

Changes in List Prices, Net Prices, and Discounts for Branded Drugs in the US, 2007-2018

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IMPORTANCE Most studies that have examined drug prices have focused on list prices, without accounting for manufacturer rebates and other discounts, which have substantially increased in the last decade.

OBJECTIVE To describe changes in list prices, net prices, and discounts for branded pharmaceutical products for which US sales are reported by publicly traded companies, and to determine the extent to which list price increases were offset by increases in discounts.

DESIGN, SETTING, AND PARTICIPANTS Retrospective descriptive study using 2007-2018 pricing data from the investment firm SSR Health for branded products available before January 2007 with US sales reported by publicly traded companies (n = 602 drugs). Net prices were estimated by compiling company-reported sales for each product and number of units sold in the US.

EXPOSURES Calendar year.

MAIN OUTCOMES AND MEASURES Outcomes included list and net prices and discounts in Medicaid and other payers. List prices represent manufacturers' price to wholesalers or direct purchasers but do not account for discounts. Net prices represent revenue per unit of the product after all manufacturer concessions are accounted for (including rebates, coupon cards, and any other discount). Means of outcomes were calculated each year for the overall sample and 6 therapeutic classes, weighting each product by utilization and adjusting for inflation.

RESULTS From 2007 to 2018, list prices increased by 159% (95% CI, 137%-181%), or 9.1% per year, while net prices increased by 60% (95% CI, 36%-84%), or 4.5% per year, with stable net prices between 2015 and 2018. Discounts increased from 40% to 76% in Medicaid and from 23% to 51% for other payers. Increases in discounts offset 62% of list price increases. There was large variability across classes. Multiple sclerosis treatments (n = 4) had the greatest increases in list (439%) and net (157%) prices. List prices of lipid-lowering agents (n = 11) increased by 278% and net prices by 95%. List prices of tumor necrosis factor inhibitors (n = 3) increased by 166% and net prices by 73%. List prices of insulins (n = 7) increased by 262%, and net prices by 51%. List prices of noninsulin antidiabetic agents (n = 10) increased by 165%, and net prices decreased by 1%. List price increases were lowest (59%) for antineoplastic agents (n = 44), but discounts only offset 41% of list price increases, leading to 35% increase in net prices.

CONCLUSIONS AND RELEVANCE In this analysis of branded drugs in the US from 2007 to 2018, mean increases in list and net prices were substantial, although discounts offset an estimated 62% of list price increases with substantial variation across classes.

← Editorial pages 826 and 831

+ Supplemental content

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From 2008 to 2016, increases in medication list prices considerably exceeded inflation,¹ leading to concerns about affordability and access for patients.² Trends in list prices, however, do not reflect changes in manufacturer discounts to payers (rebates) and other concessions that have contributed to lower net prices of drugs. The lack of discount data in most prior drug pricing research constitutes a critical limitation because rebates and other manufacturer discounts have increased over time.^{3,4} Thus, increases in list prices could reflect rising discounts rather than a change in actual net price. The lack of discount data limits drug pricing policy discussions, particularly because pharmaceutical manufacturers have recently argued that, after accounting for rebates, net prices have increased at the rate of inflation.⁵ This is especially relevant in the current legislative environment, when changes to the pharmaceutical reimbursement structure for major public payers are discussed.

The objective of this study was to describe changes in list prices, net prices, and discounts for branded pharmaceutical products for which US sales are reported by publicly traded companies, and to determine the extent to which increases in list prices were offset by increases in discounts.

Methods

Data Source and Study Sample

We obtained 2007-2018 list and net prices for branded medications from the investment firm SSR Health,⁶ which had been previously used in peer-reviewed literature.⁷⁻¹⁰ Every quarter, the investment firm estimates what it terms *net prices* as the ratio between company-reported sales for each product (numerator) and the number of units sold in the US (denominator), obtained from Symphony Health.¹¹ Data on the number of units sold include retail pharmacy, inpatient, and other clinical settings.¹¹ The estimated net prices capture all concessions made by manufacturers, including rebates, coupon cards, 340B discounts, prompt pay discounts, return provisions, and any other deductions accounted for in the reporting of sales.^{6,12} Because of the use of sales reports in estimating net prices, net pricing data were limited to branded products for which US sales are reported by publicly traded companies and did not include generics or branded drugs manufactured by private companies such as Purdue Pharma or Boehringer Ingelheim. Nevertheless, branded products manufactured by publicly traded companies were estimated to account for more than 90% of US brand sales.^{6,13} The sample was limited to drugs with market entry prior to January 2007, so that the cohort of drugs was available throughout the study period. Because only pricing data were used, the study was non-human participants research and therefore not subject to institutional review board approval.

Independent Variables

We linked the list and net pricing data to drug characteristics obtained from AnalySource (reprinted with permission by First Databank Inc),¹⁴ which contains a therapeutic class categorization according to the Uniform System of Classification.¹⁵ We identified 6 therapeutic classes of special interest, includ-

Key Points

Question To what extent have manufacturer discounts offset increases in list prices of branded pharmaceutical products in the US?

Findings Using 2007-2018 net pricing data on branded pharmaceutical products in the US, list prices increased by 159% and net prices increased by 60%. Discounts increased from 40% in 2007 to 76% in 2018 in Medicaid and increased from 23% to 51% in other payers, offsetting 62% of increases in list prices for drugs.

Meaning Although discounts partially offset list price increases of branded products from 2007 to 2018, there was still a substantial increase in net prices over this period.

ing antineoplastic agents, insulins, lipid-lowering agents, multiple sclerosis therapies, noninsulin antidiabetic agents, and tumor necrosis factor (TNF) inhibitors (definitions in the **Table**). We selected these classes because they present different levels of regulation and competition. We also classified drugs into single source and multisource, based on the availability of generic versions during the study period. Single-source drugs were those that had no generic version available at any point from 2007 to 2018, and multisource drugs were products subject to generic competition.

Outcomes

Outcomes included list prices, net prices, discounts in Medicaid, and discounts in payers other than Medicaid. List prices were expressed as wholesale acquisition costs and represent manufacturers' price to wholesalers or direct purchasers but do not account for discounts. Net prices were estimated using reported sales data as explained here, and represent average revenue per unit of a given product after all manufacturer concessions were accounted for in sales reporting. List and net prices were adjusted for inflation using the Consumer Price Index.¹⁶

Discounts were calculated by taking the difference between list and net prices (numerator) and dividing by list prices (denominator). Discounts in Medicaid and for other payers were separately estimated by the investment firm following a 4-step process: First, Medicaid discounts per unit of product were estimated as the sum of the Medicaid statutory rebate (23.1% of average manufacturer price for branded products) and the inflation rebate for price increases above the Consumer Price Index. Second, total discounts to Medicaid were estimated as the product between the discount per unit and the number of units sold to Medicaid, obtained from Medicaid drug utilization reports.⁶ Third, discounts to payers other than Medicaid were calculated as the difference between total discounts and discounts to Medicaid. Fourth, discount per unit for payers other than Medicaid was calculated as the ratio between total discounts for payers other than Medicaid and number of units sold.

Analyses

For each product and year, we calculated annual mean list prices, net prices, and discounts in Medicaid and for other payers across 4 quarters. We then calculated increases in annual list prices and net prices every year, and calculated the mean

Table. Summary of 2007-2018 Changes in List and Net Prices, Overall and by Drug Class^a

	Drug Class, %								
	All (N = 602)	Multiple sclerosis agents (n = 4) ^b	Insulins (n = 7) ^c	Lipid-lowering agents (n = 11) ^d	Noninsulin antidiabetic agents (n = 10) ^e	Tumor necrosis factor inhibitors (n = 3) ^f	Antineoplastic agents (n = 44) ^g	Single source (n = 276) ^h	Multisource (n = 287) ^h
List Price									
Change from 2007 to 2018	159	439	262	278	165	166	59	196	109
Annual mean change	9.1	18.3	12.6	13.0	12.3	9.4	4.4	10.4	7.0
Net Price									
Change from 2007 to 2018	60	157	51	95	-1	73	35	63	59
Annual mean change	4.5	10.2	4.2	7.5	2.1	5.3	2.9	4.7	4.9
List price increase offset by discounts ⁱ	62	64	81	66	101	56	41	68	46

^a Estimates for list and net prices were adjusted for general inflation using the Consumer Price Index.

^b Multiple sclerosis agents include dimethyl fumarate, fingolimod, glatiramer acetate, interferon β -1a, peg-interferon β -1a, interferon β -1b, and teriflunomide.

^c Insulins include products with Uniform System of Classification (USC) code 39100.

^d Lipid-lowering agents include products with USC code 32000.

^e Noninsulin antidiabetic agents include products with USC codes 39200 and 39300.

^f Tumor necrosis factor inhibitors include infliximab, certolizumab, etanercept, adalimumab, and golimumab.

^g Antineoplastic agents include products with USC codes 30000 and 35000.

^h The numbers of single-source and multisource drugs do not add up to the overall sample because information was not available for some drugs.

ⁱ The proportion of list price increase offset by discounts was calculated as (change in list price - change in net price)/change in list price.

of increases across the overall sample and selected subgroups. To account for relative utilization, each product was weighted by the number of units sold in the US in the respective year. This weighting prevented large increases in prices of infrequently used drugs to disproportionately skew results. We also used utilization weighting to calculate mean discounts across the overall sample and selected subgroups. All analyses were conducted at the product level. Confidence intervals were calculated to provide an estimate of precision of the study findings, not for the purpose of hypothesis testing.

Performing analyses at the year level instead of the quarter level enabled minimization of variability in net prices due to inventory variation: because of the approach used to estimate net prices (ratio between company-reported sales and number of units sold), net price estimates are subject to discrepancies between the number of units that a pharmaceutical manufacturer sells in a given quarter and the number of units that retail pharmacies and nonretail institutions sell in the same quarter. For instance, net prices could fluctuate if a wholesaler made a large purchase of a drug in quarter 1 (often the case with vaccines), and stockpiled a large number of units, which would not be sold until future quarters. This inventory fluctuation would affect net price estimates in quarter 1 because the numerator (company-reported sales) would capture all units purchased from the manufacturer, while the denominator (number of units) would only capture units dispensed to patients or payers in quarter 1. To further address this variation, which could result in net prices greater than list prices, we excluded drugs from the analysis for which annual mean net price was greater than the list price in 11 or 12 years (eTable 1 in the Supplement). For the remaining sample, we kept the drugs in the analysis but excluded the annual observations when net price was greater than list price (eTable 2 in the Supplement).

Secondary and Sensitivity Analyses

In secondary analyses, we repeated our calculations after including in the study sample not only brand-name drugs available before 2007, but also those that entered the market during the study period.

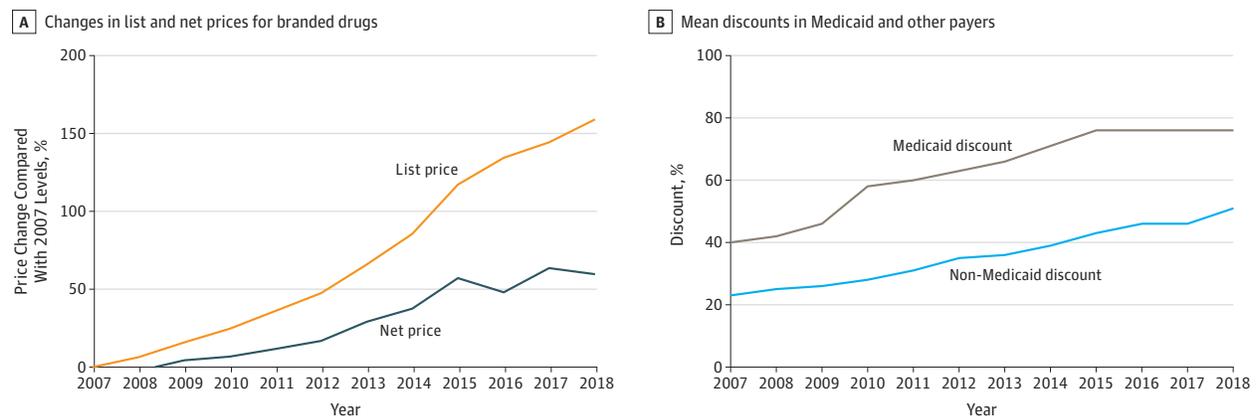
We also performed sensitivity analyses to test the robustness of our findings to different methods to address variability in net pricing data and instances when net price was greater than list price. First, we duplicated our analyses after excluding drugs with extreme variation in the number of units sold across the country (quarterly changes in the number of units greater than the 98th or 99th percentile across the sample). Second, we tested the robustness of our findings to the exclusion of observations with net price greater than list price at the quarter level instead of the annual level. Third, we tested the robustness of our results applying the data validation procedures used by the investment firm, which exclude quarterly observations with net price greater than twice their list price, or with the 8-quarter rolling average of the net price greater than the 8-quarter rolling average of the list price. All analyses used statistical software SAS version 9.4 (SAS Institute).

Results

Changes in List Prices, Net Prices, and Discounts for the Overall Sample

There were 631 branded products with market entry prior to January 2007, and after excluding those for which annual mean net price was greater than list price in 11 or 12 years, the final sample included 602 products. After exclusion of observations for which net price was greater than list price, there were a total of 4023 drug-year observations.

Figure 1. Changes in List Prices, Net Prices, and Discounts for the Overall Sample



A, Changes from 2007 to 2018 in list and net prices for branded products that were available in January 2007 and for which US sales were reported by publicly traded companies. Net prices are net of all concessions made by manufacturers including rebates, coupon cards, 340B discounts, prompt pay

discounts, return provisions, and any other deductions captured in the reporting of net sales. B, Mean discounts in Medicaid and other payers. Discounts are calculated as (list price – net price)/list price.

From 2007 to 2018, list prices increased by 159% (95% CI, 137%-181%), or 9.1% per year, from a mean of \$6 per unit in 2007 to \$18 per unit in 2018 (eTable 3 in the Supplement). Net prices increased by 60% (95% CI, 36%-84%), or 4.5% per year (Figure 1). Increases in list prices were particularly high in 2012, 2013, and 2014, averaging 13%, 12%, and 17%, respectively. Increases in net prices peaked in 2012 and 2014, when they exceeded 10%, but slowed down starting in 2015. From 2015 to 2018, net prices were relatively stable (Figure 1). Discounts increased in Medicaid from 40% (95% CI, 39%-42%) in 2007 to 76% (95% CI, 73%-78%) in 2018 and increased for other payers from 23% (95% CI, 21%-24%) to 51% (95% CI, 48%-54%). Across the study period, 62% of the increase in list prices was offset by increases in discounts (Table).

Changes in List and Net Prices by Therapeutic Class

Figure 2 and Figure 3 show changes in list and net prices each year by therapeutic class, the Table provides mean price changes from 2007 to 2018, and eTable 3 in the Supplement presents mean list prices in 2007 and 2018. eFigure 1 in the Supplement shows list and net prices in 2007 and 2018 at the product level. There was large variability in price changes across therapeutic classes. Multiple sclerosis treatments had the greatest increases in list prices (439% [95% CI, 203%-675%]) from 2007 to 2018, or 18.3% per year. Although 64% of this increase in list price was offset by increasing discounts, multiple sclerosis treatments still had the greatest increases in net prices (157% [95% CI, 72%-241%]) from 2007 to 2018, or 10.2% per year. After multiple sclerosis drugs, insulins and lipid-lowering agents had the highest increases in list price. While the list prices of insulin increased by 262% (95% CI, 73%-450%), 81% of the increase in list price was offset by discounts, so net prices of insulins increased by 51% (95% CI, -1% to 226%) from 2007 to 2018, or 4.2% per year.

List prices for noninsulin antidiabetic agents increased by 165% (95% CI, -26% to 555%) across the study period,

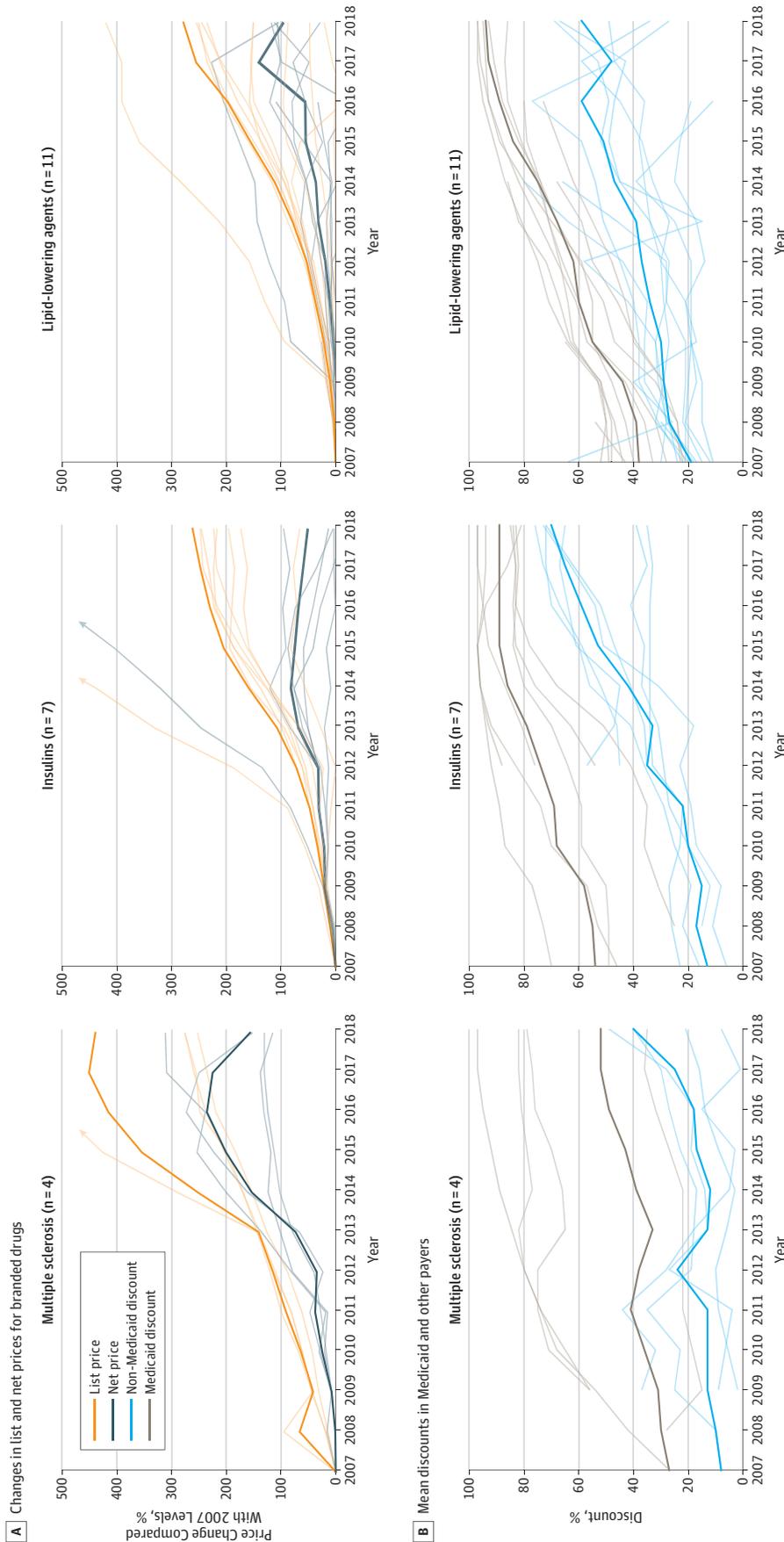
although these increases were fully offset by discounts, meaning net prices actually decreased (Table; Figure 3). List prices of TNF inhibitors increased by 166% (95% CI, 0%-377%) across the study period; however, with discounts offsetting 56% of list price increases, net prices increased by 73% (95% CI, -1% to 268%) from 2007 to 2018. List price increases were lowest for antineoplastic agents, averaging 59% (95% CI, 27%-91%) from 2007 to 2018, or 4.4% per year. In this class, however, discounts only offset 41% of list price increases, yielding a mean net price increase of 35% (95% CI, 9%-62%) across the study period, or 2.9% per year.

Changes in Discounts by Therapeutic Class

Across the study period, Medicaid discounts increased by around 40 percentage points for TNF inhibitors, noninsulin antidiabetic agents, and lipid-lowering drugs (eFigure 2 in the Supplement). In contrast, Medicaid discounts for antineoplastic agents remained relatively constant, from a mean of 49% (95% CI, 45%-53%) in 2007 to 55% (95% CI, 43%-66%) in 2018. At the end of the study period, lipid-lowering agents was the therapeutic class with the highest discounts in Medicaid (94% [95% CI, 89%-98%]), followed by insulins (89% [95% CI, 83%-96%]) and TNF inhibitors (85% [95% CI, 74%-96%]). In 2018, discounts in Medicaid were lowest for multiple sclerosis treatments (52% [95% CI, 7%-97%]) and antineoplastic agents (55% [95% CI, 43%-66%]).

Discounts in payers other than Medicaid increased the most for insulin, which increased from 13% (95% CI, 0%-35%) to 70% (95% CI, 61%-80%). Additionally, discounts for lipid-lowering agents and noninsulin antidiabetics increased by more than 40 percentage points. Discounts in other therapeutic classes increased by 25 to 32 percentage points, with the exception of antineoplastic agents, which had relatively stable discounts. Insulins, noninsulin antidiabetics, and lipid-lowering agents were the therapeutic classes with the highest discounts in 2018.

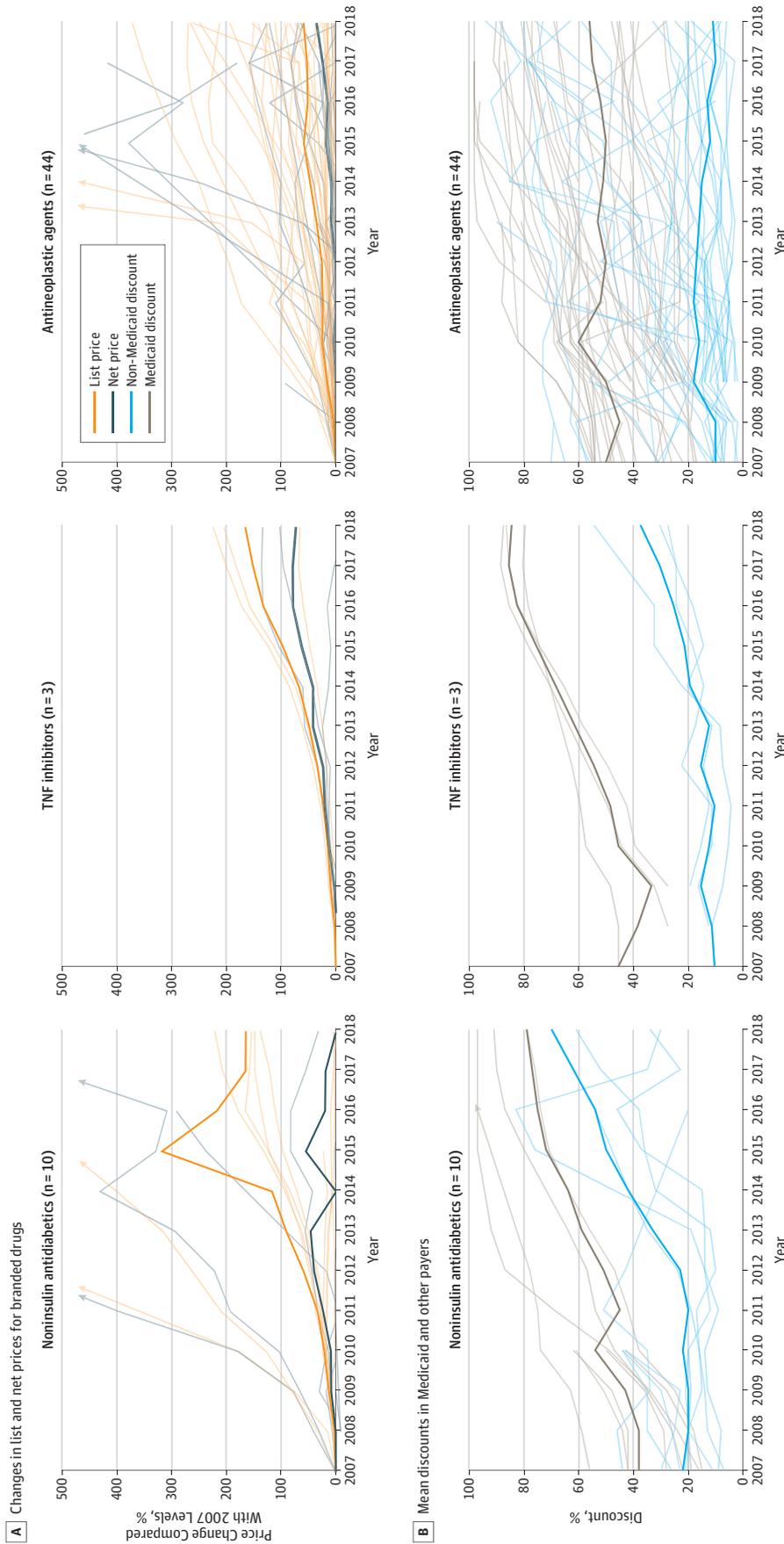
Figure 2. Changes in List Prices, Net Prices, and Discounts for Multiple Sclerosis Therapies, Insulins, and Lipid-Lowering Agents



A. Changes from 2007 to 2018 in list and net prices for branded multiple sclerosis agents (left), insulins (middle), and lipid-lowering agents (right) that were available in January 2007 and for which US sales were reported by publicly traded companies. Light-colored lines depict individual medications, and thicker lines represent the weighted mean across the class. Individual lines were not weighted by utilization in the figure, so individual lines do not necessarily sum to the class average, which is a weighted mean, as explained in the Methods section.

Net prices are net of all concessions made by manufacturers, including rebates, coupon cards, 340B discounts, prompt pay discounts, return provisions, and any other deductions accounted for in the reporting of net sales. B. Mean discounts in Medicaid and other payers from 2007 to 2018. Discounts are calculated as (list price - net price)/list price. Some individual drugs had values that exceeded the axis limits, including observations for increases in list prices of more than 1000% (arrows).

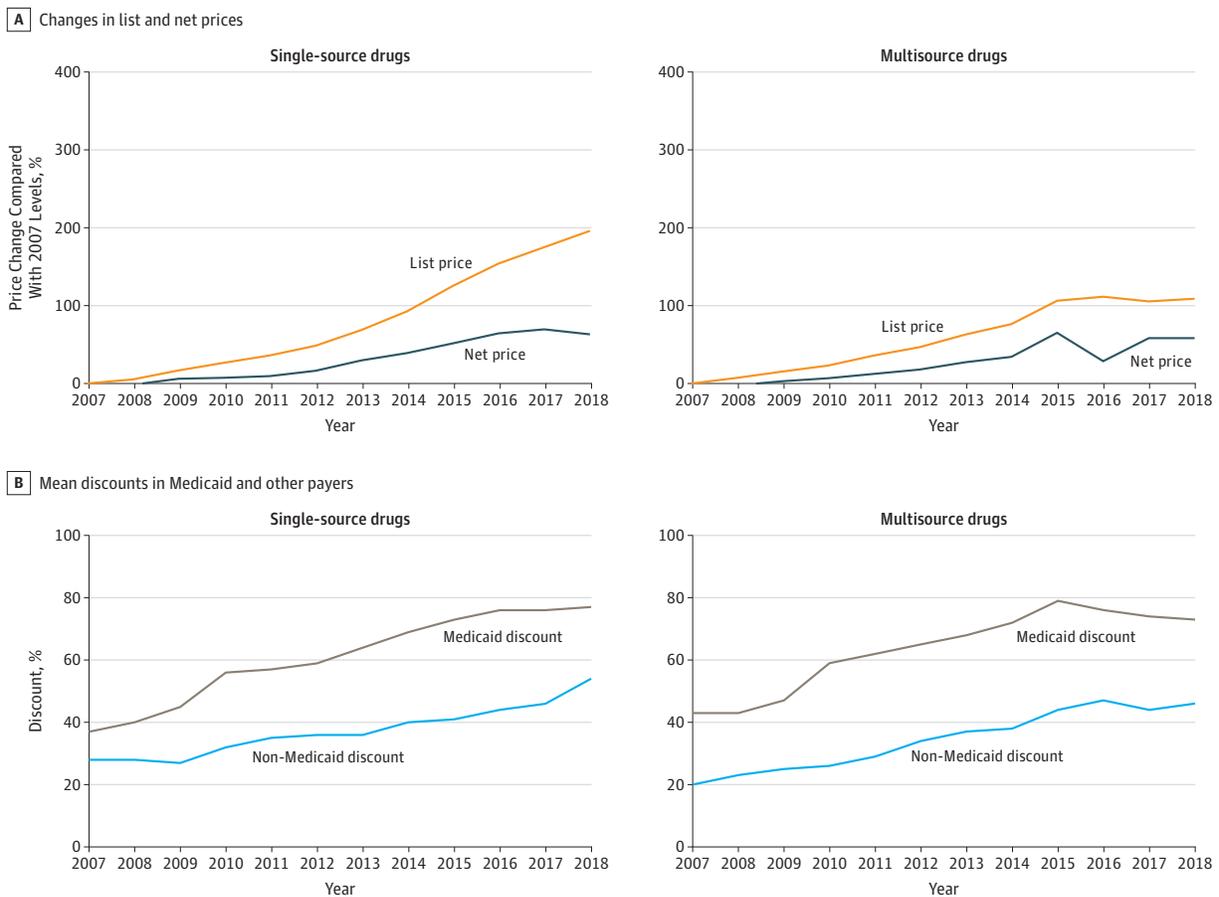
Figure 3. Changes in List Prices, Net Prices, and Discounts for Nonsulin Antidiabetics, Tumor Necrosis Factor (TNF) Inhibitors, and Antineoplastic Agents



Methods section. Net prices are net of all concessions made by manufacturers, including rebates, coupon cards, 340B discounts, prompt pay discounts, return provisions, and any other deductions accounted for in the reporting of net sales. B. Mean discounts in Medicaid and other payers. Discounts are calculated as (list price - net price)/list price. Some individual drugs had values that exceeded the axis limits, including observations for increases in list prices of more than 1000% (arrows).

A. Changes from 2007 to 2018 in list and net prices for branded nonsulin antidiabetics (left), TNF inhibitors (middle), and antineoplastic agents (right) that were available in January 2007 and for which US sales were reported by publicly traded companies. Light-colored lines depict individual medications, and thicker lines represent the weighted mean across the class. Individual lines were not weighted by utilization in the figure, so individual lines do not necessarily sum to the class average, which is a weighted mean, as explained in the

Figure 4. Changes in List Prices, Net Prices, and Discounts for Single-Source and Multisource Drugs



A, Changes from 2007 to 2018 in list and net prices for single-source (left) and multisource (right) drugs that were available in January 2007 and for which US sales were reported by publicly traded companies. Net prices are net of all concessions made by manufacturers, including rebates, coupon cards, 340B

discounts, prompt pay discounts, return provisions, and any other deductions accounted for in the reporting of net sales. B, Mean discounts in Medicaid and other payers. Discounts are calculated as (list price - net price)/list price.

Changes in List Prices, Net Prices, and Discounts by Availability of Generic Versions

List prices of single-source drugs increased faster than list and net prices of multisource drugs (Figure 4). After accounting for discounts, net prices of single-source drugs increased by 63% (95% CI, 40%-86%), while net prices of multisource drugs increased by 59% (95% CI, 8%-109%).

Results of Secondary and Sensitivity Analyses

When we included in our analyses products that entered the market after 2007, the estimates for increases in list and net prices increased (eFigure 3 in the Supplement).

Our results were robust to the exclusion of drugs that presented extreme variation in the number of units sold and to the exclusion of observations with net price greater than list price at the quarter level (eAppendix in the Supplement). Our results were also similar when we used the investment firm’s approach to address instances when net price was greater than list price (eAppendix in the Supplement).

Discussion

In this study based on investment firm data for branded drugs in the US from 2007 to 2018, inflation-adjusted list prices increased by 159% and net prices increased by 60%, with stabilization of net prices after 2015. Discounts increased from 40% to 76% in Medicaid, and from 23% to 51% for other payers. Increases in discounts offset 62% of increases in list prices, but with wide variability across classes.

The widening gap between list and net prices is increasingly discussed in policy-making and among researchers, but there have been little data to inform these discussions. Understanding changes in both list and net prices is important for making informed decisions about policies addressing prescription prices and answering policy-relevant research questions. For example, pharmaceutical manufacturers have worked to stem concerns about rising list prices by pointing to low net price increases over the last few years.^{5,17} In the

current analysis, net prices stabilized after 2015 and decreased in the last year of the study period, which is consistent with other reports.¹⁸ However, certain high-utilization branded drugs still had net price increases in the double digits, including large increases in the last few years.¹⁹ Over the 11 years from 2007 to 2018, net prices increased every year by an average of 4.5 percentage points, or 3.5 times faster than inflation. This estimate is consistent with a recent report from the US Department of Health and Human Services Office of Inspector General, which estimated that after accounting for rising rebates, Medicare Part D reimbursement for brand-name drugs increased by 4% every year from 2011 to 2015.²⁰

Payers negotiate these discounts with pharmaceutical manufacturers for placement of medications on insurer formularies. Payers have more leverage to negotiate discounts for drugs subject to competition, which explains the variability in discounts observed across therapeutic classes. For some classes, such as antineoplastic agents, for which there is little exchangeability and therefore less competition across products, discounts remained constant and list and net prices increased in parallel. In contrast, discounts offset much of the rising list prices for therapeutic classes that include several exchangeable brands or that have faced biosimilar competition, such as noninsulin diabetic agents, TNF inhibitors, or insulins. In fact, discounting has been heavily applied to stave off competition from biosimilars.²¹ Multiple sclerosis drugs are a particular case for which net price still increased by 10% per year, after inflation, even with discounts.

The variation in price increases and discounts in single-source vs multisource drugs also reflects the consequences of competition in the drug market. Increases in list prices of single-source drugs were substantially greater than increases in list prices of multisource drugs, which is to be expected given the availability of generic competitors in the latter. However, net prices of single-source and multisource drugs increased by fairly similar amounts (63% and 59%, respectively) because single-source drugs compete with other brand-name drugs for formulary space through discounting. In other words, when brand-name drugs compete against each other for formulary placement, they require heavy discounting by the manufacturer.

While the findings of this study demonstrate that rebates and discounts may have an important role in offsetting increases in list prices of drugs, discounting practices can have unintended, and unfavorable, consequences. First, discounts to payers or rebates are not passed on directly to patients, and uninsured patients or those with high deductible plans or in the deductible phase of their benefits coverage are exposed to list prices. Thus, the widening gap between list and net prices may exacerbate disparities in medication access between insured and uninsured or underinsured patients. Second, the complexity that discounting practices bring to the pharmaceutical reimbursement system often create perverse incentives for utilization of drugs subject to large rebates, even when they may not bring any additional value.

The difference in discounts between Medicaid and non-Medicaid payers is notable. Large discounts in Medicaid are primarily a result of regulation²²—the statutory unit and inflation

rebates—and not of negotiation for formulary placement. Non-Medicaid discounts are primarily a result of negotiation between insurers (with pharmacy benefit managers) and manufacturers. Recognizing this difference is important when interpreting net prices that are occasionally disclosed by manufacturers.^{17,23} When net prices are calculated factoring in Medicaid discounts, they are not representative of discounts available to most individuals with employer-sponsored insurance, particularly for therapeutic classes with a large share of utilization covered by Medicaid. Differences in discounts between Medicaid and other payers will further increase if the current Medicaid inflation rebate cap is eliminated, as recently proposed.²⁴ Currently, total rebates in Medicaid, including the base and the inflationary rebate, are capped at 100% of the average manufacturer price.

Net prices reflect discounts representing all concessions made by manufacturers and do not differentiate between rebates, discounts, co-payment cards, 340B discounts, or other concessions made by manufacturers. As a result, net prices are not simply list prices minus rebates, but rather represent manufacturer net revenue per unit of the product. This distinction is important for several reasons. First, changes in net prices over time do not only reflect changes in rebates, but also changes in other concessions, such as coupon cards, which decrease manufacturer revenue. Second, rising discounts through concessions may lower the overall net price because they reduce manufacturer revenue, but the lowered net price is not felt equally across insurers or across patients. Private insurers, for example, do not benefit from Medicaid discounts. Through setting high list prices and negotiating with payers for rebates, pharmaceutical manufacturers have the ability to set different net prices for each insurer (discriminatory pricing), which would not be challenging in the absence of rebates. Third, the manufacturer net revenue per unit is not the net price to patients, which is an important distinction. Nonetheless, these indirect estimates of net price at the drug and class level are the best available and a considerable improvement for understanding trends in drug pricing than using list price alone.

Limitations

This study has several limitations. First, the analysis was limited to branded products for which sales are reported by publicly traded companies. While this represents most branded drugs, it does not capture the totality of the market because generic drugs or branded drugs sold by private companies were not included. Second, net price estimates were calculated using reported data, and are thus subject to variability of reporting. Nevertheless, estimates were robust to sensitivity analyses. Third, there are no peer-reviewed validations of the data sources used in the study (net pricing and number of units data); thus, their accuracy is uncertain. Fourth, because of the inability to estimate supplemental rebates in Medicaid, these rebates were captured under payers other than Medicaid, which biased estimates for rebates in Medicaid downwardly and in other payers upwardly. Fifth, because analyses were not conducted in a time-dependent manner, drugs were categorized into single source vs multisource according to the availability

of generics at any point of the study period. Thus, analyses did not control for drugs that were single sourced in January 2007 and became multiple sourced across the study period. Sixth, the category of payers other than Medicaid includes a highly heterogeneous group of payers, including Medicare, commercial insurance carriers, and the Veterans Administration (VA), which obtains lower net prices than Medicare or commercial insurance.²⁵ Thus, it is likely that the inclusion of the VA led to the underestimation of net prices in commercial insurance and Medicare. However, this bias should be minimal because

the VA covers a low number of beneficiaries in comparison with all other payers combined.

Conclusions

In this analysis of branded drugs in the US from 2007 to 2018, mean increases in list and net prices were substantial, although discounts offset an estimated 62% of list price increases with wide variability across classes.

ARTICLE INFORMATION

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Author Contributions: Dr Hernandez had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Hernandez, Good, Gellad.
Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Hernandez.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Hernandez.
Obtained funding: Hernandez.
Administrative, technical, or material support: Hernandez, San-Juan-Rodriguez, Gellad

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