Comments on 46brooklyn and 3 Axis Advisors Data Analysis and Methodology On Pharmacy Reimbursement and Spread in Medicaid MCOs

Prepared for

May 2019

EXECUTIVE SUMMARY

Recent reports from 46brooklyn Research and their consulting arm 3 Axis Advisors (referred to here for simplicity as "46brooklyn") have used publicly available drug pricing data, and when available data on prescription claims from independent pharmacies, in an attempt to identify proxies to highlight the differences between what the plan sponsor reimburses the pharmacy benefit manager (PBM) for a prescription versus what the PBM reimburses the pharmacy, otherwise known as "spread". Visante examined the data sources, methodologies, and conclusions in recent 46brooklyn reports for validity, reliability and/or potential sources of error. [1,2,3,4]

Summary of findings

Problems or flaws in data sources, methodologies and conclusions

1. "Cherry picking" – 46brooklyn and 3 Axis Advisors often highlight a few select drugs in their analyses, while paying little or no attention to the costs of the overall plan. We replicated their New York state analysis and found many drugs with the opposite of the "spread" 46brooklyn frequently highlight**. In fact, 63% of all drugs exhibited "negative spread" during at least one quarter in the study period. Using the same proxies for reimbursement as the 46brooklyn studies, a "negative spread" indicates the plan sponsor, the Medicaid managed care organization (MCO), reimbursed the PBM less than the PBM reimbursed the pharmacy for the same drug. The Top 10 drugs with the largest "negative spread" exhibited total combined "negative spread" of more than $275 million during the study period.** 46brooklyn also chose to focus their analyses on "generic oral solids," which is another form of cherry picking. We found what "spread" that does appear in the data is almost entirely focused in "generic oral solids" (96% of spread is in generic oral solids), while other types of drugs (i.e., brand drugs, oral non-solids such as liquids), which comprise the majority of the drug spending, often have little to no spread.
2. Limited data samples – The **report on New York pharmacy costs includes data from only 11 independent pharmacies** (out of a total 4,886 New York retail pharmacies), while the **Illinois report includes only 21** (out of a total 2,159 Illinois retail pharmacies). Such a small sample of independent pharmacies seems highly unlikely to be representative of all independent pharmacies in the state, especially given the "independent" nature of each entity. Further, no other community pharmacies, chain pharmacies, or specialty pharmacies were included in the sample, which makes any results all but certain to be non-representative and non-generalizable across all pharmacies.
3. National Average Drug Acquisition Cost (NADAC) is one of two primary data sources used by 46brooklyn. NADAC pricing data can be highly variable with wide swings in the listed price of individual drugs, as often as monthly. This can make analyses based on average NADAC costs difficult to interpret and trends appear more volatile than they really are. CMS' State Drug Utilization Data (SDUD), the other publicly-available data source 46brookly relies upon, is also highly variable, especially for utilization data reported for MCOs. Unit reporting mismatches occur frequently and can take a long time to be rectified.[5]
4. Pricing/reimbursement analysis does not include rebates or discounts – analysis of drug costs to plan sponsors should include rebates, and analysis of NADAC costs to pharmacies should, but does not, include other discounts off invoices including wholesaler discount to pharmacies.
5. NADAC does not accurately reflect acquisition costs for specialty drugs and specialty pharmacies, which make up nearly all of the drug examples cited in the reports. CMS specifically indicates that in calculating NADAC it does not survey specialty pharmacies.
6. 46brooklyn often implies that states and taxpayers are "paying more" because of spread on a few drugs. This is misleading at best, if simply not true. The states typically pay the Medicaid MCOs a capitated rate. If the price of a drug is much higher or lower than the amount that the Medicaid MCO pays the PBM, the MCO is at risk, not the state.

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[1] "Does Pennsylvania Have A Spread Pricing Problem?" 46brooklyn Research, December 5, 2018.

[2] "Analysis of PBM Spread Pricing in New York Medicaid Managed Care." 3 Axis Advisors, January 17, 2019.

[3] "Illinois Medicaid Managed Care Pharmacy Analysis." 3 Axis Advisors, March 13, 2019.

[4] "New drug pricing analysis reveals where PBMs and pharmacies make their money." 46brooklyn. April 2019.

[5] "Unit of Measure Inconsistencies in the Medicaid Prescription Drug Program." Department of Health and Human Services Office of Inspector General. November 2007.

7. 46brooklyn takes a "tunnel vision" approach to the costs of pharmacy benefits. Reimbursement formulas for a few generic drugs are only a small sliver of the overall picture. Plan sponsors make decisions on PBM contracts based on the overall costs, quality, and outcomes associated with the entire benefit plan. For example, in New York State, generic oral solids, a main focus of the 46brooklyn analysis, accounted for only 14% of total MCO drug reimbursement between 2016 and quarter 1 of 2018. Focusing on a sliver of one small component of spending is not uncovering gross market distortions.

Analysis: The majority of findings and conclusions in 46brooklyn reports are based on outlier examples of specific prescription drugs

- The research mines two publicly available data files (see page 7, *46brooklyn Methodology* for description) to identify a handful of outlier generic drugs where the acquisition cost (the PBM payment to the pharmacy, excluding dispensing fees) has diverged from the Average Wholesale Price (AWP, the plan sponsor payment to PBM) to an extreme degree (i.e., >99% difference from AWP).
- Some Medicaid MCOs as plan sponsors have apparently chosen to use spread pricing with their PBM. This means that two different reimbursement formulas are in use at the same time, the plan payment to the PBM based on AWP and the PBM payment to the pharmacy based on acquisition costs. The difference between the two formulas creates "spread."
- For these Medicaid MCOs, spread is higher for these identified outlier generic drugs based simply on a larger difference between AWP and acquisition cost. For example, generic Abilify is highlighted in the New York report and generic Gleevec is highlighted in the Pennsylvania report. These generic drugs are outliers, and the amount of "spread" created by them is not representative of all generic drugs.
- However, even after highlighting these carefully selected outlier generic drugs, the authors admitted that outlier, "high-spread" drugs comprised only a small percentage of all generic drugs:
    - The New York report found that 50% of the prescription claims that generated "spread" were from just 6% of all generic drug claims;
    - The Pennsylvania report presents no evidence that this "high-spread" applies to more than the three presented outlier examples; and
    - The Illinois report presents "spread" analysis only in the aggregate with no explanation of the dynamics underlying the findings or of specific drugs driving it.
- PBMs are setting discounted prices for most generic drugs and passing through most of these savings to MCOs. This appears to be more than offsetting the significant difference between AWP and acquisition cost on a few outlier generic drugs, and overall, the combination of those few outliers with the many generic drugs that do not fall into that "high-spread" category net out to a total weighted average price that is lower than it would be had these claims all been dispensed in fee-for-service (FFS), saving states money on prescription drug costs.

DISCUSSION

In 2018, two consultants formed a "research company" (46brooklyn Research) and a "consulting company" (3 Axis Advisors) and began publishing results of their data analysis on pharmacy prescription drug pricing, primarily in support of independent community pharmacies. One of the principals previously headed up government affairs for the Ohio Pharmacists Association, while the other is the former president of several community pharmacies. Their published data analysis has been particularly focused on pricing for generic drugs in state Medicaid managed care programs. Their publications – reports on pharmacy pricing in Pennsylvania, New York, and Illinois, among others – have highlighted what appears to be some relatively extreme pricing differences for a few selected specialty drugs where generics are available. These pricing differences are driven by two marketplace dynamics:

1. Spread pricing, which is chosen by some plan sponsors for their PBM contracts.
2. Average Wholesale Price (AWP), which is a traditional pricing benchmark that is reliable for brand-name drugs, but does not accurately reflect actual acquisition costs for generic drugs. A few selected drugs have extreme differences between AWP and acquisition costs.

Spread Pricing

Spread pricing is one of several contractual arrangements that exist between PBMs and plan sponsors. One expert on the pharmacy and PBM market describes "spread pricing" and "pass-through pricing" strategies as follows:

> "Plan sponsors use one of two basic pricing approaches to compensate a PBM for plan administration and other services.
>
> - *Spread pricing* – PBMs are compensated for their services in part by handling the flow of drug payments from plan sponsors to network pharmacies. With spread pricing, plan sponsors compensate the PBM by permitting the PBM to retain differences, or spreads between (a) the amount that a PBM charges to a plan sponsor and (b) the amount that the PBM pays to the pharmacy that dispenses the drug to a consumer.
> - *Pass-through pricing* – Here the PBM provides all discounts, rebates, and other revenues to the plan sponsor. The PBM is paid via administrative fees. The plan sponsor pays directly for any services provided by the PBM, instead of having spreads cover these expenses."[6]

Spread pricing contract designs use two different formulas for two different contracts:

1. The PBM contract with the plan sponsor may use a formula based on discounted AWP (e.g., AWP less x% plus dispensing fee). See below for more information on AWP.
2. The PBM contract with the pharmacy uses a reimbursement formula of "Maximum Allowable Cost (MAC) plus a dispensing fee" for generic drugs. MAC is a function of the Actual Acquisition Cost (AAC) for the pharmacy, across all versions of a given drug. See below for more information on MAC.

Because one formula is based on MAC, and the other formula is based on AWP, there can be a difference in the two reimbursements, which is referred to as "spread."

Plan sponsors choose the structure of their contract with the PBM, and some choose the spread pricing model. Industry surveys of employer clients of PBMs have shown that more than one-third of clients have chosen spread pricing models for their PBM contracts during the past 5 years,[7] and that number has been declining over time.[3] PBMs also offer plan sponsor clients guaranteed discounts on drug ingredient costs, which are typically expressed as a percentage discount off of AWP. In 2018, 77% of employer clients reported a guaranteed discount from their PBM that applied to all generic medications, with an average retail AWP discount for 30-day generic prescriptions of 56%.[8] Additionally,

[6] "2019 economic report on pharmacies and pharmacy benefit managers." Drug Channels Institute, March 2019.
[7] Annual surveys, "Trends in Drug Benefit Design," 2015-2018. Pharmacy Benefit Management Institute.
[8] "2018 Trends in Drug Benefit Design." Pharmacy Benefit Management Institute.

while some MCOs chose spread pricing contracts with their PBMs, they have discontinued this practice and moved to pass-through contracts when required by their state clients. For example, when Ohio banned spread contracts for MCOs in 2018, the difference between the plan payments to PBMs and the PBM payments to pharmacies dropped to nearly zero immediately after the new requirement effective date. In fact, that PBMs quickly eliminated spread in Ohio as requested by the state is the primary take away from 46brooklyn's new report on drug pricing in Ohio.

AWP vs Actual Acquisition Cost

The second marketplace fundamental that is driving the 46brooklyn findings lays in the price differences between AWP and AAC for generic drugs.

AWP is a pricing benchmark that has been used in the pharmacy market for decades. AWP was published by drug pricing compendia and loosely tied to actual brand prices in the 1990's and 2000's. In part due to litigation, the publishers chose to discontinue publication of AWP in 2011. Since 2011, AWP is calculated as 120% of Wholesale Acquisition Cost (WAC) for brand-name drugs. WAC is the price that brand-name manufacturers offer to sell their drugs to direct purchasers. In the case of single-source brand drugs, WAC (almost always) is the actual price at which the manufacturer sells direct to purchasers. Conversely in the case of generics, WAC is almost never the actual price at which drugs are sold; actual transaction prices generally are substantially lower than WAC.[9]

CMS publishes NADAC equivalency measures that compare NADAC values to AWP. For the current most recent quarter of data – December 2018 – in aggregate, generic drugs are acquired at a mean price of AWP -78.4% and a median of AWP -86.1%.[10] This substantial difference between the mean and the median values suggests high variation across generic drugs. Additionally, as the number of labelers of a generic drug increases so does the median discount off of AWP. The actuarial firm Milliman found that on average in Medicaid programs, NADAC equivalent discounts off of AWP was 90.2% for generic drugs in 2018, and 21.8% for specialty drugs.[11] So the pharmacy marketplace has understood for decades that AWP is not closely correlated with the actual prices pharmacies pay for generics.

As 46brooklyn has recently described, the AAC for generic drugs may often be 50%, 60%, 70%, 80%, or even more than 90% below AWP. This creates variability in "spread" for some drugs (e.g., the difference between AWP-x% paid by the plan sponsor vs MAC-based reimbursement paid to the pharmacy). MCOs are aware of the difference between AWP – which is the basis for payments to their PBM – and actual acquisition costs. However, a difference between the MCO payment rate to the PBM and the PBM payment to pharmacies aligns the incentives towards pharmacies dispensing the lowest-cost drug.

Estimating Actual Acquisition Costs: MAC and NADAC

Since AWP may not be an accurate predictor of actual acquisition costs, PBMs created "MAC Lists" in the 1990's. The PBM looks at actual market prices on multi-source generics (i.e., multiple manufacturers with multiple different prices for the same generic drug dosage form), and creates an estimate for the price at which the average pharmacy can purchase that generic drug. Contracts between PBMs and pharmacies typically reimburse pharmacies according to two different formulas, which result in pharmacy reimbursement that more closely approximates actual acquisition costs for the pharmacy compared to the WAC price.

1. For brand drugs, PBMs pay pharmacies AWP minus x% plus a dispensing fee.
2. For most generic drugs, PBMs pay pharmacies MAC plus a dispensing fee.

In an effort to estimate the costs of multi-source drug for state Medicaid agencies, CMS uses the average manufacturer prices (AMPs) of drugs where there is a brand and at least two generic versions.[12] The Federal Upper Limit (FUL) is generally calculated as 175% of the weighted average of these AMPs. These publicly available FUL lists are similar in

[9] "Index of Generic Drug Acquisition Costs Now Available to Pharmacies Nationwide." SSR Health, April 2014.
[10] "NADAC Equivalency Metrics." Myers and Stauffer, on behalf of CMS. December 20, 2018.
[11] "NADAC-plus: An emerging paradigm in pharmacy pricing?" Milliman. November 2018.
[12] "Affordable Care Act – Federal Upper Limits." CMS Medicaid.gov.

design to PBM MAC lists and are the maximum reimbursement amount state Medicaid agencies can pay for listed drugs.

In 2012, CMS established the NADAC in order to create a more reliable estimate of actual acquisition costs for pharmacies. The purpose of the NADAC was to create a new national price benchmark that more closely reflects the prices that pharmacies pay to acquire prescription and over-the-counter drugs. CMS contracted with a national certified public accounting firm to conduct monthly surveys of drug ingredient costs from independent pharmacies and chain pharmacies in the United States, and to develop and maintain the NADAC pricing benchmark.[13] NADAC represents the invoice price for retail pharmacies, and does not reflect any rebates, discounts, or price concessions off of the invoice price. For brand drugs, NADAC represents the average price paid for the specific manufacturer's product. For generic drugs, CMS blends all of the variants of the drug product into one payment rate, masking the variability in actual prices paid by each pharmacy. Rather than using national estimates, some states have fielded their own actual acquisition cost surveys, which can be broader in scope than NADAC.[14]

Summary

- Plan sponsors are typically given a choice to use spread pricing or pass-through pricing in their PBM contracts. Some plan sponsors have preferred the pricing certainty represented by spread-based contact designs over less certain pass-through contracts with fees. About one–third of employers chose spread pricing in 2018 and many plan sponsors are choosing to move to pass-through contracts.
- Typically, spread pricing means that the plan sponsor pays the PBM based on an AWP-x% formula, while the PBM pays the pharmacy based on actual acquisition costs. The difference between these two formulas is called spread. The PBM will also guarantee plan sponsors a certain percentage discounts for generics, creating savings for plan sponsors.
- Finally, it is generally acknowledged that AWP does not closely correlate to the pharmacies' acquisition costs of generics. Large percentage discounts for generic pharmacy acquisition costs vs AWP are common, but the amounts of the discounts to pharmacies can vary widely across drugs.

The next section turns specifically to the Pennsylvania, New York, and Illinois state reports created by 46brooklyn Research and 3 Axis Advisors. This will examine why their analyses, focusing on just a few outlier generic drugs, should not be extrapolated to the costs of administering an entire pharmacy benefit program.

[13] "Draft Methodology for Calculating the National Average Drug Acquisition Cost (NADAC)." CMS, May 2012.

[14] See for example, California, New York, and Alabama.

46brooklyn Methodology

46brooklyn Research and 3 Axis Advisors have published a number of articles in 2018 and early 2019 about pharmacy expenditures in state Medicaid programs. These articles typically focus on a handful of generic drugs where the PBM reimburses the pharmacy based on one formula while the plan sponsor pays according to a different formula (i.e., spread pricing).

The articles are typically based on two primary data sources:

1. SDUD provides prescription data for FFS plans and MCOs, summarizing prescription claims for drugs at the national drug code (NDC) level (i.e., number of units dispensed, number of prescriptions dispensed, dollar amount reimbursed). The SDUD provides estimated plan reimbursement for specific drugs, separately for both FFS plans and MCOs. The data is summarized quarterly, so can be trended over time.[15]
2. NADAC dataset provides an estimated retail pharmacy acquisition price based on wholesaler invoices for the majority of drugs marketed in the United States. This is weekly reference data from November 2013 to current, so can also be trended over time. The NADAC file does not contain data from drugs acquired for dispensing through mail service or specialty pharmacies nor does it include any off-invoice discounts, rebates, or price concessions.[16]

By comparing the "plan reimbursement" from the SDUD data with "assumed pharmacy reimbursement" from the NADAC data, the authors calculate that there is a difference or "spread" that the PBMs retain. The authors comb through all the data to find a few of the most extreme examples of outlier generic drugs where the plan reimbursement based on AWP diverged most widely from acquisition costs.

The authors' data sources, methodology and conclusions suffer from a number of flaws:

Flaw #1: "Cherry Picking"

In their reports, 46brooklyn tends to use a few select drugs as the basis for their analyses. Generic Abilify may be the "poster child" for their analyses, cited in a few different reports. Here is an illustrative excerpt from their New York report.[17]

> *"Otsuka (the manufacturer) implemented one more price increase on January 1, 2015, bringing the WAC for Abilify 5mg to $29.73 per tablet and the AWP to $35.68 per tablet (a 20% premium to WAC). Just a few months later in April 2015, the generic (Aripiprazole) was brought to market by four different manufacturers. Fast forward more than three years to December 2018, and there are now 12 different manufacturers competing in the generic marketplace, which has driven the acquisition cost (as measured by NADAC) down to just $0.33 per tablet.*
>
> *However, as described earlier, the market-based acquisition cost is not directly factored into a transaction for generic prescriptions when contracts allow for PBMs to set and capture pricing spreads. The buyer pays some discount to AWP and the seller receives MAC plus a nominal dispensing fee. Despite the steep decline in the actual price of Aripiprazole 5mg, its AWP has remained constant at around $32.50 per tablet."*

As we have noted previously, this is simply an artifact of two different reimbursement formulas in use, combined with an extreme example of how quickly the acquisition costs fell with new generic competition while the manufacturers' AWPs were held artificially high.

And as the authors note later in their same report, this generic Abilify example is very much an outlier, and not representative of other generic drugs.

And despite the existence of some outlier drugs with high AWPs, PBMs keep overall drug costs low for plan sponsors. While a few select drugs like generic Abilify in the New York report and generic Gleevec, generic Xeloda, and generic

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[15] State Drug Utilization Data, available at Data/Medicaid.gov.

[16] National Average Drug Acquisition Cost (NADAC) weekly reference data.

[17] "Analysis of PBM Spread Pricing in New York Medicaid Managed Care." 3 Axis Advisors, January 17, 2019.

Seroquel in the Pennsylvania report may appear to show large "spread" (due to extreme behavior of AWP vs actual acquisition costs), the overall cost of all drugs to the plan sponsor is still lower in the managed care pricing model compared to a FFS model, saving the state money.

We replicated the data analysis methodology from 46brooklyn, comparing "unit costs" represented by NADAC to "MCO reimbursement" reported in SDUD. We used SDUD data for the state of New York for the study period of 2016, 2017, and 1Q2018, similar to the study period in the report (SDUD data is not yet available for 2-3-4Q2018 in New York).[18] Here and in the 46brooklyn analyses, "spread" is the difference between the "MCO reimbursement" in SDUD and the "unit costs" in NADAC. "Negative spread" is where this difference is negative and the "unit costs" are higher than the "MCO reimbursement." But instead of "cherry picking" the specific drugs that appear to exhibit the highest spread like 46brooklyn, we examined the set of drugs that appear to show the lowest "negative spread".

1. In fact, there seem to be *many* drugs that appear to exhibit "negative spread;" in other words, where MCO reimbursement is reported to be lower than NADAC. **Almost two-thirds of all reimbursed drugs in our sample (63%) exhibited "negative spread" for at least one quarter during the study period and 54% of generic oral solids did.** We attribute much of this to unit error mismatches rather than reimbursement payment terms. This highlights a problem with using these datasets to estimate reimbursement covered by contract terms that they have no visibility into.
2. In addition to "cherry picking" specific drugs (i.e., generic Abilify, generic Gleevec), 46brooklyn also chose to focus their analyses on "generic oral solids," which is another form of cherry picking. In our New York analysis, we found that the "spread" that does appear in the data is almost entirely focused in "generic oral solids" (96% of spread is in generic oral solids). In our sample, generic oral solids accounted for just 14% of the total reimbursement; this 14% is not generalizable or representative of all drug spending.
3. The Top 10 drugs that appear to exhibit "negative spread" are listed in Table 1 below, with a total combined "negative spread" of $275 million across the study period. None of these are oral solids, and only one is generic. Figure 1 graphs quarterly NADAC vs MCO reimbursement for one of these 10 drugs (Restasis), and is similar to the graphs included in the New York report.
    - However, 46brooklyn admits that it is difficult to compare data from NADAC and SDUD for drugs that are not oral solids. According to 46brooklyn, "*SDUD does not specify the units of measure that states report to CMS for different NDCs. This introduces risk to any analysis that attempts to calculate unit costs in SDUD for drugs that are not oral-solids (i.e. inhalers, pens, drops, injectables, etc.) and compare these to other cost databases. Simply put, the units of measure could be different, which will lead to an apples-to-oranges unit cost comparison. To mitigate this risk, we limited the drugs in this study to oral solids (e.g., tablets and capsules) where the chance of a unit mismatch is negligible*."[19]
4. In order to replicate 46brooklyn's "exclusion criteria" for the analytic sample of drugs studied, we also limited our analysis to oral solids only. With this limitation, we still found many drugs that appear to exhibit "negative spread." Table 1 below lists the Top 20 oral solids, with a total combined "negative spread" of $33.7 million across all quarters studied. Of the Top 20, 14 are generics that do not fit the story told by 46brooklyn using "cherry picked" data.

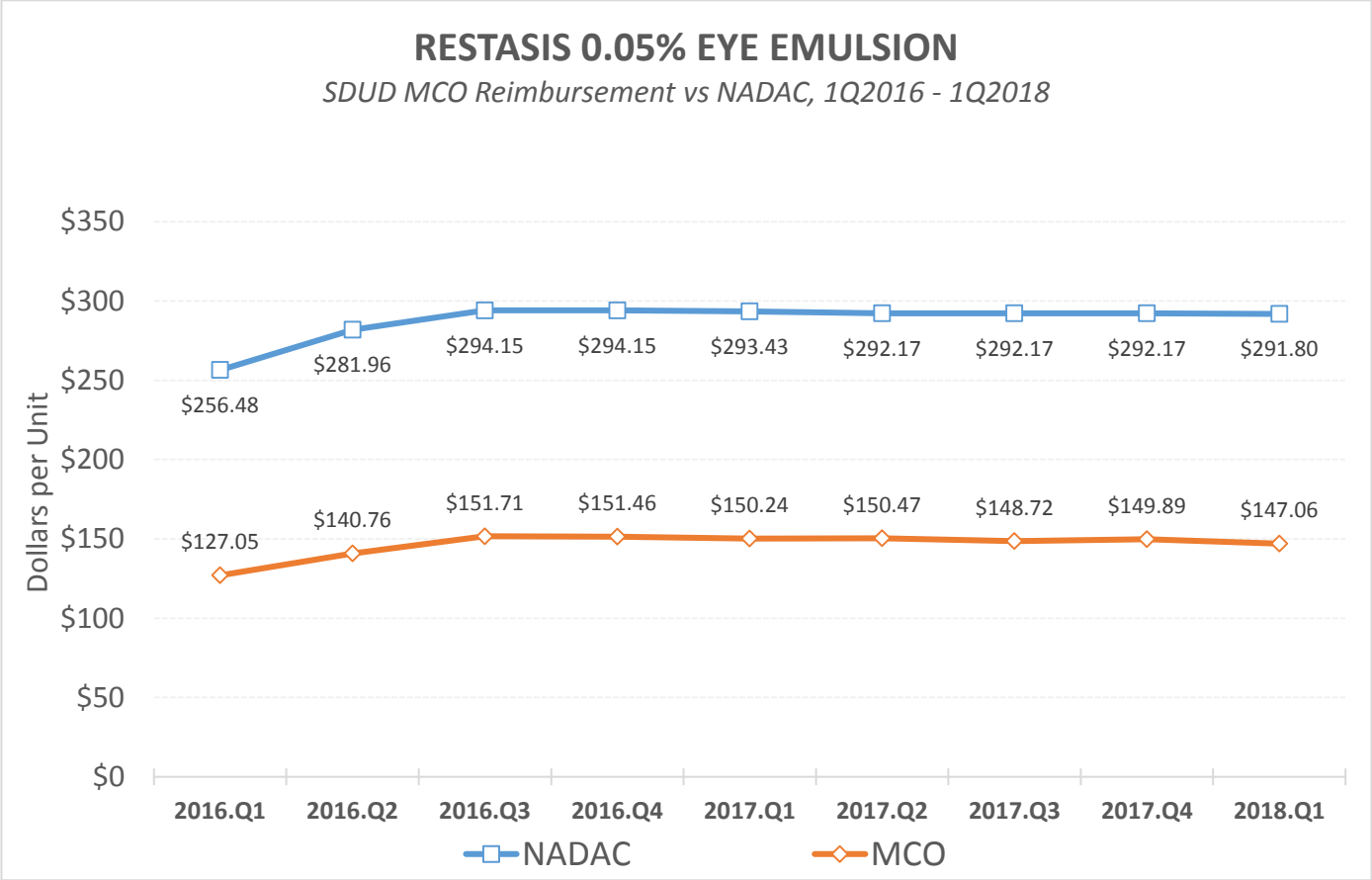
[18] "Analysis of PBM Spread Pricing in New York Medicaid Managed Care." 3 Axis Advisors, January 17, 2019.
[19] "Analysis of PBM Spread Pricing in New York Medicaid Managed Care." 3 Axis Advisors, January 17, 2019.

Table 1: New York 2016-18 Data Analysis - Top Drugs That Appear To Exhibit "Negative Spread"

	Drug Name	Brand/ Generic	Oral Solid?	Total MCO Reimbursed	Total NADAC	Total "Negative Spread"
TOP 10 Drugs That Appear to Exhibit "Negative Spread" (None are oral solid tabs/caps)						
1	AVONEX PEN 30 MCG/0.5 ML KIT	Brand	No	$21,284,994	$88,254,913	-$66,969,919
2	EPIPEN 0.3 MG AUTO-INJECTOR	Brand	No	$48,912,432	$96,302,779	-$47,390,347
3	AVONEX PREFILLED SYR 30 MCG KIT	Brand	No	$11,407,006	$47,822,261	-$36,415,254
4	POLYETHYLENE GLYCOL 3350 POWD	Generic	No	$8,976,293	$39,303,485	-$30,327,192
5	KRISTALOSE 20 GM PACKET	Brand	No	$1,435,619	$26,986,200	-$25,550,581
6	EPIPEN JR 0.15 MG AUTO-INJECTR	Brand	No	$22,690,879	$44,581,200	-$21,890,321
7	HUMIRA PEN 40 MG/0.8 ML	Brand	No	$304,950,102	$319,487,349	-$14,537,246
8	NORDITROPIN FLEXPRO 15 MG/1.5	Brand	No	$45,330,342	$59,005,555	-$13,675,213
9	RESTASIS 0.05% EYE EMULSION	Brand	No	$46,061,799	$56,507,506	-$10,445,707
10	EPINEPHRINE 0.3 MG AUTO-INJECT	Brand	No	$15,383,247	$23,885,333	-$8,502,087
	TOTAL TOP 10			**$526,432,713**	**$802,136,580**	**-$275,703,867**
TOP 20 ORAL SOLID Drugs That Appear to Exhibit "Negative Spread"						
1	HARVONI 90-400 MG TABLET	Brand	Yes	$299,306,113	$310,264,229	-$10,958,115
2	METHYLPHENIDATE ER 36 MG TAB	Generic	Yes	$26,697,183	$30,287,676	-$3,590,493
3	SOVALDI 400 MG TABLET	Brand	Yes	$71,691,373	$74,984,675	-$3,293,301
4	METHYLPHENIDATE ER 54 MG TAB	Generic	Yes	$17,521,689	$19,986,228	-$2,464,539
5	METHYLPHENIDATE ER 18 MG TAB	Generic	Yes	$12,487,906	$14,787,730	-$2,299,825
6	METHYLPHENIDATE ER 27 MG TAB	Generic	Yes	$13,215,272	$15,161,469	-$1,946,196
7	ZEPATIER 50-100 MG TABLET	Brand	Yes	$186,647,861	$188,112,565	-$1,464,704
8	COLCHICINE 0.6 MG TABLET	Generic	Yes	$9,346,973	$10,731,917	-$1,384,945
9	GILENYA 0.5 MG CAPSULE	Brand	Yes	$31,060,943	$32,116,248	-$1,055,304
10	EPCLUSA 400 MG-100 MG TABLET	Brand	Yes	$144,506,116	$145,383,100	-$876,984
11	GLEEVEC 400 MG TABLET	Brand	Yes	$8,709,371	$9,367,324	-$657,953
12	RANITIDINE 150 MG CAPSULE	Generic	Yes	$3,470,704	$4,095,630	-$624,926
13	LEVOTHYROXINE 75 MCG TABLET	Generic	Yes	$3,278,402	$3,730,142	-$451,740
14	LEVOTHYROXINE 50 MCG TABLET	Generic	Yes	$3,893,291	$4,343,525	-$450,234
15	VENLAFAXINE HCL ER 225 MG TAB	Generic	Yes	$3,532,921	$3,958,568	-$425,647
16	LEVOTHYROXINE 125 MCG TABLET	Generic	Yes	$2,000,485	$2,385,417	-$384,932
17	LEVOTHYROXINE 100 MCG TABLET	Generic	Yes	$2,686,316	$3,058,967	-$372,651
18	ABACAVIR-LAMIVUDINE-ZIDOV TAB	Generic	Yes	$3,289,543	$3,642,241	-$352,698
19	NITROGLYCERIN 0.4 MG TABLET SL	Generic	Yes	$982,678	$1,321,326	-$338,648
20	MESALAMINE 800 MG DR TABLET	Generic	Yes	$5,346,442	$5,656,285	-$309,843
	TOTAL TOP 20 ORAL SOLIDS			**$849,671,582**	**$883,375,260**	**-$33,703,678**

Figure 1: Quarterly SDUD Reimbursement and NADAC Values for Restasis

SDUD MCO reimbursement represent estimates of MCO reimbursement payments to PBMs, average quarterly NADAC values represent estimates of PBM payments to pharmacies.



Source: Visante analysis of New York State Drug Utilization Data (SDUD) and National Average Drug Acquisition Cost (NADAC) data, Centers for Medicare and Medicaid Services.

Flaw #2: The New York and Illinois pharmacy datasets include only a handful of independent pharmacies

The New York study and Illinois study both include data collected from independent community pharmacies. However, in the New York study the authors do not state in their report that the data sample comes from only eleven independent retail pharmacies. This fact was unveiled through a separate Bloomberg article. [20] The sample in the Illinois study included just 21 independent pharmacies. And besides being extremely small samples, they also do not represent the overall pharmacy market (e.g., do not represent chains, specialty pharmacies), which limits the generalizability of any findings.

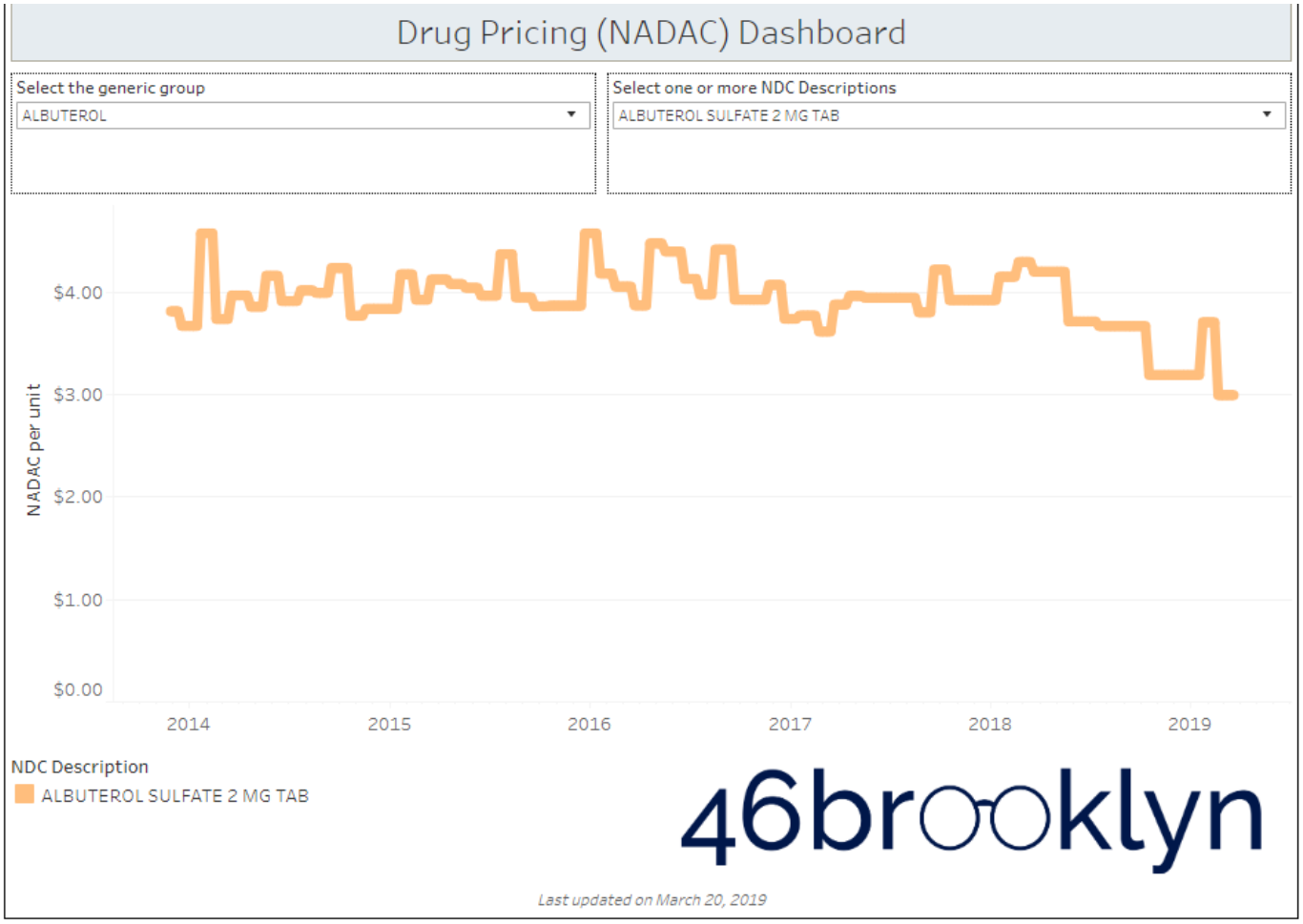
Flaw #3: Prices in NADAC survey data can be highly variable.

NADAC prices are dependent upon survey responses from retail pharmacies. This works adequately for drugs with relatively stable prices, but the survey data is not as reliable for drugs with prices that are significantly rising or falling month-to-month. The authors are comparing aggregated data from automated reporting systems that are accurate day-to-day and month-to-month in the SDUD data with NADAC collected survey data that is NOT as accurate day-to-day. This is specifically a problem when analyzing specific drugs due to their large price changes, such as 46brooklyn's focus on generic Gleevec and generic Abilify. This may also account for some of the over-time quarter-by-quarter

[20] "Drug Middlemen Got Big Markup in New York, Pharmacists Say." R Langreth, Bloomberg, January 24, 2019.

variation that was reported in the New York and Pennsylvania studies as problematic examples of "high-spread" pricing by PBMs. As an example of the volatility of NADAC, Figure 2 shows the monthly NADAC price changes per pill of generic albuterol sulfate (2 mg tablet). The NADAC price shown changes by as much as a dollar per pill on a monthly basis.

Figure 2: NADAC Pricing Per Unit of Generic Albuterol Sulfate (2mg Tablet)



Flaw #4: Pricing/reimbursement analysis does not include many discounts, including rebates

46brooklyn methodology does not include the impact of manufacturer rebates. For some drugs, rebates can account for more than 50% of brand ingredient cost. It is difficult, if not impossible, to draw conclusions about Medicaid costs on brand drugs without factoring in manufacturer rebates. And while commercial and Medicare Part D plans do not typically receive rebates on generics, Medicaid MCOs DO receive rebates of 13% on most generic drugs. The SDUD data is reported pre-rebates, so does not include the 13% rebate.[21] Furthermore, NADAC data are based on invoice prices, and do not include off-invoice discounts and price concessions that wholesalers offer pharmacies. Therefore, the NADAC values do not represent the actual net costs for the specified drugs at retail pharmacies, and the difference between the MCO payment to the PBM (SDUD) and the estimated pharmacy invoice cost (NADAC) is not a meaningful number that exists in the supply chain to represent spread.

[21] "State Drug Utilization Data (SDUD) FAQs." CMS Medicaid.gov.

Flaw #5: NADAC does not accurately reflect acquisition costs for specialty drugs and specialty pharmacies

Specialty pharmacies are excluded from the NADAC survey. Therefore, acquisition costs for specialty drugs in the NADAC survey do not represent the acquisition costs for most of the prescriptions dispensed for these drugs, which are often dispensed by specialty pharmacies. So if a specialty drug is dispensed in a community retail facility, there might be a NADAC for it, but it may not represent a true acquisition cost because it wouldn't include the costs to the specialty pharmacies, which may face different acquisition costs and receive different discounts.

While there is no single, accepted definition of "specialty pharmacies," they are typically considered pharmacies where the majority of their business is dispensing and managing drugs that are considered "specialty."[22] These specialty drugs generally treat complex conditions (e.g., cancer and HIV), and require special handling (e.g., refrigeration) and extra support for patients.[23] These drugs are also typically very expensive. Specialty pharmacies offer a variety of services tailored to the specific drug and patient populations that they serve, including clinical support, condition-based care plans, adverse side effect management and reporting, and medication adherence programs, with a goal to supporting patients, producing best clinical outcomes, and reducing waste.[24] As a result, patients who use specialty pharmacies have higher medication adherence than patients that use retail pharmacies.[25] There has been a rapid proliferation of specialty pharmacies over the last decade.[26] According to the Drug Channels Institute, there are currently over 900 specialty pharmacies accredited in the US.[27]

Specialty drugs are often a primary focus of cost/price inconsistencies identified by 46brooklyn. Their first article focused on generic Gleevec, a specialty drug with a high list price.[28] A subsequent article highlighted two specialty drugs with the "highest rate of markup": generic Gleevec and generic Xeloda.[29] The report concluding that Pennsylvania has a "spread problem" focused nearly exclusively on those same two specialty drugs as the basis for that conclusion, while ignoring the millions of claims on drugs that have little to no spread.

Flaw #6: States and taxpayers are not paying more

A number of the 46brooklyn articles imply that the "MCO spread" on selected generic drugs creates additional direct costs to the state, or by extension, to the taxpayers.

The per-claim cost paid by the Medicaid MCO to the PBM is NOT always directly linked to what the state pays to the plan. States often contract with MCOs on a per beneficiary capitation basis.[30] It is then up to the MCO to figure out how to minimize their costs under the capitation. In other words, the plans have an incentive to lower their overall costs, due to their capitation with the states. They must manage costs and quality using many different tools, one of which is the PBM of their choosing. And the PBMs must actively compete for the business of the MCOs.

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[22] "What Is a Specialty Pharmacy?" Specialty Pharmacy Times. December 18, 2013.

[23] "Specialty pharmacy, explained." Advisory Board. February 22, 2018.

[24] "Specialty pharmacy: Trending to the future." American Pharmacists Association. October 2016.

[25] "Role of Pharmacy Channel in Adherence to Hepatitis C Regimens." J Visara and SG Frazee. American Journal of Pharmacy Benefits. 2013;5(1):17-24.

[26] "Exclusive Update: The State of Specialty Pharmacy Accreditation in 2017." Drug Channels Institute. April 2017.

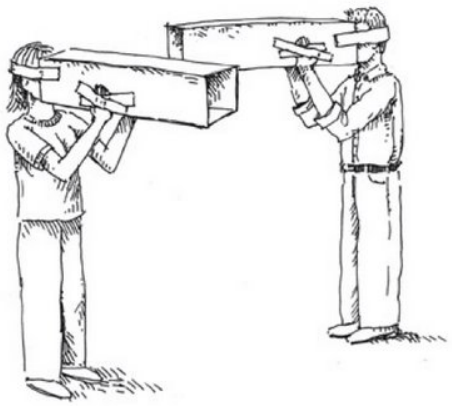
[27] "The Specialty Pharmacy Boom: Our Exclusive Update on the U.S. Market." Drug Channels Institute. April 2019.

[28] "The cancerous design of the U.S. drug pricing system." 46brooklyn Research, July 31, 2018.

[29] "Examining High Drug Markups: Introducing the Top 20 Over $20." 46brooklyn Research, October 30, 2018.

[30] According to Medicaid and CHIP Payment and Access Commission (MACPAC), "States typically pay managed care organizations for risk-based managed care services through fixed periodic payments for a defined package of benefits. These capitation payments are typically made on a per member per month (PMPM) basis." See MACPAC "Medicaid managed care payment".

Flaw #7: Plan sponsors make decisions on PBM contracts based on the overall cost of the entire benefit plan



46brooklyn methodology is based on evaluating the costs of a pharmacy benefit based on just one small sliver of the overall pharmacy benefit: a few generic oral solid prescription drugs sold by a smattering of independent pharmacies. The "generic pricing formula analysis" from 46brooklyn is only a very narrow view of one piece of the overall pharmacy benefit cost equation. For example, in New York State, generic oral solids accounted for 14% of total MCO drug reimbursement between 2016 and the first quarter of 2018. Many other variables contribute to the overall cost of the pharmacy benefit, far beyond just the generic reimbursement formulas. The plan sponsor clients will evaluate and choose their PBM based not only on a single "price," but on the ability to deliver lower costs and improved outcomes through PBM tools such as formulary management, utilization management, provider/network management, disease management, care management, improved medication adherence, etc. And increasingly, the emphasis is being extended to integrating pharmacy operations with clinical management.