

Policy Research Perspectives

Competition in Commercial PBM Markets and Vertical Integration of Health Insurers with PBMs

By José R. Guardado, PhD

Introduction

Pharmacy benefit managers (PBMs) are an increasingly important participant in health insurance markets and the supply chain for prescription drugs. They manage drug insurance benefits for the vast majority of Americans and are receiving increasing attention from policymakers and regulators. PBMs are a middleman between drug manufacturers on the one hand and health insurers (or employers) on the other. PBM services are an input to the production of health insurance services and thus a determinant of health plan premiums. PBM functions include negotiating rebates with drug manufacturers, assembling retail pharmacy networks, managing drug formularies, adjudicating pharmacy claims and designing benefits.

PBMs were created in the 1960s to help health insurers contain drug spending. PBMs can stimulate price competition among drug manufacturers by shifting demand among competing substitute drugs. In turn, manufacturers offer rebates to PBMs for their drugs to be placed favorably in a drug formulary, which PBMs are then supposed to pass on to insurers or employers. However, the PBM market needs to be competitive for rebates to be fully passed on to final consumers. Thus, it is critically important that PBM markets are competitive (Garthwaite and Scott Morton 2021; Brot-Goldbert, Che and Handel 2022; Conti, Frandsen, Powell and Rebitzer 2022).

It is not clear whether PBMs are (fully) passing on those rebates. Indeed, some economists argue that consolidation in the PBM market, combined with opaque pricing, is one cause of higher pharmaceutical prices (Garthwaite and Scott Morton 2021). Perhaps in response to this incomplete pass-through of rebates, health insurers have been vertically integrating with PBMs. As a result, the largest insurers in the country and even some smaller ones already have their own PBM or share the same owner with one.

The fact that the largest health insurers and PBMs at the national level are vertically integrated can make it appear that vertical integration is more widespread than it is. However, that may not be the case given that health insurance markets are generally local. In fact, insurers with a national presence are in the minority. Most insurers are typically licensed in a single state (Guardado and Kane 2021). Thus, a look at the local level may portray a different picture of the extent of vertical integration than at the national level.

A main intent of this paper is to describe a market of which little is known. It aims to shed light on the PBM landscape and the functions PBMs provide for health insurers. Two other data sources also review this landscape and report market shares of the largest PBMs. However, they report them based on only one type of PBM function (adjudicated drug claims), compute them only at the national level, and they provide little information about the insurers that use them (Drug Channels 2022; Health Industries Research Companies (HIRC) 2022).

Using novel data, this paper presents a descriptive analysis of PBM markets and the provision of PBM services to commercial health insurers. Due to the nature of the data, the market examined is a very specific one. It is based on commercial drug coverage that is provided by a health insurer in a health plan that includes both a medical benefit and a drug benefit.

In contrast to previous work, this paper provides information on five different PBM functions. In antitrust parlance, insurers can make or buy—they can either produce a PBM function themselves in house (make) or they can go to the market and use a PBM (buy). Sometimes the insurer shares ownership with the PBM it uses, while other times they are not affiliated.

Also in contrast to previous studies which report PBM market shares only at the national level, this paper computes shares at the national, state and MSA levels, as well as presents PBM market concentration—Herfindahl-Hirschman Indices (HHIs)—at those local levels.

It is useful to consider the market shares of the health insurers providing those drug benefits, since those are the same covered lives¹ that the PBMs are managing. This helps explain the size of PBMs' market shares. If a health insurer is big in the drug insurance market, then the PBM it uses to manage its lives ought to be big as well. To this end, the paper also presents the 10 largest health insurers' national-level market shares of drug coverage lives.

Another major advantage of the data used in this paper is that they report the PBMs that insurers use to manage their lives and conversely what insurers' lives are managed by PBMs. Thus, they can reveal whether an insurer is vertically integrated with a PBM and can be used to quantify the extent of vertical integration between health insurers and PBMs. It can also be determined whether the PBM is exclusive to an insurer or whether the PBM manages other non-affiliated insurers' lives as well. Whether or not health insurers and PBMs are vertically integrated or whether they are exclusive may have important antitrust implications. In vertical mergers, there is a risk of *input* or *customer* foreclosure.² If an insurer is already vertically integrated with a PBM, there would be less antitrust concern that proposed vertical mergers between other insurers and PBMs would foreclose the vertically integrated insurer or PBM or raise their costs. However, non-vertically integrated insurers and PBMs could still be foreclosed. Finally, if a PBM is exclusive to a specific insurer, its presence in the market does not necessarily mean that it is a viable option for that insurer's rivals.

¹ Covered lives is a standard term used in health insurance, which means the persons covered under a policy. It is synonymous with beneficiaries or enrollees. These terms are used interchangeably throughout the paper.

² For example, in the Aetna-CVS merger, the input foreclosure concern was that Aetna's insurer rivals would not be able to access the Caremark PBM or would face higher costs after the merger. Aetna's insurer competitors might be foreclosed. The *customer* foreclosure concern was that Caremark's PBM rivals might be foreclosed from having Aetna as a customer.

Data and methodology

This study uses 2020 data on commercial drug insurance coverage lives and the PBMs that health insurers use to manage those lives from the Decision Resources Group (DRG). This is the same data source used to produce *Competition in Health Insurance: A Comprehensive Study of U.S. Markets* (Guardado and Kane 2021). To collect PBM lives, DRG does not survey PBMs. Instead, in addition to asking health insurers for their *medical* covered lives, DRG asks them for their drug benefit covered lives, as well as which PBMs they use to manage them. Thus, the PBM lives reported in the DRG data are those same drug coverage lives reported by the insurers but assigned to the PBM. DRG aggregates the insurer-level lives to the PBM level so that a given PBM's lives are the sum of all lives of the insurers that use it. Although Medicare Part D and Medicaid drug coverage lives are also reported in the DRG data, this paper excludes them and focuses on the commercial market.

These drug insurance lives are part of a commercial health plan that includes both a medical benefit and a drug benefit. Sometimes a health plan does not include a drug benefit, and instead the drug benefit may be *carved out*. Employers may choose not to get drug coverage from the insurer, and instead buy the drug benefit separately, directly from a PBM. This is analogous to standalone plans in Medicare Part D, where Medicare beneficiaries can buy drug coverage separately from their medical plan. The DRG commercial data do not include carved-out lives. In fully insured health plans, DRG estimates that about 10 percent of drug coverage lives are carved out and thus not included in the data. In the self-insured market, about 65 percent of lives are carved out and also not included. Of the health insurance lives in the DRG data, 47 percent are fully insured, and 53 percent are self-insured. Thus, this suggests the data are missing about 39 percent of commercial drug coverage lives in the combined fully insured and self-insured markets.³

One advantage of the data is that they report the PBM used by insurers to perform each of five different functions: *rebate negotiation*, *retail network management*, *claims adjudication*, *formulary management* and *benefit design*. Rebate negotiation represents the negotiation of rebates between drug manufacturers and PBMs. Retail network management is the assembling of retail pharmacy networks. Claims adjudication is the administering and processing of pharmacy claims information. Formulary management represents the controlling of the drug formulary, which is a list of drugs deemed most medically appropriate and cost effective by the entity with control of it. Finally, benefit design is a means to incentivize the use of certain drugs over others, such as through tiering, copays and coinsurance. For each function, the data report either the name of the PBM that manages that function or "In house." In house indicates that the insurer performs the function itself. An insurer may use an external PBM for some functions and perform other functions in house.

This paper uses the drug coverage lives to compute PBM market shares and HHIs. To calculate firms' market shares, the market in which competition takes place needs to be defined. Markets are characterized by two aspects: a geographic market and a product market. As in *Competition in Health Insurance*, this study defines geographic markets at the state and MSA levels. In fact, the same methodology used in *Competition in Health Insurance* with respect to the raw data is used here as well. This study also excludes lives from areas where insurers are not licensed. Most

³ 39 percent is a weighted average of the carved-out shares in the self-insured and fully insured markets.

notable among these are Blue Cross Blue Shield (BCBS) insurers, which typically do not compete with one another.⁴ Thus, this paper analyzes the drug coverage lives of the same insurers as in *Competition in Health Insurance*, the latter of which looks at *medical* lives.

Other data sources (e.g., Drug Channels; HIRC) report PBM market shares at the national level though not at the local level. However, there are plausible reasons why PBM markets may also have a local dimension. Since health insurance markets are local, and when the drug benefit is tied to the medical benefit as is the case here, the market for drug coverage may also be local. As mentioned, there are very few health insurers with a national presence (Guardado and Kane 2021). Most insurers still operate locally and are typically licensed in a single state or region, such as most BCBS insurers. Thus, PBMs may also need to market locally. Moreover, analogous to health insurers' assembly of hospital and physician networks, PBMs assemble networks of pharmacies. If pharmacies need to be close to where workers live and work to buy their drugs, then, save for mail order, it is plausible that retail pharmacy markets may have a local dimension as well. For these reasons, this paper calculates PBM market shares at the local level in addition to the national level. Regardless of the competitive implications, it is nonetheless interesting to shed light on the local presence of PBMs as there could be variation across states and MSAs in their market shares compared to their national sizes.

Turning to the other aspect of the market that needs to be defined, a product market is a product or group of products for which there are no adequate substitutes. Firms belong in the product market if they compete with one another. Thus, there is a question of whether *insurers* providing a PBM service in house belong in the product market. Consider, for example, an insurer facing a price increase by a PBM. That insurer cannot switch to another *insurer* that performs a PBM function in house to supply the PBM service. This suggests that in-house lives do not belong in the market; thus, they are excluded from the analysis of PBM market concentration.

At the outset, all five PBM functions were candidate product types for which market shares and HHIs could be calculated. However, an initial analysis revealed that significant portions of the market (almost 40 percent) were being supplied by insurers in house for two of the PBM functions: formulary management and benefit design. Thus, PBM market shares and HHIs for those two functions are not presented at the state and MSA levels. However, national-level market shares for the 10 largest PBMs including in-house lives are presented to show that a lot of the managing is done in house by insurers for those two functions. This is done in two ways. First, the aggregate share of all insurers that perform the function in house is shown. Second, the PBM's name is changed from "In house" to the insurer performing the function, such that the insurer itself is considered the PBM.

To compute PBM market shares and HHIs, this paper defines three product markets based on the other three PBM functions: *rebate negotiation*, *retail network management*, and *claims adjudication*. Excluding in-house lives for these functions was inconsequential since nationally, tiny portions of drug lives are managed in house for them.⁵ PBM market shares and HHIs in states and MSAs for each of these three functions are calculated. In addition, the 10 largest PBMs' national-level market

⁴ See *Competition in Health Insurance* (Guardado and Kane 2021) for the detailed methodology employed, including the exclusions of lives from the raw data.

⁵ Three percent for rebate negotiation and fewer than one percent for retail network management and claims adjudication.

shares are presented as well. Finally, to shed light on the size of PBMs, national-level drug coverage market shares of the 10 largest health insurers are also reported.

Another major advantage of the DRG data is that they can be used to quantify the extent of vertical integration between health insurers and PBMs. The PBM that an insurer uses to manage its lives and conversely what insurers' lives are managed by the PBM are both reported. Thus, it can also be determined whether the PBM is exclusive to an insurer or whether the PBM manages other non-affiliated insurers' lives as well. The reported PBM may be owned by the insurer (or the insurer's owner), or it may be independent. Research was conducted to identify the owner of each PBM.

This study considers an insurer as vertically integrated if it meets at least one of two criteria for a given PBM function. One is that the PBM reported for the function is "In house," which is by definition vertically integrated—the firm supplies an input itself rather than buying it from the market. The other criterion is that the reported PBM is owned by the insurer or shares its same owner. In short, an insurer is vertically integrated if it performs a function in house or uses a PBM with which it shares ownership.

Initially, the presence of five PBM functions presented a challenge in determining whether an insurer is vertically integrated. In general, however, there is consistency in whether the insurer is vertically integrated across the five functions. This simplified the classification. For example, the PBM reported across all five functions for UnitedHealth Group is always the PBM it owns—OptumRx, and the PBM reported for Anthem is "In house" for two of its functions and its own IngenioRx for the other three. There are other less common cases where the insurer is vertically integrated for some functions but uses an unaffiliated PBM for others. In this analysis, if the insurer uses an affiliated PBM for at least four of the five functions, then it is considered vertically integrated. A notable insurer is Humana, which owns a PBM and uses it for four of the five functions. Thus, Humana is considered vertically integrated. In sum, although an insurer can be vertically integrated for some functions but not for others, the consistency across functions suggests that a single measure of vertical integration is valid. Thus, this study considers each insurer in a geographic area as either vertically integrated or not vertically integrated.⁶

Results

Market shares and market concentration

As indicated above, the product market in this paper has a very specific definition given what the DRG data include. It is based on enrollment in commercial drug insurance that is obtained directly from health insurers through health plans that combine the medical benefit and the drug benefit. Carved-out lives are not included.

Exhibit 1 reports national-level market shares of the 10 largest PBMs in the U.S. in 2020. They are reported for rebate negotiation, retail network management and claims adjudication. The results show little difference in the market shares and ranking of PBMs across those three PBM functions.

⁶ There were a few instances in which a parent company's subsidiary insurers were not always vertically integrated across all geographic areas. Specifically, although the parent company Centene is vertically integrated in the vast majority of areas where it operates, a few of its subsidiaries in a few states are not.

Thus, the following results discussion will focus on rebate negotiation. The four-firm concentration ratio (CR4) is 66 percent. This indicates that the four largest PBMs collectively have a 66 percent share of the national PBM commercial market. The collective share of all 10 PBMs is 97 percent.

Express Scripts is the largest PBM in the commercial drug coverage market with a 22 percent market share. The second largest PBM is OptumRx, which has a 17 percent share. Prime Therapeutics is the third biggest and has a 15 percent share. These PBMs are followed by Kaiser Pharmacy (12 percent), IngenioRx and CVS/Caremark, which have shares of 10 percent apiece, and Aetna Pharmacy Management with a seven percent share. Note that DRG still reported CVS/Caremark and Aetna separately, likely because their merger was held up in court and not approved until close to the end of 2019. Combining CVS-Caremark and Aetna would give CVS a 17 percent market share and rank it third largest—closely behind OptumRx.⁷

It is useful to consider the market shares of the health insurers providing those drug benefits, since those are the same lives that the PBMs are managing. This helps explain the size of PBMs' market shares. If a health insurer is big in the commercial drug insurance market, then the PBM it uses to manage its lives ought to be big as well. Exhibit 2 reports national-level market shares of the 10 largest commercial drug insurers in 2020 in the market for drug benefits tied to medical benefits provided by health insurers. The beneficiaries underlying Exhibit 2 are virtually the same ones underlying the PBM shares in Exhibit 1.⁸ The lives in Exhibit 1 are distributed among PBMs, while those in Exhibit 2 are distributed among insurers. Also note that these 10 insurers are the same 10 largest commercial *health* insurers in the U.S. (Guardado and Kane 2021). However, the ranking and market shares differ slightly given that the number of drug lives covered by insurers can differ from their *medical* covered lives. Part of this is due to the carve out of drug benefits described above, while some employers simply do not provide a drug benefit.

Exhibit 2 shows that with a 13 percent market share, UnitedHealth is the largest commercial drug insurer in the U.S. This helps explain why the PBM it owns and uses—OptumRx—is the second largest PBM. OptumRx's 17 percent share is larger than UnitedHealth's because OptumRx is not exclusive; it manages many other insurers' drug benefits as well. Closely behind UnitedHealth is Kaiser with a 12 percent share in the drug insurance market. The Kaiser Pharmacy PBM is used exclusively by Kaiser and thus has the same 12 percent share of lives. Because Kaiser is big in the drug insurance market, its PBM is also big.

Anthem is the third largest drug insurer with a 10 percent share. Anthem's PBM IngenioRx is used exclusively by Anthem so it also has a 10 percent share. Cigna has a 10 percent share in the drug insurance market and uses its own PBM—Express Scripts. Cigna's size is largely what makes Express Scripts the biggest PBM. However, Express Scripts is not used exclusively by Cigna and is used by many other insurers—hence its much larger PBM share. The fifth largest insurer is Aetna with a seven percent share. Aetna uses Aetna Pharmacy Management exclusively, which gives it a seven percent share as well.

⁷ The market shares are rounded. Unrounded, OptumRx's share is slightly larger than Aetna-CVS's combined share.

⁸ The only slight difference is that the lives in Exhibit 1 (for PBMs) exclude a few lives where the PBM reported is "In house" (three percent for rebate negotiation and fewer than one percent each for retail network management and claims adjudication), whereas Exhibit 2 includes those in-house lives.

The next largest insurer is Health Care Service Corporation (HCSC), which owns BCBS companies in five states. HCSC and several other BCBS insurers, including BCBS FL, jointly own and exclusively use Prime Therapeutics and collectively give it its large share of 15 percent in the PBM market. Finally, Centene's national size helps put the PBM it owns—Envolve Pharmacy Solutions (also exclusive)—among the 10 largest PBMs.

In sum, of the 10 PBMs in Exhibit 1, which have a collective market share of 97 percent in the rebate negotiation market, six of them are exclusive to an insurer (or set of insurers in the case of Prime Therapeutics). Those PBMs are Prime Therapeutics (several Blues), Kaiser Pharmacy (Kaiser), IngenioRx (Anthem), Aetna Pharmacy Management (Aetna), Envolve (Centene) and Humana Pharmacy Solutions (Humana). These six PBMs have a collective national market share of 48 percent. This has competitive implications. At least at present, although it may appear that insurers have a considerable number of PBM options to choose from, this may be overstated since most of the largest PBMs are exclusive to a given insurer. Moreover, three of the other PBMs (Express Scripts, OptumRx and CVS/Caremark), although not exclusive, are nonetheless owned by or share ownership with insurers. MedImpact is the only top 10 PBM that is not affiliated with an insurer.

The results in Exhibits 1 and 2 suggest a significant degree of vertical integration between health insurers and PBMs due to their common ownership. The eight largest insurers, which have a collective national market share of 61 percent, are affiliated with the eight biggest PBMs.

In contrast to the three PBM functions presented in Exhibit 1, formulary management and benefit design are much more often conducted by insurers in house. The following analysis, which is based on those two functions, includes in-house lives, whereas Exhibit 1 excludes them. The nine largest PBMs along with a collective share of in-house lives held by all insurers are presented in Exhibit 3. At the national level, formulary management for an aggregate 36 percent of drug coverage lives was conducted in house by insurers. The share for benefit design was similar at 38 percent. One potential explanation for such large shares is that the data exclude carved-out lives. Whereas some insurers have the capability to conduct those functions in house, some employers may not. Thus, when lives are carved out, employers may be more likely to have a PBM perform them. This possibility suggests insurer in-house shares might be lower in an analysis that also included carved-out lives.

The in-house shares reported in Exhibit 3 are the sums of several insurers' shares. To show the underlying individual insurers that are managing benefits in house, the name of the PBM that was reported as "In house" in Exhibit 3 is changed to the insurer's name in Exhibit 4. Put differently, the insurer *is* the PBM.

A few interesting findings emerge from comparing Exhibits 1 and 4, which consider different sets of PBM functions. First, Express Scripts has a decrease in market share from 22 percent to 11 percent and falls from being the largest PBM to the fourth largest. Some insurers that use Express Scripts for the functions in Exhibit 1 conduct formulary management and benefit design in house. Notable among these are BCBS MI and other BCBS insurers. Consequently, OptumRx rises to being the biggest PBM and having the largest market shares. The other notable finding is that three insurers have made it to this top 10 list. The insurer, Anthem, has 10 percent shares in formulary management and benefit design. In fact, Anthem has replaced IngenioRx as the fifth largest "PBM"

with the same 10 percent share. IngenioRx is no longer one of the largest PBMs because while Anthem uses IngenioRx for rebate negotiation, retail network management and claims adjudication (Exhibit 1), it conducts formulary management and benefit design in house (Exhibit 4).

Turning to an assessment of PBM market concentration at the local level, Exhibit 5 presents mean HHIs and the percentages of markets that are highly concentrated in state- and MSA-level markets for each of the three PBM functions indicated. More detailed results underlying these summary statistics are reported in the Appendix. Exhibit A1 reports the HHIs and the two largest PBMs' market shares in each state and MSA for the rebate negotiation market. Exhibits A2 and A3 presents this information for retail network management and claims adjudication, respectively.

The results show that on average, PBM markets are highly concentrated at the local level. In the rebate negotiation market, the mean HHI across states and MSAs is 3746 and 4103, respectively, and 78 percent of state-level markets and 85 percent of MSA-level markets are highly concentrated. The results are similar in the retail network management and claims adjudication markets. These results are not surprising. As was indicated above, if insurers have large market shares, then the PBMs they use will have large shares as well. This is indeed what the data reveal. A separate analysis finds that the average MSA-level commercial drug coverage market is also highly concentrated, with an HHI of 3438 (not shown). Insurers have large market shares, so PBMs do, too. For example, because BCBS AL is the dominant commercial drug insurer in Alabama with an 86 percent state-level share, resulting in an HHI of 7364, the PBM it uses to manage those levels—Prime Therapeutics—also has a state-level market share of 86 percent, yielding a PBM market HHI of 7389.

There are a few differences in the national-level PBM market shares presented in Exhibit 1 compared to those from Drug Channels and HIRC; the results in these two other data sources are themselves similar. The most notable is that Drug Channels reports that the largest PBM in the U.S. is CVS/Caremark with a 32 percent national market share.⁹ In contrast, this study computes a market share for CVS/Caremark and Aetna combined of 14 percent to 17 percent depending on PBM function.

There are plausible reasons that would give rise to such differences. One is that this paper focuses on the *commercial* market, whereas Drug Channels and HIRC look at all markets combined, including Medicare (Part D) and Medicaid. If CVS/Caremark is overrepresented in Medicare and/or Medicaid, they would be bigger in the market including all payer-types. Indeed, there is some evidence for this. In a separate analysis (not shown), a calculation of market shares on the entire raw DRG data without any exclusions (i.e., including Medicare and Medicaid) reveals that CVS's market share increases to approximately 22 percent. Second, the DRG data exclude drug benefits that are based on direct relationships between self-insured employers and PBMs. If CVS is overrepresented in that carved-out market segment, its market share would be smaller in the DRG data. Another potential explanation for the differences is that the shares presented by Drug Channels and HIRC are based on the *number of prescription claims* managed, whereas the DRG data are based on the number of drug coverage enrollees. If there are more claims per covered life among the elderly (Medicare) or Medicaid population than in the commercial market, that would also

⁹ <https://www.drugchannels.net/2021/04/the-top-pharmacy-benefit-managers-pbms.html>

make CVS/Caremark smaller in the DRG data. Other notable differences in market shares are for Prime Therapeutics, Kaiser, IngenioRx and Humana. This paper finds that Prime Therapeutics, Kaiser and IngenioRx are bigger and that Humana is smaller than in the Drug Channels data. The differences between data sets noted above likely explain part of the differences in these other insurers' shares as well. For example, the shares for Prime Therapeutics and Kaiser fall and Humana's rises if they are calculated based on the entire data including Medicare and Medicaid.

Extent of vertical integration of health insurers and PBMs

The national-level results of the largest PBMs and insurers presented above suggest a large extent of vertical integration between health insurers and PBMs. This seems to be what is conventionally thought because it is what prior studies suggest. As Guardado and Kane (2021) find, however, the largest health insurers nationally are not necessarily the biggest health insurers at the local level. In fact, most health insurers don't have a national presence and instead operate at the local level as they are typically licensed to operate in a single state. Such insurers may not necessarily have their own PBMs and may not be vertically integrated. Thus, a look at the extent of vertical integration at the local level may portray a different picture.

Exhibit 6 presents shares of drug lives that are covered by an insurer that is vertically integrated—i.e., has its own PBM or performs the PBM function(s) in house. Nationally, 69 percent of drug lives are covered by a vertically integrated insurer. Although the largest U.S. insurers and PBMs are vertically integrated, over 30 percent of the national market is not. Turning to the local level, there are areas where there is even less vertical integration. On average, 63 percent of state-level drug lives and 65 percent of MSA-level drug lives are vertically integrated. However, there is wide variation across states and MSAs, with some states having almost no vertical integration, while others are almost entirely vertically integrated. The state with the smallest vertical integration share (South Dakota) has only six percent of its lives vertically integrated, and the highest share of 97 percent is in North Carolina (data not shown).

Several insurers that don't have a national presence but are large at the local level are not vertically integrated. Notable examples are several BCBS insurers, and it is known that a BCBS affiliate is the largest insurer in most local health insurance markets (Guardado and Kane 2021). For example, BS of CA and BCBS MI are not vertically integrated and still use external PBMs. The same is true for many other BCBS and non-BCBS insurers.

Conclusion

This paper presents a descriptive analysis of PBM markets and the provision of PBM services to commercial health insurers. Due to the nature of the data it uses, the market examined is a very specific one. It is based on commercial drug coverage that is tied to a health insurance plan—carved-out lives are not included. Using these novel data from 2020 and in contrast to previous work, the paper provides information on five different PBM functions. Insurers have a make or buy decision when they need PBM services. They can either conduct a function in house (make) or go to the market and use a PBM (buy). The analysis finds that for three of the functions (rebate negotiation, retail network management and claims adjudication), insurers largely use a PBM. In contrast, for benefit design and formulary management, almost 40 percent of the national market is

conducted by insurers in house. One potential explanation for such large shares is that the data don't include carved-out lives. Whereas some insurers have the capability to perform those functions in house, some employers may not and instead may be more likely to have a PBM conduct them. An analysis that included carved-out lives could increase the prevalence of these functions performed by PBMs.

This study finds that Express Scripts is the largest PBM nationally in the market for managing commercial drug benefits tied to a health plan. Express Scripts has a 22 percent national-level market share in the rebate negotiation market. The second largest PBM is OptumRx, which has a 17 percent share. CVS/Caremark and Aetna Pharmacy Management have a combined market share of 17 percent, whereas Prime Therapeutics's share is 15 percent. These PBMs are followed by Kaiser Pharmacy and IngenioRx, whose shares are 12 percent and 10 percent, respectively. The market shares are similar in the retail network management and claims adjudication markets.

National-level market shares of the 10 largest commercial drug insurers are also reported. It is useful to consider these shares since those are the same lives that the PBMs are managing. If a health insurer is big in the commercial drug insurance market, then the PBM it uses to manage its lives ought to be big as well.

With a 13 percent market share, UnitedHealth is the largest commercial drug insurer in the U.S. This helps explain why its PBM—OptumRx—is the second largest PBM. OptumRx's 17 percent share is larger than UnitedHealth's because OptumRx is not exclusive to UnitedHealth. Kaiser has a 12 percent share in both the drug insurance and PBM markets because Kaiser's PBM is used exclusively by Kaiser the insurer. Because Kaiser is big in the drug insurance market, its PBM is also big.

Anthem is the third largest drug insurer with a 10 percent share. Anthem's PBM IngenioRx is used exclusively by Anthem so it also has a 10 percent share. Cigna has a 10 percent share in the drug insurance market and uses its own PBM—Express Scripts. Express Scripts is not used exclusively by Cigna so it has a much larger PBM share (22 percent) than Cigna's insurer share.

In addition and in contrast to other studies, this is the first to present PBM market shares and HHIs at the state and MSA levels. On average, it finds a high degree of PBM market concentration. This is not entirely surprising given that the average market for drug insurance is highly concentrated. As the results show, PBMs end up with large market shares because the insurers of the drug lives they manage are also big. For instance, BCBS AL has a state-level share of 86 percent in the drug coverage market so the PBM that manages its lives—Prime Therapeutics—also has a share of 86 percent in the PBM market.

The level of local market concentration in PBM markets and its competitive implications should be interpreted with some caution. On the one hand, the presence of certain PBMs in the market may not necessarily indicate they are viable options. Specifically, if PBMs are used exclusively by their affiliated insurer, they may not be viable options for other non-affiliated insurers to contract with. Of the 10 largest PBMs, six are exclusive to specific insurers. On the other hand, it may be the case that before insurers and PBMs contract with one another, there may be more PBM choices for insurers to choose from than the large PBM market shares computed here would suggest. Despite

the number of PBMs available to choose from before contracting, once a big insurer with a large market share chooses a PBM to manage *all* its lives, that PBM will end up with a large market share as well.

Finally, this paper quantifies the extent of vertical integration between health insurers and PBMs. At the national level, almost 70 percent of commercial drug coverage lives are insured by a health insurer that is vertically integrated. On average, 63 percent and 65 percent of state- and MSA-level drug insurance lives are vertically integrated. However, there is wide variation across states and MSAs, with some states having almost no vertical integration, while others are almost entirely vertically integrated. Thus, even though the largest health insurers and PBMs are vertically integrated, there is still a significant portion of the market that remains not vertically integrated, particularly at the local level.

PBMs have attracted considerable attention from regulators and policymakers. The Federal Trade Commission announced recently that it will launch an inquiry into the PBM industry, and a House Education and Labor Committee requested that the Government Accountability Office perform a study on the role of PBMs in the pharmaceutical supply chain. The findings in this paper may be helpful in answering some of those inquiries. They also have implications for PBM and health insurance markets, such as whether proposed mergers among PBMs and between insurers and PBMs should raise antitrust concerns.

References

Brot-Goldberg, Z., Che, C. Handel, B. Pharmacy Benefit Managers and Vertical Relationships in Drug Supply: State of Current Research. National Bureau of Economic Research Working Paper 29959. Cambridge MA. 2022.

Conti, R., Frandsen, B., Powell, M., Rebitzer, J. Common Agent or Double Agent? Pharmacy Benefit Managers in the Prescription Drug Market. National Bureau of Economic Research Working Paper 28866. Cambridge MA. 2022.

Fein, A. *The 2022 Economic Report on U.S. Pharmacies and Pharmacy Benefit Managers*, Drug Channels Institute. 2022.

Garthwaite C., Scott Morton F. *Perverse Incentives Encourage High Prescription Drug Prices*. Chicago, IL: ProMarket. 2021.

Guardado J., Kane, C. *Competition in Health Insurance: A Comprehensive Study of U.S. Markets*. Chicago IL: American Medical Association. 2021.

Health Industries Research Companies. *Pharmacy Benefit Managers: Market Landscape and Strategic Imperatives*. 2022.

**Exhibit 1. Largest pharmacy benefit managers in the U.S. at the national level, 2020
Commercial drug coverage markets**

PBM	Rebate Negotiation Share (%)	PBM	Retail Network Management Share (%)	PBM	Claims Adjudication Share (%)
	(1)		(2)		(3)
Express Scripts	22	Express Scripts	22	Express Scripts	22
OptumRx	17	OptumRx	17	OptumRx	16
Prime Therapeutics	15	Prime Therapeutics	15	Prime Therapeutics	15
Kaiser Pharmacy	12	Kaiser Pharmacy	12	Kaiser Pharmacy	12
IngenioRx	10	IngenioRx	10	IngenioRx	10
CVS/Caremark	10	CVS/Caremark	9	CVS/Caremark	7
Aetna Pharm Mgmt	7	Aetna Pharm Mgmt	7	Aetna Pharm Mgmt	7
Envolve Pharm Sol	2	Envolve Pharm Sol	2	SS and C Health	4
Humana Pharm Sol	1	MedImpact	2	MedImpact	2
MedImpact	1	Humana Pharm Sol	1	Envolve Pharm Sol	1

Notes:

1. Source: Author's analysis of Managed Market Surveyor Suite | Pharmacy Benefit Evaluator | Program | January 1, 2020 | Enterprise License © 2020 DR/Decision Resources, LLC. All rights reserved.
2. PBM market shares are based on commercial drug coverage lives.
3. Drug coverage lives where the insurer itself performs the function (in house) are excluded.

Exhibit 2. Largest drug insurers in the U.S. at the national level, 2020
Commercial drug coverage markets

Insurer	Market Share (%)
UnitedHealth Group	13
Kaiser	12
Anthem	10
Cigna	10
Aetna	7
HCSC (BCBS)	5
BCBS FL	3
Centene	3
BCBS MI	2
BS of CA	2

Notes:

1. Source: Author's analysis of Managed Market Surveyor Suite | MSA Rx and Medical | Program | January 1, 2020 | Enterprise License © 2020 DR/Decision Resources, LLC. All rights reserved.
2. Insurer market shares are based on commercial drug coverage lives.

**Exhibit 3. Largest pharmacy benefit managers in the U.S. at the national level, 2020
Commercial drug coverage markets**

PBM	Formulary Management Share (%)	PBM	Benefit Design Share (%)
	(1)		(2)
In house	36	In house	38
OptumRx	15	OptumRx	14
Prime Therapeutics	12	Prime Therapeutics	12
Kaiser Pharmacy	12	Kaiser Pharmacy	12
Express Scripts	11	Express Scripts	11
Aetna Pharm Mgmt	7	Aetna Pharm Mgmt	7
CVS/Caremark	3	CVS/Caremark	2
Envolve Pharm Sol	2	Envolve Pharm Sol	2
Humana Pharm Sol	1	Humana Pharm Sol	1
FutureScripts	1	FutureScripts	1

Notes:

1. Source: Author's analysis of Managed Market Surveyor Suite | Pharmacy Benefit Evaluator | Program | January 1, 2020 | Enterprise License © 2020 DR/Decision Resources, LLC. All rights reserved.
2. PBM market shares based on commercial drug coverage lives.

**Exhibit 4. Largest pharmacy benefit managers in the U.S. at the national level, 2020
Commercial drug coverage markets**

PBM	Formulary Management Share (%)	PBM	Benefit Design Share (%)
	(1)		(2)
OptumRx	15	OptumRx	14
Prime Therapeutics	12	Prime Therapeutics	12
Kaiser Pharmacy	12	Kaiser Pharmacy	12
Express Scripts	11	Express Scripts	11
Anthem	10	Anthem	10
Aetna Pharm Mgmt	7	Aetna Pharm Mgmt	7
CVS/Caremark	3	BCBS MI	2
BCBS MI	2	BS of CA	2
BS of CA	2	CVS/Caremark	2
Envolve Pharm Sol	2	Envolve Pharm Sol	2

Notes:

1. Source: Author's analysis of Managed Market Surveyor Suite | Pharmacy Benefit Evaluator | Program | January 1, 2020 | Enterprise License © 2020 DR/Decision Resources, LLC. All rights reserved.
2. PBM market shares are based on commercial drug coverage lives.
3. This exhibit presents the same information as Exhibit 3, except that here, the PBM formerly called "In house" has been changed to the insurer's name. For example, Anthem's lives are under "In house" in Exhibit 3.

Exhibit 5. Market concentration in PBM state and MSA level markets

PBM Function and Geographic Market	Mean HHI	% Highly Concentrated
<i>Rebate Negotiation</i>		
State	3746	78
MSA	4103	85
<i>Retail Network Management</i>		
State	3665	76
MSA	4068	85
<i>Claims Adjudication</i>		
State	3678	78
MSA	4072	85

Notes:

1. Source: Author's analysis of Managed Market Surveyor Suite | Pharmacy Benefit Evaluator | Program | January 1, 2020 | Enterprise License © 2020 DR/Decision Resources, LLC. All rights reserved.
2. Mean HHIs and the percentage of markets that are highly concentrated are reported based on commercial drug coverage lives.
3. Drug coverage lives where the insurer itself performs the function (in house) are excluded.

Exhibit 6. The extent of vertical integration between insurers and PBMs

Geographic Level	Vertical Integration Share		
National	69%		
	Mean	Minimum	Maximum
	(1)	(2)	(3)
State	63%	6%	97%
MSA	65%	5%	99%

Notes:

1. The percentages of commercial drug insurance coverage lives covered by an insurer that is vertically integrated with a PBM are reported.
2. The national level share is for the U.S. as a whole. The state and metropolitan statistical areas (MSA) shares are summary statistics across all 51 states (including the District of Columbia) and the 384 MSAs.

Exhibit A1. Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Alabama	7389	Prime Therapeutics	86	Express Scripts	7
Anniston-Oxford, AL	7935	Prime Therapeutics	89	Express Scripts	5
Auburn-Opelika, AL	6829	Prime Therapeutics	82	Express Scripts	12
Birmingham-Hoover, AL	6901	Prime Therapeutics	82	Express Scripts	8
Daphne-Fairhope-Foley, AL	7019	Prime Therapeutics	83	OptumRx	8
Decatur, AL	7733	Prime Therapeutics	88	Express Scripts	7
Dothan, AL	8082	Prime Therapeutics	90	Express Scripts	5
Florence-Muscle Shoals, AL	7947	Prime Therapeutics	89	Express Scripts	6
Gadsden, AL	8113	Prime Therapeutics	90	Express Scripts	5
Huntsville, AL	7039	Prime Therapeutics	83	Express Scripts	8
Mobile, AL	7248	Prime Therapeutics	85	Express Scripts	8
Montgomery, AL	7801	Prime Therapeutics	88	Express Scripts	5
Tuscaloosa, AL	8123	Prime Therapeutics	90	Express Scripts	6
Alaska	5878	Express Scripts	75	Aetna Pharm Mgmt	16
Anchorage, AK	5428	Express Scripts	71	Aetna Pharm Mgmt	18
Fairbanks, AK	4728	Express Scripts	63	Aetna Pharm Mgmt	27
Arizona	3532	OptumRx	53	Express Scripts	22
Flagstaff, AZ	6026	OptumRx	76	Aetna Pharm Mgmt	10
Lake Havasu City-Kingman, AZ	6701	OptumRx	81	Express Scripts	9
Phoenix-Mesa-Chandler, AZ	3320	OptumRx	50	Express Scripts	24
Prescott Valley-Prescott, AZ	6245	OptumRx	78	Aetna Pharm Mgmt	8
Sierra Vista-Douglas, AZ	3999	OptumRx	59	Express Scripts	16
Tucson, AZ	3975	OptumRx	59	Express Scripts	19
Yuma, AZ	3999	OptumRx	60	Express Scripts	13
Arkansas	3714	CVS/Caremark	49	OptumRx	34
Fayetteville-Springdale-Rogers, AR	3801	CVS/Caremark	50	OptumRx	34
Fort Smith, AR-OK	2988	CVS/Caremark	39	OptumRx	34
Hot Springs, AR	3679	CVS/Caremark	50	OptumRx	32
Jonesboro, AR	4256	CVS/Caremark	58	OptumRx	28
Little Rock-North Little Rock-Conway, AR	3558	CVS/Caremark	42	OptumRx	41
Pine Bluff, AR	4263	CVS/Caremark	59	OptumRx	26

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
California	2881	Kaiser Pharmacy	48	IngenioRx	16
Bakersfield, CA	2932	Kaiser Pharmacy	40	CVS/Caremark	27
Chico, CA	4049	IngenioRx	49	CVS/Caremark	40
El Centro, CA	4592	CVS/Caremark	59	IngenioRx	33
Fresno, CA	2562	Kaiser Pharmacy	37	IngenioRx	23
Hanford-Corcoran, CA	2314	IngenioRx	31	CVS/Caremark	30
Los Angeles-Long Beach-Anaheim, CA	2474	Kaiser Pharmacy	41	IngenioRx	18
Madera, CA	2602	Kaiser Pharmacy	39	IngenioRx	23
Merced, CA	3564	IngenioRx	54	CVS/Caremark	19
Modesto, CA	4370	Kaiser Pharmacy	63	IngenioRx	17
Napa, CA	5361	Kaiser Pharmacy	72	IngenioRx	11
Oxnard-Thousand Oaks-Ventura, CA	2480	Kaiser Pharmacy	33	IngenioRx	27
Redding, CA	4641	IngenioRx	62	CVS/Caremark	29
Riverside-San Bernardino-Ontario, CA	3643	Kaiser Pharmacy	57	CVS/Caremark	14
Sacramento-Roseville-Folsom, CA	4131	Kaiser Pharmacy	61	OptumRx	14
Salinas, CA	3002	IngenioRx	43	CVS/Caremark	32
San Diego-Chula Vista-Carlsbad, CA	2402	Kaiser Pharmacy	40	CVS/Caremark	21
San Francisco-Oakland-Berkeley, CA	3928	Kaiser Pharmacy	60	CVS/Caremark	10
San Jose-Sunnyvale-Santa Clara, CA	3221	Kaiser Pharmacy	53	IngenioRx	13
San Luis Obispo-Paso Robles, CA	3493	IngenioRx	45	CVS/Caremark	36
Santa Cruz-Watsonville, CA	2142	Kaiser Pharmacy	32	IngenioRx	23
Santa Maria-Santa Barbara, CA	3067	IngenioRx	40	CVS/Caremark	36
Santa Rosa-Petaluma, CA	5488	Kaiser Pharmacy	73	IngenioRx	8
Stockton, CA	5165	Kaiser Pharmacy	70	IngenioRx	12
Vallejo, CA	6618	Kaiser Pharmacy	81	OptumRx	7
Visalia, CA	3517	IngenioRx	53	CVS/Caremark	25
Yuba City, CA	2586	IngenioRx	37	Kaiser Pharmacy	28
Colorado	1996	Kaiser Pharmacy	26	Express Scripts	24
Boulder, CO	2008	Express Scripts	25	Kaiser Pharmacy	24
Colorado Springs, CO	1892	Kaiser Pharmacy	24	Express Scripts	23
Denver-Aurora-Lakewood, CO	2161	Kaiser Pharmacy	32	Express Scripts	24

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Fort Collins, CO	2370	IngenioRx	37	Express Scripts	19
Grand Junction, CO	3135	OptumRx	42	Express Scripts	31
Greeley, CO	2102	Express Scripts	28	IngenioRx	25
Pueblo, CO	2383	Kaiser Pharmacy	32	OptumRx	25
Connecticut	2720	Express Scripts	36	IngenioRx	28
Bridgeport-Stamford-Norwalk, CT	2692	Express Scripts	34	OptumRx	29
Hartford-East Hartford-Middletown, CT	2899	Express Scripts	40	IngenioRx	28
New Haven-Milford, CT	2775	Express Scripts	34	IngenioRx	33
Norwich-New London, CT	3008	IngenioRx	44	OptumRx	23
Delaware	6384	Express Scripts	78	Aetna Pharm Mgmt	13
Dover, DE	4952	Express Scripts	67	Aetna Pharm Mgmt	18
District of Columbia	2289	CVS/Caremark	35	OptumRx	20
Washington-Arlington-Alexandria, DC-VA-MD-WV	1823	Kaiser Pharmacy	23	CVS/Caremark	21
Florida	2454	Prime Therapeutics	42	OptumRx	17
Cape Coral-Fort Myers, FL	3653	Prime Therapeutics	56	Aetna Pharm Mgmt	15
Crestview-Fort Walton Beach-Destin, FL	4452	Prime Therapeutics	64	OptumRx	12
Deltona-Daytona Beach-Ormond Beach, FL	2034	OptumRx	26	Prime Therapeutics	22
Gainesville, FL	5810	Prime Therapeutics	75	OptumRx	8
Homosassa Springs, FL	4881	Prime Therapeutics	67	OptumRx	17
Jacksonville, FL	3832	Prime Therapeutics	58	OptumRx	16
Lakeland-Winter Haven, FL	2261	Prime Therapeutics	35	OptumRx	25
Miami-Fort Lauderdale-Pompano Beach, FL	1815	Prime Therapeutics	28	Envolve Pharm Sol	17
Naples-Marco Island, FL	5010	Prime Therapeutics	68	OptumRx	13
North Port-Sarasota-Bradenton, FL	3525	Prime Therapeutics	54	OptumRx	18
Ocala, FL	5962	Prime Therapeutics	76	OptumRx	13
Orlando-Kissimmee-Sanford, FL	2495	Prime Therapeutics	39	Express Scripts	21
Palm Bay-Melbourne-Titusville, FL	3117	Express Scripts	49	Prime Therapeutics	20
Panama City, FL	5865	Prime Therapeutics	76	OptumRx	9
Pensacola-Ferry Pass-Brent, FL	4099	Prime Therapeutics	60	OptumRx	16
Port St. Lucie, FL	4858	Prime Therapeutics	67	Express Scripts	13

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Punta Gorda, FL	3383	Prime Therapeutics	52	OptumRx	17
Sebastian-Vero Beach, FL	5131	Prime Therapeutics	69	OptumRx	14
Sebring-Avon Park, FL	3653	Prime Therapeutics	55	OptumRx	20
Tallahassee, FL	7673	Prime Therapeutics	87	OptumRx	6
Tampa-St. Petersburg-Clearwater, FL	2261	Prime Therapeutics	36	OptumRx	23
The Villages, FL	5332	Prime Therapeutics	71	OptumRx	16
Georgia	1719	IngenioRx	30	Express Scripts	17
Albany, GA	2361	IngenioRx	39	Envolve Pharm Sol	20
Athens-Clarke County, GA	2235	IngenioRx	39	Express Scripts	17
Atlanta-Sandy Springs-Alpharetta, GA	1646	IngenioRx	26	Express Scripts	18
Augusta-Richmond County, GA-SC	2732	IngenioRx	36	OptumRx	35
Brunswick, GA	2193	IngenioRx	36	Envolve Pharm Sol	22
Columbus, GA-AL	2254	IngenioRx	39	Express Scripts	19
Dalton, GA	2755	Express Scripts	40	Magellan Rx Mgmt	27
Gainesville, GA	1821	Express Scripts	30	IngenioRx	20
Hinesville, GA	1764	IngenioRx	25	Humana Pharm Sol	23
Macon-Bibb County, GA	2409	IngenioRx	42	OptumRx	17
Rome, GA	2461	IngenioRx	37	Express Scripts	26
Savannah, GA	2135	IngenioRx	35	OptumRx	18
Valdosta, GA	3998	IngenioRx	61	OptumRx	12
Warner Robins, GA	2113	IngenioRx	39	CVS/Caremark	13
Hawaii	4720	CVS/Caremark	64	Kaiser Pharmacy	24
Kahului-Wailuku-Lahaina, HI	4229	Kaiser Pharmacy	53	CVS/Caremark	37
Urban Honolulu, HI	4834	CVS/Caremark	66	Kaiser Pharmacy	21
Idaho	3339	CVS/Caremark	54	Prime Therapeutics	13
Boise City, ID	3170	CVS/Caremark	51	Prime Therapeutics	15
Coeur d'Alene, ID	2638	CVS/Caremark	43	Kaiser Pharmacy	24
Idaho Falls, ID	3583	CVS/Caremark	56	SelectHealth	14
Lewiston, ID-WA	3196	CVS/Caremark	45	Express Scripts	27
Pocatello, ID	4866	CVS/Caremark	68	Prime Therapeutics	14
Twin Falls, ID	3451	CVS/Caremark	54	SelectHealth	18

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Illinois	4015	Prime Therapeutics	59	OptumRx	21
Bloomington, IL	3847	Prime Therapeutics	50	OptumRx	36
Carbondale-Marion, IL	2976	OptumRx	39	Prime Therapeutics	36
Champaign-Urbana, IL	6952	OptumRx	83	Prime Therapeutics	6
Chicago-Naperville-Elgin, IL-IN-WI	3785	Prime Therapeutics	58	OptumRx	15
Danville, IL	4438	OptumRx	62	Prime Therapeutics	22
Davenport-Moline-Rock Island, IA-IL	2945	OptumRx	44	CVS/Caremark	25
Decatur, IL	4290	Prime Therapeutics	58	OptumRx	31
Kankakee, IL	3899	Prime Therapeutics	57	OptumRx	18
Peoria, IL	3739	OptumRx	45	Prime Therapeutics	41
Rockford, IL	4898	Prime Therapeutics	68	OptumRx	11
Springfield, IL	4048	Prime Therapeutics	50	OptumRx	39
Indiana	3079	IngenioRx	50	Express Scripts	16
Bloomington, IN	3384	IngenioRx	54	CVS/Caremark	17
Columbus, IN	2951	IngenioRx	43	CVS/Caremark	30
Elkhart-Goshen, IN	3515	IngenioRx	55	OptumRx	18
Evansville, IN-KY	3626	IngenioRx	56	Express Scripts	15
Fort Wayne, IN	2618	IngenioRx	43	Express Scripts	19
Indianapolis-Carmel-Anderson, IN	3194	IngenioRx	50	Express Scripts	19
Kokomo, IN	3825	IngenioRx	57	Express Scripts	18
Lafayette-West Lafayette, IN	3867	IngenioRx	58	CVS/Caremark	14
Michigan City-La Porte, IN	3474	IngenioRx	53	OptumRx	19
Muncie, IN	3193	IngenioRx	50	CVS/Caremark	18
South Bend-Mishawaka, IN-MI	2825	IngenioRx	43	Express Scripts	27
Terre Haute, IN	3977	IngenioRx	60	Express Scripts	15
Iowa	4270	CVS/Caremark	61	OptumRx	21
Ames, IA	5584	CVS/Caremark	72	OptumRx	17
Cedar Rapids, IA	5220	CVS/Caremark	70	OptumRx	13
Des Moines-West Des Moines, IA	3800	CVS/Caremark	52	OptumRx	31
Dubuque, IA	4512	CVS/Caremark	63	OptumRx	18
Iowa City, IA	5844	CVS/Caremark	75	Magellan Rx Mgmt	8

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Sioux City, IA-NE-SD	3393	CVS/Caremark	49	OptumRx	29
Waterloo-Cedar Falls, IA	3688	CVS/Caremark	50	OptumRx	33
Kansas	3244	Prime Therapeutics	47	OptumRx	29
Lawrence, KS	3097	Prime Therapeutics	51	Aetna Pharm Mgmt	13
Manhattan, KS	5575	Prime Therapeutics	74	Express Scripts	8
Topeka, KS	5953	Prime Therapeutics	76	OptumRx	9
Wichita, KS	3764	Prime Therapeutics	58	OptumRx	11
Kentucky	4014	IngenioRx	59	Humana Pharm Sol	16
Bowling Green, KY	4869	IngenioRx	67	Humana Pharm Sol	18
Elizabethtown-Fort Knox, KY	4166	IngenioRx	60	Humana Pharm Sol	21
Lexington-Fayette, KY	4423	IngenioRx	63	Humana Pharm Sol	18
Louisville/Jefferson County, KY-IN	3659	IngenioRx	56	Humana Pharm Sol	15
Owensboro, KY	4823	IngenioRx	66	Humana Pharm Sol	18
Louisiana	5371	Express Scripts	71	OptumRx	14
Alexandria, LA	5122	Express Scripts	70	OptumRx	15
Baton Rouge, LA	5681	Express Scripts	74	OptumRx	11
Hammond, LA	5575	Express Scripts	73	OptumRx	13
Houma-Thibodaux, LA	5587	Express Scripts	73	OptumRx	16
Lafayette, LA	5927	Express Scripts	75	OptumRx	13
Lake Charles, LA	5869	Express Scripts	75	OptumRx	11
Monroe, LA	5282	Express Scripts	71	OptumRx	15
New Orleans-Metairie, LA	4674	Express Scripts	65	OptumRx	18
Shreveport-Bossier City, LA	5645	Express Scripts	74	OptumRx	13
Maine	3913	IngenioRx	56	Express Scripts	25
Bangor, ME	3827	IngenioRx	49	Express Scripts	36
Lewiston-Auburn, ME	3381	IngenioRx	47	Express Scripts	27
Portland-South Portland, ME	3848	IngenioRx	56	Express Scripts	22
Maryland	2500	CVS/Caremark	39	Kaiser Pharmacy	19
Baltimore-Columbia-Towson, MD	2797	CVS/Caremark	45	Express Scripts	17
California-Lexington Park, MD	3742	CVS/Caremark	56	Express Scripts	16
Cumberland, MD-WV	3611	Express Scripts	49	CVS/Caremark	27

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Hagerstown-Martinsburg, MD-WV	3060	Express Scripts	45	CVS/Caremark	22
Salisbury, MD-DE	3322	Express Scripts	41	CVS/Caremark	38
Massachusetts	3880	CVS/Caremark	58	OptumRx	16
Barnstable Town, MA	4312	CVS/Caremark	63	Elixir Pharmacy	11
Boston-Cambridge-Newton, MA-NH	3132	CVS/Caremark	51	IngenioRx	14
Pittsfield, MA	4077	OptumRx	57	CVS/Caremark	26
Springfield, MA	3408	OptumRx	46	CVS/Caremark	33
Worcester, MA-CT	2984	CVS/Caremark	48	Express Scripts	15
Michigan	7879	Express Scripts	89	OptumRx	4
Ann Arbor, MI	7865	Express Scripts	88	Aetna Pharm Mgmt	7
Battle Creek, MI	7929	Express Scripts	89	OptumRx	7
Bay City, MI	8035	Express Scripts	89	Aetna Pharm Mgmt	7
Detroit-Warren-Dearborn, MI	7772	Express Scripts	88	OptumRx	5
Flint, MI	8291	Express Scripts	91	OptumRx	3
Grand Rapids-Kentwood, MI	8548	Express Scripts	92	OptumRx	4
Jackson, MI	9265	Express Scripts	96	OptumRx	2
Kalamazoo-Portage, MI	7499	Express Scripts	86	OptumRx	11
Lansing-East Lansing, MI	5573	Express Scripts	70	CVS/Caremark	27
Midland, MI	5814	Express Scripts	72	Aetna Pharm Mgmt	26
Monroe, MI	7057	Express Scripts	84	CVS/Caremark	5
Muskegon, MI	8878	Express Scripts	94	OptumRx	3
Niles, MI	7985	Express Scripts	89	OptumRx	6
Saginaw, MI	8469	Express Scripts	92	Aetna Pharm Mgmt	5
Minnesota	3394	Prime Therapeutics	51	Express Scripts	22
Duluth, MN-WI	3210	Prime Therapeutics	50	Express Scripts	23
Mankato, MN	5217	Prime Therapeutics	68	Express Scripts	23
Minneapolis-St. Paul-Bloomington, MN-WI	2808	Prime Therapeutics	44	Express Scripts	21
Rochester, MN	5398	Prime Therapeutics	69	Express Scripts	24
St. Cloud, MN	4278	Prime Therapeutics	61	Express Scripts	22
Mississippi	3093	Prime Therapeutics	49	Envolve Pharm Sol	17
Gulfport-Biloxi, MS	3137	Prime Therapeutics	50	OptumRx	17

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Hattiesburg, MS	3106	Prime Therapeutics	45	OptumRx	27
Jackson, MS	3412	Prime Therapeutics	54	Envolve Pharm Sol	15
Missouri	2518	OptumRx	39	IngenioRx	25
Cape Girardeau, MO-IL	4176	IngenioRx	58	OptumRx	27
Columbia, MO	2770	OptumRx	39	IngenioRx	27
Jefferson City, MO	4553	IngenioRx	63	OptumRx	24
Joplin, MO	2353	IngenioRx	40	OptumRx	18
Kansas City, MO-KS	4548	OptumRx	64	Express Scripts	18
Springfield, MO	1845	IngenioRx	28	Elixir Pharmacy	21
St. Joseph, MO-KS	5613	OptumRx	74	Express Scripts	7
St. Louis, MO-IL	2189	OptumRx	30	IngenioRx	27
Montana	3198	Prime Therapeutics	51	CVS/Caremark	17
Billings, MT	3491	Prime Therapeutics	54	Express Scripts	20
Great Falls, MT	4382	Prime Therapeutics	64	CVS/Caremark	12
Missoula, MT	3360	Prime Therapeutics	52	Express Scripts	17
Nebraska	3044	Prime Therapeutics	46	OptumRx	20
Grand Island, NE	3572	Prime Therapeutics	52	Express Scripts	25
Lincoln, NE	3145	Prime Therapeutics	47	OptumRx	20
Omaha-Council Bluffs, NE-IA	2468	Prime Therapeutics	34	OptumRx	27
Nevada	2774	OptumRx	47	IngenioRx	18
Carson City, NV	1736	MedImpact	28	IngenioRx	21
Las Vegas-Henderson-Paradise, NV	3564	OptumRx	56	IngenioRx	15
Reno, NV	1804	IngenioRx	26	OptumRx	25
New Hampshire	3399	IngenioRx	52	Express Scripts	23
Manchester-Nashua, NH	3435	IngenioRx	54	Express Scripts	19
New Jersey	2653	Prime Therapeutics	35	OptumRx	28
Atlantic City-Hammonton, NJ	4535	Prime Therapeutics	63	OptumRx	19
Ocean City, NJ	4218	Prime Therapeutics	58	OptumRx	27
Trenton-Princeton, NJ	2652	Prime Therapeutics	35	OptumRx	27
Vineland-Bridgeton, NJ	3255	Prime Therapeutics	42	Aetna Pharm Mgmt	35

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
New Mexico	3040	Prime Therapeutics	46	OptumRx	20
Albuquerque, NM	2614	Prime Therapeutics	36	CVS/Caremark	25
Farmington, NM	3448	Prime Therapeutics	50	OptumRx	27
Las Cruces, NM	2654	Prime Therapeutics	39	CVS/Caremark	26
Santa Fe, NM	3121	Prime Therapeutics	47	OptumRx	19
New York	2434	Express Scripts	35	OptumRx	27
Albany-Schenectady-Troy, NY	3687	CVS/Caremark	54	Express Scripts	23
Binghamton, NY	5070	Express Scripts	68	OptumRx	18
Buffalo-Cheektowaga, NY	7555	Express Scripts	86	OptumRx	7
Elmira, NY	5085	Express Scripts	68	CVS/Caremark	16
Glens Falls, NY	3141	CVS/Caremark	47	Express Scripts	22
Ithaca, NY	3841	Express Scripts	51	Aetna Pharm Mgmt	34
Kingston, NY	3167	CVS/Caremark	48	OptumRx	22
New York-Newark-Jersey City, NY-NJ-PA	2088	OptumRx	33	Express Scripts	20
Poughkeepsie-Newburgh-Middletown, NY	2218	CVS/Caremark	28	OptumRx	27
Rochester, NY	6447	Express Scripts	79	CVS/Caremark	13
Syracuse, NY	5749	Express Scripts	74	OptumRx	11
Utica-Rome, NY	4128	Express Scripts	57	CVS/Caremark	25
Watertown-Fort Drum, NY	4709	Express Scripts	65	CVS/Caremark	19
North Carolina	3975	Prime Therapeutics	58	OptumRx	18
Asheville, NC	4661	Prime Therapeutics	65	OptumRx	17
Burlington, NC	3740	Prime Therapeutics	56	OptumRx	19
Charlotte-Concord-Gastonia, NC-SC	3065	Prime Therapeutics	42	OptumRx	31
Durham-Chapel Hill, NC	3975	Prime Therapeutics	59	OptumRx	17
Fayetteville, NC	3828	Prime Therapeutics	57	OptumRx	19
Goldsboro, NC	6458	Prime Therapeutics	79	OptumRx	9
Greensboro-High Point, NC	3870	Prime Therapeutics	56	OptumRx	23
Greenville, NC	6423	Prime Therapeutics	79	Express Scripts	12
Hickory-Lenoir-Morganton, NC	5135	Prime Therapeutics	69	OptumRx	17
Jacksonville, NC	4843	Prime Therapeutics	67	Aetna Pharm Mgmt	12
New Bern, NC	4974	Prime Therapeutics	68	Express Scripts	18

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Raleigh-Cary, NC	3567	Prime Therapeutics	53	OptumRx	21
Rocky Mount, NC	4387	Prime Therapeutics	62	Express Scripts	18
Wilmington, NC	4244	Prime Therapeutics	59	OptumRx	27
Winston-Salem, NC	3951	Prime Therapeutics	58	OptumRx	20
North Dakota	4439	Prime Therapeutics	57	OptumRx	35
Bismarck, ND	4408	Prime Therapeutics	56	OptumRx	34
Fargo, ND-MN	4354	Prime Therapeutics	59	OptumRx	27
Grand Forks, ND-MN	4518	Prime Therapeutics	61	OptumRx	27
Ohio	2697	Express Scripts	38	IngenioRx	31
Akron, OH	3205	Express Scripts	49	IngenioRx	25
Canton-Massillon, OH	3216	Express Scripts	49	IngenioRx	26
Cincinnati, OH-KY-IN	2768	IngenioRx	44	OptumRx	19
Cleveland-Elyria, OH	3960	Express Scripts	59	IngenioRx	20
Columbus, OH	2450	Express Scripts	30	OptumRx	26
Dayton-Kettering, OH	2698	IngenioRx	42	Express Scripts	23
Lima, OH	3054	Express Scripts	39	IngenioRx	37
Mansfield, OH	3505	Express Scripts	49	IngenioRx	32
Springfield, OH	2961	IngenioRx	45	Express Scripts	24
Toledo, OH	2530	Express Scripts	35	CVS/Caremark	28
Weirton-Steubenville, WV-OH	3968	Express Scripts	58	IngenioRx	18
Youngstown-Warren-Boardman, OH-PA	3751	Express Scripts	54	IngenioRx	27
Oklahoma	3729	Prime Therapeutics	57	OptumRx	15
Enid, OK	5470	Prime Therapeutics	72	OptumRx	12
Lawton, OK	4871	Prime Therapeutics	68	OptumRx	8
Oklahoma City, OK	3089	Prime Therapeutics	50	OptumRx	16
Tulsa, OK	3236	Prime Therapeutics	51	OptumRx	18
Oregon	2144	Kaiser Pharmacy	36	Prime Therapeutics	21
Albany-Lebanon, OR	1932	Prime Therapeutics	30	CVS/Caremark	21
Bend, OR	2761	CVS/Caremark	42	Prime Therapeutics	29
Corvallis, OR	2432	Prime Therapeutics	41	CVS/Caremark	19
Eugene-Springfield, OR	3079	CVS/Caremark	49	Prime Therapeutics	22

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Grants Pass, OR	2379	CVS/Caremark	38	MedImpact	22
Medford, OR	2545	CVS/Caremark	33	Prime Therapeutics	30
Portland-Vancouver-Hillsboro, OR-WA	2915	Kaiser Pharmacy	49	Prime Therapeutics	17
Salem, OR	3371	Kaiser Pharmacy	53	Prime Therapeutics	20
Pennsylvania	3228	Express Scripts	47	OptumRx	28
Allentown-Bethlehem-Easton, PA-NJ	2596	Express Scripts	35	Prime Therapeutics	31
Altoona, PA	7610	Express Scripts	87	OptumRx	6
Bloomsburg-Berwick, PA	5021	MedImpact	68	Prime Therapeutics	15
Chambersburg-Waynesboro, PA	3430	Express Scripts	46	Prime Therapeutics	34
East Stroudsburg, PA	3380	Express Scripts	50	MedImpact	23
Erie, PA	7275	Express Scripts	85	Aetna Pharm Mgmt	9
Gettysburg, PA	3281	Express Scripts	45	Prime Therapeutics	32
Harrisburg-Carlisle, PA	3785	Express Scripts	54	Prime Therapeutics	27
Johnstown, PA	8236	Express Scripts	91	OptumRx	4
Lancaster, PA	3591	Express Scripts	49	Prime Therapeutics	33
Lebanon, PA	3597	Express Scripts	50	Prime Therapeutics	31
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	3759	OptumRx	55	Express Scripts	19
Pittsburgh, PA	7290	Express Scripts	85	Aetna Pharm Mgmt	8
Reading, PA	3337	Express Scripts	43	Prime Therapeutics	37
Scranton—Wilkes-Barre, PA	4252	Express Scripts	52	MedImpact	38
State College, PA	3435	Prime Therapeutics	47	Express Scripts	33
Williamsport, PA	4760	Express Scripts	65	MedImpact	22
York-Hanover, PA	3382	Express Scripts	47	Prime Therapeutics	32
Rhode Island	3603	Prime Therapeutics	53	OptumRx	20
Providence-Warwick, RI-MA	2865	Prime Therapeutics	39	CVS/Caremark	31
South Carolina	6948	OptumRx	83	Express Scripts	11
Charleston-North Charleston, SC	6812	OptumRx	82	Express Scripts	10
Columbia, SC	6989	OptumRx	83	Express Scripts	10
Florence, SC	7493	OptumRx	86	Express Scripts	11
Greenville-Anderson, SC	6726	OptumRx	81	Express Scripts	13
Hilton Head Island-Bluffton, SC	6858	OptumRx	82	Express Scripts	12

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	5295	OptumRx	70	Prime Therapeutics	16
Spartanburg, SC	7672	OptumRx	87	Express Scripts	9
Sumter, SC	7876	OptumRx	88	Express Scripts	6
South Dakota	5990	CVS/Caremark	74	OptumRx	22
Rapid City, SD	5165	CVS/Caremark	66	OptumRx	28
Sioux Falls, SD	5822	CVS/Caremark	73	OptumRx	23
Tennessee	5569	Express Scripts	73	OptumRx	16
Chattanooga, TN-GA	5044	Express Scripts	69	OptumRx	12
Clarksville, TN-KY	2705	Express Scripts	43	IngenioRx	23
Cleveland, TN	5836	Express Scripts	75	OptumRx	11
Jackson, TN	7202	Express Scripts	84	OptumRx	10
Johnson City, TN	6349	Express Scripts	79	OptumRx	12
Kingsport-Bristol, TN-VA	3980	Express Scripts	56	IngenioRx	26
Knoxville, TN	4713	Express Scripts	64	OptumRx	25
Memphis, TN-MS-AR	4079	Express Scripts	61	OptumRx	14
Morristown, TN	6508	Express Scripts	79	OptumRx	13
Nashville-Davidson--Murfreesboro--Franklin, TN	5145	Express Scripts	69	OptumRx	18
Texas	2132	Prime Therapeutics	34	OptumRx	22
Abilene, TX	3860	Prime Therapeutics	59	OptumRx	13
Amarillo, TX	2459	Prime Therapeutics	41	OptumRx	24
Austin-Round Rock-Georgetown, TX	1957	Prime Therapeutics	26	OptumRx	26
Beaumont-Port Arthur, TX	2314	Prime Therapeutics	37	OptumRx	22
Brownsville-Harlingen, TX	3328	Prime Therapeutics	54	OptumRx	12
College Station-Bryan, TX	2650	Prime Therapeutics	37	OptumRx	33
Corpus Christi, TX	2376	Prime Therapeutics	33	OptumRx	30
Dallas-Fort Worth-Arlington, TX	2143	Prime Therapeutics	33	OptumRx	23
El Paso, TX	1812	Prime Therapeutics	25	Aetna Pharm Mgmt	23
Houston-The Woodlands-Sugar Land, TX	1857	Prime Therapeutics	26	Express Scripts	22
Killeen-Temple, TX	2939	OptumRx	49	Prime Therapeutics	20
Laredo, TX	3574	Prime Therapeutics	57	CVS/Caremark	10
Longview, TX	3798	Prime Therapeutics	55	OptumRx	22

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Lubbock, TX	3551	Prime Therapeutics	56	OptumRx	15
McAllen-Edinburg-Mission, TX	2805	Prime Therapeutics	48	CVS/Caremark	13
Midland, TX	4766	Prime Therapeutics	67	OptumRx	13
Odessa, TX	4716	Prime Therapeutics	67	OptumRx	12
San Angelo, TX	4239	Prime Therapeutics	62	OptumRx	15
San Antonio-New Braunfels, TX	1924	Prime Therapeutics	28	OptumRx	27
Sherman-Denison, TX	3132	Prime Therapeutics	47	Express Scripts	22
Texarkana, TX-AR	2428	Prime Therapeutics	35	CVS/Caremark	27
Tyler, TX	3952	Prime Therapeutics	58	OptumRx	20
Victoria, TX	2950	Prime Therapeutics	45	Express Scripts	22
Waco, TX	2731	OptumRx	42	Prime Therapeutics	27
Wichita Falls, TX	4707	Prime Therapeutics	66	OptumRx	14
Utah	3568	SelectHealth	57	Prime Therapeutics	11
Logan, UT-ID	3769	SelectHealth	59	Prime Therapeutics	10
Ogden-Clearfield, UT	3361	SelectHealth	54	Aetna Pharm Mgmt	13
Provo-Orem, UT	4392	SelectHealth	64	Express Scripts	10
Salt Lake City, UT	3485	SelectHealth	56	Express Scripts	11
St. George, UT	4114	SelectHealth	62	OptumRx	10
Vermont	6310	Express Scripts	77	CVS/Caremark	20
Burlington-South Burlington, VT	6798	Express Scripts	81	CVS/Caremark	15
Virginia	2145	IngenioRx	33	OptumRx	20
Blacksburg-Christiansburg, VA	4696	IngenioRx	65	Aetna Pharm Mgmt	19
Charlottesville, VA	2782	IngenioRx	44	OptumRx	19
Harrisonburg, VA	4169	IngenioRx	55	OptumRx	32
Lynchburg, VA	3723	IngenioRx	56	CVS/Caremark	19
Richmond, VA	3441	IngenioRx	48	Express Scripts	30
Roanoke, VA	3910	IngenioRx	56	Aetna Pharm Mgmt	24
Staunton, VA	3928	IngenioRx	59	OptumRx	17
Virginia Beach-Norfolk-Newport News, VA-NC	3420	OptumRx	45	IngenioRx	35
Winchester, VA-WV	3014	IngenioRx	45	Express Scripts	22

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Washington	2482	Kaiser Pharmacy	33	Express Scripts	32
Bellingham, WA	3030	Kaiser Pharmacy	42	Express Scripts	30
Bremerton-Silverdale-Port Orchard, WA	2962	Kaiser Pharmacy	48	Express Scripts	20
Kennewick-Richland, WA	3055	Express Scripts	41	Kaiser Pharmacy	35
Longview, WA	4591	Kaiser Pharmacy	63	Express Scripts	25
Mount Vernon-Anacortes, WA	2684	Kaiser Pharmacy	34	Express Scripts	32
Olympia-Lacey-Tumwater, WA	2893	Kaiser Pharmacy	46	Express Scripts	24
Seattle-Tacoma-Bellevue, WA	2489	Express Scripts	34	Kaiser Pharmacy	32
Spokane-Spokane Valley, WA	2779	Express Scripts	40	Kaiser Pharmacy	31
Walla Walla, WA	2664	Express Scripts	40	Kaiser Pharmacy	29
Wenatchee, WA	3633	Express Scripts	56	OptumRx	15
Yakima, WA	2769	Express Scripts	38	Kaiser Pharmacy	30
West Virginia	5810	Express Scripts	75	OptumRx	12
Beckley, WV	5221	Express Scripts	70	Aetna Pharm Mgmt	13
Charleston, WV	5878	Express Scripts	75	Aetna Pharm Mgmt	12
Huntington-Ashland, WV-KY-OH	3365	Express Scripts	45	IngenioRx	34
Morgantown, WV	6099	Express Scripts	76	Aetna Pharm Mgmt	14
Parkersburg-Vienna, WV	6219	Express Scripts	78	OptumRx	11
Wheeling, WV-OH	3796	Express Scripts	56	IngenioRx	22
Wisconsin	1826	MedImpact	24	OptumRx	24
Appleton, WI	2252	OptumRx	33	IngenioRx	24
Eau Claire, WI	1985	MedImpact	32	IngenioRx	21
Fond du Lac, WI	2157	MedImpact	31	OptumRx	24
Green Bay, WI	1951	OptumRx	31	IngenioRx	21
Janesville-Beloit, WI	2878	Navitus	38	MedImpact	35
La Crosse-Onalaska, WI-MN	5091	MedImpact	70	Express Scripts	9
Madison, WI	4045	Navitus	57	MedImpact	28
Milwaukee-Waukesha, WI	2769	OptumRx	46	IngenioRx	17
Oshkosh-Neenah, WI	2263	OptumRx	34	IngenioRx	24

Exhibit A1 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Rebate negotiation product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Racine, WI	3087	OptumRx	48	IngenioRx	19
Sheboygan, WI	2877	OptumRx	44	IngenioRx	27
Wausau-Weston, WI	1929	MedImpact	27	Express Scripts	23
Wyoming	3723	Prime Therapeutics	54	Express Scripts	25
Casper, WY	3195	Express Scripts	40	Prime Therapeutics	35
Cheyenne, WY	3544	Prime Therapeutics	52	Express Scripts	25

Notes:

1. Source: Author's analysis of Managed Market Surveyor Suite | Pharmacy Benefit Evaluator | Program | January 1, 2020 | Enterprise License © 2020 DR/Decision Resources, LLC. All rights reserved.
2. State and MSA-level Herfindahl-Hirschman Indices (HHIs) and the market shares of the two largest PBMs in the rebate negotiation product market are reported. The market shares and HHIs are based on commercial drug coverage lives.
3. Drug coverage lives where the insurer itself performs the rebate negotiations (in house) are excluded.

Exhibit A2. Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Alabama	7389	Prime Therapeutics	86	Express Scripts	7
Anniston-Oxford, AL	7935	Prime Therapeutics	89	Express Scripts	5
Auburn-Opelika, AL	6829	Prime Therapeutics	82	Express Scripts	12
Birmingham-Hoover, AL	6901	Prime Therapeutics	82	Express Scripts	8
Daphne-Fairhope-Foley, AL	7019	Prime Therapeutics	83	OptumRx	8
Decatur, AL	7733	Prime Therapeutics	88	Express Scripts	7
Dothan, AL	8082	Prime Therapeutics	90	Express Scripts	5
Florence-Muscle Shoals, AL	7947	Prime Therapeutics	89	Express Scripts	6
Gadsden, AL	8113	Prime Therapeutics	90	Express Scripts	5
Huntsville, AL	7039	Prime Therapeutics	83	Express Scripts	8
Mobile, AL	7248	Prime Therapeutics	85	Express Scripts	8
Montgomery, AL	7801	Prime Therapeutics	88	Express Scripts	5
Tuscaloosa, AL	8123	Prime Therapeutics	90	Express Scripts	6
Alaska	5878	Express Scripts	75	Aetna Pharm Mgmt	16
Anchorage, AK	5428	Express Scripts	71	Aetna Pharm Mgmt	18
Fairbanks, AK	4728	Express Scripts	63	Aetna Pharm Mgmt	27
Arizona	3532	OptumRx	53	Express Scripts	22
Flagstaff, AZ	6026	OptumRx	76	Aetna Pharm Mgmt	10
Lake Havasu City-Kingman, AZ	6701	OptumRx	81	Express Scripts	9
Phoenix-Mesa-Chandler, AZ	3320	OptumRx	50	Express Scripts	24
Prescott Valley-Prescott, AZ	6245	OptumRx	78	Aetna Pharm Mgmt	8
Sierra Vista-Douglas, AZ	3999	OptumRx	59	Express Scripts	16
Tucson, AZ	3975	OptumRx	59	Express Scripts	19
Yuma, AZ	3999	OptumRx	60	Express Scripts	13
Arkansas	3714	CVS/Caremark	49	OptumRx	34
Fayetteville-Springdale-Rogers, AR	3801	CVS/Caremark	50	OptumRx	34
Fort Smith, AR-OK	2988	CVS/Caremark	39	OptumRx	34
Hot Springs, AR	3679	CVS/Caremark	50	OptumRx	32
Jonesboro, AR	4256	CVS/Caremark	58	OptumRx	28
Little Rock-North Little Rock-Conway, AR	3558	CVS/Caremark	42	OptumRx	41
Pine Bluff, AR	4263	CVS/Caremark	59	OptumRx	26

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
California	2881	Kaiser Pharmacy	48	IngenioRx	16
Bakersfield, CA	2932	Kaiser Pharmacy	40	CVS/Caremark	27
Chico, CA	4049	IngenioRx	49	CVS/Caremark	40
El Centro, CA	4592	CVS/Caremark	59	IngenioRx	33
Fresno, CA	2562	Kaiser Pharmacy	37	IngenioRx	23
Hanford-Corcoran, CA	2314	IngenioRx	31	CVS/Caremark	30
Los Angeles-Long Beach-Anaheim, CA	2474	Kaiser Pharmacy	41	IngenioRx	18
Madera, CA	2602	Kaiser Pharmacy	39	IngenioRx	23
Merced, CA	3564	IngenioRx	54	CVS/Caremark	19
Modesto, CA	4370	Kaiser Pharmacy	63	IngenioRx	17
Napa, CA	5361	Kaiser Pharmacy	72	IngenioRx	11
Oxnard-Thousand Oaks-Ventura, CA	2480	Kaiser Pharmacy	33	IngenioRx	27
Redding, CA	4641	IngenioRx	62	CVS/Caremark	29
Riverside-San Bernardino-Ontario, CA	3643	Kaiser Pharmacy	57	CVS/Caremark	14
Sacramento-Roseville-Folsom, CA	4131	Kaiser Pharmacy	61	OptumRx	14
Salinas, CA	3002	IngenioRx	43	CVS/Caremark	32
San Diego-Chula Vista-Carlsbad, CA	2402	Kaiser Pharmacy	40	CVS/Caremark	21
San Francisco-Oakland-Berkeley, CA	3928	Kaiser Pharmacy	60	CVS/Caremark	10
San Jose-Sunnyvale-Santa Clara, CA	3221	Kaiser Pharmacy	53	IngenioRx	13
San Luis Obispo-Paso Robles, CA	3493	IngenioRx	45	CVS/Caremark	36
Santa Cruz-Watsonville, CA	2142	Kaiser Pharmacy	32	IngenioRx	23
Santa Maria-Santa Barbara, CA	3067	IngenioRx	40	CVS/Caremark	36
Santa Rosa-Petaluma, CA	5488	Kaiser Pharmacy	73	IngenioRx	8
Stockton, CA	5165	Kaiser Pharmacy	70	IngenioRx	12
Vallejo, CA	6618	Kaiser Pharmacy	81	OptumRx	7
Visalia, CA	3517	IngenioRx	53	CVS/Caremark	25
Yuba City, CA	2586	IngenioRx	37	Kaiser Pharmacy	28
Colorado	1996	Kaiser Pharmacy	26	Express Scripts	24
Boulder, CO	2008	Express Scripts	25	Kaiser Pharmacy	24
Colorado Springs, CO	1892	Kaiser Pharmacy	24	Express Scripts	23
Denver-Aurora-Lakewood, CO	2161	Kaiser Pharmacy	32	Express Scripts	24

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Fort Collins, CO	2370	IngenioRx	37	Express Scripts	19
Grand Junction, CO	3135	OptumRx	42	Express Scripts	31
Greeley, CO	2102	Express Scripts	28	IngenioRx	25
Pueblo, CO	2383	Kaiser Pharmacy	32	OptumRx	25
Connecticut	2690	Express Scripts	35	IngenioRx	28
Bridgeport-Stamford-Norwalk, CT	2696	Express Scripts	34	OptumRx	30
Hartford-East Hartford-Middletown, CT	2813	Express Scripts	39	IngenioRx	27
New Haven-Milford, CT	2728	Express Scripts	34	IngenioRx	32
Norwich-New London, CT	2970	IngenioRx	42	OptumRx	25
Delaware	6384	Express Scripts	78	Aetna Pharm Mgmt	13
Dover, DE	4952	Express Scripts	67	Aetna Pharm Mgmt	18
District of Columbia	2289	CVS/Caremark	35	OptumRx	20
Washington-Arlington-Alexandria, DC-VA-MD-WV	1823	Kaiser Pharmacy	23	CVS/Caremark	21
Florida	2454	Prime Therapeutics	42	OptumRx	17
Cape Coral-Fort Myers, FL	3653	Prime Therapeutics	56	Aetna Pharm Mgmt	15
Crestview-Fort Walton Beach-Destin, FL	4452	Prime Therapeutics	64	OptumRx	12
Deltona-Daytona Beach-Ormond Beach, FL	2034	OptumRx	26	Prime Therapeutics	22
Gainesville, FL	5810	Prime Therapeutics	75	OptumRx	8
Homosassa Springs, FL	4881	Prime Therapeutics	67	OptumRx	17
Jacksonville, FL	3832	Prime Therapeutics	58	OptumRx	16
Lakeland-Winter Haven, FL	2261	Prime Therapeutics	35	OptumRx	25
Miami-Fort Lauderdale-Pompano Beach, FL	1815	Prime Therapeutics	28	Envolve Pharm Sol	17
Naples-Marco Island, FL	5010	Prime Therapeutics	68	OptumRx	13
North Port-Sarasota-Bradenton, FL	3525	Prime Therapeutics	54	OptumRx	18
Ocala, FL	5962	Prime Therapeutics	76	OptumRx	13
Orlando-Kissimmee-Sanford, FL	2495	Prime Therapeutics	39	Express Scripts	21
Palm Bay-Melbourne-Titusville, FL	3117	Express Scripts	49	Prime Therapeutics	20
Panama City, FL	5865	Prime Therapeutics	76	OptumRx	9
Pensacola-Ferry Pass-Brent, FL	4099	Prime Therapeutics	60	OptumRx	16
Port St. Lucie, FL	4858	Prime Therapeutics	67	Express Scripts	13
Punta Gorda, FL	3383	Prime Therapeutics	52	OptumRx	17

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Sebastian-Vero Beach, FL	5131	Prime Therapeutics	69	OptumRx	14
Sebring-Avon Park, FL	3653	Prime Therapeutics	55	OptumRx	20
Tallahassee, FL	7673	Prime Therapeutics	87	OptumRx	6
Tampa-St. Petersburg-Clearwater, FL	2261	Prime Therapeutics	36	OptumRx	23
The Villages, FL	5332	Prime Therapeutics	71	OptumRx	16
Georgia	1719	IngenioRx	30	Express Scripts	17
Albany, GA	2361	IngenioRx	39	Envolve Pharm Sol	20
Athens-Clarke County, GA	2235	IngenioRx	39	Express Scripts	17
Atlanta-Sandy Springs-Alpharetta, GA	1646	IngenioRx	26	Express Scripts	18
Augusta-Richmond County, GA-SC	2732	IngenioRx	36	OptumRx	35
Brunswick, GA	2193	IngenioRx	36	Envolve Pharm Sol	22
Columbus, GA-AL	2254	IngenioRx	39	Express Scripts	19
Dalton, GA	2755	Express Scripts	40	Magellan Rx Mgmt	27
Gainesville, GA	1821	Express Scripts	30	IngenioRx	20
Hinesville, GA	1764	IngenioRx	25	Humana Pharm Sol	23
Macon-Bibb County, GA	2409	IngenioRx	42	OptumRx	17
Rome, GA	2461	IngenioRx	37	Express Scripts	26
Savannah, GA	2135	IngenioRx	35	OptumRx	18
Valdosta, GA	3998	IngenioRx	61	OptumRx	12
Warner Robins, GA	2113	IngenioRx	39	CVS/Caremark	13
Hawaii	4720	CVS/Caremark	64	Kaiser Pharmacy	24
Kahului-Wailuku-Lahaina, HI	4229	Kaiser Pharmacy	53	CVS/Caremark	37
Urban Honolulu, HI	4834	CVS/Caremark	66	Kaiser Pharmacy	21
Idaho	3339	CVS/Caremark	54	Prime Therapeutics	13
Boise City, ID	3170	CVS/Caremark	51	Prime Therapeutics	15
Coeur d'Alene, ID	2638	CVS/Caremark	43	Kaiser Pharmacy	24
Idaho Falls, ID	3583	CVS/Caremark	56	SelectHealth	14
Lewiston, ID-WA	3201	CVS/Caremark	45	Express Scripts	27
Pocatello, ID	4866	CVS/Caremark	68	Prime Therapeutics	14
Twin Falls, ID	3451	CVS/Caremark	54	SelectHealth	18

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Illinois	4015	Prime Therapeutics	59	OptumRx	21
Bloomington, IL	3847	Prime Therapeutics	50	OptumRx	36
Carbondale-Marion, IL	2976	OptumRx	39	Prime Therapeutics	36
Champaign-Urbana, IL	6952	OptumRx	83	Prime Therapeutics	6
Chicago-Naperville-Elgin, IL-IN-WI	3779	Prime Therapeutics	58	OptumRx	15
Danville, IL	4438	OptumRx	62	Prime Therapeutics	22
Davenport-Moline-Rock Island, IA-IL	2945	OptumRx	44	CVS/Caremark	25
Decatur, IL	4290	Prime Therapeutics	58	OptumRx	31
Kankakee, IL	3899	Prime Therapeutics	57	OptumRx	18
Peoria, IL	3739	OptumRx	45	Prime Therapeutics	41
Rockford, IL	4898	Prime Therapeutics	68	OptumRx	11
Springfield, IL	4048	Prime Therapeutics	50	OptumRx	39
Indiana	3086	IngenioRx	50	OptumRx	16
Bloomington, IN	3384	IngenioRx	54	CVS/Caremark	17
Columbus, IN	2951	IngenioRx	43	CVS/Caremark	30
Elkhart-Goshen, IN	3515	IngenioRx	55	OptumRx	18
Evansville, IN-KY	3626	IngenioRx	56	Express Scripts	15
Fort Wayne, IN	2618	IngenioRx	43	Express Scripts	19
Indianapolis-Carmel-Anderson, IN	3194	IngenioRx	50	Express Scripts	19
Kokomo, IN	3825	IngenioRx	57	Express Scripts	18
Lafayette-West Lafayette, IN	3867	IngenioRx	58	CVS/Caremark	14
Michigan City-La Porte, IN	3474	IngenioRx	53	OptumRx	19
Muncie, IN	3193	IngenioRx	50	CVS/Caremark	18
South Bend-Mishawaka, IN-MI	2828	IngenioRx	43	Express Scripts	26
Terre Haute, IN	3977	IngenioRx	60	Express Scripts	15
Iowa	4210	CVS/Caremark	60	OptumRx	21
Ames, IA	5567	CVS/Caremark	72	OptumRx	17
Cedar Rapids, IA	5169	CVS/Caremark	70	OptumRx	12
Des Moines-West Des Moines, IA	3752	CVS/Caremark	51	OptumRx	31
Dubuque, IA	4206	CVS/Caremark	61	OptumRx	18
Iowa City, IA	5836	CVS/Caremark	75	Magellan Rx Mgmt	8

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Sioux City, IA-NE-SD	3371	CVS/Caremark	48	OptumRx	29
Waterloo-Cedar Falls, IA	3681	CVS/Caremark	50	OptumRx	33
Kansas	3244	Prime Therapeutics	47	OptumRx	29
Lawrence, KS	3097	Prime Therapeutics	51	Aetna Pharm Mgmt	13
Manhattan, KS	5575	Prime Therapeutics	74	Express Scripts	8
Topeka, KS	5953	Prime Therapeutics	76	OptumRx	9
Wichita, KS	3764	Prime Therapeutics	58	OptumRx	11
Kentucky	4014	IngenioRx	59	Humana Pharm Sol	16
Bowling Green, KY	4869	IngenioRx	67	Humana Pharm Sol	18
Elizabethtown-Fort Knox, KY	4166	IngenioRx	60	Humana Pharm Sol	21
Lexington-Fayette, KY	4423	IngenioRx	63	Humana Pharm Sol	18
Louisville/Jefferson County, KY-IN	3659	IngenioRx	56	Humana Pharm Sol	15
Owensboro, KY	4823	IngenioRx	66	Humana Pharm Sol	18
Louisiana	5371	Express Scripts	71	OptumRx	14
Alexandria, LA	5122	Express Scripts	70	OptumRx	15
Baton Rouge, LA	5681	Express Scripts	74	OptumRx	11
Hammond, LA	5575	Express Scripts	73	OptumRx	13
Houma-Thibodaux, LA	5587	Express Scripts	73	OptumRx	16
Lafayette, LA	5927	Express Scripts	75	OptumRx	13
Lake Charles, LA	5869	Express Scripts	75	OptumRx	11
Monroe, LA	5282	Express Scripts	71	OptumRx	15
New Orleans-Metairie, LA	4674	Express Scripts	65	OptumRx	18
Shreveport-Bossier City, LA	5645	Express Scripts	74	OptumRx	13
Maine	3095	IngenioRx	45	OptumRx	25
Bangor, ME	3099	IngenioRx	41	Express Scripts	30
Lewiston-Auburn, ME	2764	IngenioRx	39	Express Scripts	23
Portland-South Portland, ME	3030	IngenioRx	42	OptumRx	28
Maryland	2500	CVS/Caremark	39	Kaiser Pharmacy	19
Baltimore-Columbia-Towson, MD	2797	CVS/Caremark	45	Express Scripts	17
California-Lexington Park, MD	3742	CVS/Caremark	56	Express Scripts	16
Cumberland, MD-WV	3611	Express Scripts	49	CVS/Caremark	27

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Hagerstown-Martinsburg, MD-WV	3060	Express Scripts	45	CVS/Caremark	22
Salisbury, MD-DE	3322	Express Scripts	41	CVS/Caremark	38
Massachusetts	3159	Express Scripts	43	CVS/Caremark	29
Barnstable Town, MA	3310	Express Scripts	45	OptumRx	30
Boston-Cambridge-Newton, MA-NH	2750	Express Scripts	40	CVS/Caremark	26
Pittsfield, MA	3853	Express Scripts	52	OptumRx	30
Springfield, MA	3085	Express Scripts	36	OptumRx	35
Worcester, MA-CT	2950	Express Scripts	43	CVS/Caremark	27
Michigan	7705	Express Scripts	88	OptumRx	4
Ann Arbor, MI	7817	Express Scripts	88	Aetna Pharm Mgmt	7
Battle Creek, MI	7849	Express Scripts	88	OptumRx	8
Bay City, MI	7676	Express Scripts	87	Aetna Pharm Mgmt	8
Detroit-Warren-Dearborn, MI	7496	Express Scripts	86	OptumRx	5
Flint, MI	8060	Express Scripts	90	OptumRx	3
Grand Rapids-Kentwood, MI	8479	Express Scripts	92	OptumRx	4
Jackson, MI	9167	Express Scripts	96	OptumRx	2
Kalamazoo-Portage, MI	7442	Express Scripts	85	OptumRx	11
Lansing-East Lansing, MI	5536	Express Scripts	69	CVS/Caremark	27
Midland, MI	5699	Express Scripts	71	Aetna Pharm Mgmt	27
Monroe, MI	6808	Express Scripts	82	CVS/Caremark	6
Muskegon, MI	8838	Express Scripts	94	OptumRx	3
Niles, MI	7835	Express Scripts	88	OptumRx	7
Saginaw, MI	8045	Express Scripts	89	Aetna Pharm Mgmt	7
Minnesota	2547	Prime Therapeutics	37	MedImpact	28
Duluth, MN-WI	2542	Prime Therapeutics	38	MedImpact	27
Mankato, MN	4284	Prime Therapeutics	61	Express Scripts	21
Minneapolis-St. Paul-Bloomington, MN-WI	2317	MedImpact	32	Prime Therapeutics	30
Rochester, MN	4463	Prime Therapeutics	62	Express Scripts	22
St. Cloud, MN	2999	Prime Therapeutics	42	MedImpact	31
Mississippi	3093	Prime Therapeutics	49	Envolve Pharm Sol	17
Gulfport-Biloxi, MS	3137	Prime Therapeutics	50	OptumRx	17

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Hattiesburg, MS	3106	Prime Therapeutics	45	OptumRx	27
Jackson, MS	3412	Prime Therapeutics	54	Envolve Pharm Sol	15
Missouri	2518	OptumRx	39	IngenioRx	25
Cape Girardeau, MO-IL	4176	IngenioRx	58	OptumRx	27
Columbia, MO	2770	OptumRx	39	IngenioRx	27
Jefferson City, MO	4553	IngenioRx	63	OptumRx	24
Joplin, MO	2353	IngenioRx	40	OptumRx	18
Kansas City, MO-KS	4548	OptumRx	64	Express Scripts	18
Springfield, MO	1845	IngenioRx	28	Elixir Pharmacy	21
St. Joseph, MO-KS	5613	OptumRx	74	Express Scripts	7
St. Louis, MO-IL	2189	OptumRx	30	IngenioRx	27
Montana	3198	Prime Therapeutics	51	CVS/Caremark	17
Billings, MT	3491	Prime Therapeutics	54	Express Scripts	20
Great Falls, MT	4382	Prime Therapeutics	64	CVS/Caremark	12
Missoula, MT	3360	Prime Therapeutics	52	Express Scripts	17
Nebraska	3044	Prime Therapeutics	46	OptumRx	20
Grand Island, NE	3572	Prime Therapeutics	52	Express Scripts	25
Lincoln, NE	3145	Prime Therapeutics	47	OptumRx	20
Omaha-Council Bluffs, NE-IA	2464	Prime Therapeutics	34	OptumRx	27
Nevada	2774	OptumRx	47	IngenioRx	18
Carson City, NV	1736	MedImpact	28	IngenioRx	21
Las Vegas-Henderson-Paradise, NV	3564	OptumRx	56	IngenioRx	15
Reno, NV	1804	IngenioRx	26	OptumRx	25
New Hampshire	2851	IngenioRx	41	OptumRx	28
Manchester-Nashua, NH	2935	IngenioRx	41	OptumRx	32
New Jersey	2308	Prime Therapeutics	35	OptumRx	19
Atlantic City-Hammonton, NJ	4394	Prime Therapeutics	63	FutureScripts	15
Ocean City, NJ	4029	Prime Therapeutics	58	FutureScripts	22
Trenton-Princeton, NJ	2317	Prime Therapeutics	35	Aetna Pharm Mgmt	21
Vineland-Bridgeton, NJ	3159	Prime Therapeutics	42	Aetna Pharm Mgmt	35

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
New Mexico	3055	OptumRx	39	Prime Therapeutics	35
Albuquerque, NM	3227	OptumRx	48	Prime Therapeutics	24
Farmington, NM	3387	Prime Therapeutics	43	OptumRx	37
Las Cruces, NM	2596	Prime Therapeutics	32	OptumRx	31
Santa Fe, NM	3034	OptumRx	37	Prime Therapeutics	37
New York	2434	Express Scripts	35	OptumRx	27
Albany-Schenectady-Troy, NY	3685	CVS/Caremark	54	Express Scripts	23
Binghamton, NY	5070	Express Scripts	68	OptumRx	18
Buffalo-Cheektowaga, NY	7555	Express Scripts	86	OptumRx	7
Elmira, NY	5085	Express Scripts	68	CVS/Caremark	16
Glens Falls, NY	3141	CVS/Caremark	47	Express Scripts	22
Ithaca, NY	3841	Express Scripts	51	Aetna Pharm Mgmt	34
Kingston, NY	3167	CVS/Caremark	48	OptumRx	22
New York-Newark-Jersey City, NY-NJ-PA	1924	OptumRx	30	Express Scripts	20
Poughkeepsie-Newburgh-Middletown, NY	2218	CVS/Caremark	28	OptumRx	27
Rochester, NY	6447	Express Scripts	79	CVS/Caremark	13
Syracuse, NY	5749	Express Scripts	74	OptumRx	11
Utica-Rome, NY	4128	Express Scripts	57	CVS/Caremark	25
Watertown-Fort Drum, NY	4709	Express Scripts	65	CVS/Caremark	19
North Carolina	3975	Prime Therapeutics	58	OptumRx	18
Asheville, NC	4661	Prime Therapeutics	65	OptumRx	17
Burlington, NC	3740	Prime Therapeutics	56	OptumRx	19
Charlotte-Concord-Gastonia, NC-SC	3065	Prime Therapeutics	42	OptumRx	31
Durham-Chapel Hill, NC	3975	Prime Therapeutics	59	OptumRx	17
Fayetteville, NC	3828	Prime Therapeutics	57	OptumRx	19
Goldsboro, NC	6458	Prime Therapeutics	79	OptumRx	9
Greensboro-High Point, NC	3870	Prime Therapeutics	56	OptumRx	23
Greenville, NC	6423	Prime Therapeutics	79	Express Scripts	12
Hickory-Lenoir-Morganton, NC	5135	Prime Therapeutics	69	OptumRx	17
Jacksonville, NC	4843	Prime Therapeutics	67	Aetna Pharm Mgmt	12
New Bern, NC	4974	Prime Therapeutics	68	Express Scripts	18

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Raleigh-Cary, NC	3567	Prime Therapeutics	53	OptumRx	21
Rocky Mount, NC	4387	Prime Therapeutics	62	Express Scripts	18
Wilmington, NC	4244	Prime Therapeutics	59	OptumRx	27
Winston-Salem, NC	3951	Prime Therapeutics	58	OptumRx	20
North Dakota	4374	Prime Therapeutics	56	OptumRx	34
Bismarck, ND	4345	Prime Therapeutics	56	OptumRx	34
Fargo, ND-MN	4188	Prime Therapeutics	58	OptumRx	27
Grand Forks, ND-MN	4384	Prime Therapeutics	60	OptumRx	26
Ohio	2696	Express Scripts	38	IngenioRx	31
Akron, OH	3205	Express Scripts	49	IngenioRx	25
Canton-Massillon, OH	3216	Express Scripts	49	IngenioRx	26
Cincinnati, OH-KY-IN	2768	IngenioRx	44	OptumRx	19
Cleveland-Elyria, OH	3960	Express Scripts	59	IngenioRx	20
Columbus, OH	2450	Express Scripts	30	OptumRx	26
Dayton-Kettering, OH	2698	IngenioRx	42	Express Scripts	23
Lima, OH	3054	Express Scripts	39	IngenioRx	37
Mansfield, OH	3505	Express Scripts	49	IngenioRx	32
Springfield, OH	2961	IngenioRx	45	Express Scripts	24
Toledo, OH	2530	Express Scripts	35	CVS/Caremark	28
Weirton-Steubenville, WV-OH	3968	Express Scripts	58	IngenioRx	18
Youngstown-Warren-Boardman, OH-PA	3751	Express Scripts	54	IngenioRx	27
Oklahoma	3729	Prime Therapeutics	57	OptumRx	15
Enid, OK	5470	Prime Therapeutics	72	OptumRx	12
Lawton, OK	4871	Prime Therapeutics	68	OptumRx	8
Oklahoma City, OK	3089	Prime Therapeutics	50	OptumRx	16
Tulsa, OK	3236	Prime Therapeutics	51	OptumRx	18
Oregon	2197	Kaiser Pharmacy	36	Prime Therapeutics	21
Albany-Lebanon, OR	2011	Prime Therapeutics	30	CVS/Caremark	23
Bend, OR	2914	CVS/Caremark	43	Prime Therapeutics	29
Corvallis, OR	2532	Prime Therapeutics	41	CVS/Caremark	22
Eugene-Springfield, OR	3214	CVS/Caremark	51	Prime Therapeutics	22

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Grants Pass, OR	2453	CVS/Caremark	39	MedImpact	22
Medford, OR	2669	CVS/Caremark	35	Prime Therapeutics	30
Portland-Vancouver-Hillsboro, OR-WA	2928	Kaiser Pharmacy	49	Prime Therapeutics	17
Salem, OR	3382	Kaiser Pharmacy	53	Prime Therapeutics	20
Pennsylvania	2944	Express Scripts	47	FutureScripts	21
Allentown-Bethlehem-Easton, PA-NJ	2579	Express Scripts	35	Prime Therapeutics	31
Altoona, PA	7610	Express Scripts	87	OptumRx	6
Bloomsburg-Berwick, PA	5021	MedImpact	68	Prime Therapeutics	15
Chambersburg-Waynesboro, PA	3430	Express Scripts	46	Prime Therapeutics	34
East Stroudsburg, PA	3380	Express Scripts	50	MedImpact	23
Erie, PA	7275	Express Scripts	85	Aetna Pharm Mgmt	9
Gettysburg, PA	3281	Express Scripts	45	Prime Therapeutics	32
Harrisburg-Carlisle, PA	3785	Express Scripts	54	Prime Therapeutics	27
Johnstown, PA	8236	Express Scripts	91	OptumRx	4
Lancaster, PA	3591	Express Scripts	49	Prime Therapeutics	33
Lebanon, PA	3597	Express Scripts	50	Prime Therapeutics	31
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	3021	FutureScripts	47	Express Scripts	19
Pittsburgh, PA	7290	Express Scripts	85	Aetna Pharm Mgmt	8
Reading, PA	3336	Express Scripts	43	Prime Therapeutics	37
Scranton--Wilkes-Barre, PA	4252	Express Scripts	52	MedImpact	38
State College, PA	3435	Prime Therapeutics	47	Express Scripts	33
Williamsport, PA	4760	Express Scripts	65	MedImpact	22
York-Hanover, PA	3382	Express Scripts	47	Prime Therapeutics	32
Rhode Island	3541	Prime Therapeutics	52	OptumRx	22
Providence-Warwick, RI-MA	2342	Prime Therapeutics	28	Express Scripts	25
South Carolina	6948	OptumRx	83	Express Scripts	11
Charleston-North Charleston, SC	6812	OptumRx	82	Express Scripts	10
Columbia, SC	6989	OptumRx	83	Express Scripts	10
Florence, SC	7493	OptumRx	86	Express Scripts	11
Greenville-Anderson, SC	6726	OptumRx	81	Express Scripts	13
Hilton Head Island-Bluffton, SC	6858	OptumRx	82	Express Scripts	12

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	5295	OptumRx	70	Prime Therapeutics	16
Spartanburg, SC	7672	OptumRx	87	Express Scripts	9
Sumter, SC	7876	OptumRx	88	Express Scripts	6
South Dakota	5803	CVS/Caremark	73	OptumRx	22
Rapid City, SD	5127	CVS/Caremark	66	OptumRx	28
Sioux Falls, SD	5429	CVS/Caremark	70	OptumRx	22
Tennessee	5569	Express Scripts	73	OptumRx	16
Chattanooga, TN-GA	5044	Express Scripts	69	OptumRx	12
Clarksville, TN-KY	2705	Express Scripts	43	IngenioRx	23
Cleveland, TN	5836	Express Scripts	75	OptumRx	11
Jackson, TN	7202	Express Scripts	84	OptumRx	10
Johnson City, TN	6349	Express Scripts	79	OptumRx	12
Kingsport-Bristol, TN-VA	3980	Express Scripts	56	IngenioRx	26
Knoxville, TN	4713	Express Scripts	64	OptumRx	25
Memphis, TN-MS-AR	4079	Express Scripts	61	OptumRx	14
Morristown, TN	6508	Express Scripts	79	OptumRx	13
Nashville-Davidson--Murfreeseboro--Franklin, TN	5145	Express Scripts	69	OptumRx	18
Texas	2132	Prime Therapeutics	34	OptumRx	22
Abilene, TX	3860	Prime Therapeutics	59	OptumRx	13
Amarillo, TX	2459	Prime Therapeutics	41	OptumRx	24
Austin-Round Rock-Georgetown, TX	1957	Prime Therapeutics	26	OptumRx	26
Beaumont-Port Arthur, TX	2314	Prime Therapeutics	37	OptumRx	22
Brownsville-Harlingen, TX	3328	Prime Therapeutics	54	OptumRx	12
College Station-Bryan, TX	2650	Prime Therapeutics	37	OptumRx	33
Corpus Christi, TX	2376	Prime Therapeutics	33	OptumRx	30
Dallas-Fort Worth-Arlington, TX	2143	Prime Therapeutics	33	OptumRx	23
El Paso, TX	1812	Prime Therapeutics	25	Aetna Pharm Mgmt	23
Houston-The Woodlands-Sugar Land, TX	1857	Prime Therapeutics	26	Express Scripts	22
Killeen-Temple, TX	2939	OptumRx	49	Prime Therapeutics	20
Laredo, TX	3574	Prime Therapeutics	57	CVS/Caremark	10
Longview, TX	3798	Prime Therapeutics	55	OptumRx	22

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Lubbock, TX	3551	Prime Therapeutics	56	OptumRx	15
McAllen-Edinburg-Mission, TX	2805	Prime Therapeutics	48	CVS/Caremark	13
Midland, TX	4766	Prime Therapeutics	67	OptumRx	13
Odessa, TX	4716	Prime Therapeutics	67	OptumRx	12
San Angelo, TX	4239	Prime Therapeutics	62	OptumRx	15
San Antonio-New Braunfels, TX	1924	Prime Therapeutics	28	OptumRx	27
Sherman-Denison, TX	3132	Prime Therapeutics	47	Express Scripts	22
Texarkana, TX-AR	2428	Prime Therapeutics	35	CVS/Caremark	27
Tyler, TX	3952	Prime Therapeutics	58	OptumRx	20
Victoria, TX	2950	Prime Therapeutics	45	Express Scripts	22
Waco, TX	2731	OptumRx	42	Prime Therapeutics	27
Wichita Falls, TX	4707	Prime Therapeutics	66	OptumRx	14
Utah	3568	SelectHealth	57	Prime Therapeutics	11
Logan, UT-ID	3769	SelectHealth	59	Prime Therapeutics	10
Ogden-Clearfield, UT	3361	SelectHealth	54	Aetna Pharm Mgmt	13
Provo-Orem, UT	4392	SelectHealth	64	Express Scripts	10
Salt Lake City, UT	3485	SelectHealth	56	Express Scripts	11
St. George, UT	4114	SelectHealth	62	OptumRx	10
Vermont	6181	Express Scripts	76	CVS/Caremark	20
Burlington-South Burlington, VT	6748	Express Scripts	81	CVS/Caremark	15
Virginia	2145	IngenioRx	33	OptumRx	20
Blacksburg-Christiansburg, VA	4696	IngenioRx	65	Aetna Pharm Mgmt	19
Charlottesville, VA	2782	IngenioRx	44	OptumRx	19
Harrisonburg, VA	4169	IngenioRx	55	OptumRx	32
Lynchburg, VA	3723	IngenioRx	56	CVS/Caremark	19
Richmond, VA	3441	IngenioRx	48	Express Scripts	30
Roanoke, VA	3910	IngenioRx	56	Aetna Pharm Mgmt	24
Staunton, VA	3928	IngenioRx	59	OptumRx	17
Virginia Beach-Norfolk-Newport News, VA-NC	3420	OptumRx	45	IngenioRx	35
Winchester, VA-WV	3014	IngenioRx	45	Express Scripts	22

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Washington	2482	Kaiser Pharmacy	33	Express Scripts	32
Bellingham, WA	3031	Kaiser Pharmacy	42	Express Scripts	30
Bremerton-Silverdale-Port Orchard, WA	2964	Kaiser Pharmacy	48	Express Scripts	20
Kennewick-Richland, WA	3055	Express Scripts	41	Kaiser Pharmacy	35
Longview, WA	4591	Kaiser Pharmacy	63	Express Scripts	25
Mount Vernon-Anacortes, WA	2684	Kaiser Pharmacy	34	Express Scripts	32
Olympia-Lacey-Tumwater, WA	2893	Kaiser Pharmacy	46	Express Scripts	24
Seattle-Tacoma-Bellevue, WA	2489	Express Scripts	34	Kaiser Pharmacy	32
Spokane-Spokane Valley, WA	2779	Express Scripts	40	Kaiser Pharmacy	31
Walla Walla, WA	2665	Express Scripts	40	Kaiser Pharmacy	29
Wenatchee, WA	3631	Express Scripts	56	OptumRx	15
Yakima, WA	2769	Express Scripts	38	Kaiser Pharmacy	30
West Virginia	5810	Express Scripts	75	OptumRx	12
Beckley, WV	5221	Express Scripts	70	Aetna Pharm Mgmt	13
Charleston, WV	5878	Express Scripts	75	Aetna Pharm Mgmt	12
Huntington-Ashland, WV-KY-OH	3365	Express Scripts	45	IngenioRx	34
Morgantown, WV	6099	Express Scripts	76	Aetna Pharm Mgmt	14
Parkersburg-Vienna, WV	6219	Express Scripts	78	OptumRx	11
Wheeling, WV-OH	3796	Express Scripts	56	IngenioRx	22
Wisconsin	1874	MedImpact	27	OptumRx	23
Appleton, WI	2249	OptumRx	33	IngenioRx	24
Eau Claire, WI	2145	MedImpact	36	IngenioRx	20
Fond du Lac, WI	2160	MedImpact	31	OptumRx	24
Green Bay, WI	1948	OptumRx	31	IngenioRx	21
Janesville-Beloit, WI	2879	Navitus	38	MedImpact	35
La Crosse-Onalaska, WI-MN	5173	MedImpact	71	Express Scripts	9
Madison, WI	4042	Navitus	57	MedImpact	28
Milwaukee-Waukesha, WI	2764	OptumRx	46	IngenioRx	17
Oshkosh-Neenah, WI	2263	OptumRx	34	IngenioRx	24

Exhibit A2 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Retail pharmacy network management product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Racine, WI	3079	OptumRx	48	IngenioRx	19
Sheboygan, WI	2872	OptumRx	44	IngenioRx	27
Wausau-Weston, WI	1942	MedImpact	28	Express Scripts	23
Wyoming	3723	Prime Therapeutics	54	Express Scripts	25
Casper, WY	3195	Express Scripts	40	Prime Therapeutics	35
Cheyenne, WY	3544	Prime Therapeutics	52	Express Scripts	25

Notes:

1. Source: Author's analysis of Managed Market Surveyor Suite | Pharmacy Benefit Evaluator | Program | January 1, 2020 | Enterprise License © 2020 DR/Decision Resources, LLC. All rights reserved.
2. State and MSA-level Herfindahl-Hirschman Indices (HHIs) and the market shares of the two largest PBMs in the retail pharmacy network management product market are reported. The market shares and HHIs are based on commercial drug coverage lives.
3. Drug coverage lives where the insurer itself performs the rebate negotiations (in house) are excluded.

Exhibit A3. Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

State and MSAs	HHI	PBM 1	Share (%)	PBM 2	Share (%)
Alabama	7389	Prime Therapeutics	86	Express Scripts	7
Anniston-Oxford, AL	7935	Prime Therapeutics	89	Express Scripts	5
Auburn-Opelika, AL	6829	Prime Therapeutics	82	Express Scripts	12
Birmingham-Hoover, AL	6901	Prime Therapeutics	82	Express Scripts	8
Daphne-Fairhope-Foley, AL	7019	Prime Therapeutics	83	OptumRx	8
Decatur, AL	7733	Prime Therapeutics	88	Express Scripts	7
Dothan, AL	8082	Prime Therapeutics	90	Express Scripts	5
Florence-Muscle Shoals, AL	7947	Prime Therapeutics	89	Express Scripts	6
Gadsden, AL	8113	Prime Therapeutics	90	Express Scripts	5
Huntsville, AL	7039	Prime Therapeutics	83	Express Scripts	8
Mobile, AL	7248	Prime Therapeutics	85	Express Scripts	8
Montgomery, AL	7801	Prime Therapeutics	88	Express Scripts	5
Tuscaloosa, AL	8123	Prime Therapeutics	90	Express Scripts	6
Alaska	5878	Express Scripts	75	Aetna Pharm Mgmt	16
Anchorage, AK	5428	Express Scripts	71	Aetna Pharm Mgmt	18
Fairbanks, AK	4728	Express Scripts	63	Aetna Pharm Mgmt	27
Arizona	3532	OptumRx	53	Express Scripts	22
Flagstaff, AZ	6026	OptumRx	76	Aetna Pharm Mgmt	10
Lake Havasu City-Kingman, AZ	6701	OptumRx	81	Express Scripts	9
Phoenix-Mesa-Chandler, AZ	3320	OptumRx	50	Express Scripts	24
Prescott Valley-Prescott, AZ	6245	OptumRx	78	Aetna Pharm Mgmt	8
Sierra Vista-Douglas, AZ	3999	OptumRx	59	Express Scripts	16
Tucson, AZ	3975	OptumRx	59	Express Scripts	19
Yuma, AZ	3999	OptumRx	60	Express Scripts	13
Arkansas	3714	CVS/Caremark	49	OptumRx	34
Fayetteville-Springdale-Rogers, AR	3802	CVS/Caremark	50	OptumRx	34
Fort Smith, AR-OK	2961	CVS/Caremark	38	OptumRx	35
Hot Springs, AR	3679	CVS/Caremark	50	OptumRx	32
Jonesboro, AR	4256	CVS/Caremark	58	OptumRx	28
Little Rock-North Little Rock-Conway, AR	3558	CVS/Caremark	42	OptumRx	41
Pine Bluff, AR	4263	CVS/Caremark	59	OptumRx	26

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
California	2885	Kaiser Pharmacy	48	IngenioRx	16
Bakersfield, CA	2839	Kaiser Pharmacy	40	SS and C Health	25
Chico, CA	3964	IngenioRx	49	SS and C Health	39
El Centro, CA	2886	SS and C Health	33	IngenioRx	33
Fresno, CA	2529	Kaiser Pharmacy	37	IngenioRx	23
Hanford-Corcoran, CA	2270	IngenioRx	31	SS and C Health	29
Los Angeles-Long Beach-Anaheim, CA	2438	Kaiser Pharmacy	41	IngenioRx	18
Madera, CA	2580	Kaiser Pharmacy	39	IngenioRx	23
Merced, CA	3546	IngenioRx	54	SS and C Health	18
Modesto, CA	4367	Kaiser Pharmacy	63	IngenioRx	17
Napa, CA	5358	Kaiser Pharmacy	72	IngenioRx	11
Oxnard-Thousand Oaks-Ventura, CA	2425	Kaiser Pharmacy	33	IngenioRx	27
Redding, CA	4514	IngenioRx	62	SS and C Health	26
Riverside-San Bernardino-Ontario, CA	3627	Kaiser Pharmacy	57	IngenioRx	13
Sacramento-Roseville-Folsom, CA	4126	Kaiser Pharmacy	61	OptumRx	14
Salinas, CA	2886	IngenioRx	43	SS and C Health	30
San Diego-Chula Vista-Carlsbad, CA	2581	Kaiser Pharmacy	45	IngenioRx	13
San Francisco-Oakland-Berkeley, CA	3921	Kaiser Pharmacy	60	SS and C Health	10
San Jose-Sunnyvale-Santa Clara, CA	3218	Kaiser Pharmacy	53	IngenioRx	13
San Luis Obispo-Paso Robles, CA	3447	IngenioRx	45	SS and C Health	35
Santa Cruz-Watsonville, CA	2129	Kaiser Pharmacy	32	IngenioRx	23
Santa Maria-Santa Barbara, CA	3001	IngenioRx	40	SS and C Health	35
Santa Rosa-Petaluma, CA	5485	Kaiser Pharmacy	73	IngenioRx	8
Stockton, CA	5162	Kaiser Pharmacy	70	IngenioRx	12
Vallejo, CA	6618	Kaiser Pharmacy	81	OptumRx	7
Visalia, CA	3486	IngenioRx	53	SS and C Health	25
Yuba City, CA	2557	IngenioRx	37	Kaiser Pharmacy	28
Colorado	1996	Kaiser Pharmacy	26	Express Scripts	24
Boulder, CO	2008	Express Scripts	25	Kaiser Pharmacy	24
Colorado Springs, CO	1892	Kaiser Pharmacy	24	Express Scripts	23
Denver-Aurora-Lakewood, CO	2161	Kaiser Pharmacy	32	Express Scripts	24

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Fort Collins, CO	2370	IngenioRx	37	Express Scripts	19
Grand Junction, CO	3135	OptumRx	42	Express Scripts	31
Greeley, CO	2102	Express Scripts	28	IngenioRx	25
Pueblo, CO	2383	Kaiser Pharmacy	32	OptumRx	25
Connecticut	2690	Express Scripts	35	IngenioRx	28
Bridgeport-Stamford-Norwalk, CT	2696	Express Scripts	34	OptumRx	30
Hartford-East Hartford-Middletown, CT	2813	Express Scripts	39	IngenioRx	27
New Haven-Milford, CT	2728	Express Scripts	34	IngenioRx	32
Norwich-New London, CT	2970	IngenioRx	42	OptumRx	25
Delaware	6384	Express Scripts	78	Aetna Pharm Mgmt	13
Dover, DE	4952	Express Scripts	67	Aetna Pharm Mgmt	18
District of Columbia	2289	CVS/Caremark	35	OptumRx	20
Washington-Arlington-Alexandria, DC-VA-MD-WV	1824	Kaiser Pharmacy	23	CVS/Caremark	22
Florida	2454	Prime Therapeutics	42	OptumRx	17
Cape Coral-Fort Myers, FL	3653	Prime Therapeutics	56	Aetna Pharm Mgmt	15
Crestview-Fort Walton Beach-Destin, FL	4452	Prime Therapeutics	64	OptumRx	12
Deltona-Daytona Beach-Ormond Beach, FL	2034	OptumRx	26	Prime Therapeutics	22
Gainesville, FL	5810	Prime Therapeutics	75	OptumRx	8
Homosassa Springs, FL	4881	Prime Therapeutics	67	OptumRx	17
Jacksonville, FL	3832	Prime Therapeutics	58	OptumRx	16
Lakeland-Winter Haven, FL	2261	Prime Therapeutics	35	OptumRx	25
Miami-Fort Lauderdale-Pompano Beach, FL	1815	Prime Therapeutics	28	Envolve Pharm Sol	17
Naples-Marco Island, FL	5010	Prime Therapeutics	68	OptumRx	13
North Port-Sarasota-Bradenton, FL	3525	Prime Therapeutics	54	OptumRx	18
Ocala, FL	5962	Prime Therapeutics	76	OptumRx	13
Orlando-Kissimmee-Sanford, FL	2495	Prime Therapeutics	39	Express Scripts	21
Palm Bay-Melbourne-Titusville, FL	3117	Express Scripts	49	Prime Therapeutics	20
Panama City, FL	5865	Prime Therapeutics	76	OptumRx	9
Pensacola-Ferry Pass-Brent, FL	4099	Prime Therapeutics	60	OptumRx	16
Port St. Lucie, FL	4858	Prime Therapeutics	67	Express Scripts	13
Punta Gorda, FL	3383	Prime Therapeutics	52	OptumRx	17

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Sebastian-Vero Beach, FL	5131	Prime Therapeutics	69	OptumRx	14
Sebring-Avon Park, FL	3653	Prime Therapeutics	55	OptumRx	20
Tallahassee, FL	7673	Prime Therapeutics	87	OptumRx	6
Tampa-St. Petersburg-Clearwater, FL	2261	Prime Therapeutics	36	OptumRx	23
The Villages, FL	5332	Prime Therapeutics	71	OptumRx	16
Georgia	1719	IngenioRx	30	Express Scripts	17
Albany, GA	2361	IngenioRx	39	RxAdvance	20
Athens-Clarke County, GA	2235	IngenioRx	39	Express Scripts	17
Atlanta-Sandy Springs-Alpharetta, GA	1646	IngenioRx	26	Express Scripts	18
Augusta-Richmond County, GA-SC	2732	IngenioRx	36	OptumRx	35
Brunswick, GA	2193	IngenioRx	36	RxAdvance	22
Columbus, GA-AL	2254	IngenioRx	39	Express Scripts	19
Dalton, GA	2755	Express Scripts	40	Magellan Rx Mgmt	27
Gainesville, GA	1821	Express Scripts	30	IngenioRx	20
Hinesville, GA	1764	IngenioRx	25	SS and C Health	23
Macon-Bibb County, GA	2409	IngenioRx	42	OptumRx	17
Rome, GA	2461	IngenioRx	37	Express Scripts	26
Savannah, GA	2135	IngenioRx	35	OptumRx	18
Valdosta, GA	3998	IngenioRx	61	OptumRx	12
Warner Robins, GA	2113	IngenioRx	39	CVS/Caremark	13
Hawaii	4720	CVS/Caremark	64	Kaiser Pharmacy	24
Kahului-Wailuku-Lahaina, HI	4229	Kaiser Pharmacy	53	CVS/Caremark	37
Urban Honolulu, HI	4834	CVS/Caremark	66	Kaiser Pharmacy	21
Idaho	3339	CVS/Caremark	54	Prime Therapeutics	13
Boise City, ID	3170	CVS/Caremark	51	Prime Therapeutics	15
Coeur d'Alene, ID	2638	CVS/Caremark	43	Kaiser Pharmacy	24
Idaho Falls, ID	3583	CVS/Caremark	56	SelectHealth	14
Lewiston, ID-WA	3201	CVS/Caremark	45	Express Scripts	27
Pocatello, ID	4866	CVS/Caremark	68	Prime Therapeutics	14
Twin Falls, ID	3451	CVS/Caremark	54	SelectHealth	18

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Illinois	4015	Prime Therapeutics	59	OptumRx	21
Bloomington, IL	3847	Prime Therapeutics	50	OptumRx	36
Carbondale-Marion, IL	2976	OptumRx	39	Prime Therapeutics	36
Champaign-Urbana, IL	6952	OptumRx	83	Prime Therapeutics	6
Chicago-Naperville-Elgin, IL-IN-WI	3779	Prime Therapeutics	58	OptumRx	15
Danville, IL	4438	OptumRx	62	Prime Therapeutics	22
Davenport-Moline-Rock Island, IA-IL	2945	OptumRx	44	CVS/Caremark	25
Decatur, IL	4290	Prime Therapeutics	58	OptumRx	31
Kankakee, IL	3899	Prime Therapeutics	57	OptumRx	18
Peoria, IL	3739	OptumRx	45	Prime Therapeutics	41
Rockford, IL	4898	Prime Therapeutics	68	OptumRx	11
Springfield, IL	4048	Prime Therapeutics	50	OptumRx	39
Indiana	3079	IngenioRx	50	Express Scripts	16
Bloomington, IN	3384	IngenioRx	54	CVS/Caremark	17
Columbus, IN	2951	IngenioRx	43	CVS/Caremark	30
Elkhart-Goshen, IN	3515	IngenioRx	55	OptumRx	18
Evansville, IN-KY	3626	IngenioRx	56	Express Scripts	15
Fort Wayne, IN	2618	IngenioRx	43	Express Scripts	19
Indianapolis-Carmel-Anderson, IN	3194	IngenioRx	50	Express Scripts	19
Kokomo, IN	3825	IngenioRx	57	Express Scripts	18
Lafayette-West Lafayette, IN	3867	IngenioRx	58	CVS/Caremark	14
Michigan City-La Porte, IN	3474	IngenioRx	53	OptumRx	19
Muncie, IN	3193	IngenioRx	50	CVS/Caremark	18
South Bend-Mishawaka, IN-MI	2825	IngenioRx	43	Express Scripts	27
Terre Haute, IN	3977	IngenioRx	60	Express Scripts	15
Iowa	4210	CVS/Caremark	60	OptumRx	21
Ames, IA	5567	CVS/Caremark	72	OptumRx	17
Cedar Rapids, IA	5169	CVS/Caremark	70	OptumRx	12
Des Moines-West Des Moines, IA	3752	CVS/Caremark	51	OptumRx	31
Dubuque, IA	4206	CVS/Caremark	61	OptumRx	18
Iowa City, IA	5836	CVS/Caremark	75	Magellan Rx Mgmt	8

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Sioux City, IA-NE-SD	3371	CVS/Caremark	48	OptumRx	29
Waterloo-Cedar Falls, IA	3681	CVS/Caremark	50	OptumRx	33
Kansas	3244	Prime Therapeutics	47	OptumRx	29
Lawrence, KS	3097	Prime Therapeutics	51	Aetna Pharm Mgmt	13
Manhattan, KS	5575	Prime Therapeutics	74	Express Scripts	8
Topeka, KS	5953	Prime Therapeutics	76	OptumRx	9
Wichita, KS	3764	Prime Therapeutics	58	OptumRx	11
Kentucky	4014	IngenioRx	59	SS and C Health	16
Bowling Green, KY	4869	IngenioRx	67	SS and C Health	18
Elizabethtown-Fort Knox, KY	4166	IngenioRx	60	SS and C Health	21
Lexington-Fayette, KY	4423	IngenioRx	63	SS and C Health	18
Louisville/Jefferson County, KY-IN	3659	IngenioRx	56	SS and C Health	15
Owensboro, KY	4823	IngenioRx	66	SS and C Health	18
Louisiana	5371	Express Scripts	71	OptumRx	14
Alexandria, LA	5122	Express Scripts	70	OptumRx	15
Baton Rouge, LA	5681	Express Scripts	74	OptumRx	11
Hammond, LA	5575	Express Scripts	73	OptumRx	13
Houma-Thibodaux, LA	5587	Express Scripts	73	OptumRx	16
Lafayette, LA	5927	Express Scripts	75	OptumRx	13
Lake Charles, LA	5869	Express Scripts	75	OptumRx	11
Monroe, LA	5282	Express Scripts	71	OptumRx	15
New Orleans-Metairie, LA	4674	Express Scripts	65	OptumRx	18
Shreveport-Bossier City, LA	5645	Express Scripts	74	OptumRx	13
Maine	3095	IngenioRx	45	OptumRx	25
Bangor, ME	3099	IngenioRx	41	Express Scripts	30
Lewiston-Auburn, ME	2764	IngenioRx	39	Express Scripts	23
Portland-South Portland, ME	3030	IngenioRx	42	OptumRx	28
Maryland	2500	CVS/Caremark	39	Kaiser Pharmacy	19
Baltimore-Columbia-Towson, MD	2797	CVS/Caremark	45	Express Scripts	17
California-Lexington Park, MD	3742	CVS/Caremark	56	Express Scripts	16
Cumberland, MD-WV	3611	Express Scripts	49	CVS/Caremark	27

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Hagerstown-Martinsburg, MD-WV	3060	Express Scripts	45	CVS/Caremark	22
Salisbury, MD-DE	3322	Express Scripts	41	CVS/Caremark	38
Massachusetts	3159	Express Scripts	43	CVS/Caremark	29
Barnstable Town, MA	3310	Express Scripts	45	OptumRx	30
Boston-Cambridge-Newton, MA-NH	2750	Express Scripts	40	CVS/Caremark	26
Pittsfield, MA	3853	Express Scripts	52	OptumRx	30
Springfield, MA	3085	Express Scripts	36	OptumRx	35
Worcester, MA-CT	2950	Express Scripts	43	CVS/Caremark	27
Michigan	7879	Express Scripts	89	OptumRx	4
Ann Arbor, MI	7865	Express Scripts	88	Aetna Pharm Mgmt	7
Battle Creek, MI	7929	Express Scripts	89	OptumRx	7
Bay City, MI	8035	Express Scripts	89	Aetna Pharm Mgmt	7
Detroit-Warren-Dearborn, MI	7772	Express Scripts	88	OptumRx	5
Flint, MI	8291	Express Scripts	91	OptumRx	3
Grand Rapids-Kentwood, MI	8548	Express Scripts	92	OptumRx	4
Jackson, MI	9265	Express Scripts	96	OptumRx	2
Kalamazoo-Portage, MI	7499	Express Scripts	86	OptumRx	11
Lansing-East Lansing, MI	5573	Express Scripts	70	CVS/Caremark	27
Midland, MI	5814	Express Scripts	72	Aetna Pharm Mgmt	26
Monroe, MI	7057	Express Scripts	84	CVS/Caremark	5
Muskegon, MI	8878	Express Scripts	94	OptumRx	3
Niles, MI	7985	Express Scripts	89	OptumRx	6
Saginaw, MI	8469	Express Scripts	92	Aetna Pharm Mgmt	5
Minnesota	2547	Prime Therapeutics	37	MedImpact	28
Duluth, MN-WI	2553	Prime Therapeutics	38	MedImpact	27
Mankato, MN	4284	Prime Therapeutics	61	Express Scripts	21
Minneapolis-St. Paul-Bloomington, MN-WI	2324	MedImpact	32	Prime Therapeutics	30
Rochester, MN	4463	Prime Therapeutics	62	Express Scripts	22
St. Cloud, MN	2999	Prime Therapeutics	42	MedImpact	31
Mississippi	3093	Prime Therapeutics	49	RxAdvance	17
Gulfport-Biloxi, MS	3137	Prime Therapeutics	50	OptumRx	17

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Hattiesburg, MS	3106	Prime Therapeutics	45	OptumRx	27
Jackson, MS	3412	Prime Therapeutics	54	RxAdvance	15
Missouri	2518	OptumRx	39	IngenioRx	25
Cape Girardeau, MO-IL	4176	IngenioRx	58	OptumRx	27
Columbia, MO	2770	OptumRx	39	IngenioRx	27
Jefferson City, MO	4553	IngenioRx	63	OptumRx	24
Joplin, MO	2353	IngenioRx	40	OptumRx	18
Kansas City, MO-KS	4548	OptumRx	64	Express Scripts	18
Springfield, MO	1845	IngenioRx	28	Elixir Pharmacy	21
St. Joseph, MO-KS	5613	OptumRx	74	Express Scripts	7
St. Louis, MO-IL	2189	OptumRx	30	IngenioRx	27
Montana	3198	Prime Therapeutics	51	CVS/Caremark	17
Billings, MT	3491	Prime Therapeutics	54	Express Scripts	20
Great Falls, MT	4382	Prime Therapeutics	64	CVS/Caremark	12
Missoula, MT	3360	Prime Therapeutics	52	Express Scripts	17
Nebraska	3044	Prime Therapeutics	46	OptumRx	20
Grand Island, NE	3572	Prime Therapeutics	52	Express Scripts	25
Lincoln, NE	3145	Prime Therapeutics	47	OptumRx	20
Omaha-Council Bluffs, NE-IA	2464	Prime Therapeutics	34	OptumRx	27
Nevada	2774	OptumRx	47	IngenioRx	18
Carson City, NV	1736	MedImpact	28	IngenioRx	21
Las Vegas-Henderson-Paradise, NV	3564	OptumRx	56	IngenioRx	15
Reno, NV	1804	IngenioRx	26	OptumRx	25
New Hampshire	2851	IngenioRx	41	OptumRx	28
Manchester-Nashua, NH	2935	IngenioRx	41	OptumRx	32
New Jersey	2308	Prime Therapeutics	35	OptumRx	19
Atlantic City-Hammonton, NJ	4394	Prime Therapeutics	63	FutureScripts	15
Ocean City, NJ	4029	Prime Therapeutics	58	FutureScripts	22
Trenton-Princeton, NJ	2317	Prime Therapeutics	35	Aetna Pharm Mgmt	21
Vineland-Bridgeton, NJ	3159	Prime Therapeutics	42	Aetna Pharm Mgmt	35

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
New Mexico	3040	Prime Therapeutics	46	OptumRx	20
Albuquerque, NM	2614	Prime Therapeutics	36	CVS/Caremark	25
Farmington, NM	3448	Prime Therapeutics	50	OptumRx	27
Las Cruces, NM	2654	Prime Therapeutics	39	CVS/Caremark	26
Santa Fe, NM	3121	Prime Therapeutics	47	OptumRx	19
New York	2277	Express Scripts	34	OptumRx	26
Albany-Schenectady-Troy, NY	3685	CVS/Caremark	54	Express Scripts	23
Binghamton, NY	5070	Express Scripts	68	OptumRx	18
Buffalo-Cheektowaga, NY	4367	Express Scripts	54	Pharmacy Benefit Dimns	37
Elmira, NY	5085	Express Scripts	68	CVS/Caremark	16
Glens Falls, NY	3141	CVS/Caremark	47	Express Scripts	22
Ithaca, NY	3841	Express Scripts	51	Aetna Pharm Mgmt	34
Kingston, NY	3167	CVS/Caremark	48	OptumRx	22
New York-Newark-Jersey City, NY-NJ-PA	1924	OptumRx	30	Express Scripts	20
Poughkeepsie-Newburgh-Middletown, NY	2218	CVS/Caremark	28	OptumRx	27
Rochester, NY	6414	Express Scripts	79	CVS/Caremark	13
Syracuse, NY	5749	Express Scripts	74	OptumRx	11
Utica-Rome, NY	4128	Express Scripts	57	CVS/Caremark	25
Watertown-Fort Drum, NY	4709	Express Scripts	65	CVS/Caremark	19
North Carolina	3986	Prime Therapeutics	58	OptumRx	18
Asheville, NC	4661	Prime Therapeutics	65	OptumRx	17
Burlington, NC	3740	Prime Therapeutics	56	OptumRx	19
Charlotte-Concord-Gastonia, NC-SC	3065	Prime Therapeutics	42	OptumRx	31
Durham-Chapel Hill, NC	3975	Prime Therapeutics	59	OptumRx	17
Fayetteville, NC	3828	Prime Therapeutics	57	OptumRx	19
Goldsboro, NC	6458	Prime Therapeutics	79	OptumRx	9
Greensboro-High Point, NC	3870	Prime Therapeutics	56	OptumRx	23
Greenville, NC	6423	Prime Therapeutics	79	Express Scripts	12
Hickory-Lenoir-Morganton, NC	5135	Prime Therapeutics	69	OptumRx	17
Jacksonville, NC	4843	Prime Therapeutics	67	Aetna Pharm Mgmt	12
New Bern, NC	4974	Prime Therapeutics	68	Express Scripts	18

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Raleigh-Cary, NC	3567	Prime Therapeutics	53	OptumRx	21
Rocky Mount, NC	4387	Prime Therapeutics	62	Express Scripts	18
Wilmington, NC	4244	Prime Therapeutics	59	OptumRx	27
Winston-Salem, NC	3951	Prime Therapeutics	58	OptumRx	20
North Dakota	4374	Prime Therapeutics	56	OptumRx	34
Bismarck, ND	4345	Prime Therapeutics	56	OptumRx	34
Fargo, ND-MN	4188	Prime Therapeutics	58	OptumRx	27
Grand Forks, ND-MN	4384	Prime Therapeutics	60	OptumRx	26
Ohio	2697	Express Scripts	38	IngenioRx	31
Akron, OH	3205	Express Scripts	49	IngenioRx	25
Canton-Massillon, OH	3216	Express Scripts	49	IngenioRx	26
Cincinnati, OH-KY-IN	2767	IngenioRx	44	OptumRx	19
Cleveland-Elyria, OH	3960	Express Scripts	59	IngenioRx	20
Columbus, OH	2450	Express Scripts	30	OptumRx	26
Dayton-Kettering, OH	2698	IngenioRx	42	Express Scripts	23
Lima, OH	3054	Express Scripts	39	IngenioRx	37
Mansfield, OH	3505	Express Scripts	49	IngenioRx	32
Springfield, OH	2961	IngenioRx	45	Express Scripts	24
Toledo, OH	2530	Express Scripts	35	CVS/Caremark	28
Weirton-Steubenville, WV-OH	3968	Express Scripts	58	IngenioRx	18
Youngstown-Warren-Boardman, OH-PA	3751	Express Scripts	54	IngenioRx	27
Oklahoma	4240	Prime Therapeutics	62	OptumRx	16
Enid, OK	5574	Prime Therapeutics	73	OptumRx	12
Lawton, OK	5048	Prime Therapeutics	70	OptumRx	8
Oklahoma City, OK	3520	Prime Therapeutics	55	OptumRx	17
Tulsa, OK	3833	Prime Therapeutics	57	OptumRx	20
Oregon	2197	Kaiser Pharmacy	36	Prime Therapeutics	21
Albany-Lebanon, OR	2011	Prime Therapeutics	30	CVS/Caremark	23
Bend, OR	2914	CVS/Caremark	43	Prime Therapeutics	29
Corvallis, OR	2532	Prime Therapeutics	41	CVS/Caremark	22
Eugene-Springfield, OR	3214	CVS/Caremark	51	Prime Therapeutics	22

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Grants Pass, OR	2453	CVS/Caremark	39	MedImpact	22
Medford, OR	2669	CVS/Caremark	35	Prime Therapeutics	30
Portland-Vancouver-Hillsboro, OR-WA	2928	Kaiser Pharmacy	49	Prime Therapeutics	17
Salem, OR	3382	Kaiser Pharmacy	53	Prime Therapeutics	20
Pennsylvania	2944	Express Scripts	47	FutureScripts	21
Allentown-Bethlehem-Easton, PA-NJ	2579	Express Scripts	35	Prime Therapeutics	31
Altoona, PA	7610	Express Scripts	87	OptumRx	6
Bloomsburg-Berwick, PA	5021	MedImpact	68	Prime Therapeutics	15
Chambersburg-Waynesboro, PA	3430	Express Scripts	46	Prime Therapeutics	34
East Stroudsburg, PA	3380	Express Scripts	50	MedImpact	23
Erie, PA	7275	Express Scripts	85	Aetna Pharm Mgmt	9
Gettysburg, PA	3281	Express Scripts	45	Prime Therapeutics	32
Harrisburg-Carlisle, PA	3785	Express Scripts	54	Prime Therapeutics	27
Johnstown, PA	8236	Express Scripts	91	OptumRx	4
Lancaster, PA	3591	Express Scripts	49	Prime Therapeutics	33
Lebanon, PA	3597	Express Scripts	50	Prime Therapeutics	31
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	3021	FutureScripts	47	Express Scripts	19
Pittsburgh, PA	7290	Express Scripts	85	Aetna Pharm Mgmt	8
Reading, PA	3336	Express Scripts	43	Prime Therapeutics	37
Scranton--Wilkes-Barre, PA	4252	Express Scripts	52	MedImpact	38
State College, PA	3435	Prime Therapeutics	47	Express Scripts	33
Williamsport, PA	4760	Express Scripts	65	MedImpact	22
York-Hanover, PA	3382	Express Scripts	47	Prime Therapeutics	32
Rhode Island	3541	Prime Therapeutics	52	OptumRx	22
Providence-Warwick, RI-MA	2342	Prime Therapeutics	28	Express Scripts	25
South Carolina	6948	OptumRx	83	Express Scripts	11
Charleston-North Charleston, SC	6812	OptumRx	82	Express Scripts	10
Columbia, SC	6989	OptumRx	83	Express Scripts	10
Florence, SC	7493	OptumRx	86	Express Scripts	11
Greenville-Anderson, SC	6726	OptumRx	81	Express Scripts	13
Hilton Head Island-Bluffton, SC	6858	OptumRx	82	Express Scripts	12

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	5295	OptumRx	70	Prime Therapeutics	16
Spartanburg, SC	7672	OptumRx	87	Express Scripts	9
Sumter, SC	7876	OptumRx	88	Express Scripts	6
South Dakota	5803	CVS/Caremark	73	OptumRx	22
Rapid City, SD	5127	CVS/Caremark	66	OptumRx	28
Sioux Falls, SD	5429	CVS/Caremark	70	OptumRx	22
Tennessee	5569	Express Scripts	73	OptumRx	16
Chattanooga, TN-GA	5041	Express Scripts	69	OptumRx	12
Clarksville, TN-KY	2705	Express Scripts	43	IngenioRx	23
Cleveland, TN	5836	Express Scripts	75	OptumRx	11
Jackson, TN	7202	Express Scripts	84	OptumRx	10
Johnson City, TN	6349	Express Scripts	79	OptumRx	12
Kingsport-Bristol, TN-VA	3981	Express Scripts	56	IngenioRx	26
Knoxville, TN	4713	Express Scripts	64	OptumRx	25
Memphis, TN-MS-AR	4078	Express Scripts	61	OptumRx	14
Morristown, TN	6508	Express Scripts	79	OptumRx	13
Nashville-Davidson--Murfreeseboro--Franklin, TN	5145	Express Scripts	69	OptumRx	18
Texas	2132	Prime Therapeutics	34	OptumRx	22
Abilene, TX	3860	Prime Therapeutics	59	OptumRx	13
Amarillo, TX	2459	Prime Therapeutics	41	OptumRx	24
Austin-Round Rock-Georgetown, TX	1957	Prime Therapeutics	26	OptumRx	26
Beaumont-Port Arthur, TX	2314	Prime Therapeutics	37	OptumRx	22
Brownsville-Harlingen, TX	3328	Prime Therapeutics	54	OptumRx	12
College Station-Bryan, TX	2650	Prime Therapeutics	37	OptumRx	33
Corpus Christi, TX	2376	Prime Therapeutics	33	OptumRx	30
Dallas-Fort Worth-Arlington, TX	2143	Prime Therapeutics	33	OptumRx	23
El Paso, TX	1812	Prime Therapeutics	25	Aetna Pharm Mgmt	23
Houston-The Woodlands-Sugar Land, TX	1857	Prime Therapeutics	26	Express Scripts	22
Killeen-Temple, TX	2939	OptumRx	49	Prime Therapeutics	20
Laredo, TX	3574	Prime Therapeutics	57	CVS/Caremark	10
Longview, TX	3798	Prime Therapeutics	55	OptumRx	22

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Lubbock, TX	3551	Prime Therapeutics	56	OptumRx	15
McAllen-Edinburg-Mission, TX	2805	Prime Therapeutics	48	CVS/Caremark	13
Midland, TX	4766	Prime Therapeutics	67	OptumRx	13
Odessa, TX	4716	Prime Therapeutics	67	OptumRx	12
San Angelo, TX	4239	Prime Therapeutics	62	OptumRx	15
San Antonio-New Braunfels, TX	1924	Prime Therapeutics	28	OptumRx	27
Sherman-Denison, TX	3132	Prime Therapeutics	47	Express Scripts	22
Texarkana, TX-AR	2428	Prime Therapeutics	35	CVS/Caremark	27
Tyler, TX	3952	Prime Therapeutics	58	OptumRx	20
Victoria, TX	2950	Prime Therapeutics	45	Express Scripts	22
Waco, TX	2731	OptumRx	42	Prime Therapeutics	27
Wichita Falls, TX	4707	Prime Therapeutics	66	OptumRx	14
Utah	3568	SelectHealth	57	Prime Therapeutics	11
Logan, UT-ID	3769	SelectHealth	59	Prime Therapeutics	10
Ogden-Clearfield, UT	3361	SelectHealth	54	Aetna Pharm Mgmt	13
Provo-Orem, UT	4392	SelectHealth	64	Express Scripts	10
Salt Lake City, UT	3485	SelectHealth	56	Express Scripts	11
St. George, UT	4114	SelectHealth	62	OptumRx	10
Vermont	6181	Express Scripts	76	CVS/Caremark	20
Burlington-South Burlington, VT	6748	Express Scripts	81	CVS/Caremark	15
Virginia	2234	IngenioRx	36	Express Scripts	22
Blacksburg-Christiansburg, VA	4884	IngenioRx	66	Aetna Pharm Mgmt	19
Charlottesville, VA	3219	IngenioRx	50	Aetna Pharm Mgmt	22
Harrisonburg, VA	5812	IngenioRx	75	Express Scripts	11
Lynchburg, VA	4085	IngenioRx	60	CVS/Caremark	20
Richmond, VA	3559	IngenioRx	49	Express Scripts	31
Roanoke, VA	4178	IngenioRx	59	Aetna Pharm Mgmt	25
Staunton, VA	4395	IngenioRx	64	OptumRx	10
Virginia Beach-Norfolk-Newport News, VA-NC	3745	IngenioRx	56	Express Scripts	19
Winchester, VA-WV	3145	IngenioRx	47	Express Scripts	23

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Washington	2482	Kaiser Pharmacy	33	Express Scripts	32
Bellingham, WA	3031	Kaiser Pharmacy	42	Express Scripts	30
Bremerton-Silverdale-Port Orchard, WA	2964	Kaiser Pharmacy	48	Express Scripts	20
Kennewick-Richland, WA	3055	Express Scripts	41	Kaiser Pharmacy	35
Longview, WA	4591	Kaiser Pharmacy	63	Express Scripts	25
Mount Vernon-Anacortes, WA	2684	Kaiser Pharmacy	34	Express Scripts	32
Olympia-Lacey-Tumwater, WA	2893	Kaiser Pharmacy	46	Express Scripts	24
Seattle-Tacoma-Bellevue, WA	2489	Express Scripts	34	Kaiser Pharmacy	32
Spokane-Spokane Valley, WA	2779	Express Scripts	40	Kaiser Pharmacy	31
Walla Walla, WA	2665	Express Scripts	40	Kaiser Pharmacy	29
Wenatchee, WA	3631	Express Scripts	56	OptumRx	15
Yakima, WA	2769	Express Scripts	38	Kaiser Pharmacy	30
West Virginia	5841	Express Scripts	75	OptumRx	12
Beckley, WV	5221	Express Scripts	70	Aetna Pharm Mgmt	13
Charleston, WV	5878	Express Scripts	75	Aetna Pharm Mgmt	12
Huntington-Ashland, WV-KY-OH	3365	Express Scripts	45	IngenioRx	34
Morgantown, WV	6099	Express Scripts	76	Aetna Pharm Mgmt	14
Parkersburg-Vienna, WV	6219	Express Scripts	78	OptumRx	11
Wheeling, WV-OH	3796	Express Scripts	56	IngenioRx	22
Wisconsin	1894	MedImpact	27	OptumRx	24
Appleton, WI	2253	OptumRx	33	IngenioRx	24
Eau Claire, WI	2223	MedImpact	37	IngenioRx	20
Fond du Lac, WI	2160	MedImpact	31	OptumRx	24
Green Bay, WI	1976	OptumRx	31	IngenioRx	21
Janesville-Beloit, WI	2879	Navitus	38	MedImpact	35
La Crosse-Onalaska, WI-MN	5174	MedImpact	71	Express Scripts	9
Madison, WI	4042	Navitus	57	MedImpact	28
Milwaukee-Waukesha, WI	2806	OptumRx	46	IngenioRx	17
Oshkosh-Neenah, WI	2280	OptumRx	35	IngenioRx	24

Exhibit A3 (continued). Market concentration (HHI) and largest PBMs' market shares, as of January 1, 2020
Claims adjudication product markets

<u>State and MSAs</u>	<u>HHI</u>	<u>PBM 1</u>	<u>Share (%)</u>	<u>PBM 2</u>	<u>Share (%)</u>
Racine, WI	3117	OptumRx	49	IngenioRx	20
Sheboygan, WI	2872	OptumRx	44	IngenioRx	27
Wausau-Weston, WI	2025	MedImpact	28	Express Scripts	23
Wyoming	3723	Prime Therapeutics	54	Express Scripts	25
Casper, WY	3195	Express Scripts	40	Prime Therapeutics	35
Cheyenne, WY	3544	Prime Therapeutics	52	Express Scripts	25

Notes:

1. Source: Author's analysis of Managed Market Surveyor Suite | Pharmacy Benefit Evaluator | Program | January 1, 2020 | Enterprise License © 2020 DR/Decision Resources, LLC. All rights reserved.
2. State and MSA-level Herfindahl-Hirschman Indices (HHIs) and the market shares of the two largest PBMs in the pharmacy claims adjudication product market are reported. The market shares and HHIs are based on commercial drug coverage lives.
3. Drug coverage lives where the insurer itself performs the rebate negotiations (in house) are excluded.