JOHNS HOPKINS
UNIVERSITY

The Center for Hospital Finance
and Management
624 North Broadway / Third Floor
Baltimore MD 21205
410-955-3241 / Fax 410-955-2301

Testimony of Gerard F. Anderson, PhD
Professor
Johns Hopkins Bloomberg School of Public Health
Johns Hopkins School Of Medicine
Director of the Johns Hopkins Center for Hospital Finance and Management

U.S. House of Representatives
House Committee on Energy and Commerce

DRUG PRICING: ANALYSIS OF HR 3

September 25, 2019

Chairman Frank Pallone, Jr., ranking member Greg Walden, subcommittee chairwoman Anna Eshoo and members of the Committee, it is my pleasure to be testifying in front of the House Committee on Energy and Commerce. The opinions expressed herein are my own and do not necessarily reflect the views of The Johns Hopkins University.

My name is Gerard Anderson and I am a professor at Johns Hopkins University in the Bloomberg School of Public Health and the School of Medicine. Currently, I am the principal investigator for the Drug Access and Affordability Program at Johns Hopkins as well as a member of Maryland's Prescription Drug Affordability Board.[1]

Two years ago, I had the opportunity to describe in detail the drug supply chain to this Committee in a hearing organized by Representative Michael Burgess, MD. I remember several members asking me the question – "why does the United States pay so much higher prices for drugs than other industrialized countries?"

As a result of these questions, we conducted a study of the prices paid in the US, Ontario Canada, Japan and the UK for 79 brand name drugs that did not have generic equivalents in the US market. [2] These 79 drugs were responsible for more than half of Medicare Part D spending in 2016. We found that the US was paying, on average, 3-4 times higher than other countries were paying for these drugs, even after taking into account the rebates the drug companies are paying in the United States and in the other countries. These 79 drugs, without viable competitors, were responsible for much of the differential between what the US and other countries were spending on prescription drugs.

I have attached a list of the 79 drugs to my testimony showing the US price and the prices

[1] https://www.baltimoresun.com/opinion/op-ed/bs-ed-op-0701-drug-affordability-20190627-story.html

[2] Kang, S. Y., DiStefano, M. J., Socal, M. P., & Anderson, G. F. (2019). Using External Reference Pricing In Medicare Part D To Reduce Drug Price Differentials With Other Countries. *Health Affairs*, *38*(5), 804-811.

in Ontario, Canada, the UK and Japan. While the average drug was 3-4 times more expensive in the US, there was significant variation by drug. Some drugs were only 30% more expensive in the US, while other drugs were almost 7000% more expensive. Policymakers should focus on those drugs with the greatest price differential.

One other finding from the article is worth noting. The longer a brand name drug remains on the market, the greater the price differential between the US and other countries. This is because following launch, drug prices tend to go up in the US and they go down in other countries. The US needs a mechanism to control prices following launch.

I have been asked to comment on the proposed legislation.

Market Failure

PBM/PDPs routinely negotiate drug prices. In many cases, they are quite effective in negotiating drug prices. They are most effective when they can choose between a brand-name drug and a generic or when they can choose between two or more brand name drugs with therapeutic alternatives. In these cases, the existence of therapeutic alternatives gives PBM/PDPs some negotiating power.

PBM/PDPs have a problem when they negotiate the price of a drug without any viable therapeutic alternatives. This is the reason we focused on the 79 brand name drugs without generic alternatives in our paper. We were not surprised to find that they were 3-4 times more expensive in the US than other countries, on average. This is because the PBM/PDP has no real viable alternative to use in the negotiation. It is faced with a "take it or leave it" choice and in most cases they need the drug in their formulary so they must pay the high price. The market is

simply not working for this type of drug. The government needs to intervene when there is no viable therapeutic alternative for the PBM/PDP to choose and the market does not work.

In summary, intervention is needed when there is market failure and this occurs when there are no therapeutically alternatives available. The PBM/PDPs have no ability to obtain lower prices without an alternative available.

Does Negotiation Work?

One approach to address market failure is governmental negotiation. I begin by noting that it is possible for the government to negotiate drug prices.

- Other industrialized countries have been negotiating with drug companies for many years quite successfully. Other countries pay substantially lower prices than the US for the 79 drugs in our study.
- Medicaid programs are able to negotiate prices for supplemental rebates. All Medicaid programs negotiate and generally they are able to obtain considerable discounts.
- The Veterans Administration and the Department of Defense routinely negotiate discounts greater than the federal supply schedule. We estimate that the VA and DOD are paying on average 30-40% less than Medicare PDPs for the same drugs.

Negotiation has been used effectively to set drug prices in the US and abroad for many years.

In summary, negotiation is both possible and results in lower prices, even for drugs without therapeutic competition.

Which Drugs Require Negotiation?

Not all drugs will require negotiation. HR3 targets at least 25 drugs for negotiation, specifically those that "the Secretary projects will result in the greatest savings to the Federal Government or fair price eligible individuals…" The provision continues, "the savings shall be projected taking into consideration both the volume of drugs for which payment is made … and the amount by which the net price for the drug exceeds the AIM price for the drugs."

The 79 drugs we identified in our paper satisfy this criterion and provide examples of the kinds of drugs that HR 3 may target. I have attached a list of these 79 drugs and the prices that were paid in Ontario Canada, Japan and the United Kingdom for these drugs. The House Ways and Means Committee has also looked at these 79 drugs and issued a report on them this week.

For many drugs there is robust competition and reasonable prices can be obtained by the PDP/PBMs. Changing the benefit structure will increase the likelihood that the PBM/PDPs will negotiate even more aggressively on these drugs. This is most apparent for generic drugs with three or more competitors. Often the prices for generic drugs with three or more competitors are at or below international prices and so government intervention is not needed. There are also branded drugs where there are several therapeutic alternatives and entities like PBM/PDPs can obtain lower prices for these drugs. This is also generally true for branded drugs with generic competition.

The problem occurs when there is no competition and no therapeutic alternatives for that drug. This is where market failure occurs We have seen this problem in a few drugs that are off patent (think Martin Shkreli and Daraprim), but most commonly and most importantly it occurs for brand name drugs without any viable competition. In this case, the PMB/PDP has no bargaining leverage. This is when the prices become 3-4 times more expensive in the US than

other countries and government intervention is necessary.

One possibility is to select a specific number of drugs for the Secretary to negotiate each and every year. You could, for example, choose the 250 drugs responsible for the greatest spending in the US. However, some of these drugs already have competitors and the PBM/PDPs are able to negotiate prices for these drugs already. Negotiation might generate little additional savings.

Congress should have the Secretary focus on those drugs where negotiation can have the greatest impact – these are drugs where the price differential between what the US pays and what other countries pay is the greatest and where the most spending occurs. These are the drugs that HR 3 targets.

There are approximately 50-100 or so drugs that fall into this category, but these drugs are responsible for approximately half of all drug spending in the US.

The Secretary should be given some flexibility to add drugs to the ones that are subject to negotiation. An example could be EpiPen. The Secretary needs to have flexibility to negotiate prices for drugs used by patients that have significant public health benefits, but have high prices relative to their cost of production. In the case of EpiPen the active ingredient (Epinephrine) is a generic drug and it low cost. The high cost is associated with the dispenser, not the drug.

One possibility is to negotiate prices annually. But the drug market is continually changing. Drugs lose their patent protection and market exclusivity during the year. New drugs enter the market. The system will need to be able to adjust to changing market conditions, sometimes at multiple points during the year. HR 3 includes this provision.

In summary, it is appropriate to focus the government negotiation on a small

number of drugs without robust competition and high prices compared to international prices.

It is Important To Include Everyone in the Negotiation

One possibility is to allow only Medicare to negotiate prices. The problem with this approach is that the same PBM/PDPs that are negotiating for Medicare are also negotiating for the private sector. If the PBM/PDPs cannot negotiate effectively for Medicare, then they also cannot negotiate effectively for the private sector.

Also, it does not make sense for the private sector to pay much higher prices for the same drugs as Medicare. It could result in access issues for Medicare beneficiaries and higher prices for private insurers. This is especially true for drugs that are much more expensive in the US than other countries because there are no therapeutic alternatives. The maximum fair price in HR 3 will be much more effective if both the public and private sectors are paying the same prices.

HR 3 contains provisions for self-insured companies to opt out of the government negotiations if they choose.

In summary, allowing the federal government to negotiate prices for expensive drugs without competition in both the public and private sectors will be more effective in lowering drug prices for everyone.

Bringing Drug Companies to the Table In Good Faith

Policy makers's challenge is to provide sufficient incentive to bring the drug company to the table to negotiate, but also make sure the government is willing to impose the penalty if the drug company does not negotiate in good faith. The challenge is to develop a viable penalty. It is a Goldilocks challenge – not too little and not too much.

There are a number of approaches to encourage/force drug companies to negotiate. These approaches need to be evaluated in the context of the Goldilocks problem. To accomplish this, it should be possible to modify the penalties if they are perceived to be insufficient to induce the drug companies to negotiate or too onerous for the government to actually apply the penalty.

It will also be necessary to define a negotiation in good faith. If the drug company proposes a one-dollar reduction in the list price, the question is whether this is actually a good faith negotiation. Congress will need to provide some guidelines around what constitutes a good faith negotiation.

One approach is to use the international price index to compare the prices in other countries. If the drug company accepts one price in other countries and then argues that this is an unreasonable price in the US, then this is not a good faith negotiation. HR 3 has this provision.

In summary, imposing financial penalties for drug companies will bring them to the table. International prices can be used to determine if the drug company is negotiating in good faith.

International Price Index

Drug companies voluntarily agree to sell their drugs in other countries. They are not compelled to sell the drugs at the price determined by the negotiation process or the formula in these other countries. As a result, using external reference prices demonstrates a willingness of the drug companies to sell the drug at that price in other countries. They would not sell the drug if they did not earn a profit at that price in other countries.

Most industrialized countries use external reference pricing to help determine the prices they will pay for drugs[3]. When there are multiple doses or different ways to administer the drug it is possible to find a common unit (milligrams) to compare prices. We did this in our comparison of the 79 drugs and so do other countries that use external reference pricing[4].

Often external reference pricing is not the only factor, but one of several factors that the country uses to set drug prices. Often negotiation is also part of the process.

The Trump Administration has proposed using external reference pricing or an international price index to determine the prices in Part B[5]. This same approach could be used in Part D[6]. As noted above, the prices in the US are particularly high in the US for drugs that do not have any robust competition.

It is important to choose countries that have a significant pharmaceutical market so that the drug companies cannot exclude them from the market. In our paper, we chose Canada, UK, and Japan, but is would be appropriate to add Australia, France, Germany and other large

---

[3] Ruggeri, Kai, and Ellen Nolte. "Pharmaceutical pricing: the use of external reference pricing." *Rand health quarterly* 3.2 (2013).

[4] [4] Kang, S. Y., DiStefano, M. J., Socal, M. P., & Anderson, G. F. (2019). Using External Reference Pricing In Medicare Part D To Reduce Drug Price Differentials With Other Countries. *Health Affairs*, *38*(5), 804-811.

[5] *https://www.hhs.gov › about › news › 2018/10/25 › ipi-policy-brief*

5. https://www.brookings.edu/blog/usc-brookings-schaeffer-on-health-policy/2019/09/09/considerations-for-expanding-international-reference-pricing-beyond-medicare-part-b/

industrialized countries to the mix.

The key is to find countries that have transparent or semi-transparent prices so that comparisons are valid. Germany and Japan have transparent prices and other countries provide rebate numbers for categories of drugs, just not specific drugs[7].

When we examined the price differentials between the US and other industrialized countries, we found wide variation by drug. In the US, some drugs were only 30% more expensive, while prices for other drugs were almost 7000% more expensive in the US. It would be possible to use the International Price Index to identify those drugs with the highest markups in the US and target them for negotiation for a market basket of drugs.

It is also possible to focus only on countries that rely on market forces to at least initially set their prices. These are countries like Denmark and Germany. Avik Roy has taken a look at these countries and has found that their prices are similar. The international prices seem to be similar regardless of whether markets or regulation is used to set prices.

In summary, international price indices can be used to target drugs that are substantially more expensive in the US and focus the negotiations on these drugs.

When there is not an international price

The United States is often the first country to have access to a new drug. As a result, there is no external reference price to use.

One option is to allow the drug company to set the price at whatever it wants to charge until there is an external reference price. The problem with this approach is that a drug company could earn huge profits in the United States while other countries were evaluating the drug and

[7] Kang, S. Y., DiStefano, M. J., Socal, M. P., & Anderson, G. F. (2019). Using External Reference Pricing In Medicare Part D To Reduce Drug Price Differentials With Other Countries. *Health Affairs*, *38*(5), 804-811

determining a suitable price.

A better approach is to compare the price that was initially set in the United States to the external reference price once other countries decide to cover the drug and determine a price. If the initial United States price is substantially higher than the international reference price, then the United States should require the drug company to pay back some of the excess charge. Drug companies have an expectation of what the price will be in other countries. This is something they tell the investment banking community on a regular basis.

This provision will prevent drug companies from setting very high prices for drugs in the United States that ultimately are substantially lower in other countries. Drug companies do not want to have to pay back money later. HR 3 sets this differential at 200% of the international reference price. Drug companies have a good idea of what other countries will ultimately pay for drugs, so the percentage could go lower than 200%.

In summary, it is necessary to have a mechanism in place before there is an international price. Allowing the drug company to set the price initially at whatever rate they want may be the only option, but it is important to have a mechanism in place to penalize the drug company if the price they set is much higher than international standards.

Will Drug Companies Be Able to Raise Prices In Other Countries?

One concern is that drug companies will raise prices in other countries if the United States uses them as reference countries. The drug companies have every incentive to do this. The question is how effective they will be in actually raising the price in other countries. In my

opinion, they will be unlikely to be able to get the other countries to actually pay higher prices. They may be able to increase the list price for the drugs in the other countries, but I expect they will be unable to raise the actual transaction price.

First, this assumes that the drug companies have the power to raise prices in other countries at their own discretion. Drug companies are not that powerful.

Second, it assumes that the drug companies are already not attempting to maximize their revenues in these other countries. I would not want to be the country representative for one of the large drug companies who told his/her bosses "we could have gotten higher prices in my country, but since the US is paying so much I did not get the maximum price that I could".

It is also important to recognize that external reference pricing has been used for many years and the effects have already been built into the pricing structure. Yes, the US is the 800 pound gorilla where most of the drug companies earn their profits, and this could change the pricing calculations slightly, but the effect of external reference pricing is already built into the pricing in other countries.

Third, and most important is that these countries are unlikely to pay more simply because the US is paying less. These countries already have mechanisms in place to obtain lower drug prices and these mechanisms will not change if the United States pays lower prices.

My favorite approach to keep prices low is Japan[8]. Japan asks the pharmacies how much they paid for the drug this year. Japan then uses that information to lower the price it is will pay for drugs in the next year to that price +2%. Every year the drug companies have to lower the price below the price Japan is willing to pay to sell their drug. Because of their system, the price for drugs in Japan keeps going down. In Germany, increasing the post-launch price without

[8] Ikegami, Naoki, and Gerard F. Anderson. "In Japan, all-payer rate setting under tight government control has proved to be an effective approach to containing costs." *Health Affairs* 31.5 (2012): 1049-1056.

providing substantial evidence of additional benefit is legally prohibited.[9]

Other countries have other ways to set prices that are unlikely to be affected by the United States price.

1. The UK system for determining drug coverage is operated by a government agency called NICE. NICE sets a price based on the cost-effectiveness of the drug. The United States price would not affect this calculation.
2. Many countries use the UK as one of the reference countries since it is one of the first to acquire the drug.
3. Germany allows the company to set a very high price in the first year, but the company has to justify the high price in subsequent years by demonstrating better clinical outcomes and economic value than the previous treatment modality.
4. France looks at the increased therapeutic value. The price paid in the United States is not a factor in this calculation.
5. I would be happy to explain the systems in Canada, Australia, and other countries, but the main point is that they mostly determine prices based on the value of the drug, not on the amount the United States pays for the drug.

There is also a concern that the rebates are not transparent in other countries. Given the large differentials between what the US is paying and other countries are paying for similar drugs, initially it may not matter if all the rebates in these other countries are included since the differentials are currently so large.

[9] Wenzl M, Paris V. Pharmaceutical reimbursement and pricing in Germany. Organization for Economic Cooperation and Development. 2018. https://www.oecd.org/health/health-systems/Pharmaceutical-Reimbursement-and-Pricing-in-Germany.pdf

However, this will need to be rectified after several years if the US prices decline. HR 3 has provisions allowing the Secretary to obtain the true transaction prices in these other countries and to keep this information secret so that it does not interfere with negotiations around the world. The international prices can be kept secret by the federal government much like they currently do for drug specific rebates.

In summary, countries already have in place mechanisms designed to control price increases and to set a reasonable launch price. In addition, most countries use external reference prices so the idea that other countries base their prices on a few countries is already embedded in the system.

Penalize Price Hikes

We know that drug companies are much more willing to increase prices than decrease prices. The Associated Press has compared drug prices increases and drug prices decreases over the last few years. They found that price increases are approximately 96 times more likely to occur than price declines in the first 7 months of 2018[10].

We recently began examining the pricing of ultra expensive drugs in the US. We define the ultra expensive drugs as drugs costing more than an individual earns in a year. Currently, this is around $63,000.

We found that there were 110 drugs that met this criterion in 2018. We then examined how they became ultra-expensive drugs. Almost one third of the drugs were already on the market in 2012, but were not ultra-expensive drugs in 2012. They became ultra-expensive drugs by raising their prices. Setting a rate of increase limit on these drugs will prevent some drugs

[10] https://www.ajmc.com/newsroom/ap-for-each-drug-price-cut-there-were-96-price-hikes-this-year-so-far

from becoming ultra expensive.

We conducted and published a study that asked 1000 senior economists how they perceive price increases for drugs.[11] Most economists agreed that price increases above the rate of inflation are not justified. This is because the marginal cost of production is low and not likely to increase faster than overall inflation. The economists did not accept the argument that research and development could be used to justify price increases. Research and development expenses have already been incurred and therefore could not be used to justify future price increases. Economists and accountants call these "sunk costs" and "sunk costs" cannot be used to justify price increases. Setting the penalty at the rate of inflation seems reasonable. HR 3 does this.

Price increases are especially burdensome on patients, especially patients taking expensive drugs. For expensive drugs the patient is likely to pay a percentage of the list price of the drug. When the list price increases, the patient will pay more because cost sharing is related to the list price in most formularies. This is why patients are so upset about the rising prices for drugs

In summary, imposing a penalty for price hikes is justified because: 1) there is no economic rationale for the price hike and 2) the price hike is especially burdensome for the patient.

Changing The Benefit Design

The benefit design when the Medicare Modernization Act was passed in 2003 was crafted to fit within budget constraints and was not based on sound insurance principles. I cannot

[11] Trujillo, A. J., Karmarkar, T., Alexander, C., Padula, W., Greene, J., & Anderson, G. (2018). Fairness in drug prices: do economists think differently from the public?. *Health Economics, Policy and Law*, 1-12.

think of an insurance package that includes anything like a "donut hole," where the benefit design gives coverage, then the patient loses coverage, and then the patient gets coverage back.

The Affordable Care Act addressed some of the problem with coverage by requiring the drug companies to fill in some of the "donut hole." However, recently a new problem has arisen. There is an increasing number of new ultra expansive drugs. These drugs automatically push the beneficiary into catastrophic coverage where they must pay more than one month of their social security benefit just for that drug.

The current system also has the Medicare program paying 80% of the cost when the beneficiary is in the catastrophic phase of coverage. Catastrophic coverage is the fastest growing part of the Part D spending primarily because of all the new ultra expensive drugs. However, Medicare cannot negotiate the price of these drugs in spite of paying 80% of the cost. The PDPs, which provide coverage to the beneficiaries, only pay 15% of the cost and the drug company pays nothing. The beneficiary pays the remaining 5%.

HR 3 changes the incentives so that the drug company and the PDP have more "skin in the game" since they are the ones determining the price of the drug and therefore are more concerned about the level of spending for the Medicare program and the beneficiary.

However, having more "skin in the game" and being able to negotiate the price of drugs without any viable competition are two different things. Simply giving the PDPs more incentive to negotiate more effectively will not solve the problem when the drug companies hold all the cards when there is no viable therapeutic alternative.

In summary, it is important to change the incentives so the PDPs and the drug companies have more "skin in the game" when they negotiate prices for expensive drugs

that immediately place the beneficiary into the catastrophic benefit phase.

Limit Out of Pocket Cost Sharing

Currently, there is no limit on how much Medicare beneficiaries must pay out of pocket for prescription drugs in Medicare Part D. Five percent of Medicare beneficiaries with the most out of pocket spending will pay at least $2000.This is more than 10% of their annual social security benefit.

There seems to be agreement that an out of pocket cap is needed – the disagreement is about where to place the cap. The Trump Administration proposed $4950, the Senate Finance Committee proposed $3100, and HR 3 places it at $2000.

We examined Medicare claims data for 2017 and found that the $4950 and the $3100 thresholds will benefit less than 1% of Medicare beneficiaries, while the $2000 threshold will benefit approximately 4% of Medicare beneficiaries. We estimate that if Medicare absorbed all the out of pocket costs above $2000 that it would cost the Medicare program an estimated $233 million or only 0.3% of the Medicare budget. However, this change is only part of the change in the benefit design. In HR 3, there are also changes in the percentage that Medicare pays, the PDP pays and the drug company pays. When these are included in the calculation the cost to the federal government should be reduced.

In summary, a $2000 out of pocket limit would benefit four times more Medicare beneficiaries at a minimal additional cost over the higher out of pocket maximums proposed by the Trump Administration and the Senate Finance Committee and the cost

would be offset by changing who pays for the drugs.

The Effect On Innovation

One concern about this bill is the potential effect of HR 3 on innovation. As someone who has spent the last 37 years as a professor at Johns Hopkins, I totally support innovation. Johns Hopkins is the first research university in the US and Johns Hopkins receives more money from the federal government and the NIH for research than any other university. Innovation is critical.

It is unlikely that US researchers would suffer if the US paid lower prices for drugs. While the drug companies might reward countries with higher drug prices on the margin, innovation occurs where the best scientists are located. The US has many of the best universities in the world and this is where many of the drug discoveries occur. In addition, the NIH pays for most of the world's research funding for basic biomedical research.

Increasingly, drug research is done first in academic medical centers and then the research is purchased by the drug companies. A recent example of this pattern of drug development was the first effective Hepatitis C drug. The initial research was conducted at Emory University, funded by the NIH, and then Gilead purchased the rights to the drug for almost $11 billion dollars. The key point is that the research was done in the United States and NIH did the initial funding.[12]

We examined how much the NIH invested in the ten best selling drugs. Nearly all of the drugs had some level of NIH funding and several of them had over $100 million in funding from the NIH. According to our research, the two drugs with the most NIH funding were Januvia at

[12] https://www.finance.senate.gov/ranking-members-news/wyden-grassley-sovaldi-investigation-finds-revenue-driven-pricing-strategy-behind-84-000-hepatitis-drug

$227 million followed by Remicade at $218 million. Januvia development was sponsored by 93 different NIH projects and Remicade development was sponsored by 454 different NIH projects. It is most likely that this research originated in the United States.

In HR 3 research and development costs are key elements of the negotiation provisions of the package. It is important to know that research and development is less than 20% of the cost of operating most large drug companies and that marketing is a larger percentage than research and development. If pushed to lower prices I would assume drug companies would continue their investment in research and development because without new products the brand name drug companies have nothing to sell.

In summary, the drug companies invest in the United States because it is where the best scientists are located, not because the United States pays higher prices for drugs.

I am glad that I do not have to tell you that the American public is having difficulties paying for prescription drugs. Your constituents explain this issue much more effectively than I can.

Thank you for the opportunity to testify and I am happy to answer any questions.

Appendix. 79 Medicare Part D drugs included in the study (Kang et al. 2019. Health Affairs), USD, September 2018

Rank by total spending	Brand name	Generic name	Ex-factory price by brand name				Estimated post-rebate price	
			US	UK	Japan	Ontario, Canada	US	Ontario, Canada
1	Harvoni	Ledipasvir/Sofosbuvir	1,125.00	631.36	438.51	613.96	924.75	429.77
2	Revlimid	Lenalidomide	695.48	250.62	73.19	-	571.68	-
3	Lantus Solostar	Insulin Glargine,Hum.Rec.Anlog	26.95	3.43	5.17	4.79	22.15	3.36
4	Januvia	Sitagliptin Phosphate	15.70	1.62	1.38	2.39	12.90	1.68
5	Advair Diskus	Fluticasone/Salmeterol	12.27	0.77	0.99	1.39	10.09	0.98
6	Xarelto	Rivaroxaban	13.95	2.45	4.25	2.22	11.47	1.56
7	Eliquis	Apixaban	6.98	1.29	1.80	1.27	5.74	0.89
8	Spiriva	Tiotropium Bromide	13.26	1.58	1.55	1.34	10.90	0.94
9	Lantus	Insulin Glargine,Hum.Rec.Anlog	26.96	3.43	-	4.78	22.16	3.35
10	Enbrel	Etanercept	1,196.46	238.90	246.26	308.91	983.49	216.24
11	Levemir Flextouch	Insulin Detemir	29.38	3.81	-	5.62	24.15	3.94
12	Sensipar	Cinacalcet HCl	39.89	8.66	-	13.00	32.79	9.10
13	Novolog Flexpen	Insulin Aspart	37.26	2.78	-	3.26	30.63	2.28
14	Humalog Kwikpen U-100	Insulin Lispro	35.36	2.67	3.93	3.02	29.06	2.11
15	Ibrance	Palbociclib	538.94	191.12	180.90	-	443.01	-
16	Imbruvica	Ibrutinib	135.33	69.52	-	-	111.24	-
17	Sovaldi	Sofosbuvir	1,000.00	566.62	338.69	507.17	822.00	355.02
18	Tecfidera	Dimethyl Fumarate	122.77	33.33	32.40	-	100.91	-
19	Xtandi	Enzalutamide	90.88	33.22	18.88	-	74.70	-
20	Zytiga	Abiraterone Acetate	170.53	66.45	-	-	140.18	-
21	Victoza 3-Pak	Liraglutide	96.71	17.80	-	-	79.49	-

Rank by	Brand name	Generic name	Ex-factory price by brand name				Estimated post-rebate price	
22	Tradjenta	Linagliptin	13.72	1.62	1.25	1.98	11.28	1.38
23	Vesicare	Solifenacin Succinate	12.13	1.44	1.47	1.31	9.97	0.92
24	Humalog	Insulin Lispro	27.47	2.26	2.34	2.30	22.58	1.61
25	Invokana	Canagliflozin	15.48	1.78	1.53	2.14	12.73	1.50
26	Pradaxa	Dabigatran Etexilate Mesylate	6.68	1.16	1.09	1.28	5.49	0.89
27	Novolog	Insulin Aspart	36.55	2.74	-	2.79	30.04	1.95
28	Letairis	Ambrisentan	308.48	73.38	-	-	253.57	-
29	Janumet	Sitagliptin Phos/Metformin HCl	7.16	0.81	-	1.30	5.88	0.91
30	Jakafi	Ruxolitinib Phosphate	204.00	53.97	46.47	-	167.69	-
31	Atripla	Efavirenz/Emtricitab/Tenofovir	90.80	24.17	-	35.10	74.64	24.57
32	Levemir	Insulin Detemir	29.38	3.81	-	5.62	24.15	3.94
33	Ranexa	Ranolazine	6.87	0.84	-	-	5.65	-
34	Myrbetriq	Mirabegron	11.75	1.32	1.22	1.13	9.66	0.79
35	Forteo	Teriparatide	1,372.79	154.13	144.78	-	1,128.43	-
36	Humira	Adalimumab	2,436.02	479.10	259.05	596.41	2,002.41	417.49
37	Pomalyst	Pomalidomide	791.66	575.57	448.66	-	650.74	-
38	Xifaxan	Rifaximin	36.02	6.17	1.62	6.07	29.60	4.25
39	Triumeq	Abacavir/Dolutegravir/Lamivudi	93.51	36.20	55.91	33.46	76.86	23.42
40	Aubagio	Teriflunomide	233.18	50.43	-	-	191.67	-
41	Gilenya	Fingolimod HCl	261.90	71.43	65.34	-	215.28	-
42	Linzess	Linaclotide	12.90	1.83	0.72	-	10.60	-
43	Daklinza	Daclatasvir Dihydrochloride	750.00	397.11	63.37	331.97	616.50	232.38
44	Prezista	Darunavir Ethanolate	39.99	11.87	11.30	14.98	32.87	10.48
45	Tarceva	Erlotinib HCl	215.30	53.05	56.94	-	176.98	-
46	Vimpat	Lacosamide	9.72	2.40	2.43	3.34	7.99	2.34
47	Ofev	Nintedanib Esylate	152.64	48.78	48.35	-	125.47	-

Rank by	Brand name	Generic name	Ex-factory price by brand name				Estimated post-rebate price	
48	Isentress	Raltegravir Potassium	24.92	10.66	12.46	10.87	20.48	7.61
49	Afinitor	Everolimus	518.27	111.34	78.42	-	426.02	-
50	Toujeo Solostar	Insulin Glargine,Hum.Rec.Anlog	82.74	10.02	-	-	68.01	-
51	Opsumit	Macitentan	301.00	104.58	113.87	-	247.42	-
52	Tivicay	Dolutegravir Sodium	55.25	22.62	26.05	15.10	45.41	10.57
53	Sprycel	Dasatinib	341.56	88.38	56.76	-	280.77	-
54	Avonex Pen	Interferon Beta-1a	1,697.49	222.45	313.96	-	1,395.33	-
55	Humalog Mix 75-25 Kwikpen	Insulin Lispro Protamin/Lispro	35.36	2.81	3.99	3.05	29.06	2.14
56	Tasigna	Nilotinib HCl	113.70	29.55	31.97	-	93.46	-
57	Premarin	Estrogens, Conjugated	5.36	0.08	0.15	0.27	4.40	0.19
58	Genvoya	Elviteg/Cobi/Emtric/Tenofo Ala	98.19	39.89	55.67	34.97	80.71	24.48
59	Tracleer	Bosentan	181.35	36.69	31.59	-	149.07	-
60	Multaq	Dronedarone HCl	10.51	1.53	-	-	8.64	-
61	Avonex	Interferon Beta-1a	1,697.49	222.45	321.37	-	1,395.33	-
62	Amitiza	Lubiprostone	6.18	1.44	0.99	-	5.08	-
63	Rebif	Interferon Beta-1a/Albumin	606.67	92.12	-	-	498.68	-
64	Trulicity	Dulaglutide	182.55	24.91	27.76	-	150.06	-
65	Stelara	Ustekinumab	16,597.86	2,921.09	-	3,557.82	13,643.44	2,490.47
66	Stribild	Elviteg/Cobi/Emtric/Tenofo Dis	103.00	39.89	55.67	37.19	84.67	26.04
67	Onglyza	Saxagliptin HCl	13.61	1.54	0.95	2.23	11.19	1.56
68	Uloric	Febuxostat	10.68	1.18	0.87	-	8.78	-
69	Combigan	Brimonidine Tartrate/Timolol	161.04	12.24	-	17.25	132.38	12.07
70	Effient	Prasugrel HCl	15.30	2.31	2.83	1.48	12.58	1.04
71	Nexavar	Sorafenib Tosylate	155.58	43.45	37.50	-	127.89	-
72	Brilinta	Ticagrelor	5.88	1.33	1.12	1.20	4.84	0.84

Rank by	Brand name	Generic name	Ex-factory price by brand name				Estimated post-rebate price	
73	Dulera	Mometasone/Formoterol	23.95	-	-	0.65	19.69	0.46
74	Xeljanz	Tofacitinib Citrate	68.26	16.76	20.94	18.56	56.11	12.99
75	Lialda	Mesalamine	9.36	0.97	1.63	1.32	7.69	0.93
76	Humulin 70-30	Insulin NPh Hum/Reg Insulin Hm	14.87	1.97	4.42	2.50	12.22	1.75
77	Reyataz	Atazanavir Sulfate	7.93	3.55	-	3.57	6.52	2.50
78	Suboxone	Buprenorphine HCl/Naloxone HCl	40.94	6.88	5.87	9.10	33.65	6.37
79	Orencia	Abatacept	1,032.76	411.43	224.10	-	848.93	-