

# Rising Drug Prices and the Strain on the American Healthcare System

An STS Research Paper  
presented to the faculty of the  
School of Engineering and Applied Science  
University of Virginia

by

Ben Osborne

March 26, 2020

On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Signed: Ben Osborne

Approved: \_\_\_\_\_ Date \_\_\_\_\_  
Peter Norton, Department of Engineering and Society

## **Rising Drug Prices and the Strain on the American Healthcare System**

Americans spent \$3.2 trillion on healthcare (almost \$10,000 per person on average) in 2015, accounting for 17.8 percent of the U.S. gross domestic product (GDP) (Branning & Vater, 2016). In a study of healthcare spending in the United States and 10 other high-income (mainly European) countries, Emanuel (2018) found that the US spends approximately twice as much on medical care and that the “prices of labor and goods, including pharmaceuticals, and administrative costs appeared to be the major drivers of the difference in overall cost.” Drug prices have most directly impacted American consumers as drug manufacturers have increased their product prices. Per capita prescription drug spending in the US exceeds that in all other countries. In 2013, per capita spending on prescription drugs in the US was \$858, compared with an average of \$400 for 19 other industrialized nations (Kesselheim et al., 2016). Manufacturers may set high drug prices in part due to market exclusivity, conferred by patents (Kesselheim et al., 2016). Pharmaceutical companies defend such protections as essential to research and development.

How are interest groups competing to influence drug prices in U.S. healthcare? Pharmaceutical companies, pharmacy benefit managers, and health insurance providers, which are the main players in establishing drug prices for patients, have all acknowledged that rising drug prices are hurting American consumers. However, these industries have a history of shifting blame amongst each other, with none of the three taking direct responsibility for their respective role in rising drug prices.

## Review of Research

The pharmaceutical industry insists that its direct control over drug prices ensures future financing of research and development of innovative products, while critics argue that restrictive pricing policies will not diminish innovation. Eli Lilly CEO David Ricks suggests that drug prices would still soar if drug prices are capped; “There’s a lot of rhetoric in the air, and most of it non-productive. We could cap that forever, and what we get is less innovation and still have growing health-care costs” (Lovelace, 2019). According to Moreno & Epstein (2019), no robust empirical evidence supports a direct causal relationship between greater firms’ profit margins and the generation of more innovation. However, in an analysis of longitudinal data from 1,347 U.S. firms from 1990-2004, Brown et al. (2008) determined that supply shifts in finance (in both cash flow and stock market investment) have an aggregate effect on R&D investment. However, evidence suggests drug price increases cover up annual revenue declines.

Prescription drug price rebates in Medicare Part D affect drug pricing. Critics of rebates argue that they have increased the costs patients pay out of pocket and through Medicare as a whole, while defenders contend that rebates help lower overall drug costs through negotiations between pharmaceutical manufacturers and health plan sponsors or the pharmacy benefit manager working on the plan’s behalf. Dusetzina et al. (2017) found that, over time, the difference between net and list prices for drugs in the US has widened, partly due to increases in list prices and growing rebate percentages. For example, the average rebate for prescription drugs in the Medicare Part D program rose from 8.6 percent in 2006 to 14.3 percent in 2014 (Dusetzina et al., 2017). Aitken et al. (2016) contends that two market developments explain why list drug prices and rebates have risen together: the growing importance of pharmacy benefit managers and the increasing share of people who pay list prices for pharmaceuticals.

Many researchers have exposed gross increases in drug prices within the last decade. An economic evaluation by Wineinger et al. (2019) found that of 49 common top-selling brand-name drugs, 78 percent of the drugs that have been available since 2012 have seen an increase in insurer and out-of-pocket costs by more than 50 percent, and 44 percent have more than doubled in price. Beyond brand-name drugs, less commercially available lifesaving drugs have seen steep price increases. Gupta et al. (2016) document steep rises in drug prices of naloxone, a heroin overdose drug. They report that only Amphastar manufactures 1-mg-per-milliliter injections, which after a 95 percent price increase in September 2014 now cost \$39.60 each. A two-dose Evzio package was priced at \$690 in 2014 but is \$4,500 today, a price increase of more than 500 percent in just over two years.

Various participants in the drug pricing system are at fault for increasing drug prices. Kesselheim et al. (2016) in a review of medical and health policy literature determined the availability of generic drugs after patent expirations is an important means of reducing drug prices, but pharmaceutical companies have delayed their availability via business and legal strategies. They also determined another key contributor to drug spending is physician prescribing choices when comparable alternatives are available at different costs (Kesselheim et al., 2016). Drettwan & Kjos (2019) contend that controversial practices of pharmacy benefit managers have incentivized driving formulary status and prohibited pharmacists from disclosing information on lower-cost prescription alternatives. Finally, a survey conducted by Haren and McConnell (2009) revealed that cost-shifting leads to undesirable health and cost consequences and has largely failed to slow health cost growth, but health insurers rely on this modality as their primary cost-containment strategy.

In a review of drug life cycles, therapeutic drug markets, and regulatory frameworks, van der Gronde et al. (2017) attributed high prices in part to changes in drug life-cycle dynamics, to the unintended effects of patent legislation, to public policy, and to orphan drug programs. However, in a risk-return analysis Popa et al. (2018) contend: “Drawing conclusions based on industry profitability only is inappropriate as such analysis does not account for risks faced by investors.” They note that from 2004 to 2016, the biopharmaceutical industry’s risk-adjusted return on investment did not exceed that of other industries. Johns Hopkins health policy expert Gerard Anderson (2017) argues: “The objective is getting the prices lowered so that everybody can afford the drugs, but at the same time bringing enough money onto the system – increasing the volume – so that pharmaceutical companies can continue to innovate” (Gerard Anderson, 2017). Patent reform, reference pricing, outcome-based pricing, and incentivizing physicians and pharmacists to prescribe low-cost drugs are among the most promising short-term policy options, but their effects on patient treatment, drug innovation, and doctor’s practices are unsettled (van der Gronde et al., 2017).

## **Patients**

Those most impacted by increasing drug prices are patients. The American Medical Association states, “Prescription drug price increases can lead some patients to not be able to afford critical medicine, causing them to skip doses of their medications or split pills, or force them to abandon treatment altogether” (AMA, 2019). The exorbitant prices of specific drugs can cause incredible burden for patients with rare diseases as well. According to the American Hospital Association: “It is estimated that 5 percent of U.S. patients account for nearly half of the country’s health care expenditures” (AHA, 2017). Also, one in four families reported difficulty

in paying for their prescriptions (Kaiser Family Foundation, 2016), and 19 million Americans or 8 percent of the population are purchasing their medicines overseas due to high drug prices (Kaiser Family Foundation, 2016).

Patients and hospitals want affordable drugs. The advocacy Patients for Affordable Drugs commented in a press release: “Eighty-six percent of Americans – majorities of Democrats, Republicans, and Independents – support allowing Medicare to negotiate for lower prescription drug prices” (PFAD, 2019). According to a POLITICO-Harvard T.H. Chan School of Public Health poll, lowering prescription drug prices was cited as the most critical issue by voters (POLITICO, 2017). Hospitals bear a heavy financial burden when the cost to buy drugs increases; not only in the purchase price, but in patients who end up in the hospital when they cannot afford their medications (Morse, 2019). Hospitals must pay for drugs too when insurance and patients fail to. A study released by the American Hospital Association revealed that providers dealing with higher costs must make cuts elsewhere. Specifically, 25 percent of those responding to the study said they had cut staff and 17 percent said they had cut services (Morse, 2019).

### **Pharmaceutical Companies**

The unique nature of the pharmaceutical industry’s market complicates the task of setting prices. In many traditional industries with a competitive market, firms often set prices only slightly higher than the marginal cost of producing an additional good, because in most industries fixed costs (e.g., capital equipment, R&D, and other overhead) are relatively low compared with total costs of production. However, setting prices close to marginal cost does not work for innovation industries—including biopharmaceuticals—wherein the marginal cost of

producing another good (e.g., a pill or dose) is usually relatively small in comparison with the overall fixed costs, especially research, development, and testing (Kennedy, 2019).

Pharmaceutical companies must also recoup the costs of failed drugs. The market dynamics of the pharmaceutical industry are indeed often cited by industry leaders and opponents of Big Pharma to substantiate claims regarding the validity and ethics involved in recent rises in drug prices.

Pharmaceutical companies assert that drug pricing practices are in the interests of R&D and innovation. The Pharmaceutical Research and Manufacturers of America (PhRMA) claims: “Despite what critics say, the U.S. biopharmaceutical industry spends three times more on the research and development (R&D) of new treatments and cures than on the marketing and promotion of medicines” (Campbell, 2019). Pfizer CEO Ian Read said, “We feel we appropriately price our products to the value in the marketplace, and that’s essential for free market systems where you need to recover and direct resources to further innovation” (Berkot, 2017). Finally, the Biotechnology Innovation Organization (BIO) (the world’s largest trade association representing biotechnology companies, academic institutions, and state biotechnology centers) claims, “Without doubt, government-imposed price controls in the largest market in the world would seriously harm investment in the next generation of medical breakthroughs” (BIO, 2016).

Large and increasing percentages of operating expenses do contribute to R&D for the biggest players in the industry. On Merck’s latest earning call, CFO Robert Davis stated that R&D expenses accounted for just over 28 percent of Merck’s operating expenses, and the company expects to see an increase in innovation spending faster than sales over the next couple of years as the company makes investments in combination studies for Keytruda as well as

further investment in cancer drugs Lynparza and Lenvima (Shoib et al., 2019). Bristol-Myers Squibb Co. in testimony before the Senate Finance Committee hearing on drug prices in February 2019 asserted that just over 31 percent of its operating expenses contributed to R&D in 2018 (*Drug Pricing in America*, 2019). Notably, however, the company spent only \$4.9 billion in R&D in 2017, while \$11.5 billion was spent on dividends, stock buybacks, marketing, sales and administrative costs that same year (Shoib et al., 2019). Pfizer Inc., AbbVie Inc., and AstraZeneca PLC also contributed 20.8, 25.2, and 26.5 percent of operating expenses toward R&D, respectively, in 2018 (*S&P Global Market Intelligence*, 2019).

Although industry leaders and groups within the Pharmaceutical industry support necessary drug price increases to support R&D and innovation, there is a clear trend that annual drug price increases result from revenue declines. Specifically, for at least the last decade, revenue declines have been large for many pharmaceuticals because blockbuster drugs for treating cholesterol, blood pressure, diabetes, depression, and acid reflux have all become generic (Engelberg, 2019). In order to avoid reporting lower revenue and profits, drug manufactures have often increased the prices of drugs that remain protected by patents. An annual report published in 2017 by the QuintilesIMS Institute found that lost revenue from patent expirations was \$185 billion whereas revenues gained from new medicines was only \$169 billion. Generic drug use rose from 72 to 90 percent of all prescriptions (Aitken, 2017). While R&D considerations are crucial for determining the necessary portion of net revenue required for reinvestment in drug development programs, price increases within the last decade were obligatory to maintain revenues and profits in a shrinking market for new medicines.

The Pharmaceutical industry has also argued that drug prices have not dramatically increased. According to the Biotechnology Innovation Organization (BIO), prescription drugs



costs have been very stable in recent years. BIO claims: “Prescription medicines comprise just 14 percent of all health care spending, which is roughly the same share as in 1960.” This claim is remarkable considering that more than 450 new medicines have been brought to market between 1999 and 2014 (Altarum, 2015). In fact, the American Medical Association (AMA) states, “In 1990, the share the nation spent for pharmaceuticals accounted for 5.6 percent of total health care spending, but grew to nearly 10% in 2017” (American Medical Association, 2019). Healthcare spending as a whole too has increased drastically since the 1960s. Health spending totaled \$74.6 billion in 1970, \$1.4 trillion by 2000, and \$3.6 trillion in 2018 (Kamal et al., 2019). The increases in total healthcare spending over the past several decades is a direct result of rising prescription medicine, hospital, and healthcare spending, among many other expenses. However, BIO contends that payments to doctors and hospitals drive future healthcare spending, as these payments are expected to grow by a combined \$1.1 trillion over the next decade (BIO, 2016).

Pharmaceutical companies have used the patent system to a great degree to protect drug products from competitors and maintain high prices. At the Biotechnology Innovation Organization’s International Convention in 2014, USPTO Deputy Director Michelle K. Lee stated that about 30,000 patents were granted in the “Drug, Bio-Affecting and Body Treating Compositions” classification since 2009 (Lee, 2014). According to a report by the Initiative for Medicines, Access, and Knowledge (I-MAK), they found that, on average, across the top 12 grossing drugs in America: there are 125 patent applications filed and 71 granted patents per drug, there are 38 years of attempted patent protection blocking generic competition sought by drug makers for each of these top grossing drugs, and over half of the top 12 drugs in America have more than 100 attempted patents per drug (I-MAK, 2019). The Association for Accessible Medicines (AAM) argues that too often some brand-name drug companies attempt to patent

features of drugs that do not represent true innovation. Instead, some attempt to bury competition from generic and biosimilar drugs indefinitely by finding ways to repackage existing inventions in later patents. These “patent thickets” deter competition by discouraging competitors from entering a market because of the exorbitant cost of litigating meritless patents (AAM, 2020).

Although the pharmaceutical industry has presented and defended many arguments defending the current drug pricing system, the industry has also pitched ideas to reduce drug prices. At the 2020 J.P. Morgan Healthcare Conference, CEOs from the world’s largest pharmaceutical companies pitched ideas for lowering drug prices; none, however, offered to cut prices on any of their own drugs (Lovelace, 2020). Regeneron CEO Leonard Schleifer suggested adding an out-of-pocket maximum for beneficiaries through changes to Medicare, while Pfizer CEO Albert Bourla supported passing rebates paid to pharmacy benefit managers through consumers, arguing the current system drove up list prices and out-of-pocket costs. Bristol-Myers Squibb CEO Giovanni Caforio and Roche CEO Bill Anderson blamed hospitals for marking up the price of medicines, sometimes by triple-digit percentages (Lovelace, 2020). Finally, Eli Lilly CEO David Ricks blamed health insurers for high drug costs, stating that they ultimately determine what patients pay at the pharmacy counter (Lovelace, 2020).

### **Pharmacy Benefit Managers**

Pharmacy Benefit Managers (PBMs) play an important role in how drugs are priced. PBMs are companies hired by insurers to manage drug benefit programs and act as intermediaries between insurers, manufacturers, and pharmacies (ACA, 2015). They negotiate upfront discounts on the prices of prescription drugs with pharmaceutical companies, as well as rebates, which reward favorable coverage of a particular drug. These prescription drug

agreements are held secret, so it is unknown if savings ever reach patients (American Medical Association, 2019). Although PBMs are supposed to pass these negotiated savings on to patients, excess rebates and fees are often retained by PBMs rather than passing lower prices on to patients. Specifically, when patients obtain drugs from the pharmacy, they are charged a copay based on the list price rather than a negotiated price. This co-payment is often higher than the cash price, and pharmacies are often prohibited by PBM contracts from informing patients about this cost-saving opportunity (ACA, 2015).

The PBMs industry argues that they are advocates for consumers by fighting for prescription drug accessibility and affordability. According to the Pharmaceutical Care Management Association (PCMA), the national association representing America's pharmacy benefit managers, by the use of "...advanced tools to manage pharmacy benefits, such as negotiating price concessions from drug manufacturers, improving patient adherence to prescribed medications, encouraging the use of generic drugs, managing high-cost medications, and offering more affordable pharmacy channels, PBMs have achieved an overall stable drug trend for prescription costs" (PCMA, 2020). The PCMA also argue that PBMs facilitate patient pharmacy care management and provide real-time information to physicians and patients so they know, when a drug is prescribed, whether it is on the formulary and the patient's cost-sharing obligation. Finally, the PCMA also states, "One of the most important functions PBMs perform is negotiating price concessions with drug manufacturers to lower costs for consumers" (PCMA, n.d.).

Contrary to the PCMA's positions regarding PBMs benefits to consumers, the American Medical Association (AMA) determined that PBMs may not have, and do not have an incentive to act in favor of consumers. Specifically, the AMA Council on Medical Service "believes that

PBMs' role managing drug benefits now resembles the typical role of insurers, and they should be treated as such by regulators" (Hinsdale, 2019). The council determined that the negative fluidity of drug benefits are largely a result of the rebate system and the constant negotiations that take place to advance the interests of many drug benefit stakeholders, but not patients (Hinsdale, 2019). How much of the savings from rebates are passed on to patients or payers is undisclosed. The degree to which savings are passed on to payers and patients impacts health plan premiums as well as cost-sharing requirements (American Medical Association, 2019). Overall, the AMA Council on Medical Service determined that, "The opaque nature of PBM negotiations of drug prices has raised questions whether the rebate process results in list prices above what they would be absent rebates, as neither PBMs nor drug manufacturers currently have an incentive to lower list prices" (Hinsdale, 2019).

### **Health Insurance Companies**

Although pharmaceutical companies determine drug list prices and Pharmacy Benefit Managers negotiate prices between the pharmaceuticals and health insurers, health insurance companies directly determine the price patients pay for drugs out of pocket. These out of pocket costs include deductibles, coinsurance, and copayments for covered services plus all costs for services that are not covered (HealthCare.gov, n.d.). Under a health care plan, the list of covered prescription drugs is called a formulary, and this formulary is usually divided into tiers of coverage based on the type or usage of particular medications. Each tier has defined out-of-pocket costs that patients must pay before receiving their prescriptions (Patient Advocate Foundation, 2019). These tiers are derived in order for health insurance companies to balance the premiums they charge against drug costs.

The health insurance industry argues that pharmaceutical companies are to blame for high drug prices. The trade organization America's Health Insurance Plans (AHIP) states, "Big Pharma knows insurance providers want to keep patient costs down, so they manipulate the system to keep prices as high as possible, hold on to their monopoly power, and point the finger at everyone but themselves" (AHIP, 2019). The President and CEO of AHIP stated: "The problem is the price of drugs ... drug makers must be held accountable to lower prices for consumers and patients" (Grow, 2019). The health insurance industry also supports the role of PBMs in negotiating beneficial drug prices for consumers. Specifically, the AHIP argues that health insurance providers and PBMs use their bargaining power to negotiate a significant discount from pharmaceuticals via rebates, and therefore a lower net price for patients (AHIP, 2019).

Health insurers have also suggested that close relationships between doctors and pharmaceutical companies have impacted drug affordability. According to a report by ProPublica cited by Matt Eyles, AHIP President and CEO, direct cash payments to doctors from pharmaceuticals amounted to more than \$10 billion between 2014 and 2019 (Charles Ornstein, 2019). Matt Eyles also argues, "pharmaceutical companies have provided gifts, meals, high-end trips, and other items of value to physicians, but drugmakers also make direct cash payments to physicians for various services provided on the drugmaker's behalf" (AHIP, 2019). Pharmaceutical industry influence has led some physicians to neglect price in determining a prescription. In a review, Davari et al. (2018) determined that in 33 studies of factors that influence prescription decisions, doctors' personal attributes, cost of medicine, and pharmaceutical industries' marketing and promotion strategies were mentioned most.

Transparency in drug pricing and in the drug distribution system is crucial to not only understand factors that drive the escalating out-of-pocket costs to patients, but to also hold the major participants in drug pricing accountable. While existing and publicly available data can be used to draw fault amongst each major participant in drug pricing, the same data has been used by the industries to blame others in the system. There is demonstrable fault held between pharmaceutical companies, pharmacy benefit managers, health insurance companies, and hospitals and their physicians, but without clear transparency amongst these players in drug pricing, blame will continue to be shifted between them. Patent reform, reference pricing, outcome-based pricing, and incentivizing physicians and pharmacists to prescribe low-cost drugs are promising short-term policy options, but avoid holding specific industries accountable. Policy actions that reveal contracts between pharmaceuticals and pharmacy benefit managers, publish health insurers and pharmacy benefit manager's negotiations, and distribute available cost savings information to patients at the pharmacy constitute just a few potentially profound policy options that hold major players in the healthcare industry accountable. To preserve and strengthen the drug pricing system's integrity, health care stakeholders should promote policies that maintain innovation and competition, while also upholding greater transparency for patients.

## References

- ACA (n.d.) American College of Rheumatology. Pharmacy Benefit Managers Are Driving Up Drug Costs for Patients. (n.d.). [www.rheumatology.org/Portals/0/Files/Issue-Brief-Pharmacy-Benefit-Manager-Transparency.pdf](http://www.rheumatology.org/Portals/0/Files/Issue-Brief-Pharmacy-Benefit-Manager-Transparency.pdf).
- Altarum Institute (2015). A Ten Year Projection of the Prescription Drug Share of National Health Expenditures Including Non-Retail. [altarum.org/sites/default/files/uploaded-publication-files/Non-Retail%20Rx%20Forecast%20Data%20Brief\\_with%20Addendum.pdf](http://altarum.org/sites/default/files/uploaded-publication-files/Non-Retail%20Rx%20Forecast%20Data%20Brief_with%20Addendum.pdf).
- AAM (2020). Association for Accessible Medicines. Abuse of the Patent System Is Keeping Drug Prices High for Patients. [accessiblemeds.org/campaign/abuse-patent-system-keeping-drug-prices-high-patients](http://accessiblemeds.org/campaign/abuse-patent-system-keeping-drug-prices-high-patients)
- Aitken, M. (2017, May). *Medicine Use and Spending in the U.S.* [structurecms-staging-psyclone.netdna-ssl.com/client\\_assets/dwonk/media/attachments/590c/6aa0/6970/2d2d/4182/0000/590c6aa069702d2d41820000.pdf?1493985952](http://structurecms-staging-psyclone.netdna-ssl.com/client_assets/dwonk/media/attachments/590c/6aa0/6970/2d2d/4182/0000/590c6aa069702d2d41820000.pdf?1493985952).
- Aitken, M., Berndt, E. R., Cutler, D., Kleinrock, M., & Maini, L. (2016). Has the Era of Slow Growth for Prescription Drug Spending Ended? *Health Affairs (Project Hope)*, 35(9), 1595–1603. doi.org/10.1377/hlthaff.2015.1636.
- American Hospital Association (2017). *Improving Care for High-Need, High-Cost Patients*. [www.hpoe.org/Reports-HPOE/2017/improving-care-for-high-need-high-cost-patients.pdf](http://www.hpoe.org/Reports-HPOE/2017/improving-care-for-high-need-high-cost-patients.pdf).
- Are prescription drug costs out of control? (2016, July 20). Drugcostfacts.Org. [www.drugcostfacts.org/us-healthcare-spending](http://www.drugcostfacts.org/us-healthcare-spending).
- Berkot, B. (2017). Pfizer CEO says no need to alter its drug pricing practices. Reuters. [www.reuters.com/article/us-pfizer-results-idUSKBN15F1B9](http://www.reuters.com/article/us-pfizer-results-idUSKBN15F1B9)
- Branning, G., & Vater, M. (2016). Healthcare Spending: Plenty of Blame to Go Around. *American Health & Drug Benefits*, 9(8), 445-47.
- Bristol-Myers Had Largest Proportion of Operating Expenses Going Toward R&D in 2018 (%). (2019). S&P Global Market Intelligence.
- Brown, J., Fazzari, S., & Peterson, B. (2008, April 12). Financing Innovation and Growth: Cash Flow, External Equity, and the 1990s R&D Boom. *Journal of Finance*. [papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1000382](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1000382).
- Campbell, H. (2019, Oct. 3). The Truth about the Marketing and Promotion of Medicines. Phrma.org. [catalyst.phrma.org/the-truth-about-the-marketing-and-promotion-of-medicines](http://catalyst.phrma.org/the-truth-about-the-marketing-and-promotion-of-medicines).

- Charles Ornstein, T. W. (2019, Oct. 17). *We Found Over 700 Doctors Who Were Paid More Than a Million Dollars by Drug and Medical Device Companies ProPublica*. [www.propublica.org/article/we-found-over-700-doctors-who-were-paid-more-than-a-million-dollars-by-drug-and-medical-device-companies](http://www.propublica.org/article/we-found-over-700-doctors-who-were-paid-more-than-a-million-dollars-by-drug-and-medical-device-companies).
- Davari, M., Khorasani, E., & Tigabu, B. M. (2018). Factors Influencing Prescribing Decisions of Physicians: A Review. *Ethiopian Journal of Health Sciences*, 28(6), 795–804. [doi.org/10.4314/ejhs.v28i6.15](https://doi.org/10.4314/ejhs.v28i6.15).
- Drettwan, J. J., & Kjos, A. L. (2019). An Ethical Analysis of Pharmacy Benefit Manager (PBM) Practices. *Pharmacy: Journal of Pharmacy Education and Practice*, 7(2). [doi.org/10.3390/pharmacy7020065](https://doi.org/10.3390/pharmacy7020065).
- Drug Price Negotiations & Rebates (n.d.). PCMA. [www.pcmanet.org/policy-issues/drug-price-negotiations-rebates-2](http://www.pcmanet.org/policy-issues/drug-price-negotiations-rebates-2).
- Drug Pricing in America: A Prescription for Change, Part II*, Senate (2019). [www.finance.senate.gov](http://www.finance.senate.gov).
- Emanuel, E.J. (2018). The Real Cost of the U.S. Health Care System. *JAMA*, 319(10), 983-85. [doi.org/10.1001/jama.2018.1151](https://doi.org/10.1001/jama.2018.1151).
- Engelberg, A. (2019, Feb. 28). A Shortfall in Innovation Is the Cause of High Drug Prices *Health Affairs*. [www.healthaffairs.org/doi/10.1377/hblog20190228.636555/full](http://www.healthaffairs.org/doi/10.1377/hblog20190228.636555/full).
- Gerard Anderson (2017, April 3). Examining the rising costs of prescription drugs in the U.S., and possible alternatives. *The Hub*. [hub.jhu.edu/2017/04/03/drug-pricing-health-policy-expert-gerard-anderson](http://hub.jhu.edu/2017/04/03/drug-pricing-health-policy-expert-gerard-anderson).
- Grow, K. (2019, Sep. 19). AHIP Issues Statement on House Speaker Nancy Pelosi’s Drug Pricing Plan. *AHIP*. [www.ahip.org/ahip-issues-statement-on-house-speaker-nancy-pelosis-drug-pricing-plan](http://www.ahip.org/ahip-issues-statement-on-house-speaker-nancy-pelosis-drug-pricing-plan).
- Haren, M.C., & McConnell, K. (2009). Patient Cost-Sharing on the Rise: Results from the Benefit Design Index. *American Health and Drug Benefits*, 2(2), 70-77.
- Hinsdale, J. (2019). *Report 5 of the Council on Medical Service (A-19)* (no. 19). American Medical Association. [www.ama-assn.org/system/files/2019-07/a19-cms-report-5.pdf](http://www.ama-assn.org/system/files/2019-07/a19-cms-report-5.pdf).
- How Are Prescription Drug Prices Determined?* (2019, April 9). American Medical Association. [www.ama-assn.org/delivering-care/public-health/how-are-prescription-drug-prices-determined](http://www.ama-assn.org/delivering-care/public-health/how-are-prescription-drug-prices-determined).
- How Big Pharma Plays Games to Manipulate the System & Pad Profits (2019, July 29). AHIP. [www.ahip.org/the-house-playing-itself/](http://www.ahip.org/the-house-playing-itself/).



- Kaiser Health Tracking Poll: November 2016* (2016, Nov.). Henry J. Kaiser Family Foundation. [files.kff.org/attachment/Kaiser-Health-Tracking-Poll-Nov.-2016-Topline](https://files.kff.org/attachment/Kaiser-Health-Tracking-Poll-Nov.-2016-Topline).
- Kaiser Health Tracking Poll: September 2016* (2016, Sep.). Henry J. Kaiser Family Foundation. [files.kff.org/attachment/Kaiser-Health-Tracking-Poll-Sep.-2016](https://files.kff.org/attachment/Kaiser-Health-Tracking-Poll-Sep.-2016).
- Kamal, R., McDermott, D., & Cox, C. (2019, Dec. 20). How Has U.S. Spending on Healthcare Changed Over Time? *Peterson-Kaiser Health System Tracker*. [www.healthsystemtracker.org/chart-collection/u-s-spending-healthcare-changed-time](http://www.healthsystemtracker.org/chart-collection/u-s-spending-healthcare-changed-time).
- Kennedy, J. (2019). *The Link Between Drug Prices and Research on the Next Generation of Cures*. Information Technology and Innovation Foundation. [itif.org/publications/2019/09/09/link-between-drug-prices-and-research-next-generation-cures](https://itif.org/publications/2019/09/09/link-between-drug-prices-and-research-next-generation-cures).
- Kesselheim, A.S., Avorn, J., & Sarpatwari, A. (2016). The High Cost of Prescription Drugs in the United States: Origins and Prospects for Reform. *JAMA*, *316*(8), 858-71. [doi.org/10.1001/jama.2016.11237](https://doi.org/10.1001/jama.2016.11237).
- Lee, M. (2014, June 25). *The Benefits of IP in the Biotech and Pharmaceutical Industries*. [www.uspto.gov/about-us/news-updates/benefits-ip-biotech-and-pharmaceutical-industries](http://www.uspto.gov/about-us/news-updates/benefits-ip-biotech-and-pharmaceutical-industries).
- Lovelace, B. (2019, July 30). *Eli Lilly CEO to 2020 candidates: Capping drug prices would not lead to lower health-care costs*. CNBC. [www.cnbc.com/2019/07/30/eli-lilly-ceo-david-ricks-drug-price-caps-will-not-lower-health-costs.html](http://www.cnbc.com/2019/07/30/eli-lilly-ceo-david-ricks-drug-price-caps-will-not-lower-health-costs.html)
- Lovelace, B. (2020, Jan. 16). *Pharma Execs Pitch Ideas at #JPM20 to Lower Drug Costs. None of Them Include Dropping Their Own Prices*. CNBC. [www.cnbc.com/2020/01/16/at-jpm-big-pharma-execs-insist-high-drug-costs-are-not-their-fault.html](http://www.cnbc.com/2020/01/16/at-jpm-big-pharma-execs-insist-high-drug-costs-are-not-their-fault.html).
- Moreno, S.G., & Epstein, D. (2019). The price of innovation: The role of drug pricing in financing pharmaceutical innovation. A conceptual framework. *Journal of Market Access & Health Policy*, *7*(1). [doi.org/10.1080/20016689.2019.1583536](https://doi.org/10.1080/20016689.2019.1583536).
- Morse, S. (2019, Feb. 8). High Drug Prices: Who's Really to Blame? *Healthcare Finance News*. [www.healthcarefinancenews.com/news/high-drug-prices-whos-really-blame](http://www.healthcarefinancenews.com/news/high-drug-prices-whos-really-blame).
- Out-of-Pocket Costs—HealthCare.gov Glossary. (n.d.). HealthCare.Gov. [www.healthcare.gov/glossary/out-of-pocket-costs](http://www.healthcare.gov/glossary/out-of-pocket-costs).
- Overpatented, Over Priced: How Excessive Pharmaceutical Patenting is Extending Monopolies and Driving up Drug Prices*. (2019). Initiative for Medicines, Access, and Knowledge. [www.i-mak.org/wp-content/uploads/2018/08/I-MAK-Overpatented-Overpriced-Report.pdf](http://www.i-mak.org/wp-content/uploads/2018/08/I-MAK-Overpatented-Overpriced-Report.pdf).

Patients for Affordable Drugs. (2019, Sep. 25). *Patients to Congress: Let Medicare Negotiate*. Patients for Affordable Drugs. [www.patientsforaffordabledrugs.org/2019/09/25/let-medicare-negotiate-2](http://www.patientsforaffordabledrugs.org/2019/09/25/let-medicare-negotiate-2).

PBMs Will Save Health Plan Sponsors and Consumers More Than \$1 Trillion on Prescription Drugs. (2020, Feb. 19). *PCMA*. [www.pcmanet.org/pbms-will-save-health-plan-sponsors-and-consumers-more-than-1-trillion-on-prescription-drugs](http://www.pcmanet.org/pbms-will-save-health-plan-sponsors-and-consumers-more-than-1-trillion-on-prescription-drugs).

Popa, C., Holvoet, K., Van Montfort, T., Groeneveld, F., & Simoens, S. (2018). Risk-Return Analysis of the Biopharmaceutical Industry as Compared to Other Industries. *Frontiers in Pharmacology*, 9. doi.org/10.3389/fphar.2018.01108.

Public's Views of Tax Reform and other Domestic Issues (2017, Sep.). *Politico*. [www.politico.com/f/?id=0000015e-a4d7-d873-adfe-bdd740140000](http://www.politico.com/f/?id=0000015e-a4d7-d873-adfe-bdd740140000).

Shoaib, Z., Woleben, J., & Gibney, M. (2019, March 5). Big Pharma Spends Up to 31% of Expenses in R&D to Justify Price of Medicines. [www.spglobal.com/market-intelligence/en/news-insights/latest-news-headlines/50306210](http://www.spglobal.com/market-intelligence/en/news-insights/latest-news-headlines/50306210).

Shouldn't the U.S. Government Do More to Regulate High Drug Prices? (2016, July 20). *BIO / MRP*. [www.drugcostfacts.org/drug-pricing-regulations](http://www.drugcostfacts.org/drug-pricing-regulations).

Too-Cozy Relationship Between Drugmakers and Doctors (2019, Nov. 18). *AHIP*. [www.ahip.org/the-too-cozy-relationship-between-drugmakers-and-doctors/](http://www.ahip.org/the-too-cozy-relationship-between-drugmakers-and-doctors/)

Understanding Drug Tiers (2019). Patient Advocate Foundation. [www.patientadvocate.org/explore-our-resources/understanding-health-insurance/understanding-drug-tiers](http://www.patientadvocate.org/explore-our-resources/understanding-health-insurance/understanding-drug-tiers).

van der Gronde, T., Uyl-de Groot, C. A., & Pieters, T. (2017). Addressing the challenge of high-priced prescription drugs in the era of precision medicine: A systematic review of drug life cycles, therapeutic drug markets and regulatory frameworks. *PLoS ONE*, 12(8). doi.org/10.1371/journal.pone.0182613.

Wineinger, N. E., Zhang, Y., & Topol, E. J. (2019). Trends in Prices of Popular Brand-Name Prescription Drugs in the United States. *JAMA Network Open*, 2(5), e194791–e194791. doi.org/10.1001/jamanetworkopen.2019.4791.