AARP PUBLIC POLICY INSTITUTE

SEPTEMBER 2019

Rx Price Watch Report

Trends in Retail Prices of 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

AARP®
Real Possibilities

Table of Contents

EXECUTIVE SUMMARY 1

FINDINGS 3

I. Price Trends for Most Widely Used Prescription Drugs 3

II. Twelve-Year Cumulative Retail Price Changes for Most Widely Used Prescription Drugs, 2006 to 2017 7

CONCLUDING OBSERVATIONS 8

APPENDIX A: OVERVIEW OF COMBINED MARKET BASKET OF DRUG PRODUCTS 9

APPENDIX B: DETAILED METHODOLOGY AND DESCRIPTION OF RETAIL PRICE DATA 10

Figures

Figure 1. Average Annual Prescription Drug Price Change Consistently Higher than Inflation between 2006 and 2017 3

Figure 2. Rolling Average and Point-to-Point Changes in Retail Prices Have Consistently Exceeded Rate of General Inflation since 2006 4

Figure 3. Components of Annual Percentage Change in Retail Prices in AARP Combined Market Basket of Most Widely Used Prescription Drugs, 2006 to 2017 5

Figure 4. The Average Annual Cost of Widely Used Prescription Drugs Would Be Substantially Lower if Retail Price Changes Were Limited to General Inflation 8

Tables

Table 1. Characteristics of Drugs Widely Used by Older Americans 9

Table A-1. Average Annual Percent Change in Price for Hypothetical Prescription Drug A, 2017 15

Table A-2. Average Changes in Price and Cost of Therapy for 10 Hypothetical Prescription Drugs, 2017 16

Table A-3. Recalculating Weights When Prescription Drugs Drop Out of the Sample 17

Executive Summary

Retail prices for a combined set of widely used prescription drugs consistently increased faster than general inflation in every year from 2006 to 2017. These findings are primarily attributable to strong drug price growth among brand name and specialty drugs, which more than offset often substantial price decreases among generic drugs.

For a consumer who takes a prescription drug on a chronic basis, the average annual cost of therapy for one widely used drug reached almost $20,000 in 2017. Notably, the annual cost of therapy would have been more than $12,500 lower in 2017 if price changes had been limited to the rate of general inflation between 2006 and 2017.

AARP's Public Policy Institute finds that average price increases for 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. Prescription drug prices have regularly increased faster than general inflation over the past 12 years—the entire period since the beginning of our report series on prescription drug prices in 2004.[1]

In 2017, the average annual increase in retail prices[2] for AARP's overall (combined) market basket of 754 prescription drugs—which included 267 brand name drugs, 390 generic drugs, and 97 specialty drugs widely used by older Americans, including Medicare beneficiaries—was 4.2 percent. The general inflation rate was 2.1 percent over the same time period.

Increases in the retail price of prescription drugs have a corresponding impact on the cost of drug therapy for the individual and all other payers. In 2017, the average annual retail cost of drug therapy for the widely used brand name, generic, and specialty prescription drugs used in this analysis was almost $20,000 per year. This average annual cost was nearly 20 percent higher than the average Social Security retirement

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.

benefit ($16,848).[3] It was also more than three-quarters of the median income for Medicare beneficiaries ($26,200)[4] and almost one-third of the median US household income ($60,336).[5]

Notably, the average annual cost of drug therapy for one drug used on a chronic basis would have been more than $12,500 lower in 2017 (i.e., $7,263 v. $19,816) if retail price changes had been limited to the rate of general inflation between 2006 and 2017.

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 recently noted that high drug prices and drug price increases are a major factor in recent Medicare prescription drug 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.

Previous reports by the AARP Public Policy Institute have focused on retail price changes for traditional outpatient prescription drugs (both *brand name* and *generic* drugs) and *specialty* prescription drugs (also including both *brand name* and *generic* drugs). Separate analyses of the price changes for these groups of drugs are reported because these sets of drugs are typically made by different drug manufacturers and their prices are subject to different market dynamics, pricing, and related behaviors. However, it is also useful to view the average price change for the combined market basket of outpatient prescription drugs widely used by older Americans in order to determine the trend across all types of prescription drugs.[8]

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 prescription drugs from 2006 through 2017, using both rolling average and point-to-point methods (see Appendix B). The second set of findings summarizes the *cumulative* impact of retail price changes for prescription drugs that have taken place across the entire 12-year period from 2006 through 2017.

3 The average monthly Social Security retirement benefit in 2017 was approximately $1,404 per month. Social Security Administration, *Annual Statistical Supplement to the Social Security Bulletin, 2018* (Washington, DC, Social Security Administration, 2019), https://www.ssa.gov/policy/docs/statcomps/supplement/2018/5b.pdf.

4 The median annual income for Medicare beneficiaries was $26,200 in 2016. Gretchen Jacobson et al., *Income and Assets of Medicare Beneficiaries, 2016-2035* (Washington, DC: Kaiser Family Foundation, April 2017).

5 Gloria G. Guzman, "Household Income: 2017, American Community Survey Briefs," ACSBR/17-01, US Census Bureau, Washington, DC, September 2018.

6 Medicare Payment Advisory Commission (MedPAC), *June 2018 Report to the Congress*: *Medicare and the Health Care Delivery System* (Washington, DC, MedPAC, June 2018).

7 American Academy of Actuaries, "Issue Brief: Prescription Drug Spending in the U.S. Health Care System: An Actuarial Perspective," American Academy of Actuaries, Washington, DC, March 2018. https://www.actuary.org/sites/default/files/files/publications/PrescriptionDrugs.030718.pdf.

8 See Appendix A for a brief overview of the combined market basket.

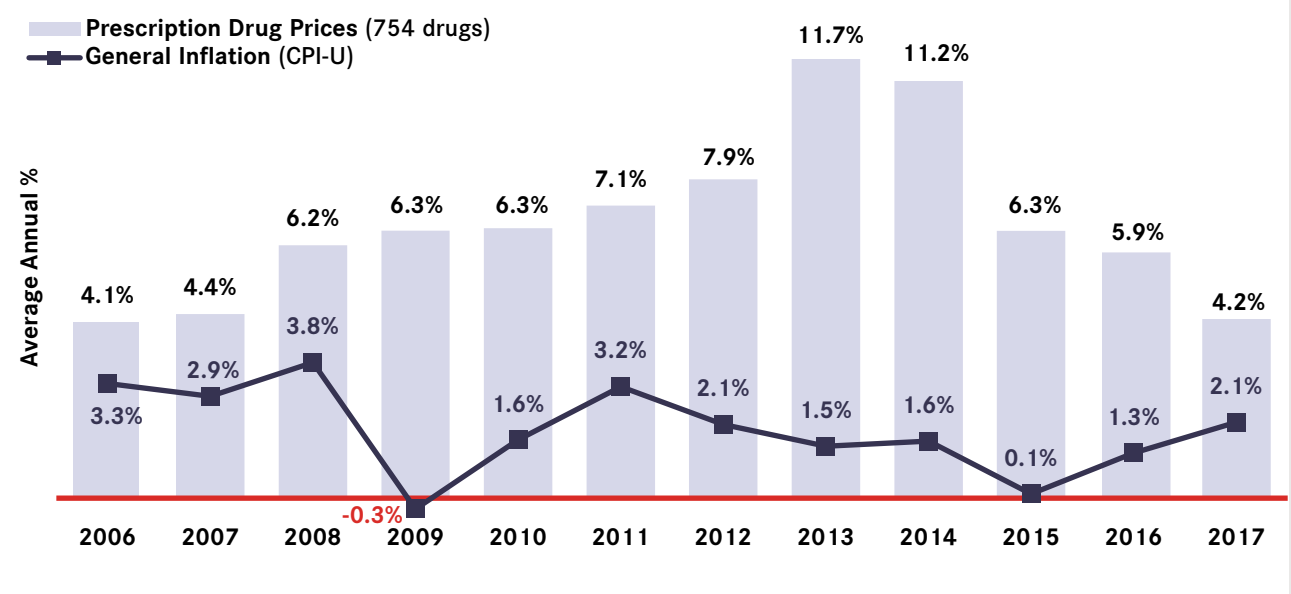
Findings

I. PRICE TRENDS FOR MOST WIDELY USED PRESCRIPTION DRUGS

- Retail prices for the AARP combined set of prescription drug products most widely used by older Americans rose 4.2 percent in 2017 (Figure 1).[9] This average annual increase was lower than the drug price increases observed in the prior 11 years (i.e., 2007 to 2017), which ranged from 4.4 percent to 11.7 percent.
- The average annual retail price increase in 2017 for these 754 widely used prescription drugs was twice the rate of general inflation (4.2 percent v. 2.1 percent).[10]
  - Two of the three market baskets (brand name and specialty drugs) experienced substantial price increases of 8.4 percent and 7.0 percent, respectively, in 2017, while

Figure 1

Average Annual Prescription Drug Price Change Consistently Higher than Inflation between 2006 and 2017



Note: Calculations of the average annual prescription drug price change include the 754 drug products most widely used by older Americans (see Appendix A).

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

9 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.

10 The general inflation rate used in this report is based on the average annual rate of change in the Consumer Price Index–All Urban Consumers for All Items (CPI-U; seasonally adjusted), Bureau of Labor Statistics series CUSR0000SA0.

the third market basket (generic drugs) decreased 9.3 percent in 2017.[11]

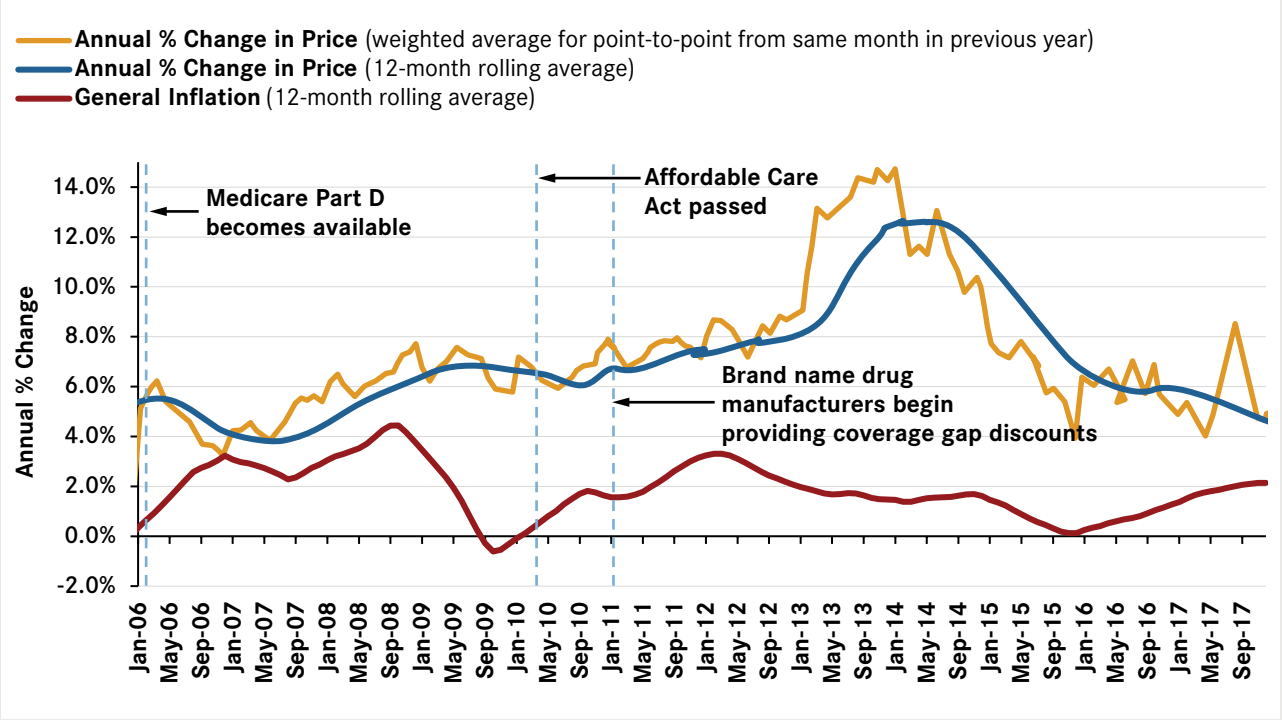
- The average annual increase in retail prices for the AARP combined set of drug products exceeded the corresponding rate of general inflation every year from 2006 through 2017.

The annual retail price change for all prescription 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 all drug prices that occurs for a single month (referred to as an annual *point-to-point* change).

Figure 2 shows the percentage change in prescription drug prices for each month compared with the same month in the previous year. This trend is shown alongside the 12-month rolling average to allow more detailed examination of the rate and timing of prescription drug price changes over the entire study period. This analysis reveals three broad trends in the AARP combined market basket of prescription drugs since implementation of the Medicare Part D program in 2006:

Figure 2.

Rolling Average and Point-to-Point Changes in Retail Prices Have Consistently Exceeded Rate of General Inflation since 2006



Note: Calculations of the average annual prescription drug price change include the 754 drug products most widely used by older Americans (see Appendix A).

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

11 Stephen W. Schondelmeyer and Leigh Purvis, "*Rx Price Watch* Report: Trends in Retail Prices of Brand Name Prescription Drugs Widely Used by Older Americans, 2017 Year-End Update," AARP Public Policy Institute, Washington, DC, September 2018; Stephen W. Schondelmeyer and Leigh Purvis, "*Rx Price Watch* Report: Trends in Retail Prices of Generic Prescription Drugs Widely Used by Older Americans, 2017 Year-End Update," AARP Public Policy Institute, Washington, DC, April 2019; Stephen W. Schondelmeyer and Leigh Purvis, "*Rx Price Watch* Report: Trends in Retail Prices of Specialty Prescription Drugs Widely Used by Older Americans, 2017 Year-End Update," AARP Public Policy Institute, Washington, DC, June 2019." These reports can all be found at http://www.aarp.org/rxpricewatch.

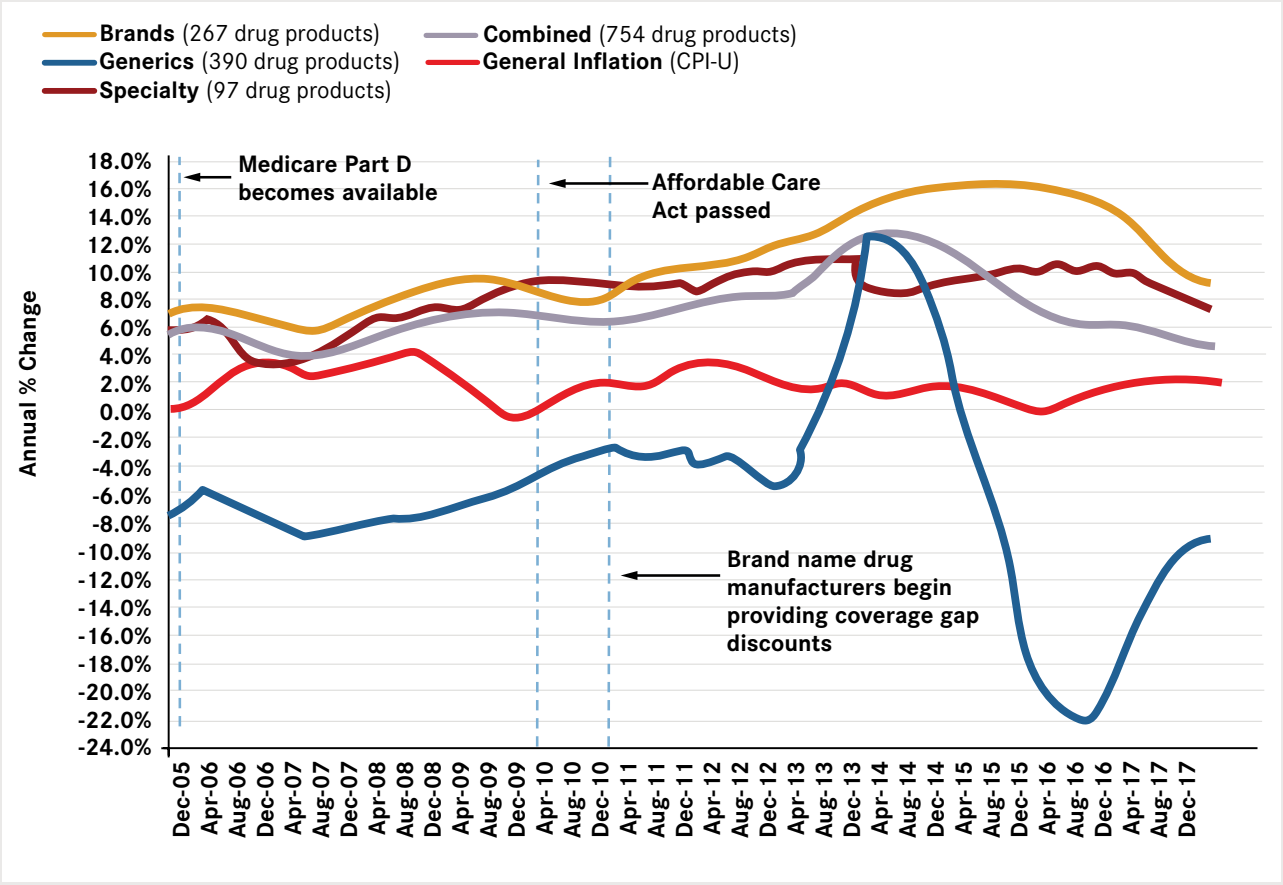
- Retail price changes for the AARP combined set of prescription drugs have consistently exceeded the rate of general inflation since 2006.
- The point-to-point average change in prices was only slightly higher than the rate of inflation between November 2006 and December 2006. However, the rolling average change in prices has consistently remained higher than the rate of general inflation between 2006 and 2017.
- The gap between the rate of prescription drug price change for the AARP combined market basket and the rate of change in general inflation accelerated dramatically between 2012 and 2014 but has since slowed.

The annual trends seen in the combined market basket reflect retail price changes in the brand name, generic, and specialty market baskets. As Figure 3 shows, the rates of price increase in the brand name and specialty market baskets have exceeded the rate of general inflation since at least January 2006. In contrast, on average, retail prices for generic drugs have generally been declining (i.e., there has been an average negative change in the retail price of generics) over the same time period.

It is notable that retail prices for the generic market basket increased dramatically between

Figure 3.

Components of Annual Percentage Change in Retail Prices in AARP Combined Market Basket of Most Widely Used Prescription Drugs, 2006 to 2017



Note: Calculations of the average annual prescription drug price change include the 754 drug products most widely used by older Americans (see Appendix A).

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

June 2013 and December 2014—even exceeding the rate of price increases among widely used specialty drugs. These price increases had a strong impact on the average annual increase in retail prices for the combined index, pushing the rate of increase as high as 12.5 percent. Similarly, dramatic decreases in retail prices for the generic market basket that began in January 2015 and peaked in August 2016 caused the average annual increase in retail prices for the combined index to slow over that time period.

These findings are particularly striking given that generics already have comparatively low prices and represent a relatively small share (21.4 percent) of total drug expenditures in the AARP combined market basket.

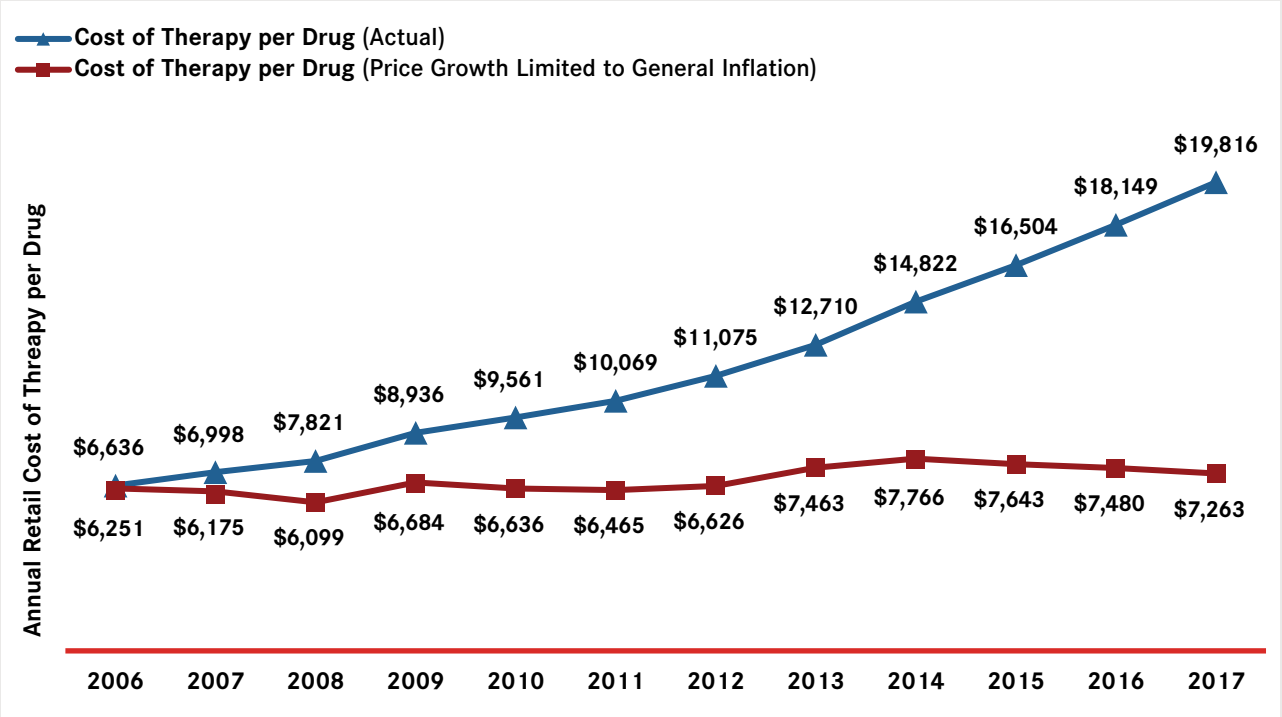
The average cost of prescription drug therapy reached $19,816 per drug per year in 2017.

Figure 4 presents the retail price for 535 widely used brand name, generic, and specialty prescription drugs indicated for treating chronic conditions (out of a total market basket of 754 drugs) when the price is expressed as an average annual cost of therapy per drug.

- The average annual cost of therapy was almost $20,000 per drug per year for widely used prescription drugs at the end-payer (retail) level in 2017.
  - This average annual cost ($19,816) is nearly three times the average annual cost ($6,636) for a widely used prescription drug in 2006, the year Medicare implemented Part D.

Figure 4.

The Average Annual Cost of Widely Used Prescription Drugs Would Be Substantially Lower if Retail Price Changes Were Limited to General Inflation



Note: Calculations of the average annual prescription drug price change include the 754 drug products most widely used by older Americans (see Appendix A).

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

The average price of therapy for the AARP combined market basket greatly exceeded the average price of therapy for the brand name and generic market baskets. The higher price of therapy for the combined market basket is due to the markedly higher price level of specialty drug products.

- The average annual cost of therapy for widely used *generic* drug products was $365 in 2017.
- The average annual cost of therapy for widely used *brand name* drug products was $6,798 in 2017.
- The average annual cost of therapy for widely used *specialty* drug products was $78,871 in 2017.

In 2017, the average annual price of therapy for specialty prescription drugs was almost 12 times higher than the average annual price of therapy for brand name prescription drugs ($78,871 v. $6,798, respectively) and more than 215 times higher than the average annual price of therapy for generic prescription drugs ($78,871 v. $365, respectively).[12]

Notably, the average annual cost of therapy per drug for the 535 widely used brand name, generic, and specialty drug products used in this analysis would have been $7,263—more than $12,500 lower—in 2017 if their retail price changes had been limited to the rate of general inflation between 2006 and 2017.[13]

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

This AARP report tracked prescription drug prices at the retail level for the 12-year period from December 31, 2005, to December 31, 2017. Forty-two percent (318 of 754) of the widely used drugs in the AARP combined market basket were on the market for the entire 12-year period (i.e., the end of 2005 through the end of 2017).

Cumulatively, the average retail price for these 318 widely used drug products increased 203.4 percent over 12 years, compared with a 25.1 percent increase in general inflation in the same period. This means that prescription drug prices increased more than eight times the rate of general inflation during this time period.

Seventy percent (223 of 318) of the drug products that have been on the market since the end of 2005 are used to treat chronic conditions. The average annual retail cost of drug therapy for prescription drug products on the market since the end of 2005 and used to treat chronic conditions was $10,828 in 2017. This amount represents an increase of $7,415 over the 2006 annual cost of $3,412.

12 Schondelmeyer and Purvis, "Brand Name Prescription Drugs"; Schondelmeyer and Purvis, "Generic Prescription Drugs"; Schondelmeyer and Purvis, "Specialty Prescription Drugs."

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. Aaron S. Kesselheim, Jerry Avorn, and Ameet 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.

Concluding Observations

The findings of this report show that average annual price increases for widely used prescription drug have consistently exceeded the rate of general inflation. These findings are attributable primarily to drug price growth among brand name and specialty drugs, which more than offset the often substantial price decreases among generic drugs.

The continued increases in overall prescription drug price growth despite substantial price decreases among widely used generic drugs could be an indication that employers and government programs can no longer rely on lower-priced generic drugs to counterbalance the price growth trends seen in the brand name and specialty prescription drug markets.

Increases in the price of prescription drugs affect both patients and the larger economy. If recent trends in prescription drug prices and related price increases continue, it will almost undoubtedly become more difficult for patients to access and afford necessary medications. This will lead to poorer health outcomes and higher health care costs in the future.[14]

Spending increases driven by high and growing prescription drug prices affect all Americans in some way. Those with private health insurance will pay higher premiums and/or cost sharing for their health care coverage[15] and government programs will grow faster than the tax-based revenue that supports them, leading to higher taxes and/or cuts in public health or other programs.

Policy makers interested in slowing prescription drug price increases should focus on changes that produce long-term, meaningful, and sustainable effects. While policy options should encourage meaningful pharmaceutical innovation, an equally important goal should be improving the 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 brand name, generic, and specialty drug products.

14 Zachary A. Marcum, Mary Ann Sevick, and Steven M. Handler, "Medication Nonadherence: A Diagnosable and Treatable Medical Condition," *Journal of the American Medical Association* 309, no. 20 (2013): 2105–06; Aurel O. Iuga and Maura J. McGuire, "Adherence and Health Care Costs," *Risk Management and Healthcare Policy* 7 (2014): 35–44.

15 American Academy of Actuaries, "Issue Brief."

Appendix A: Overview Of Combined Market Basket Of Drug Product

The brand name market basket for this price change study is composed of 267 drug products. The generic market basket is composed of 390 widely used generic drug products. The specialty market basket for this price change study is composed of 97 widely used specialty drug products.

There are 754 drug products in the overall (combined) market basket.[16] Brand name prescription drugs consumed the majority of the expenditures (53.2 percent), while generic drugs were the vast majority of prescriptions dispensed (78.9 percent). Specialty drugs, not including any payments made under Medicare Parts A and B,[17] represented 25.4 percent of expenditures and 0.5 percent of prescriptions (see Table 1).

Based on retail prescription drug prices from the Truven Health MarketScan® Research Databases, price changes were determined by comparing the retail price for a drug product in a given month with the price for the same drug product in the same month in the previous year. A 12-month rolling average of these price changes was then calculated to determine an average annual price change.

Price changes for the three market baskets (brand name, generic, and specialty drugs) were combined using fixed weights proportional to the total expenditures for each market basket in 2014 (see "Share of Expenditures" column in Table 1). These weights remained fixed over time so that the combined index represented price changes and not changes in the mix of drugs prescribed and used.

Table 1.
Characteristics of Drugs Widely Used by Older Americans

Type of Prescription	Share of Prescriptions	Share of Expenditures
Brand name	20.6%	53.2%
Generic	78.9%	21.4%
Specialty	0.5%	25.4%

Note: Retail price data 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 ufual and customary price that a pharmacy would charge a cash-pay consumer for the same prescription. Totals may not sum due to rounding.

Source: PRIME *Institute, University of Minnesota, based on 2014 data from the Truven Health MarketScan® Research Databases and a Medicare Part D plan provider. See Appendix B for additional detail.*

16 In order to measure the impact of changes in retail price alone, the weights for drug products in this market basket are fixed over time. Drug products that enter the market as generics after 2014 are not included in this index. If drug products are withdrawn from the market, they are dropped from the market basket in subsequent periods and the weights of other drugs are proportionately adjusted.

17 Because the specialty market basket does not include drugs that fall under Medicare Parts A and B, these numbers do not reflect total specialty drug utilization and spending among Medicare beneficiaries.

Appendix B: 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.[18] In 2009, AARP and the *PRIME* Institute created an additional drug price index based on actual retail prices[19] from Truven Health's MarketScan® Commercial Database and MarketScan® Medicare Supplemental Database (Truven Health MarketScan® Research Databases).[20] 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 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

18 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.

19 The retail prices used in this report series 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.

20 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.

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.[21] 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,[22] 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 past 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 of 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 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

21 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. "New Drugs at FDA: CDER's New Molecular Entities and New Therapeutic Biological Products," US Food & Drug Administration, accessed September 1, 2018, https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DrugInnovation/default.htm.

22 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.

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,[23] 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, 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

23 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®.

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 267 brand name GPI-patent status groups (i.e., both brand single source and brand multiple source) and 390 generic GPI-patent status groups. Also, 97 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.[24] 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.[25] 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 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.[26]

24 Danielson, "White Paper."

25 Danielson, "White Paper."

26 Danielson, "White Paper."

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.[27] 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:
3. Total payment amount
    a. Metric quantity
    b. Ingredient cost
    c. Days' supply
    d. Average wholesale price
    e. 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.

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:

27 Danielson, "White Paper."

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

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)/12, or 2.67 percent.[28]

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 × 0.15) + (10.0 × 0.14) + (2.67 × 0.07) + … + (1.0 × 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

28 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-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**

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 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

Table A-3.
Recalculating Weights When Prescription Drugs Drop Out of the Sample

Drug Name	2014 Weights		2011 Weights	
	Share of 2014 Sales	Dollar Value of 2014 Sales	2014 Dollar 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%**

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 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.

Research Report 2019-18, September 2019

601 E Street, NW
Washington DC 20049

Follow us on Twitter @AARPpolicy
on facebook.com/AARPpolicy
www.aarp.org/ppi

For more reports from the Public Policy Institute, visit http://www.aarp.org/ppi/.

https://doi.org/10.26419/ppi.00073.003

AARP®
Real Possibilities