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Prescription drug spending by payer: Implications for managed care

Yousef Chavehpour [a], Rajesh Balkrishnan [b], Joel E. Segel [c,*]

[a] Department of Health Policy and Administration, Pennsylvania State University (YC, JES), State College, PA, USA
[b] School of Medicine, University of Virginia (RB), Charlottesville, VA, USA
[c] Penn State Cancer Institute, Pennsylvania State University (JES), Hershey, PA, USA

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ABSTRACT

Background: Brand-name prescription drugs are an important driver of prescription drug spending, but different payers may bear these costs differentially necessitating different policy goals for each payer. But little is known about how the top 10 selling drugs in the U.S. impact spending across payers.

Objective: To estimate the differential spending burden of top prescription drugs on Medicaid, Medicare, commercial coverage, and out-of-pocket (OOP) spending.

Methods: The percentage of total prescription drug spending, total spending, total prescriptions, and average cost per prescription overall and for each of the following payers – Medicaid, Medicare, private insurance, and OOP – was calculated for each of the top 10 selling prescription drugs using 2017–2019 Medical Expenditure Panel Survey data.

Results: These 10 prescription drugs accounted for average annual spending of $83.4 billion and 19.0% of all prescription drug spending. Medicare tended to contribute the highest fraction of spending. The average annual cost per prescription ranged from $500 for Advair to $7400 for Tecfidera. Significant variation in the average annual number of prescriptions filled was observed, ranging from 1.4 million for Tecfidera to 13.6 million for Lantus.

Conclusions: The findings highlight the significant impact of the top 10 selling prescription drugs on U.S. prescription drug spending. The wide variation in per prescription cost as well as contribution to each payer's prescription drug burden emphasizes how policies targeting top-selling drugs may differentially impact payers as well as how payer-specific policies may differ substantially even for top selling drugs.

1. Introduction

Prescription drug expenditures in the U.S. have been consistently increasing for years[1,2] and are a growing concern for the American healthcare system as it can lead to higher premiums, unaffordable out-of-pocket (OOP) costs, and may limit access to care for patients.[3–5] In 2021, retail prescription drug spending reached $378 billion, or $1147 per capita, representing 9% of all healthcare expenditures.[1] In addition, according to a recent report by the Congressional Budget Office, the average price of a prescription for brand-name drugs doubled in the Medicare Part D program between 2009 and 2018, while it increased by 50% in Medicaid.[5] Two important drivers of the recent growth in prescription drug spending are the approval of expensive new therapies and the increasing prices of existing drugs.[1,6] While, brand-name drugs constitute only 10% of all prescriptions in the U.S., they represent a substantial 72% of drug spending.[4]

A relatively small fraction of top-selling prescription drugs account for a significant share of the overall growth in total expenditure, emphasizing the importance of focusing on top-selling drugs in order to understand prescription drug spending.[7–10] A Kaiser Family Foundation report highlighted a small percentage of drugs covered under Medicare Part B and Part D command a disproportionate share of program resources. In Medicare Part D, the 10 highest-selling drugs, for which no generic or biosimilar alternatives existed in 2019, accounted for just 0.3% of all covered products, yet represented 16% of total Part D spending for that year.[10] Beyond Medicare, Wineinger et al. (2019) found the median annual cost increase for 49 high-volume brand-name drugs was 9.5% from 2012 through 2017.[9] Even within Medicaid, spending on the top 18 brand-name drugs increased 173% from $3.6 billion in 2015 to $9.9 billion in 2019.[11]

Despite extensive documentation of rising prescription drug prices,[10,12] a nuanced understanding of how specific high cost prescription

drugs differentially impact different payers (e.g., Medicaid, Medicare, private insurers, and consumer OOP spending) is still lacking. Prescription drug spending and growth varies considerably across payers. Commercial health insurance (including Medicare Advantage plans) accounted for the highest share of spending at 45% (or $166.4 billion in spending) in 2019, with an annual growth rate of 5.7% over the past two years.[6] Meanwhile, Medicare covered 28% ($103.5 billion) of prescription drug spending and experienced growth of 5.8% per year. Finally, OOP spending represented 15% ($55.4 billion) and grew by 2.6% per year.[6] This variation highlights the importance of delving deeper into the patterns of spending for top-selling prescription drugs and how these patterns differ across payers.

As policymakers and payers consider how to best address the high cost of prescription drugs, a critical issue is understanding patterns of spending for top-selling prescription drugs and how they both overlap and differ across payers. For example, some top-selling drugs may be of particular importance for only a subset of payers. Others may impact multiple payers. These patterns have important implications for how policy approaches may differentially impact certain payers. Therefore, this study aimed to analyze the utilization and spending of 10 top-selling prescription drugs in the U.S. by payer, specifically Medicaid, Medicare, private insurance, and OOP payments, using nationally representative data from the Medical Expenditure Panel Survey (MEPS).

2. Methods

2.1. Data sources and sample selection

Medical Expenditure Panel Survey data for the years 2017–2019 were used. This survey collects information on sociodemographics, health care utilization, and health care spending from a nationally representative sample of the U.S. civilian, non-institutionalized population. These data include information on prescription drugs taken including type, dosage, and payment for each prescription from pharmacies and online or mail order. Injectables, infusion drugs, and those omitted due to confidentiality reasons such as orphan drugs or drugs prescribed to fewer than 200,000 individuals are not included in MEPS.[13] In order to identify the 10 top-selling prescription drugs for the 2017–2019 period, the International Quality and Value Institute Advisors (IQVIA) National Sales Perspectives database and Evaluate Pharma company were used, which are widely recognized sources for identifying top-selling prescription drugs.[14–18] The reason for utilizing both sources was to create a more comprehensive list of top-selling prescription drugs during that specific timeframe. Appendix A contains a list of these prescription drugs and the conditions they primarily treat.

2.2. Statistical approach

Within each year of MEPS and for each of the top 10 selling prescription drugs, the total number of prescriptions filled and average cost per prescription were tabulated. Total spending per drug was calculated using the overall person-level weights developed by MEPS. To produce estimates that represent the national population, the survey weights allow the aggregation of individual level spending to the population level.[13] For each drug, the fraction of total prescription drug spending the specific drug represents as well the fraction of spending borne by each of the following payers – Medicaid, Medicare, private insurance, and OOP (including those with health insurance) were calculated.

Finally, for each prescription drug, its relevant importance to each payer was examined. First, the total payer-specific spending for each drug was calculated. Second, the fraction of total of payer-specific spending each drug represents (e.g., a value of 1.5% means the drug represents 1.5% of all prescription drug spending for that payer) was calculated. All spending was in 2019 dollars adjusted using the CPI prescription drugs.[19]

3. Results

Overall, the top 10 selling prescription drugs included in this study annually accounted for 71.6 million total prescriptions for average annual spending of $83.4 billion or 19.0% of all prescription drug spending (Table 1). Nearly a quarter of the spending was for Humira. A significant variation in the average annual number of prescriptions filled, ranging from 1.4 million for Tecfidera to 13.6 million for Lantus was observed. A considerable variation was also observed in the average annual cost per prescription, which ranged from $500 for Advair to $7410 for Tecfidera. These overall numbers however mask considerable variation in per drug spending by payer.

Medicare tended to contribute the highest fraction of spending for several prescription drugs, including Lantus, Eliquis, Januvia, Lyrica, Advair, Xarelto, and Victoza (Fig. 1). Of the total spending for these drugs, Medicare represented 43 to 62% of spending for each drug (Fig. 1). For each of these seven prescription drugs, the next highest contributor was private health insurance followed by either out-of-pocket spending (Eliquis and Xarelto) or Medicaid (Lantus, Januvia, Lyrica, Advair, and Victoza). The remaining three exhibited different patterns. Private coverage was the highest payer for Humira (70.4% of spending), Tecfidera (86.6% of spending), and Enbrel (49.4%).

For each of the top 10 selling prescription drugs, Table 2 displays the total spending by payer as well as the percent of all payer-specific prescription drug spending that drug represents (e.g. 1.6% means that the drug represents 1.6% of *all* prescription drug spending for that payer). In total, the top 10 prescription drugs led to $4.3 billion in Medicaid spending, equivalent to 8.7% of all Medicaid spending on prescription drugs. However, compared to other payers the top 10 selling drugs made up a relatively smaller fraction of overall Medicaid prescription drug spending (8.7% compared to 19%, 24.7%, and 13% in Medicare, Private and OOP, respectively). Among payers, private coverage was the largest for the top 10 prescription drugs, spending $42.8 billion, followed by Medicare at $28.0 billion (Table 2).

Humira and Tecfidera were the top two prescription drugs with a combined spending of $35 billion, equivalent to 8.0% of overall spending on all prescription drugs (Table 1). These two drugs also topped the list for private payer with annual spending of $26.6 billion, which accounted for 15.3% of total private prescription drug spending (Fig. 1). Medicare spending on these prescription drugs amounted to $5.0 billion, which was equivalent to 3.4% of Medicare's overall prescription drugs spending. Individuals spent $2.3 billion OOP on these prescription drugs, representing 4.8% of total annual OOP prescription drugs spending). However, Medicaid spending on Tecfidera was less than $100 million, and Humira's spending was around $500 million, which was 1.0% of all Medicaid spending on prescription drugs (Table 2).

Medicare spent $4.1 billion annually on Eliquis, which represented 2.8% of all Medicare prescription drug spending (Table 2). Eliquis was

Table 1
Number of prescriptions, average and total spending of top 10 selling prescription drugs in the U.S. from 2017 to 2019.

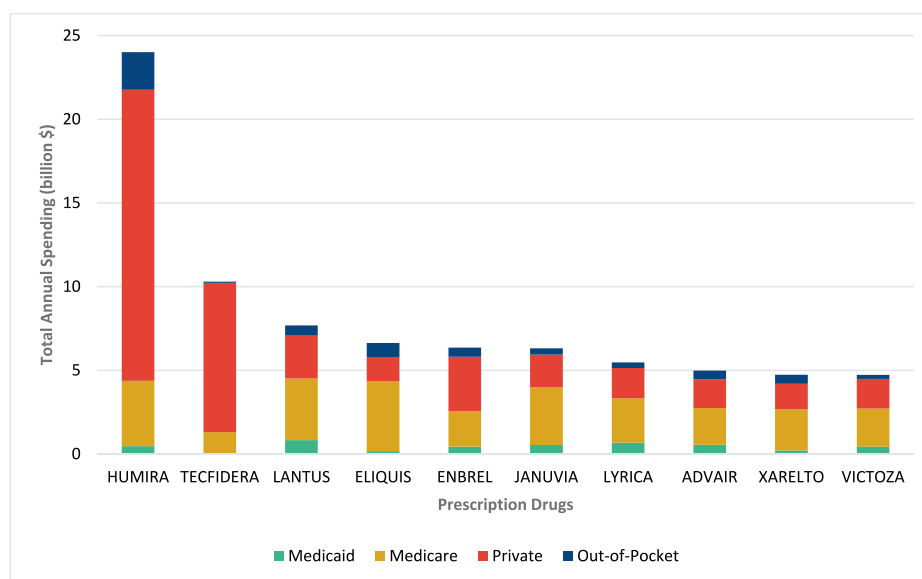| Rank	Name	Number of prescriptions (million)	Cost per prescription ($)	Total spending (billion $)	Overall Spending (%)
1	Humira	3.7	6560	24.7	5.7
2	Tecfidera	1.4	7410	10.3	2.3
3	Lantus	13.6	590	8.0	1.8
4	Eliquis	11.2	590	6.8	1.5
5	Enbrel	1.3	5250	6.6	1.5
6	Januvia	9.0	710	6.5	1.5
7	Lyrica	9.6	600	5.7	1.3
8	Advair	10.2	500	5.1	1.2
9	Xarelto	7.4	640	4.9	1.1
10	Victoza	4.2	1150	4.8	1.1
	Total	**71.6**		**83.4**	**19.0**

Fig. 1. Total annual spending and payer-specific spending of top 10 selling prescription drugs in the U.S., 2017–2019.

Table 2
Payer-specific total spending and percentage of total payer RX spending for the top 10 selling prescription drugs, in the U.S. from 2017 to 2019.

Medicaid			Medicare			Private			Out-of-Pocket		
Name	Total spending (billion $)	Percent of total Medicaid Rx Spending	Name	Total spending (billion $)	Percent of total Medicare Rx Spending	Name	Total spending (billion $)	Percent of total Private Rx Spending	Name	Total spending (billion $)	Percent of total OOP Rx Spending
Lantus	0.8	1.6	Eliquis	4.1	2.8	Humira	17.7	10.3	Humira	2.2	4.6
Lyrica	0.7	1.4	Lantus	3.8	2.6	Tecfidera	8.9	5.0	Eliquis	0.8	1.7
Advair	0.5	1.1	Humira	3.7	2.6	Enbrel	3.3	2.0	Lantus	0.6	1.3
Januvia	0.5	1.0	Januvia	3.5	2.3	Lantus	2.5	1.5	Enbrel	0.5	1.1
Humira	0.5	1.0	Lyrica	2.6	1.8	Januvia	1.9	1.1	Advair	0.5	1.1
Victoza	0.5	0.9	Xarelto	2.4	1.6	Lyrica	1.8	1.1	Xarelto	0.5	1.1
Enbrel	0.4	0.9	Victoza	2.3	1.5	Victoza	1.8	1.0	Januvia	0.4	0.8
Xarelto	0.2	0.4	Advair	2.2	1.5	Advair	1.8	1.0	Lyrica	0.3	0.7
Eliquis	0.2	0.4	Enbrel	2.1	1.4	Xarelto	1.6	0.9	Victoza	0.2	0.5
Tecfidera	0.0	0.0	Tecfidera	1.3	0.8	Eliquis	1.5	0.9	Tecfidera	0.1	0.2
Total	**4.3**	**8.7**		**28**	**19.0**		**42.8**	**24.7**		**6.2**	**13.0**

Note Total spending is aggregated using person-level weights. Prescriptions drugs are ordered by payer-specific total spending (highest to lowest). Rx – prescription drug.

also the most frequently prescribed drug for Medicare, with 7.2 million prescriptions and average cost of $563 per prescription (as listed in Appendix B). In comparison to other payers, Medicare also spent a higher proportion on Lantus and Januvia which together accounted for $7.2 billion of Medicare's spending on prescription drugs (representing 4.9% of all Medicare spending on prescription drugs).

Among the top 10 prescription drugs, private payers outspent Medicare on only three drugs, namely Humira, Tecfidera, and Enbrel. These three drugs accounted for a total of $29.9 billion in annual spending, while Medicare spent a combined $7.1 billion on them. Private payers' annual spending on Enbrel was significantly higher than that of other payers, amounting to $3.3 billion, or 2% of total private prescription drug spending. Meanwhile, Medicare spent $2.1 billion, followed by $0.5 billion and $0.4 billion for Medicaid and OOP, respectively.

4. Discussion

The top 10 prescription drugs accounted for a significant proportion of all prescription drug spending, with average annual spending of $83.4 billion (19%). Humira had the highest annual spending with $27.7 billion, accounting for 5.7% of total prescription drug spending;

followed by Tecfidera and Lantus with $10.3 and $8.0 billion, respectively (2.3 and 1.8% of overall annual spending on prescription drugs). However, significant variation across payers was also observed. Medicare tended to be the payer that represented the highest fraction of spending, although the exception was private insurance in the cases of Humira, Tecfidera, and Enbrel.

It was also observed that spending patterns by payer varied by drugs. Some drugs, such as Humira and Lantus, represented a significant share of spending across all payers. Others had greater impacts on a subset of payers. For instance, Eliquis accounted for $4.1 billion spending to Medicare, which was the drug that had the highest expenditure within Medicare. Yet, it was near the bottom of the top ten for both Medicaid and private payers. Eliquis' high place in OOP spending is likely driven by Medicare patient cost-sharing. Lyrica, on the other hand, was the second highest spending to Medicaid but much lower for other payers. For private payers, spending was heavily concentrated on only three drugs— Humira, Tecfidera, and Enbrel (annually $29.9 billion, or over 17% of all private prescription drug spending).

To our knowledge, this is the first comprehensive study to investigate the impact of the top 10 selling drugs in the U.S. on spending across various payers, using data from a nationally representative survey. While there are a limited number of studies that focus on top-selling

drugs or specific drugs for a particular payer using retail data, our research fills a significant gap. For instance, a study using data from 2015 to 2019 revealed that the total retail spending by all payers on the top 18 brand-name drugs in 2019 amounted to $120.1 billion, with Medicaid's aggregated gross spending being $9.9 billion.[11] Similarly, a report by the Kaiser Family Foundation, using IBM MarketScan Claims data, indicated that in 2016, Medicaid and Medicare each allocated approximately 16% of their drug expenditures to their top 10 drugs, compared to 18% for large employers.[10] Similarly, the present study also found that Medicaid and Medicare spent 8.7% and 19%, respectively, on their top 10 prescription drugs.

The findings of this study have important implications for prescription drug policies aimed at controlling drug spending by payer. For example, the recently passed Inflation Reduction Act (IRA) includes three key policies to reduce prescription drug costs: allowing Medicare to negotiate select drug prices, limiting drug price growth to inflation, and repealing the drug rebate rule.[20] Unsurprisingly, this is likely to differentially impact certain drugs. While there may be spillovers to other payers, these results indicate that the impact of policies on controlling drug prices and spending can vary by drug and payer. This variation is particularly important when Medicaid beneficiaries and OOP spending have the potential to benefit from the spillover effects of such policies. Broader payer-specific policies may be important to ensure access to and affordability of top-selling drugs.

Furthermore, the rising share of Medicaid spending allocated to a limited number of high-cost drugs has prompted the implementation of several Medicaid-specific drug pricing strategies aimed at controlling spending. These strategies include drug spending caps and enhanced negotiations for additional rebates on high-priced drugs.[21,22] A more nuanced understanding of whether the increased spending is driven by volume or price as well as which specific drugs contribute to the spending increases, would facilitate the development of more tailored policies. In addition, individual states have adapted unique approaches to address their specific prescription drug spending. For example, certain states have established prescription drug affordability boards, which consult international reference rates to set upper payment limits or impose penalties on manufacturers for unjustified price increases.[21] These policies have the potential to be more effective if payers target the primary drivers behind their prescription drug spending.

To build on these findings reveal that alterations in spending on the top 10 prescription drugs can yield varying impacts on different payers, there is the following thought experiment. Suppose there were a 1% reduction in spending on each these top ten drugs. This would translate to substantial savings: $43 million for Medicaid, $280 million for Medicare, $428 million for private insurances, and $62 million for OOP spending. Furthermore, focusing on Humira, as the top-spending drug, a 1% decrease in this spending would correspond to a decrease of approximately $4.7 million for Medicaid, $39.0 million for Medicare, $173.9 million for private insurance, and $22.5 million for OOP spending. Similarly, targeting Eliquis as Medicare's top spending drug, a 1% decrease in its spending would result in a reduction around $1.7 million for Medicaid, $41.8 million for Medicare, $14.5 million for private insurance, and $8.4 million for OOP spending. These examples underscore the significant and distinct impacts that reductions in spending on these top drugs can have on various payers.

4.1. Limitations

This study has some limitations that must be acknowledged. First, MEPS only provides information on prescription drugs purchased from pharmacies (including online and mail order). Thus, these analysis does not include specialty drugs that are primarily administered by providers. Second, due to confidentiality concerns, MEPS does not include information on drugs taken by fewer than 200,000 individuals, which includes some top selling drugs (e.g., Revlimid). Third, the analysis was limited to the top 10 drugs, and as a result, spending for other

prescription drugs was not investigated; hence, there may be other drugs with high spending that were omitted. Further, the list used in this study is based on data obtained from both IQVIA and Evaluate Pharma, which primarily reflect gross sales figures and do not account for rebates and discounts. Fourth, top selling drugs necessarily change over time (as new ones are introduced and older ones become generic). Given the study's timeframe of 2017–2019, extrapolation to other years may not be fully accurate. While this may mean the specific drugs may differ in other years, the spending patterns by payer findings are likely to remain consistent. These limitations underscore the need for further research to provide a more complete understanding of prescription drug spending patterns and their impact across payers.

5. Conclusions

This study highlights the significant impact of the top 10 prescription drugs on overall prescription drug spending in the U.S. However, it also demonstrates that even within a narrow group of top selling prescription drugs, the impact on payers can vary tremendously. As policymakers implement policies to limit price growth and aim for affordability, it will be important to understand when these might have important spillovers onto other payers or when it will be necessary to implement separate, payer-specific policies. Results suggest that a 'one size fits all' policy approach is unlikely to address prescription drug affordability effectively, given the significant variations observed by drug and payer.

Contributors

All authors have contributed significantly to the manuscript preparation. Every author has reviewed and approved the final version of the manuscript being submitted. They guarantee that the article is their original work, has not been previously published, and is not under consideration for publication elsewhere.

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Yousef Chavehpour: Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Rajesh Balkrishnan:** Writing – review & editing, Methodology, Conceptualization. **Joel E. Segel:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization.

Declaration of competing interest

Dr. Balkrishnan reports consulting for Ostuka Pharmaceuticals Inc.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.rcsop.2024.100406.

References

1. Martin AB, Hartman M, Benson J, Catlin A, The National Health Expenditure Accounts Team. National Health Care Spending in 2021: decline in federal spending outweighs greater use of health care. *Health Aff (Millwood)*. 2023;42(1):6–17.
2. Schumock GT, Stubbings JA, Wiest MD, et al. National trends in prescription drug expenditures and projections for 2018. *Am J Heal Pharm*. 2018;75(14):1023–1038.
3. Crowley R, Daniel H, Cooney TG, Engel LS. Envisioning a better U.S. health care system for all: coverage and cost of care. *Ann Intern Med*. 2020;172:S7–S32. https://doi.org/10.7326/M19-2415.
4. Kesselheim AS, Avorn J, Sarpatwari A. The high cost of prescription drugs in the United States: origins and prospects for reform. *JAMA*. 2016;316(8):858–871. https://doi.org/10.1001/JAMA.2016.11237.

5.. Congressional Budget Office. Prescription Drugs: Spending, Use, and Prices. Accessed December 18, 2023 https://www.cbo.gov/system/files/2022-01/57 050-Rx-Spending.pdf; 2022.

6. Martin AB, Hartman M, Lassman D, Catlin A. National health care spending in 2019: steady growth for the fourth consecutive year. *Health Aff*. 2021;40(1):14–24.

7. Hernandez I, Good CB, Cutler DM, Gellad WF, Parekh N, Shrank WH. The contribution of new product entry versus existing product inflation in the rising costs of drugs. *Health Aff*. 2019;38(1):76–83. https://doi.org/10.1377/ HLTHAFF.2018.05147/SUPPL_FILE/2018-05147_SUPPL_APPENDIX.PDF.

8. Clemans-Cope L, Epstein M, Banthin J, Kesselheim AS, Hwang TJ. Estimates of Medicaid and non-medicaid net prices of top-selling brand-name drugs incorporating best price rebates, 2015 to 2019. *JAMA Heal Forum*. 2023;4(1). https://doi.org/10.1001/JAMAHEALTHFORUM.2022.5012. e225012-e225012.

9. Wineinger NE, Zhang Y, Topol EJ. Trends in prices of popular brand-name prescription drugs in the United States. *JAMA Netw Open*. 2019;2(5):e194791.

10.. Cubanski J, Neuman T. Relatively Few Drugs Account for a Large Share of Medicare Prescription Drug Spending | KFF. Accessed December 18, 2023 https://www.kff.or g/medicare/issue-brief/relatively-few-drugs-account-for-a-large-share-of-medi care-prescription-drug-spending/; 2021.

11. Clemans-Cope L, Epstein M, Banthin J, Kesselheim AS, Hwang TJ. Estimates of medicaid and non-medicaid net prices of top-selling brand-name drugs incorporating best price rebates, 2015 to 2019. *JAMA Heal Forum*. 2023;4(1). e225012-e225012.

12. Bosworth A, Sheingold S, Finegold K, De Lew N, Sommers BD. *Price Increases for Prescription Drugs*. 2016-2022.

13.. *Agency for Healthcare Research and Quality*. MEPS HC-213A; 2021. Accessed December 18, 2023 https://meps.ahrq.gov/data_stats/download_data/pufs/h21 3a/h213adoc.pdf.

14. Schumock GT, Li EC, Wiest MD, et al. National trends in prescription drug expenditures and projections for 2017. *Am J Health-Syst Pharm*. 2017;74(15): 1158–1173.

15.. EvaluatePharma. World Preview 2019, Outlook to 2024. https://info.evaluate. com/rs/607-YGS-364/images/EvaluatePharma_World_Preview_2019.pdf; 2019.

16. Urquhart L. Market watch: top drugs and companies by sales in 2017. *Nat Rev Drug Discov*. 2018;17(4):232.

17. Urquhart L. Top drugs and companies by sales in 2018. *Nat Rev Drug Discov*. 2019. Published online March 12.

18. Urquhart L. Top companies and drugs by sales in 2019. *Nat Rev Drug Discov*. 2020;19 (4):228.

19.. Agency for Healthcare Research and Quality. *Using Appropriate Price Indices for Expenditure Comparisons*. 2023.

20. Sullivan SD. Medicare drug Price negotiation in the United States: implications and unanswered questions. *Value Health*. 2023;26(3):394–399.

21. Gattine D, Reck J, Lanford S. *State Strategies To Lower Drug Prices: New Legislative and Medicaid Models*. Published online. 2021.

22. Sachs RE, Donohue JM, Dusetzina SB. Confronting state medicaid drug spending pressures. *JAMA*. 2020;324(18):1831–1832. https://doi.org/10.1001/ JAMA.2020.19325.