POLICY
PIONEER HEALTH
BRIEF

Five Reasons Why Drug Rebates Are Harmful to Patients and to the Healthcare System

By Dr. William S. Smith

Introduction

The pharmaceutical marketplace in the United States largely operates on the basis of a rebate system. The system evolved as a way that pharmaceutical manufacturers could reward good customers, such as pharmaceutical benefit managers (PBM) and health plans, who had purchased a promised share of the manufacturers' product.

Here is how the rebate system works. Imagine that a manufacturer launches a new drug into a disease area that already has numerous drugs. How can this new drug compete with all those established ones? The answer: offer a rebate payment to customers who achieved a certain level of market share for your new product. The manufacturer of the new drug would approach the PBM, who may represent one or numerous health plans, and promise that if the PBM can achieve 30 percent market share for their new drug, the manufacturer will pay the PBM a rebate equaling 40 percent of the list price. The PBM assents to this rebate agreement and then proceeds to place restrictions on the competing drugs, such as prior authorizations or higher copayments, to achieve that 30 percent market share for the new drug.

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At the end of the first quarter, the PBM would send the manufacturer of the new drug a spreadsheet to verify that the restrictions placed upon the older drugs had succeeded in achieving a 30 percent market share for the new drug. Along with that spreadsheet, the PBM would send an invoice for the agreed upon rebate payment.

Hypothetically, were this new drug to be somewhat expensive, say $1500 per month, or $4500 per quarter, the 40 percent promised rebate payment would total $1800 per patient. Let's also imagine that the PBM represents several large health plans and 50,000 patients in these plans were now taking the new drug. The rebate payment to the PBM for this one drug, ***in just the first quarter***, would be $90,000,000, or an annual total of $360,000,000.

By this hypothetical example, we can see the massive amount of money that is passing through the hands of PBMs. A recent study by Harvard researchers indicates that between 2012 and 2017, the average rebate increased from 32 percent to 48 percent.[1] Another study estimated that

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rebate payments by drug manufacturers totaled $89 billion in 2016.[2] The study said that rebate payments were "split across private health plans ($23 billion), Medicare Part D plans ($31 billion), Medicaid ($32 billion), and other payers ($3 billion)." Given that IQVIA, a well-respected health information technology and clinical research firm, estimates that the prescription drug marketplace may grow to $600 billion by 2023, the $89 billion estimate for 2016 may not adequately capture the current and future levels of rebate payments.[3] Another pharmaceutical analyst put the number much higher and argues that the difference between invoice prices and net prices approached $166 billion in 2018.[4] Regardless of the exact number, the amount of rebates washing around in the healthcare system is enormous.

The public policy implications of this trend are enormous. The Pharmaceutical Care Management Association, the trade association for PBMs, points out that pharmaceutical customers, such as Medicare, are saving huge amounts of money through rebates.[5] One would hope that these rebate payments allow for lower premium payments by patients.

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On the other hand, there is considerable evidence that the rebate system encourages drug manufacturers to launch drugs with higher invoice prices, i.e. "sticker prices," or to raise invoice prices on drugs already on the market. In other words, drug manufacturers may artificially increase their invoice prices knowing that rebates will take their actual revenues down to a level that is quite satisfactory and profitable for them. One recent study at the University of Southern California indicates that "drug rebates and list prices are positively correlated: On average, a $1 increase in rebates is associated with a $1.17 increase in list price."[6]

In addition to the public policy implications, this rapid rise in rebate growth should be recognized by reporters who cover the drug industry. If the Harvard study is correct and rebates now entail 48 percent of list prices, media reports about drug price increases should acknowledge that list prices are a very deceptive benchmark to cite when reporting on drug manufacturers' prices. In the conclusion of this report, we review a sample of media stories to ascertain how the media is covering drug prices in light of rebate growth.

Let's look at the major problems with the rebate system:

1. Delays, Denials and Access Restrictions for Patients

The rebate system, by its very nature, requires that PBMs utilize aggressive techniques to manipulate the market shares of drugs in order to meet the thresholds in their contracts. If they do not meet these market share thresholds, they will fail to receive the billions in rebate payments doled out each year. PBM tactics to manipulate market share are extensive: "step therapy" requiring patients to "step" through a cheaper drug before they can receive the drug that their doctor prescribed; "prior authorization" or requiring extensive paperwork approvals before a drug can be prescribed; "fail first" requirements forcing patients to fail on a cheaper drug before they get the more expensive one; and, "tiering" of drugs by requiring much higher out-of-pocket costs for certain types of drugs than for others.

In the abstract, of course, these tactics and techniques could simply be a method for PBMs to favor the most therapeutically effective, and simultaneously, cost-effective drugs. Unfortunately, there is some evidence that these techniques are designed to maximize rebate payments rather than to enforce the most therapeutically effective formulary. One New York oncologist was recently quoted in an op-ed piece asserting that PBMs had "inflicted cancer patients with an unspeakably bureaucratic maze of delays and denials into my job of filling life-saving prescriptions" for patients.[7] The oncology community has been particularly outspoken about PBM practices to manipulate market share because oncologists require considerable flexibility to experiment, in a time-sensitive manner, with a variety of prescriptions, some written "off label," to gain control over a patient's cancer. Bureaucratic delays in gaining access to therapies can literally be deadly for cancer patients.

2. Invoice Price Inflation

As the recent report from Harvard researchers indicated, between 2012 and 2017 average rebates increased from 32 percent to 48 percent. During that same period, the researchers pointed out that "annual inflation of list prices was 12 percent while that of net prices was 3 percent, implying that financial rewards to manufacturers per unit sold have not grown proportionately to list prices."[8] This list price-net price variability was particularly true for insulin products, where they found that annual list price inflation was 16 percent but net prices were "relatively flat," rising by just 2 percent per year. These Harvard researchers concluded that "analysts and economists working in public policy should be extremely cautious in drawing policy conclusions based on list prices alone."

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The Harvard study had been preceded only a month earlier by one from the University of Southern California that pointed out that list price inflation has an adverse impact upon patients.[9] The author of the study was quoted as saying: "High list prices impact a lot of patients directly, including uninsured

as well as insured patients whose copays and deductibles are based on the drugs' list price. They also impact overall healthcare spending."

While this list price inflation can create confusion among policy makers and media observers who mistakenly believe drug prices are "skyrocketing," the more insidious result of artificial list price growth is the impact on patient out-of-pocket costs. As pharmacists at the University of Massachusetts Medical School have pointed out, patient copays and coinsurance tend to be based on a drug's list price, not its net price.[10] Therefore, artificially high list price inflation, driven by manufacturers' desire to offer deeper rebates, has the deleterious side effect of artificially raising out-of-pocket costs for patients. For example, under this system, if a drug's list price is $1000 per month and its net price (less rebates) is only $520 per month ***and*** a patient's coinsurance requirement is 10 percent of the drug's list price, out-of-pocket costs will total $100 rather than $52.

3. Weakening the Role of the Pharmacist

Retail pharmacists can be an important source of therapeutic, as well as cost-saving, advice for patients. PBM practices have arguably disrupted and weakened the role of pharmacists. Policy makers became aware of this problem when the issue of "gag" clauses emerged in the public consciousness. For a number of years, PBMs had forced retail pharmacies to sign contracts that prevented pharmacists from telling patients if they could save money by paying cash, rather than using insurance, to pay for a prescription. For example, a patient using their insurance might be charged a $20 co-pay by a PBM for a low-cost generic drug that would cost only $10 if the patient were simply to pay cash. Gag clauses in the pharmacy contracts prevented pharmacists from pointing this out to the patient. Congress has banned the use of gag clauses but patients still may not be able to credit their cash payments for prescription drugs toward their coinsurance requirements.[11]

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The latest issue to emerge regarding PBM practices toward retail pharmacy is called "spread pricing." This practice allows the PBM to pocket the "spread" or the difference between what they are paid by a health plan for a drug and the amount the PBM pays the pharmacy. So, for example, a PBM might have a contract with a health plan to be paid $100 whenever prescription drug X is dispensed to a patient in that health plan. However, the PBM then signs a contract with a retail pharmacy promising to reimburse them only $75 for prescription drug X, allowing the PBM to pocket the $25 spread and denying the pharmacy needed revenue. Some states have passed legislation to ban spread pricing. Legislation has been proposed at the federal level but has not yet passed.[12]

4. Driving the Healthcare System to More Expensive Drugs

Rebates are a feature of the branded drug market, not the generic drug market. The reason for this is obvious: the margins on most generic drugs are paper thin so there is not enough revenue per pill for manufacturers to offer meaningful rebates that would incentivize PBMs to push generic drugs in their formularies.

The growth in rebates for branded drugs seems to have had the perverse effect of knocking generic drugs off of the preferred "tier" with the lowest co-pay toward higher tiers where branded drugs typically were placed. For example, a recent study by the healthcare consulting firm Avalere pointed out that, for the first time, Medicare Part D plans had placed the *majority* of generic drugs on non-generic tiers.[13] That study found that: "the *proportion* of generics placed on a generic tier has decreased, steadily falling from 64% in 2016 to 47% in 2020—a 17 percentage point decline."

The rebate problem is particularly acute in the area of biosimilars. While generic drugs are exact copies of branded drugs, biosimilars are copies of biologic drugs that are not identical to the branded drug, but are pharmaceutically "equivalent" to the brand, i.e. "similar."

With the growth in biologic drugs, many times called "specialty drugs," biosimilars held out the promise of reducing overall drug costs because they could be created without all the research and development costs that were required of the original biologic drug. One study estimated that biosimilars would save $54 billion over 10 years.[14] These savings are potentially so significant because, although biologic drugs are only 2 percent of U.S. prescriptions, they represent 37 percent of U.S. spending on drugs.[15]

However, unlike generic drugs, biosimilars are large molecules that are very difficult, and more expensive, to manufacture. Therefore, while biosimilars can be offered at a discount to the original branded biologic because of reduced R&D costs, they cannot be sold at a discount as deep as small molecule generic drugs. The FDA, for example, has estimated that when multiple generics compete with a small molecule branded drug, prices can drop 95 percent compared with the brand price.[16]

For biosimilars, because of their more expensive manufacturing costs, discounts off the brand cannot be this deep. One estimate found that biosimilars were only 10 percent to 37 percent cheaper than the brand.[17] Another study argued that the discounts for the biosimilar were more in the range of 15–16 percent.[18]

Irrespective of the exact level of discounts for biosimilars, the discounts are not so deep that PBMs will automatically prefer the biosimilar to the originator product. If the company that manufactures the originator product offers a

substantial rebate, this may block access to the biosimilar. While there are multiple impediments for biosimilars entering the market, such as patent challenges, rebates are one significant obstacle. As *Forbes* put it: "Rebates paid to pharmacy benefit managers by incumbent biologics companies also play a role in shutting biosimilars out of the market"[19] The CEO of Novartis, a manufacturer of biologics, put it more starkly: "The rebate wall stifles competition by blocking biosimilar access and uptake. We need to tear down the rebate wall and create better contracting models that help patients access cost-saving biosimilar treatments."[20]

The pervasive use of rebates in the U.S. is probably one of the primary reasons that the uptake of biosimilars in Europe is outpacing uptake in the U.S.[21]

The debate over originator drugs versus biosimilars is highly complex. Because biosimilars are not exact copies of the originator drug, policy makers may want to allow doctors the freedom to prescribe either product since subtle differences in the molecule could make a difference for some patients. Moreover, originator companies may point out that if rebates make their products less costly than the biosimilar, what is the issue? Finally, some manufacturers of originator products offer drug coupons to patients that significantly reduce their out-of-pocket costs for the drug: it is hard to argue that patients should take more money out of their pocket for the biosimilar so the "healthcare system" can save money.

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One can, however, reach the tentative conclusion that manufacturers of biosimilars should be able, in the abstract, to offer their products at a discount to originator products because biosimilars entail far lower R&D costs. Yet, biosimilars have been slow to penetrate the market and one important reason is the use of rebates.

5. What Value Do Rebates Bring?

The pervasive and growing use of rebates can be viewed from two perspectives. By extracting significant rebates from manufacturers, PBMs undeniably play a role in reducing drug costs for their clients, potentially providing for lower premiums for patients and lower healthcare costs for employers. In addition, it is possible that rebates provide patients with access to better drugs. We gave an earlier example of how rebates have knocked some generic drugs off of the generic tiers of some Part D plans. While this may inhibit patient access to cheaper generic drugs, it may also provide patients with lower out-of-pocket costs for a newer, better drug. So rebates may have the potential to improve clinical outcomes and healthcare quality.

Yet, with more than $100 billion worth of rebate checks being written each year, one can certainly question whether the overall quality of the healthcare system is improved by these massive payments. As one health plan executive put it, "celebrating a higher rebate is like evaluating your weekly grocery spend by how much you saved by being a club member, not by how much you spent overall and whether you bought appropriate food."[22] If manufacturers are simply hiking list prices to make room for deeper rebates—and there is evidence that they are—how is this improving outcomes, saving money for patients, or providing physicians with broader access to an array of drug therapies? While PBMs certainly have well-regarded clinical staff advising them on formulary management, does the presence of rebates weaken patient care and make formularies less than optimal?

From an academic perspective, there is considerable difficulty in reaching firm conclusions about the influence of rebates on the quality of healthcare because the entire system is opaque. One cannot study the potential influence of rebates because rebate levels, and the negotiations that generate those payments, are completely confidential. Are the quality of formularies improved or degraded through rebate payments? The answer is that we do not know.

There is some evidence that PBM formulary management practices—the practices necessary to secure rebate payments—may have a detrimental impact upon patient care. For example, the oncology community has complained that PBM practices designed to steer patients away from some therapies and towards others cause important delays in treating patients. In 2018, the American Society of Clinical Oncology (ASCO) surveyed hundreds of U.S. oncology practices about their views on PBMs and found that "three-quarters of practices reported that PBMs interfered with patient care and/or made it difficult to get their work done."[23] ASCO argued that there is evidence that: "Delays in cancer care have previously been associated with worse outcomes,and the adverse impact of cancer care delay caused directly by utilization management strategies (eg, prior authorization and step therapy) on outcomes deserves more investigation."

Far more transparency will be required for PBMs to prove that rebate payments improve the quality of healthcare and that formulary management practices do more than simply save money.

This is a hugely important question for the healthcare system as one recent analysis indicates that global PBM revenue will grow from $356 billion in 2018 to $625 billion in 2025.[24] This means that PBM revenues are on par with the combined revenues of the top ten pharmaceutical companies, which were estimated to be $392 billion in 2019.[25] Policymakers require considerably more evidence that the PBM sector, now a behemoth in the healthcare system, brings quality improvements commensurate with their revenues.

Conclusion

Last year, President Trump proposed a rule, that was later withdrawn, to ban rebates in the Medicare program.[26] The administration's unsuccessful venture into the world of rebate reform demonstrates how difficult it is to eliminate a system that has, for many years, been the most efficient way for drug manufacturers to provide discounts to good customers, a common and necessary tool in the business world. While this brief is not proposing a specific reform, we do seek to point out some of the market distortions and patient access restrictions and costs that may be caused by rebates.

The one specific recommendation we make is that the public should be much more aware of how formulary design, out-of-pocket costs, and overall drug prices are very much determined by the rebate system. While we cannot recommend making rebate levels transparent, as it may limit the levels of discounts that are offered, we certainly would recommend more public education and transparency about the rebate system itself. Patients and their physicians should be prompted to ask questions about the drugs that are preferred on their plan's formulary or why their co-pays have been rising. For any PBM practices that may be dubious, we believe sunlight to be the best disinfectant.

That raises the question of how much sunlight is being cast on PBM practices around rebates. We know, of course, that the media covers drug prices extensively. A Google search of "skyrocketing drug prices" produces 676,000 hits. However, because the recent Harvard study indicates that rebates entail 48 percent of the invoice prices of drugs, how informed is the public about the role of rebates in drug pricing and the other potentially adverse effects of high rebate payments. We set off to find out.

We pulled a random sample of 100 media stories that came up from a Google search on drug prices. The stories were pulled at random but we tried to select both national and regional stories with some emphasis upon media outlets in the New England region.

What we found is that, overall, the media is performing poorly in explaining the decisive role of rebates in the pharmaceutical market and in drug pricing. Overall 64 percent of the stories we sampled didn't mention rebates.

Some media outlets performed better than others. The majority of *Wall Street Journal* stories on drug prices discussed the rebate issue. *The Boston Globe* discussed rebates in 7 of 13 of their stories on drug prices.

Some outlets performed less well. For a number of publications, including *The Economist, Politico, the Portland Press Herald, The Providence Journal,* and *The New York Times,* rebates were not mentioned in any story we sampled. Regional New England papers also performed poorly with only 2 stories of 11 mentioning rebates. (For details, see Appendix A.)

The weakness of media coverage of the rebate issue misinforms the public about the true prices of biopharmaceuticals. It also misleads them into thinking that their rising copayments and coinsurance are due to rising drug costs when, in fact, rising out-of-pocket costs are largely due to invoice price inflation driven by the desire for ever-higher rebates.

Appendix A

News Publisher	Yes	No
Wall Street Journal		
Why Drug Companies May Resist Milking Covid-19 Treatments	1	0
Price Controls Would Throttle Biomedical Innovation	0	1
Obscure Model Puts a Price on Good Health - and Drives Down Drug Costs	1	0
Drugmakers, Worried About Losing Pricing Power, Are Lobbying Hard	1	0
Drug Prices Get Washington's Attention Ahead of 2020 Election	1	0
Trump Plans Order to Tie Drug Prices to Other Nations' Costs	0	1
	4	**2**
Boston Globe		
White House abandons plan to eliminate hidden rebates in order to lower drug prices	1	0
Pressure grows on Mass. legislators to rein in high drug prices	0	1
Senate leaders to offer antidote for high drug costs	0	1
MS drug prices are driving up Medicare costs, study says	1	0
Massachusetts Senate zeroes in on drug costs	0	1
House Democrats pass bill to empower Medicare to negotiate drug prices	1	0
Four bills ask Legislature to target high drug prices	1	0
Drug price transparency: Round 2	1	0
Reining in the spending on drugs: What Mass. can learn from other states	1	0
Pharmaceutical industry mounts opposition to state's efforts to curb drug costs	0	1
Charlie Baker's plan to curb drug prices strains his relationship with biotechs	0	1
Deal struck on $43 billion state budget, drug price controls	0	1
Watchdog group cites 7 best-selling drugs it says didn't warrant price increases	1	0
	7	**6**
The Economist		
Why drug prices in America are so high	0	1
The global battle over high drug prices	0	1
	0	**2**
Financial Times		
UK regulator seeks to reinstate £90m fine against Pfizer and Flynn	0	1
Why prescription drugs cost so much more in America	1	0
	1	**1**
Fierce Pharma		
Net prices decline in the first quarter, but the political threat returns	1	0
Can the price be right? With the world watching, Gilead faces a no-win decision on remdesivir	0	1
Maryland, Massachusetts statehouses press drug-pricing bills as feds founder	0	1
Pharma spends big as Massachusetts lawmakers review drug-pricing bills	0	1
State laws trying to force drug price transparency come up short, study says	0	1
Massachusetts puts transparency demands on PBMs as drug spend jumps 4%	1	0
	2	**4**

News Publisher	Yes	No
WBUR		
Mass. Uses Fear Of Public Scrutiny To Secure Deeper Medicaid Discounts From Drugmakers	1	0
Senate Rolling Out Plan to Tame Drug Prices	0	1
Massachusetts, The Innovation Hub, Debates Aggressive Drug Price Controls	1	0
Mass. Residentes Want Government Action on High Drug Prices	0	1
Questions Surround The Role Of Pharmacy Benefit Managers In Driving Drug Prices	0	1
	2	**3**
StatNews		
Regeneron wasn't paying 'kickbacks.' It was helping people pay egregious Medicare copays	1	0
With a new Congress, a window opens to finally bring down drug prices	0	1
Why putting drug prices in ads is a bad idea	1	0
The right way to address prescription drug costs	0	1
John Arnold: Are pharmacy benefit managers the good guys or bad guys of drug pricing?	1	0
Gilead announces long-awaited price for Covid-19 drug remdesivir	0	1
	3	**3**
MassLive		
House Democrats unveil package to enhance Affordable Care Act, reduce health care costs and drug prices	0	1
Massachusetts Senate unanimously approves bill targeting high drug prices	0	1
Lawmakers reach compromise to let MassHealth negotiate drug prices	1	0
Gov. Charlie Baker wants to give MassHealth power to set prices for expensive drugs	1	0
	2	**2**
Providence Journal		
U.S. drug prices fall - first time since 1973	0	1
High costs of prescription drugs increasingly discourage proper use, AARP study finds	0	1
4 things you might not know about prescription drug costs	0	1
R.I's Cicilline backs bill to lower drug costs by allowing Medicare to negotiate prices	0	1
	0	**4**
Hartford Courant		
Federal law can keep prescription prices down	0	1
Lawmakers rally support for wide-ranging bill to lower cost of prescription drugs	0	1
Critics say 'pharmacy benefit managers' are driving up cost of drugs, forcing independent pharmacies out of business	1	0
From $27 to $196 a bottle: Connecticut generic drug lawsuit alleges consumers paid for drug companies' greed	0	1
	1	**3**
Framingham Source		
Coalition of Attorney Generals Sue 26 Pharmaceutical Companies & 10 Others on Price-Fixing 80 Drugs	0	1
Sen. Warren Introduces Legislation to Boost U.S. Pharmaceutical Manufacturing Capacity & End Over-Reliance on Critical Drugs From Foreign Countries	0	1
	0	**2**

News Publisher	Yes	No
Portland Press Herald		
Commentary: Congress has an opportunity to lower drug costs – and there's no time to waste	0	1
Maine Voices: U.S. House-passed bill would cut drug prices	0	1
	0	**2**
Concord Monitor		
My Turn: A bill that will bring down drug prices for everyone	0	1
Our Turn: Health insurance bait and switch must end	0	1
NYTimes		
Major Insurers Pledge $55 Million to Try to Lower Generic Drug Prices	0	1
Remdesivir, the First Coronavirus Drug, Gets a Price Tag	0	1
	0	**2**
Health Affairs		
Prescription Drug Policy: The Year in Review, And the Year Ahead	1	0
Alternative Drug Purchasing Arrangements Do Not Justify Raising The Prices Medicaid Pays For Brand Drugs	1	0
	2	**0**
Politico		
2020 drug price increases unlikely to change policy	0	1
'Hot spotting' doesn't work. So what does?	0	1
	0	**2**
Other New England Newspapers		
Kate Luczko: Let's lower our prescription drug costs	0	1
Guest View: NH must address prescription drug affordability now	0	1
Rising drug prices a tough pill for many in RI	0	1
90% of Americans fear pharma will use Covid-19 pandemic to raise drug costs	0	1
Massachusetts legislators help pass federal bill to lower prescription drug prices	0	1
PBMs driving up drug and insurance prices, critics say	1	0
Aide: Gov. Baker's drug pricing plan has already saved the state millions of dollars	0	1
Drug industry riled by state cost report	1	0
State Senate Passes Prescription Drug Price Bill	0	1
Jim Kenyon: Containing prescription costs may hinge on politics	0	1
Remdesivir – An Important First Step	0	1
	2	**9**
Other Newspapers		
New Risks, New Rewards, New Exposure	1	0
Most Americans concerned about rising drugs costs amid COVID-19, Gallup says	0	1
Companies have raised prices on 245 drugs during pandemic, advocacy group says	0	1
The CEO of Novartis on Developing Drugs During a Pandemic	0	1
Invisible Middlemen Are Slowing Down American Health Care	1	0
State Policy Options To Reduce Prescription Drug Spending	1	0
Pricing and Payment for Medicaid Prescription Drugs	1	0
Perspectives: When It Comes To Curbing High Drug Costs, Good Intentions Aren't Enough To Cut It	0	1

News Publisher	Yes	No
Numerous State Laws and Pending Bills Intended to Address Rising Drug Prices	1	0
Examining the Impact of HIV Drug Costs on Medicare Patients	0	1
US report: Prescription drug prices down slightly last year	1	0
With $200M Series A, EQRx aims to tackle high drug prices	0	1
With Rising Drug Prices a Concern, Some Companies Enact Their Own Control Plans	0	1
COVID-19 Drug Pricing: A Pivotal Point for Pharma	0	1
Market for Compounded Drugs Needs Greater Transparency and Regulatory Certainty	0	1
Pandemic profiteering: Gilead Sciences cashes in on COVID-19	0	1
Why Are Insulin Prices Still So High for U.S. Patients?	1	0
Negotiation: A three-step solution to affordable prescription drugs	1	0
New tuberculosis treatment for developing countries to cost $1,040	0	1
Drug Prices in US Continue to Soar; Are Profits Too High?	0	1
To Control Drug Prices, States May Have to Face Off Against Feds	1	0
Capping Patients' Insulin Costs on Agenda in Several States	0	1
Price increases largely to blame for $3 billion spending hike on biologic DMARDs	1	0
Mass. HPC: Transparency for PBM Spread Pricing	0	1
Is the Medication You're Taking Worth Its Price?	0	1
	14	**33**

Endnotes

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About the Author

Dr. William S. Smith is Visiting Fellow in Life Sciences at Pioneer Institute. He writes about public policy issues impacting the life sciences industry with particular emphasis upon pharmaceuticals. Dr. Smith has 25 years of experience in government and in corporate roles. He spent ten years at Pfizer as Vice President of Public Affairs and Policy. He later served as a consultant to major pharmaceutical, biotechnology and medical device companies, and was President of a small medical device company for three years. His career has also included senior staff positions for the Republican House leadership on Capitol Hill, the White House, and in the Governor's office in Massachusetts. He is affiliated as Research Fellow and Managing Director with the Center for the Study of Statesmanship at The Catholic University of America (CUA). He earned his PhD at CUA and a bachelor's degree from Georgetown University.

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