower rates of price growth, than do older drugs. This pattern occurs both because newer drugs may

TABLE A-3

Recalculating Weights When Prescription Drugs Drop out of the Sample

Drug Name	2014 Weights		2011 Weights	
	Share of 2014 Sales (%)	Value of 2014 Sales (\$)	2014 Sales of Drugs on Market in 2011 (\$)	2014 Share of Drugs on Market in 2011 (%)
A	15%	\$15,000	\$15,000	18%
B	14%	\$14,000	\$14,000	16%
C	7%	\$ 7,000	\$ 7,000	8%
D	10%	\$10,000	\$10,000	12%
E	5%	\$ 5,000	\$ 5,000	6%
F	14%	\$14,000	\$14,000	16%
G	2%	\$ 2,000	\$ 2,000	2%
H	18%	\$18,000	\$18,000	21%
I	13%	\$13,000	–	–
J	2%	\$ 2,000	–	–
TOTAL	100%	\$100,000	\$85,000	100%

have been introduced at higher prices and because price increases for brand name drugs tend to accelerate in rate and amount closer to the end of a product's effective patent life.

CALCULATING ANNUAL COST OF THERAPY FOR A DRUG PRODUCT

To assess the impact of price changes on dollars spent, we calculated an annual cost of therapy for each drug product. This annual cost of therapy analysis excludes drug products in the market basket that are used primarily for treatment of acute conditions or that are typically taken for a limited period of time. The amount of a drug that an average adult would take on a daily basis was determined using the “usual daily dose” reported in the Medi-Span Price Rx Pro® database.

When this information was not available from Medi-Span, we used dosing information in the FDA-approved labeling for the drug product. The weighted average annual cost of therapy was also calculated using the 2014 sales volumes to weight the annual cost of each drug product to produce the aggregate annual cost of therapy across all drug products in the study's market basket.

DEFINING MANUFACTURER

We defined a drug manufacturer as the firm marketing the drug product under its corporate name in 2014. If a listed manufacturer is a division of another firm, we defined its drugs as marketed by the parent firm. This includes cases

in which the firm marketing a drug product may have changed over time due to mergers and acquisitions, divestitures of specific drug products, or for other reasons. The analysis of drug manufacturers reported separately on manufacturers with at least two drug products (at the NDC level) among the most widely used drugs.

DEFINING THERAPEUTIC CATEGORY

Drug products can be classified by the therapeutic purpose for which they are used. If a drug has multiple uses, the most common indication typically becomes the classifier. To group drug products in this study into similar therapeutic categories, we used Medi-Span's therapeutic coding scheme, known as the GPI code.

The therapeutic categories used in this study use an intermediate GPI-level code that specifies the groupings of similar chemical entities such as “Proton Pump Inhibitors.” A brand name therapeutic category may include drug products that are brand single source or brand multiple source.

Appendix B

AARP Market Basket Effect of Brand Name Drugs Facing Generic Competition

This AARP report tracked prices at the retail level for widely used brand name drug products for the 12-year period from December 31, 2005, to December 31, 2017. The market basket for this analysis included 267 brand name prescription drug products.³⁶ One-fifth (53 of 267) of the widely used drug products in the brand name market basket were for drug products used to treat acute or intermittent conditions, while the remaining 80 percent (214 of 267) of drug products were used to treat chronic conditions. The chronic and acute drug product were further subdivided into groups of drug products that faced generic competition by the end of 2017 and those that did not.

Figure B-1 shows the 2017 annual percent change in brand name drug prices for the four drug product groups: (1) Chronic-Use Brand Name Drugs with No Generic Competition; (2) Chronic-Use Brand Name Drugs with Generic Competition; (3) Acute-Use Brand Name Drugs with Generic Competition; and (4) Acute-Use Brand Name Drugs with No Generic Competition.

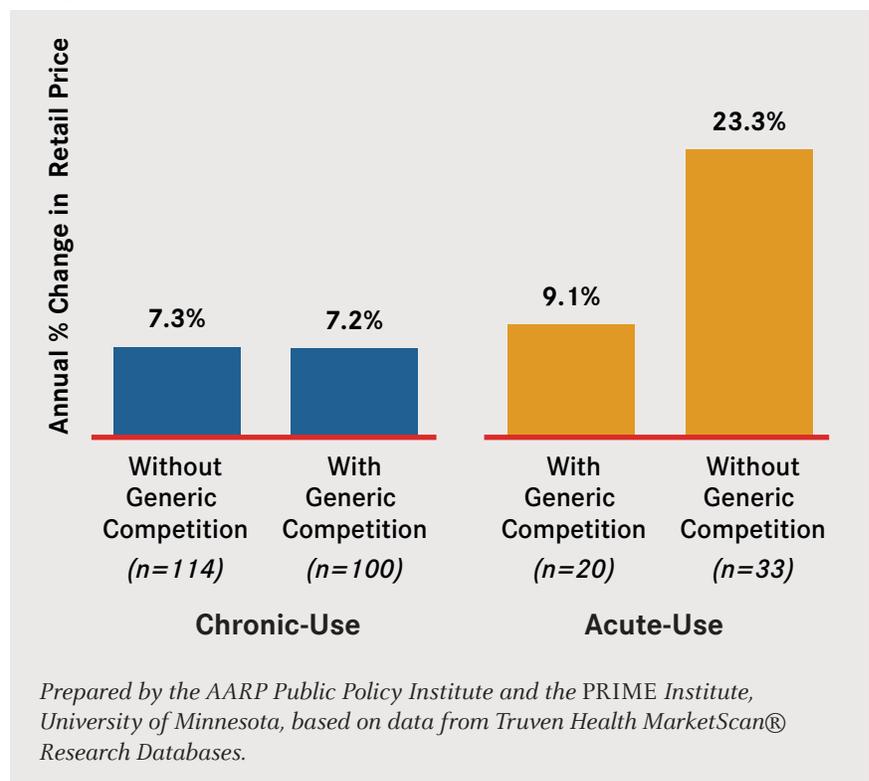
Comparing the annual price change trends for these four groups, we found the following:

- The average annual retail price change for chronic-use brand name drugs with (100 drug products) and without (114

drug products) generic competition was similar in 2017 (7.2 percent v. 7.3 percent, respectively). Thus, generic competition did not appear to have a substantial impact on retail price changes among chronic-use brand name drugs in 2017.

- Acute-use brand name drugs with generic competition (20 drugs) had an average annual retail price increase of 9.1 percent in 2017. In contrast, acute-use brand name drugs without generic competition (33 drugs) had an average

FIGURE B-1
Retail Price Trends for Chronic- and Acute-Use Brand Name Drugs with and without Generic Competition



³⁶ The current brand name drug market basket originally included 268 widely used brand name drugs. However, fluticasone propionate powder, a corticosteroid used in compounding, had insufficient retail price data in 2017 and was dropped from this analysis.

annual price increase of 23.3 percent over the same time period. This was the highest average annual rate of price increase in 2017 among the groups studied.

- When combined, the 53 acute-use brand name drugs had a much higher average rate of retail price increases in 2017 than the 214 chronic-use brand name drugs (18.3 percent v. 7.3 percent).

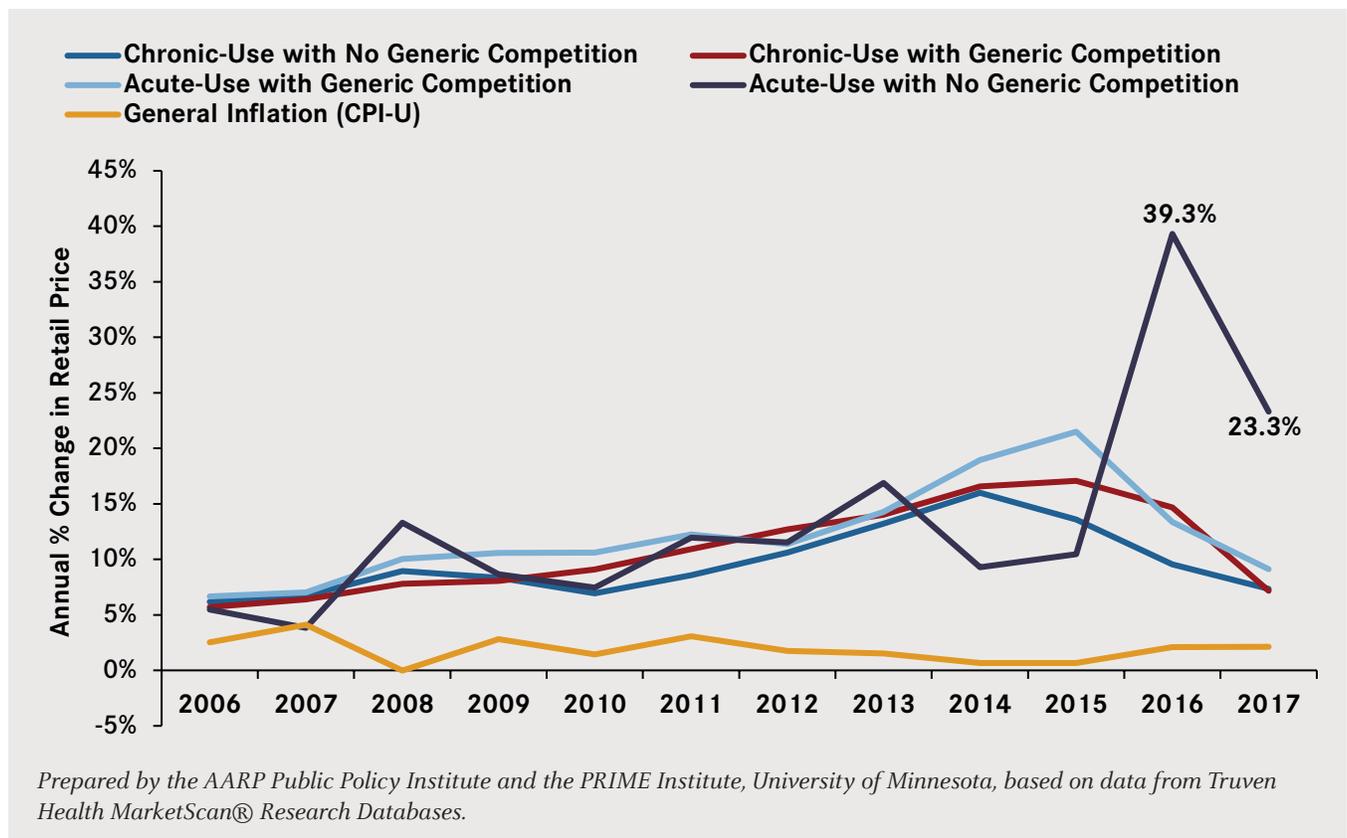
We also found that retail price changes among the four groups of widely used brand name drugs were relatively comparable between 2006 and 2017. However, retail prices for acute-use brand name drug products with no generic competition saw a dramatic spike in 2016 and 2017 that did not occur in the other three brand name drug product groups (Figure B-2).

- Acute-use brand name drug products with no generic competition (53 drugs) had an average annual price increase of 39.3 percent in 2016 and an average annual price increase of 23.3 percent in 2017.

- The acute-use brand name drug products with no generic competition included several niche categories of drug products, such as:
 - Opioids including Oxycontin, Oxycontin ER (4 strengths), Opana ER, Suboxone, and ketamine.
 - Drug products for use in the eye, ear, nose and throat such as: Durezol Ophthalmic, Prolensa Ophthalmic, Ilevro Ophthalmic, Lotemax Ophthalmic, Ciprodex Otic, Nasonex (nasal inhaler), and Dymista Nasal.
 - Special diagnostic preparation products such as: Suprep Bowel Prep and MoviPrep.
 - Other special product types such as vaccines (Zostavax), topicals (Carac and Zoviras), and compounding drugs and supplies (flurbiprofen powder, ketamine powder, and Stera Base).

Overall, the rate of retail price increases for chronic-use drugs with generic competition was

FIGURE B-2
Retail Price Trends for Chronic- and Acute-Use Brand Name Drugs with and without Generic Competition, 2006 to 2017



similar to the rate of retail price increases for chronic-use drugs with no generic competition (7.2 percent v. 7.3 percent, respectively) in 2017. Further, acute-use brand name drug products had substantially higher retail price increases in 2017 compared to chronic-use brand name drug

products (18.3 percent v. 7.3 percent, respectively). The highest average rate of retail price increase in 2017 was for acute-use brand name drug products with no generic competition (23.3 percent). Many of the drug products in this group are opioids or special dosage forms.

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