Value-Based Payment Programs in Healthcare and Their Application to Pharmacies

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Executive Summary

Value-based payment (VBP) is one of the leading trends in healthcare of the last decade. VBP programs aim to pay providers based on the quality and value of the care they provide, rather than based solely on the volume of services. This approach is designed to promote better outcomes and more efficient use of resources.

This report addresses the following objectives:

- Describes the theory behind VBP.
- Summarizes the use and effectiveness of VBP in healthcare to date and key lessons learned.
- Describes the current state of pharmacy VBP, including the types of measures used and recent changes to incentives like pharmacy direct and indirect remuneration (DIR) used in the Medicare Part D program.
- Describes the impact of performance on medication measures on selected clinical outcomes.
- Summarizes potential opportunities and challenges for pharmacy VBP as it continues to evolve.

To meet these objectives, we conducted a review of the literature, focusing on recent systematic reviews (see methods in Appendix B), completed interviews with key informants (see methods in Appendix C) with experience in quality and value measurement in healthcare and pharmacy services, and analyzed performance on pharmacy-related measures in Medicare and Medicaid public reporting programs.

Although the variety of VBP models implemented to date has produced inconsistent evidence for improving quality and reducing costs, those that have demonstrated greater success include models with mandatory participation, longer contracting periods, risk-sharing on the part of the provider or organization, and technical and professional support for providers. In addition to building on those lessons, key takeaways for pharmacy VBP include:

- The clinical expertise and expanded scope of services provided by pharmacists present an opportunity to increase value in healthcare.
- Existing measures in VBP programs such as medication adherence have a positive effect on important clinical outcomes.
- As new measures that address the expanded role of pharmacists in care delivery are developed, they should adopt standardized specifications and build on current reporting programs, particularly with respect to clinical management of patients.
- Engaging pharmacists as clinical providers and providing technical support to pharmacies and pharmacists will help promote cooperation between payers and pharmacies in establishing VBP programs.

The rest of the report proceeds as follows. The report begins with a summary of the theory of VBP compared to fee-for-service payment. The next section focuses on the application of VBP to general medical care and describes key features and typology of VBP, the extent of VBP uptake, and what is known about the success of VBP programs. Then, we describe the prevailing model of VBP within pharmacy services, changes affecting the model, and the types of measures used in pharmacy VBP program (analyses of pharmacy-related measures in other VBP programs are included in Appendix D). We

then discuss insights from our key informant interviews about the future of VBP in pharmacy. We conclude with recommendations.

Background: Context for Value-Based Payment in Healthcare

Rising healthcare spending has been a fiscal concern for federal and state governments, employers, and payers for decades. The traditional fee-for-service (FFS) system in which clinicians and treatment facilities are paid per unit of service delivered, be it office visits or hospital days, has been the core payment model for healthcare purchasing in the 20th and 21st centuries.

Since the early 1990s, both private and public insurers have experimented with VBP arrangements to determine whether financial incentives can drive improvements in quality of care (Damberg et al. 2014). Generally, VBP refers to a variety of contractual arrangements that incentivize healthcare providers and systems to provide more cost-efficient and high-quality care by tying reimbursement to a provider's impact on population spending and care quality (Conrad, 2015).

Provider payments in VBP models are tied to populations or services with adjustments based on selected quality and financial metrics. VBP programs come in several flavors (discussed below), but they aim to introduce financial incentives to deliver care in a way that sensitizes the provider to population-level spending and targets for quality of care. VBP models push providers to calibrate care delivery to improve quality for a given level of spending, reduce spending for a given level of quality, or both. As a result, payers achieve net reductions in healthcare spending, the providers and payers share in those savings, and patients receive better quality of care, leaving everyone better off.

The Patient Protection and Affordable Care Act of 2010 (ACA) launched a decade of experimentation in payment models building on existing quality reporting programs (e.g., Medicare Advantage Star Ratings system for Part C and D recipients) and supporting new models of service delivery funded through the new Center for Medicare & Medicaid Innovation (CMMI).

Damberg and colleagues (2014) identified three principal value-based payment models. Central to each is the notion of financial rewards (or penalties) accruing to providers based on financial and/or quality performance. Pay for performance (P4P) arrangements typically involve incremental payments or penalties to providers based on their achievement and/or improvement relative to a performance target. For example, CMS's Hospital Readmission Reduction Program adjusts hospital payment based on how effective they are at avoiding hospital readmissions, but similar P4P arrangements exist for clinicians (e.g., Merit-based Incentive Payment System (MIPS)) and health plans (e.g., Medicare Advantage Star Ratings). They are also common in the commercial sector, such as the Integrated Healthcare Association's VBP programs for physician organizations and health plans.

Accountable care organizations (ACOs) bring together healthcare providers who agree to coordinate care for a population and be judged on financial and quality metrics. Depending on the structure, providers receive a share of the savings earned or the losses generated in the process of treating the covered population, typically subject to meeting minimum targets for quality of care. The Medicare Shared

Savings Program (MSSP) is an example of a federally operated ACO program, but they exist across commercial and Medicaid payers as well (Girdish et al., 2022; Muhlestein et al., 2021; Lloyd et al., 2015).

Bundled payment arrangements define a standardized healthcare service and attach payment for the entire treatment episode. The Comprehensive Care for Joint Replacement model being tested by the CMS Innovation Center is one example of a bundled payment value-based arrangement. In this program, CMS pays a fixed rate for hip, knee, and total ankle replacement surgeries with quality requirements related to complication rates and patient experience; once those targets are met, CMS reconciles payments to providers based on the difference between actual and expected payment targets. Private insurance has implemented such models for joint replacement, too, although case volume within a given carrier and population have limited their expansion (Jacofsky, 2017).

Design and Experience of VBP in Healthcare

Design

The key elements of VBP have been studied for at least twenty-five years (Meyer et al., 1997; Maio et al., 2003). Core components include contractual arrangements that spell out the requirements for purchasers, insurers, and providers and selection of preferred providers in terms of financial and quality performance; data infrastructure to support financial and quality measurement; consumer education to increase the salience of quality in healthcare purchasing decisions; and financial incentives to reward or penalize based on quality and financial targets. Chee and colleagues (2016) collapsed these factors into three core features: (1) the external environment, including policies, programs, or regulations that may promote VBP; (2) provider characteristics, including the structure of the healthcare system, resources and capabilities, and patient population served; and (3) program features, including measures used, financial incentives, and risk structure.

More recently the Health Care Payment Learning & Action Network (HCP-LAN) has developed the widely used alternative payment model framework that assigns strategies into four categories based on their use of FFS payment structure and quality and value measures (Exhibit 1):

- Category 1. FFS with no link to quality and value. At this stage, providers are paid on a per-unit basis without consideration of efficiency or quality metrics. Traditional Medicare in the time prior to its quality reporting programs would be a classic example.

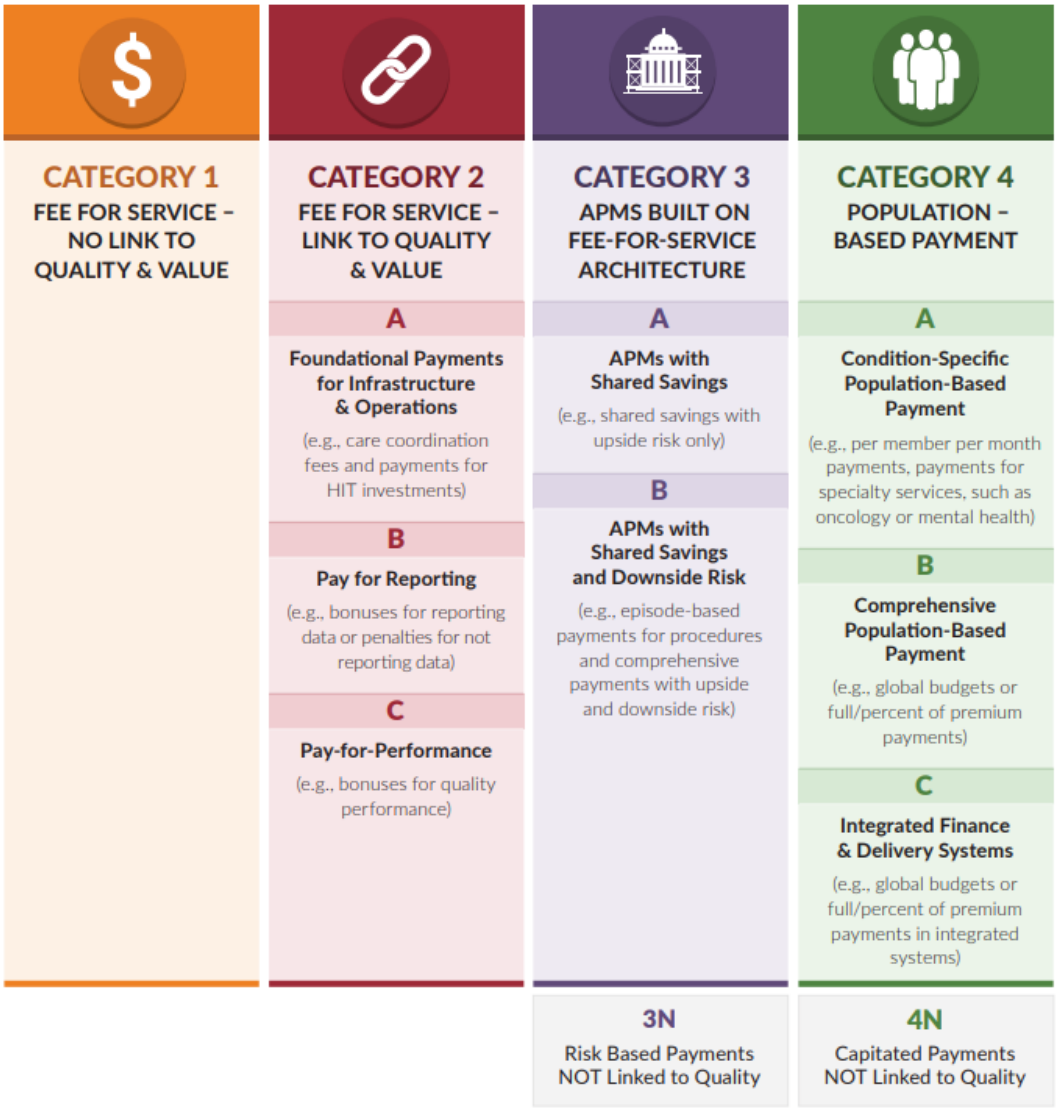
- Category 2. FFS linked to quality and value. Programs in this stage are focused on the capture of data to support evaluation of quality and financial performance. Some programs may only be at the stage of building the data collection infrastructure, while more mature programs will publicly report performance results and the most mature programs will award bonus payments or impose penalties tied to achievement on the measures. The Medicare Advantage Star Ratings program and quality-incentive programs (e.g., Hospital Readmission Reduction Program) fall into this category.

- Category 3. Alternative payment models built on FFS architecture. These models hold providers financially accountable for performance. A key differentiator is the degree of risk sharing borne by providers. Some programs rely on the "carrot" of shared savings to promote improved quality and financial performance, whereas others add the "stick" of shared losses in the event financial and quality targets are not achieved. Also, the quality metrics expand to include notions of "appropriate care" or care that is to be avoided because it is generally not clinically beneficial (e.g., use of antibiotics to treat acute sinusitis; use of imaging for low back pain without meeting certain clinical criteria). CMMI's accountable care organization models are a primary example of this framework. Episode-based payment models, in which a defined service such as knee arthroplasty are contracted at a fixed rate with certain minimum quality criteria (e.g., the Comprehensive Joint Replacement model), are also classified here.

- Category 4. Population-based payment. Payment is organized around prospective payment for people with certain conditions (e.g., Oncology Care Model, Advanced Care Model) or people in

general populations that cover all health services paid prospectively using a global capitated budget (e.g., CMS's Direct Contracting model under the Global Option) (NORC at the University of Chicago, 2020).

Exhibit 1 Health Care Payment Learning and Action Network's Alternative Payment Model Framework



Source: The MITRE Corporation. (2021).

Experience and Participation in VBP

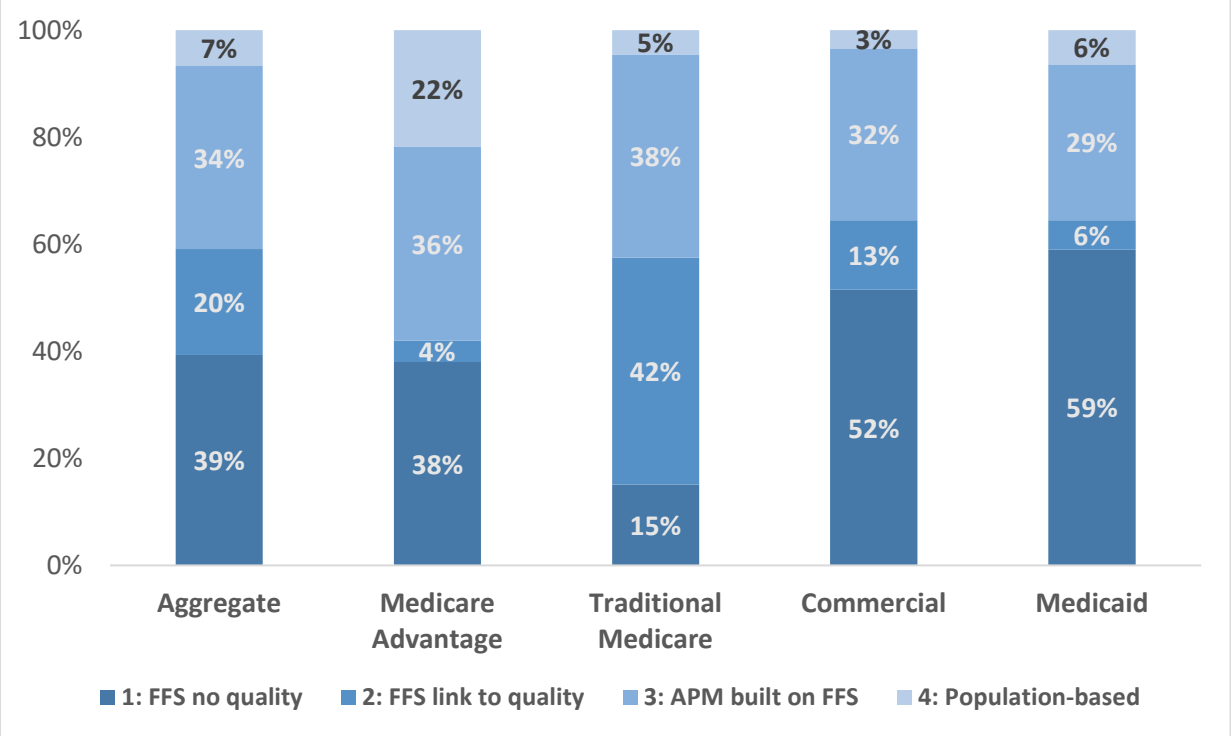
In response to the ACA, the Centers for Medicare & Medicaid Services (CMS) has led the value agenda through value-based reporting and payment programs. CMMI, authorized by the ACA, established the infrastructure to identify and support innovations in service delivery (e.g., bundled and episode payments models, primary care transformation) that promote value as demonstrated through higher quality or

reductions in low-value services. As a result, CMS and CMMI's initiatives span all four APM categories targeting providers at various levels as well as health plans and delivery systems.

The private sector likewise has pushed for value-based care through various initiatives (e.g., California Integrated Health Care Association Pay for Performance; Blue Cross Blue Shield Massachusetts' Alternative Quality Contract). The targets of VBP have ranged from health plans and hospitals to group practices and individual clinicians; they address general populations (e.g., all individuals in a community) and administratively or clinically narrow ones (e.g., dual-eligible Medicare-Medicaid beneficiaries, patients with end-stage renal disease).

As of 2020, 61 percent of all payments were made through a VBP arrangement at APM Category 2 or above (Exhibit 2). Medicare Advantage plans make 62 percent of provider payments through Category 2 or higher APMs. Even Traditional Medicare, which is most closely associated with FFS payment arrangements, has 85 percent of dollars routed through some form of VBP, with 43 percent at Categories 3 or 4. Less than half of commercial (48%) and Medicaid (41%) dollars are routed through VBP programs at Category 2 or above.

Exhibit 2: Percent of Dollars in Value-Based Payment Models by APM Category and Payer Source, 2020.



Source: The MITRE Corporation. (2021).

Assessment of Impact

Recently, the transition to VBP appears to have slowed as reviews have found mixed evidence of efficacy (Eijkenaar et al. 2013; Damberg et al., 2014; Mendelson et al., 2017). Markovitz & Ryan (2017) attempted

to tease out potential effects for sub-populations based on patient and catchment area factors (e.g., race, age, income, rurality), organizational and structural capabilities (e.g., size, teaching affiliation, organizational culture), and P4P program characteristics (e.g., size and frequency of bonus) but found inconclusive evidence of impact.

Although there is not yet a definitive recipe for VBP success (Chee et al., 2016), earlier reviews (e.g., Damberg et al., 2014) have recognized some critical factors that promote favorable outcomes: the magnitude of financial incentives; use of measures that signal what is important (what is valued); standardized methodology for absolute (rather than relative) performance ratings; provider engagement; and, support with respect to data collection and quality improvement. More recent reviews have adjusted thinking about the financial incentives and highlighted additional factors that may increase the opportunity for success.

- Mandatory participation. A review of 21 Medicare pilot programs found the greatest reduction in spending and savings for the Medicare program was among programs with mandatory participation (CMS, 2022). Werner et al. (2021) noted additional benefits of mandatory participation: (1) simpler adoption of newer payment models and fairer competition and benchmarks at a regional level; (2) incorporation of late adopters rather than organizations already immersed in the transformation away from FFS; and (3) stronger evaluation of studies.

- Two-sided risk arrangements. Werner and colleagues (2021) have suggested two-sided risk arrangements will be an important part of the path forward. Behavioral economics has noted the greater motivational impact of financial penalties on behavior than rewards of nominally equal size (Conrad, 2015). Recent work from Humana, for example, illustrates the potential for better control of resource use (hospitalizations, emergency department visits) and quality (using AHRQ Prevention Quality Indicators) in two-sided as opposed to upside-only risk contracts (Gondi et al., 2022).

- Contract length. Programs that shift greater accountability onto providers over longer periods of time (e.g., 5 years) show some notable success (Werner et al., 2021). Longer contract terms help address what can be relatively high startup costs in the early years of transition and allow time for the organization to recoup longer-term savings resulting from improved quality and continuity of treatment. The feasibility of such strategies may be superseded by other factors (e.g., CMS limits Medicare Advantage to annual contracts).

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Value-Based Payment in Pharmacy Services

While VBP arrangements have permeated much of the healthcare industry the adoption of these alternative payment models in the pharmacy setting has not kept pace. Unlike other sectors of the healthcare industry, the pharmacy setting is unique and special consideration must be made when considering VBP implementation. Our key informants noted important differences such as the role of pharmacists in the care continuum: historically they have been treated in many ways more like a medical supplier rather than as a clinical expert on par with other clinical professionals. While they play dual roles and their clinical contributions have become more important over time, the absence of an accountability framework for pharmacies has impeded development of VBP programs here compared to other healthcare settings and professions.

The primary mechanism for implementing VBP for pharmacy has been through what is called Pharmacy Direct and Indirect Remuneration (DIR) in the Medicare program. In practice, these payments provide bonuses or penalties from the plan (via pharmacy benefit managers) to pharmacies based on performance on an agreed upon set of quality measures. This section describes DIR and regulatory changes affecting DIR.

Pharmacy DIR

Pharmacy DIR was designed and initially implemented within the Medicare Part D program by its prescription drug plans (PDPs). Pharmacy DIR supplies pharmacy providers with additional reimbursement or requires additional payments based on pharmacies' performance on contractually agreed upon quality metrics, which is consistent with APM Category 2.

Plan sponsors or their representative pharmacy benefit managers may negotiate point of sale (POS) and post-POS price concessions with pharmacy providers. POS price concessions, such as discounts off average wholesale price (AWP), reduce the drug cost at the pharmacy counter. Post-POS price concessions are amounts that a pharmacy provider pays or receives to dispense a plan prescription, participate in a plan's preferred network, or for costs of administration. These amounts are only realized after the POS transaction and can be partially based on certain performance metrics such as medication adherence and generic drug dispensing rates as well as opioid dispensing oversight and medication counseling services. The magnitude of post-POS concessions can only be reliably estimated and reconciled after the transaction. These post-POS concessions and payment adjustments that change the eventual pharmacy cost are collectively known as Pharmacy DIR.[1] The DIR payment structure varies by Part D plan structure but is generally based on a flat rate or a percentage.

A recent survey of pharmacies assessed the types of measures used in performance contracts across Medicare, commercial, and Medicaid payers (Urick et al., 2021). The most used measures—with rates above 90 percent for Medicare, 80 percent for commercial, and around 50 percent for Medicaid—were medication adherence measures and similar possession-ratio measures that target prescription fills for people with chronic conditions like diabetes and hypertension. These measures' use in the Medicare Star

[1] Plan benefit providers have attempted to implement post-POS price concessions in commercial and Medicaid markets, even if not technically "pharmacy DIR."

Ratings program has led some to say the Star Ratings are “the starting point” for pharmacy DIR agreements. (Traynor, 2017).

The next most used were measures related to formulary compliance and generic drug prescriptions, with relatively few that included measures tied to medical spending or resource use (e.g., inpatient or emergency department use), which may reflect the relatively weak influence pharmacists have on such measures. Medication adherence for chronic conditions like diabetes and hypertension have received the most attention, but in principle any service within a pharmacist’s scope of practice, from vaccinations to medication counseling and adjustment, could be included.

Evolution of DIR

Over time DIR has come to represent a mix of the pharmacy DIR payments and penalties from plans to pharmacies and manufacturer concessions. The perceived growth of pharmacy DIR has led to increased interest in shaping the regulatory landscape for pharmacy VBP. Most significantly, in 2022 CMS published a final rule that will transform how price concessions are accounted for in the negotiated price at the POS. Beginning in 2024, Part D plans will be required to include all pharmacy price concessions (DIR) in the negotiated price at the POS. CMS defines the negotiated price as the baseline, or lowest possible, payment to a pharmacy provider for a prescription that is covered under each Part D plan contract. This negotiated price will be used to determine beneficiary cost sharing for beneficiaries in the Part D plan.

The rule change will have a substantial impact on pharmacy DIR because it effectively eliminates the pool of dollars plans and PBMs were using for the quality incentives. Although the rule was intended to pass savings to consumers through lower prices at the point of sale, it may increase consumer costs through higher premiums resulting from higher projected spending by health plans. Breaking the quality and incentive link between the performance measures and DIR payments also potentially hinders the transition from volume-based to value-based payment. At the state level, there have also been regulatory policy proposals and changes to the structure of VBP for pharmacy providers (NASHP, 2018).

Case Study of Impact of Current VBP Measures

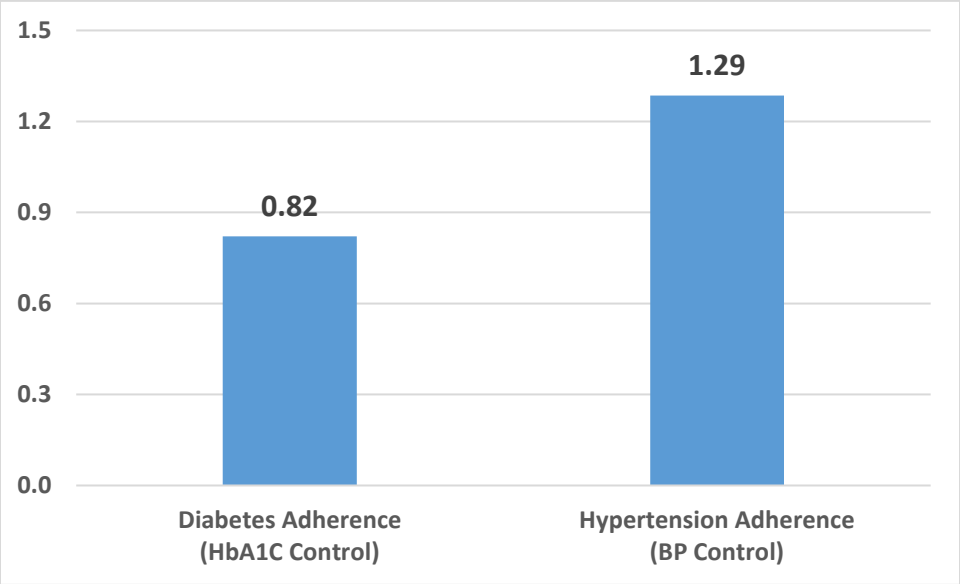
As noted above, medication adherence measures are the most widely used in pharmacy VBP programs. Part of the reason is due to the simplicity of their calculation using claims data. Also, the medication adherence is more within the capacity of a pharmacy or pharmacist to control than outcomes like readmissions, which make them more useful for performance-based contracting.

Another factor, however, is that medication adherence for certain chronic conditions is associated with improvements in "intermediate outcomes" such as blood pressure and blood sugar control that are predictive of lower morbidity and mortality. For example, current standards of care suggest management of HbA1c for many adult populations with diabetes to below 9.0% reduces the risk of diabetes-related harms (e.g., retinopathy, neuropathy, and kidney disease) and cardiovascular events (ElSayed, et al., 2023). Likewise, pharmacological management of hypertension is closely linked to declines in cardiovascular events among other benefits (Thomopoulos, Parati, & Zanchetti, 2017).

While these linkages are commonly understood, we wanted to illustrate the impact of improving diabetes and hypertension medication adherence on HbA1c and blood pressure control. We reviewed current public reporting of quality measures in Medicare and Medicaid and conducted some initial analyses that are summarized in Appendix D. Here, we highlight the impact of medication adherence for patients that use medication to manage blood sugar and blood pressure in the Medicare Advantage (MA) program on clinical outcomes.

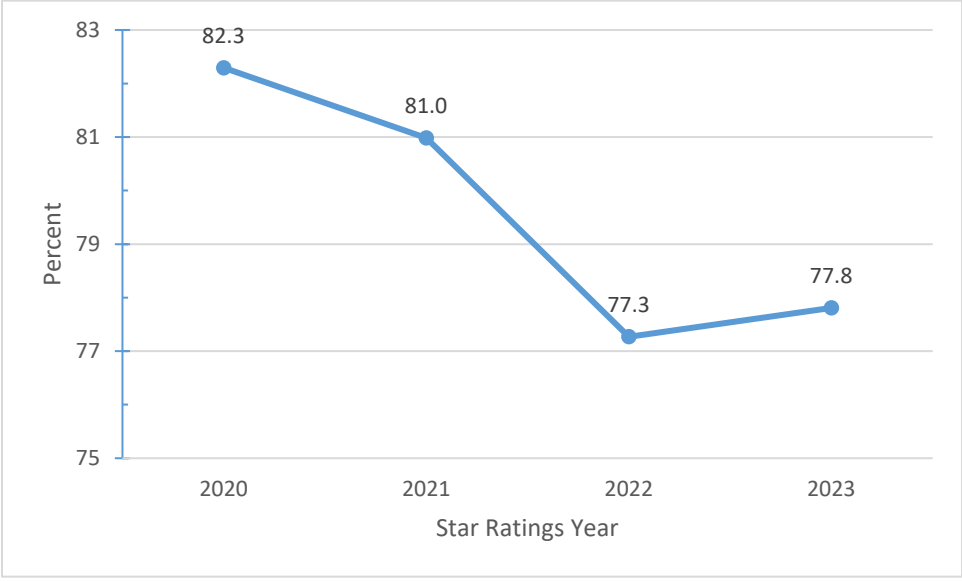
In rating years 2020-2023 (performance years 2018-2021), MA plans reported on the proportion of plan members with fills sufficient to cover 80% of days they were supposed to take the medication and the proportion of members with diabetes that had a recorded hemoglobin A1c value below 9.0%. A least-squares regression of health plans diabetes medication adherence rates in relationship to the proportion of patients below 9.0% HbA1c showed a significant positive association: a one percentage point increase in diabetes medication adherence was associated with a 0.82 percentage point increase in patients with HbA1c control (below 9.0%) (Exhibit 3) This association demonstrates the clinical value of the application of this type of measure within a VBP program in pharmacy. Further, the positive relationship between adherence and A1C control, when viewed in the context of the performance declines observed for the 2022 and 2023 ratings years (likely due to COVID), demonstrates the opportunity to use these types of targets as part of a pharmacy incentive program to improve outcomes (Exhibit 4; see also Exhibit D.3-1 in Appendix D for detail and methods).

Exhibit 3. Effect of Medication Adherence on Intermediate Outcome Measures, Medicare Advantage.



Note: Diabetes adherence impact is measured for Star Ratings Years 2020-2023. Hypertension adherence impact is measured for Star Ratings Year 2023 only.

Exhibit 4. Percent of Plan Members with HbA1c Controlled Below 9.0%, Medicare Advantage, Star Ratings Years 2020-2023.



Note: Adjusted for impact of diabetes medication adherence.

Similar to the association between medication adherence and HbA1c control, our findings demonstrated a similar positive relationship between hypertension medication adherence and blood pressure control (Exhibit 3). A one percentage point increase in hypertension medication adherence resulted in a 1.29 percentage point increase in plan members with blood pressure under control (below 140/90). Information on MA plan performance for hypertension medication adherence and blood pressure control were only available for the most recent year FY 2023 (performance year 2021).

The results presented here help to illustrate the importance of medication adherence measures and their impact on clinical outcomes, and in turn help validate the focus on these measures in value-based payment arrangements for pharmacies.

Discussion

While uptake has been slow, pharmacy VBP models are becoming more prevalent. As more pharmacies and patients are managed through these arrangements, it is important to learn from the VBP efforts in the rest of healthcare and mold those lessons to the unique aspects of pharmacy services. Our key informant interviews identified several interrelated factors to consider in the design of VBP for pharmacy: role of the pharmacist; measures used; data infrastructure and interchange; and provider support and engagement. In particular:

- The clinical expertise and expanded scope of services provided by pharmacists present an opportunity to increase value in healthcare.
- Existing measures in VBP programs such as medication adherence have a positive effect on important clinical outcomes.
- As new measures that address the expanded role of pharmacists in care delivery are developed, they should adopt standardized specifications and build on current reporting programs, particularly with respect to clinical management of patients.
- Engaging pharmacists as clinical providers and providing technical support to pharmacies and pharmacists will help promote cooperation between payers and pharmacies in establishing VBP programs.

This section will discuss this feedback in the context of the preceding sections.

Role of Pharmacist

Pharmacists have unique expertise that supports primary and specialty care providers in their clinical management of patients. However, they do not have the same direct patient responsibility as a primary care doctor or nurse practitioner, for example. The pharmacist's connection to the patient is as an adjunct to another patient-provider relationship.

As a result, our panelists noted that the scope of risk and reward that pharmacies and pharmacists can take on is limited. For example, the APM category 3 and 4 versions of VBP focused on population and episode-based care management are unlikely to work for pharmacies and pharmacists as accountable entities because they are not the prescribers and have incomplete information about the full spectrum of patients' clinical and social needs. For most circumstances, APM category 2, the pay-for-performance level, may be as far as most VBP programs can go, but that is still meaningful. The key informants noted, however, where the pharmacist is part of a clinical team (e.g., cancer treatment) and where the clinical team is at-risk for clinical decisions, additional pharmacy measurement and accountability may be warranted.

Likewise, the role of pharmacies and pharmacists has expanded in recent years. Increasingly pharmacies operate retail clinics that provide primary care services. Pharmacies have also been an important resource for vaccine administration during the COVID public health emergency, augmenting their current offerings for flu and other vaccines. Health plans and pharmacy benefit managers have leveraged pharmacists' proximity to patients to support patient management, boost performance on medication adherence measures by encouraging prescription pickups, and fill gaps in vaccinations such as flu shots.

Many measures that apply to health plans have become the foundation of measurement for initial pharmacy VBP programs.

The key informants noted, however, that pharmacists have the potential to provide additional value. Pharmacists currently provide counseling to patients for medications, provide important follow up for adherence purposes, and play an important safety role in avoiding harmful medication interactions and safe dosing. In addition to adapting the medication adherence measures for pharmacy accountability, the Pharmacy Quality Alliance (PQA), a leading measure steward in pharmacy quality measurement, has identified opportunities to close performance gaps related to vaccinations, initiate medication adjustments to dose or class of medications based on patient needs, and to build upon pharmacy-based primary care to support expanded lab testing and treatment in pharmacies (Cost, 2022). Expanding the scope of services requires important legal and regulatory changes, often at the state level, that present their own implementation hurdles (Adams & Weaver, 2019).

Measures

As the scope of services offered by and through pharmacies has expanded, so might the measurement landscape change. Today, the most used measures are for medication adherence, which have a long tradition of data collection feasibility through administrative data and reasonable evidence tying the process metrics to improved outcomes such as blood pressure and blood sugar control.

An expanded menu of measures that represents the full scope of clinical services provided by pharmacies presents one opportunity for expanding VBP within pharmacies that target primary care and chronic care management. As data infrastructure capacity improves (see below), pharmacies could contribute to direct data capture beyond prescription drug claims. Some opportunities, such as those related to intermediate outcomes collection or potential counseling services (e.g., smoking cessation), reflect the expanded role of pharmacists in clinical care. Other opportunities exist to capture more timely and perhaps more informative patient experience data, to obtain patient-reported outcomes (e.g., individually defined goal-based measures), or to capture social determinants of health data specific to the patient's needs (e.g., transportation, mobility issues, residential instability) that may inform a pharmacy's or health plan's patient outreach.

PQA is testing a variety of adaptations and extensions of measures (PQA, 2022). They are currently testing adaptations of existing adherence measures to support pharmacy-level accountability. Other topics include the reporting, control and improvement of lab values (e.g., blood pressure and hemoglobin A1c) and closing vaccination gaps. In addition, PQA is examining the feasibility of collecting screening and referral rates for social determinants of health factors. As the number and types of measures increases, it will be important to maintain a consistent set of measure specifications to ensure fair comparisons across pharmacies and pharmacists and avoid the waste associated with reporting the same concept in slightly different ways.

An alternative approach that builds on the expanded vision for pharmacists' role may be to capitalize on team-based care models that include pharmacists through comprehensive medication management (CMM). These teams could, in turn, serve as an accountable unit onto which payers could attach payment

and outcomes accountability. As part of a clinical care team, pharmacists in a CMM framework move beyond mere adherence monitoring to contribute their expertise in adjusting dosage to meet patients' therapeutic goals (American College of Clinical Pharmacy, n.d.). The pharmacist's participation shifts from a set of medication-related activities embodied in Medicare's medication therapy management (MTM) approach to a focus on clinical and utilization outcomes and total patient management with other clinicians (Buck & McFarland, 2021). Team-based care is more common in models of care like the patient centered medical home (PCMH) and among certain specialized patient populations such as cardiovascular and renal care (Odum & Whaley-Connell, 2012) and oncology (Ignoffo et al., 2021). This could lead to expanding the scope of costs and services managed in ACO models to include pharmacy services as well.

Data Infrastructure

A common refrain in the literature is the importance of data infrastructure for quality and cost measurement. This includes not just data capture related to the specific prescriptions (e.g., fills-related adherence, medication interactions), but also the analytic and reporting functions that support management to the required measure set. This includes the capacity to query and filter on specific attributes and to link information across data systems.

Our panelists noted a key strength for pharmacy VBP is the prevalence of data infrastructure afforded to pharmacies in larger chains (e.g., CVS, Kroger) but also resources with high participation such as the EQuiPP platform provided by Pharmacy Quality Solutions.[2] Both offer the capacity to collect and report standardized measures as well as dashboards or patient registries to address quality shortfalls (e.g., patients with diabetes who have not filled or picked up medications). PQA adapts its adherence measures in Part D, for example, for pharmacy-level accountability.

These systems are not perfect. There may still be some role for additional technical support or adjusted contract terms for early years of VBP with pharmacies. Nevertheless, pharmacy data systems may be starting from a higher baseline than other areas of healthcare as they begin their journey to VBP.

Support and Engagement

A critical factor may be enlisting the support of pharmacies and pharmacists as partners in the VBP process. This can take a variety of forms. One such point of engagement is through the selection of measures that have clinical value and that are suited for pharmacy accountability or that pharmacies and pharmacists can meaningfully influence. New and adapted measures that incorporate their clinical expertise may provide additional motivation to support VBP efforts. A voice in measure selection and transparency with respect to calculation, targets, and incentives may also build trust among pharmacists and organizations.

Engaging pharmacists as treatment providers and acknowledging the full scope of their value-adding contributions to patient care may help to enlist them as partners in VBP transformation. Specialty

[2] The Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP) platform, provided by Pharmacy Quality Solutions (PQS), is a foundational part of many pharmacies' reporting of measures in the Part D (prescription drug) program for the Medicare Advantage Star Ratings program for health plans.

pharmacies present an opportunity on which to build because in those settings pharmacists often are already included as part of the patient's care team.

As noted above, support may also take the form of technical resources for collection, patient management, and reporting. This may be especially important for smaller and rural pharmacies or in new areas of responsibility (e.g., medication adjustment, collection of lab values). It also includes creating payment mechanisms to support the expanded scope of services. The challenge will be how to best focus such support as prior healthcare infrastructure investments have had mixed results (Jones et al., 2014).

Conclusion

Value-based payment (VBP) in pharmacy has the potential to improve patient outcomes and reduce costs for health plans and members. There is a growing recognition of the clinical roles that pharmacies and pharmacists can play, beyond medication dispensing and adherence, such as medication adjustment, vaccination, and outcomes monitoring. With this growth will come increased accountability requirements for pharmacies and pharmacists, similar to other clinical providers.

The relatively late expansion of VBP into pharmacy services affords the opportunity to learn from prior interventions and avoid past mistakes of VBP programs elsewhere in healthcare. Standardization of measures can improve the usability of data for consumers and purchasers as well as reduce the administrative cost of reporting for pharmacies. Multi-year engagements between payers and pharmacies, where feasible now or perhaps in the future with administrative changes, may also support successful VBP design.

Pharmacy services can benefit from expansion of P4P-type arrangements at APM category 2. Patients benefit from the improvements on quality measures, and payers benefit both from the reduced future healthcare spending and the bonuses linked to performance on quality reporting programs (e.g., Medicare Advantage Star Ratings). The number of measures will expand with the expanded services offered by pharmacists. Future research during measure development may trace the impact of such measures on additional clinical outcomes and unnecessary medical services like hospitalizations and emergency department visits. As this evidence for the measures grows and incentives spread, patients will benefit and pharmacists may be more supportive participants in VBP offerings.

Additionally, building upon team-based care models that include pharmacists as part of a clinical team that is responsible for managing cost and outcomes, that includes pharmacy services as part of cost management, and that incorporates measures tailored to the contributions of pharmacists could also enhance progress in VBP. Many such team-based approaches exist for special clinical populations (e.g., oncology patients, patients receiving gene therapies), but other opportunities may emerge as well.

Implementing policies to support data collection and reporting that align with the clinical scope of pharmacies and pharmacists can also be beneficial. Additionally, providing technical support to small and independent pharmacies, as well as those in rural areas, can help improve performance as well as meaningful participation in VBP models. Pharmacies, especially chains, often have access to information on popoulations facing social disadvantages; leveraging this information to support improved performance may help to reduce disparities reduction for these patient subgroups. Expanding measurement to capture the patient perspective through the use of patient experience and patient goals as measures, which will require additional data and workflow management, may expand the potential to demonstrate the value of pharmacy services.

Appendix A. Bibliography

Adams, A. J., & Weaver, K. K. (2019). Pharmacists' Patient Care Process: A State "Scope of Practice" Perspective. *INNOVATIONS in pharmacy*, *10*(2).

Agarwal, R., Liao, J. M., Gupta, A., & Navathe, A. S. (2020). The Impact of Bundled Payment On Health Care Spending, Utilization, And Quality: A Systematic Review: A systematic review of the impact on spending, utilization, and quality outcomes from three Centers for Medicare and Medicaid Services bundled payment programs. *Health Affairs*, *39*(1), 50-57.

American College of Clinical Pharmacy. (n.d.). Comprehensive Medication Management in Team-Based Care. https://www.pcpcc.org/sites/default/files/event-attachments/CMM%20Brief.pdf

Brooks-LaSure C, Fowler E, Seshamani M, & Tsai D. (2021). "Innovation At the Centers For Medicare And Medicaid Services: A Vision For The Next 10 Years", *Health Affairs Blog*, August 12, 2021.DOI: 10.1377/hblog20210812.211558

Buck M. & McFarland S. (2021). "CMM vs. MTM: Patient-focused process vs. medication-focused activity," https://gtmr.org/blog-cmm-vs-mtm-patient-focused-process-vs-medication-focused-activity/#:~:text=In%20MTM%2C%20the%20pharmacist%20often,these%20changes%20in%20the%20EHR.

Chee, T. T., Ryan, A. M., Wasfy, J. H., & Borden, W. B. (2016). Current State of Value-Based Purchasing Programs. *Circulation*, *133*(22), 2197–2205. https://doi.org/10.1161/CIRCULATIONAHA.115.010268

Center for Medicare & Medicaid Services (CMS). 2022. *Synthesis of Evaluation Results across 21 Medicare Models, 2012-2020*. https://innovation.cms.gov/data-and-reports/2022/wp-eval-synthesis-21models.

Conrad D. A. (2015). The Theory of Value-Based Payment Incentives and Their Application to Health Care. *Health services research*, *50 Suppl 2*(Suppl 2), 2057–2089. https://doi.org/10.1111/1475-6773.12408

Crook HL, Saunders RS, Roiland R, Higgins A, & McClellan MB. (2021a). "A Decade of Value-Based Payment: Lessons Learned and Implications For The Center For Medicare And Medicaid Innovation, Part 1," *Health Affairs Blog*, June 9, 2021. DOI: 10.1377/hblog20210607.656313.

Crook HL, Saunders RS, Roiland R, Higgins A, & McClellan MB. (2021b). "A Decade of Value-Based Payment: Lessons Learned and Implications for The Center For Medicare And Medicaid Innovation, Part 2", *Health Affairs Blog*, June 10, 2021. DOI: 10.1377/hblog20210607.230763.

Dybdal, K., Blewett, L.A., Sonier, J., & Spencer, D. February 2014. "Paying for Value in Medicaid: A Synthesis of Advanced Payment Models in Four States." Final Report prepared for Medicaid and CHIP Payment and Access Commission (MACPAC). Minneapolis, MN: State Health Access Data Assistance Center (SHADAC).

Dybdal, K., Hartman, L., & Spencer, D. August 2015. "State Medicaid Reforms Aimed at Changing Care Delivery at the Provider Level." Final Report prepared for Medicaid and CHIP Payment and Access Commission (MACPAC). Minneapolis, MN: State Health Access Data Assistance Center (SHADAC).

Eijkenaar, F., Emmert, M., Scheppach, M., & Schöffski, O. (2013). Effects of pay for performance in health care: a systematic review of systematic reviews. *Health policy (Amsterdam, Netherlands)*, *110*(2-3), 115–130. https://doi.org/10.1016/j.healthpol.2013.01.008

ElSayed, N. A., Aleppo, G., Aroda, V. R., Bannuru, R. R., Brown, F. M., Bruemmer, D., Collins, B. S., Hilliard, M. E., Isaacs, D., Johnson, E. L., Kahan, S., Khunti, K., Leon, J., Lyons, S. K., Perry, M. L., Prahalad, P., Pratley, R. E., Seley, J. J., Stanton, R. C., Gabbay, R. A., … on behalf of the American Diabetes Association (2023). 6. Glycemic Targets: Standards of Care in Diabetes-2023. *Diabetes care*, *46*(Suppl 1), S97–S110. https://doi.org/10.2337/dc23-S006

Erickson L. (2017). *Value Based Pay for Performance (P4P) for Physician Groups: Key Design Decisions*. Oakland, CA: Integrated Healthcare Association https://iha.org/wp-content/uploads/2020/10/Fact-Sheet-Value-Based-Pay-for-Performance-for-Physician-Groups-Key-Pay-for-Performance-Design-Decisions%E2%80%8B.pdf.

Fein, A. J. (2020). Pharmacy DIR Fees Hit a Record $9 Billion in 2019 – That's 18% of Total Medicare Part D Rebates. https://www.drugchannels.net/2020/02/pharmacy-dir-fees-hit-record-9-billion.html

Girdish, C., Rossini, A., Sutton, B. S., Parente, A. K., & Howell, B. L. (2022). The Longitudinal Impact of a Multistate Commercial Accountable Care Program on Cost, Use, And Quality. *Health affairs (Project Hope), 41(*12), 1795–1803. https://doi.org/10.1377/hlthaff.2022.00279

Ignoffo, R. J., Knapp, K. K., Seung, A., Brown, V., Hough, S., Rieband, G., Dang, T. O., Palumbo, A., & Urmanski, A. (2021). Trends in the delivery of care to oncology patients in the United States: Emphasis on the role pharmacists on the healthcare team. *Journal of oncology pharmacy practice, 27*(1), 5–13. https://doi.org/10.1177/1078155220907674.

Integrated Healthcare Association. (2022). *Align. Measure. Perform. (AMP) Programs Value-Based Incentive Design Measurement Year 2021.* Oakland, CA: Integrated Healthcare Association. https://iha.org/wp-content/uploads/2022/11/AMP-MY21-Value-Based-Incentive-Design-Oct22.pdf.

Jacofsky, D. J. (2017). Episodic payments (bundling) PART I. *The bone & joint journal, 99-B(10)*, 1280-1285. https://doi.org/10.1302/0301-620X.99B10.BJJ-2017-0355.R1.

Jones, S. S., Rudin, R. S., Perry, T., & Shekelle, P. G. (2014). Health information technology: an updated systematic review with a focus on meaningful use. *Annals of internal medicine*, *160*(1), 48–54. https://doi.org/10.7326/M13-1531.

Joynt Maddox, K. E., Sen, A. P., Samson, L. W., Zuckerman, R. B., DeLew, N., & Epstein, A. M. (2017). Elements of program design in Medicare's value-based and alternative payment models: a narrative review. *Journal of General Internal Medicine*, *32*(11), 1249-1254.

Kissam, S. M., Beil, H., Cousart, C., Greenwald, L. M., & Lloyd, J. T. (2019). States Encouraging Value-Based Payment: Lessons from CMS's State Innovation Models Initiative. *The Milbank quarterly*, *97*(2), 506–542. https://doi.org/10.1111/1468-0009.12380.

Lloyd, J., Houston, R., & McGinnis, T. (2015). Medicaid accountable care organization programs: State profiles. Center for Health Care Strategies. Published October http://www.advancingstates.org/sites/nasuad/files/ACO-Policy-Paper_022718.pdf

Maio V, Goldfarb N, Carter C., & Nash D. (2003). Value-Based Purchasing: A Review of the Literature. (636). The Commonwealth Fund. https://www.commonwealthfund.org/publications/fund-reports/2003/may/value-based-purchasing-review-literature.

Markovitz, A. A., & Ryan, A. M. (2017). Pay-for-Performance: Disappointing Results or Masked Heterogeneity? *Medical care research and review: MCRR*, *74*(1), 3–78. https://doi.org/10.1177/1077558715619282

Mendelson, A., Kondo, K., Damberg, C., Low, A., Motúapuaka, M., Freeman, M., O'Neil, M., Relevo, R., & Kansagara, D. (2017). The Effects of Pay-for-Performance Programs on Health, Health Care Use, and Processes of Care: A Systematic Review. *Annals of internal medicine*, *166*(5), 341–353. https://doi.org/10.7326/M16-1881

Meyer J, Rybowski L, Eichler R. Theory and Reality of Value-Based Purchasing: Lessons from the Pioneers. AHCPR Publication No. 98-0004, November 1997. Agency for Health Care Policy and Research, Rockville, MD. http://www.ahrq.gov/qual/meyerrpt.htm

Milad, M. A., Murray, R. C., Navathe, A. S., & Ryan, A. M. (2022). Value-Based Payment Models in The Commercial Insurance Sector: A Systematic Review. *Health affairs (Project Hope)*, *41*(4), 540–548. https://doi.org/10.1377/hlthaff.2021.01020

The MITRE Corporation. (2021). *APM Measurement: Progress of Alternative Payment Models: 2020-2021 Methodology and Results Report*. http://hcp-lan.org/workproducts/APM-Methodology-2020-2021.pdf

Muhlestein D., Bleser WK, Saunders RS, & McClellan MB. (2021). "All-Payer Spread of ACOs And Value-Based Payment Models In 2021: The Crossroads And Future Of Value-Based Care", Health Affairs Blog, June 17, 2021. DOI: 10.1377/hblog20210609.824799.

NASHP. (2018, Oct. 4). *Comparison of State Pharmacy Benefit Managers Laws*. https://www.nashp.org/comparison-state-pharmacy-benefit-managers-laws

NORC at the University of Chicago. (2020). *Common Alternative Payment Model (APM) Approaches: Reference Guide*. Washington, DC: Assistant Secretary for Policy & Evaluation. https://aspe.hhs.gov/sites/default/files/private/pdf/261946/Common-APMs-Reference-Guide.pdf

Odum, L., & Whaley-Connell, A. (2012). The Role of Team-Based Care Involving Pharmacists to Improve Cardiovascular and Renal Outcomes. *Cardiorenal medicine*, *2*(4), 243–250. https://doi.org/10.1159/000341725

Pharmacy Quality Alliance (PQA). (2022). Pharmacy Measure Development Action Plan: May 2022 Update. https://www.pqaalliance.org/assets/docs/PQA_Pharmacy_Measure_Development_Action_Plan_2022-05.pdf

Salako, A., Ullrich, F., & Mueller, K. (2017). Issues Confronting Rural Pharmacies after a Decade of Medicare Part D. *Rural policy brief*, (2017 3), 1–5. https://rupri.public-health.uiowa.edu/publications/policybriefs/2017/Issues%20confronting%20rural%20pharmacies.pdf.

Smith B. (2021). CMS Innovation Center at 10 Years - Progress and Lessons Learned. *The New England journal of medicine*, *384*(8), 759–764. https://doi.org/10.1056/NEJMsb2031138.

Song Z, Ji Y, Safran DG, & Chernew, M. E. (2019). Health care spending, utilization, and quality 8 years into global payment. *The New England Journal of Medicine*, *381*(3), 252–263. https://doi.org/10.1056/NEJMsa1813621.

Steenhuis, S., Struijs, J., Koolman, X., Ket, J., & VAN DER Hijden, E. (2020). Unraveling the Complexity in the Design and Implementation of Bundled Payments: A Scoping Review of Key Elements from a Payer's Perspective. *The Milbank quarterly*, *98*(1), 197–222. https://doi.org/10.1111/1468-0009.12438.

Thomopoulos, C., Parati, G., & Zanchetti, A. (2017). Effects of blood-pressure-lowering treatment on outcome incidence in hypertension: 10–Should blood pressure management differ in hypertensive patients with and without diabetes mellitus? Overview and meta-analyses of randomized trials. *Journal of hypertension*, *35*(5), 922-944.

Traynor, K. (2017). DIR Fees Pose a 5-Star Problem for Pharmacies. https://www.ashp.org/news/2017/03/27/dir-fees-pose-a-5-star-problem-for-pharmacies?loginreturnUrl=SSOCheckOnly

Urick, B. Y., Pathak, S., Hughes, T. D., & Ferreri, S. P. (2021). Design and effect of performance-based pharmacy payment models. Journal of Managed Care & Specialty Pharmacy, 27(3), 306–315. https://doi.org/10.18553/jmcp.2021.27.3.306

Visante. (2020). The Return on Investment (ROI) on PBM services. https://www.pcmanet.org/wp-content/uploads/2020/02/ROI-on-PBM-Services-FINAL_.pdf

Werner RM, Emanuel E, Pham HH, & Navathe AS. February 2021. "The Future of Value-Based Payment: A Road Map to 2030." White Paper. Philadelphia PA: Leonard Davis Institute of Health Economics. https://repository.upenn.edu/cgi/viewcontent.cgi?article=1150&context=ldi_issuebriefs.

Zanchetti, A., Thomopoulos, C., & Parati, G. (2015). Randomized controlled trials of blood pressure lowering in hypertension: a critical reappraisal. *Circulation research*, *116*(6), 1058-1073.

Zaresani, A., & Scott, A. (2021). Is the evidence on the effectiveness of pay for performance schemes in healthcare changing? Evidence from a meta-regression analysis. *BMC health services research*, *21*(1), 175. https://doi.org/10.1186/s12913-021-06118-8

Zhang, H., Cowling, D. W., Graham, J. M., & Taylor, E. (2019). Five-year Impact of a Commercial Accountable Care Organization on Health Care Spending, Utilization, and Quality of Care. *Medical care*, *57*(11), 845–854. https://doi.org/10.1097/MLR.0000000000001179

Zhou, D., Xi, B., Zhao, M., Wang, L., & Veeranki, S. P. (2018). Uncontrolled hypertension increases risk of all-cause and cardiovascular disease mortality in US adults: the NHANES III Linked Mortality Study. *Scientific reports*, *8*(1), 9418. https://doi.org/10.1038/s41598-018-27377-2.

Appendix B. Literature Review Methods

Purpose of this Analysis

The literature review serves as a landscape assessment of value-based payment (VBP) that documents the breadth and depth of its spread across the healthcare industry, including pharmacy services, summarizes the evidence supporting the effectiveness of VBP, and identifies opportunities to shape the development of VBP in pharmacy services by learning from the success and failures in other healthcare contexts.

Research Questions

1. What is known about the history and trends in adoption of VBP in healthcare and pharmacy? How are VBP arrangements evolving as evidence accumulates about their effectiveness?
2. What is known about the effectiveness of VBP arrangements used in healthcare and pharmacy services? What are the critical success factors in effective VBP arrangements?
3. What measures are used in pharmacy VBP arrangements? How is measurement accounting for social risk factors and health equity considerations?

Keywords included in search criteria:

- "Value-based payment"
- "Alternative-payment model"
- "Bundled payment"
- "Performance-based"
- "Value-based pharmaceutical contracts"
- "Pharmacy"
- "Quality measurement"

Article Review, Information Extraction, and Synthesis

Our literature review strategy consisted of three steps:

1. Title screening
2. Abstract screening
3. Full-text screening

Throughout the title screening, researchers reviewed the titles of articles flagged by our search strategy, implemented our inclusion/exclusion criteria, and determined which articles will move on to the abstract screening stage. In the abstract screening stage, researchers reviewed the abstracts of the articles chosen from the search results and then decided if the article should be retrieved. Following, the full-text screening involves analyzing the full text of articles relevant to our research questions.

Exclusion Criteria

Only articles that were published in English and after January 2010 were included in our search. We also limited our search to healthcare programs implemented in the U.S.

Appendix C. Key Informant Interview Methods

Purpose of this Analysis

The second component of our landscape assessment was a set of semi-structured interviews with key informants representing the various stakeholders in value-based healthcare and pharmacy services. The interviews supplement the literature review by identifying additional sources of studies (e.g., surfacing relevant items in the gray literature) and providing expert insight on current evidence and trends in the market for value-based care generally and pharmacy specifically, information that may not be readily available in the published literature.

We met with Elevance Health to agree on the critical topic areas and perspectives to cover. We also worked with the client to identify primary targets for each perspective, and backup candidates. Examples of perspectives to be represented include pharmacy industry, purchasers and health plans, measure developers, public policy, and academic experts. As part of our selection process and to ensure efficient and timely completion, we targeted candidates capable of addressing multiple perspectives.

Interview Protocol, Synthesis, and Limitations

Participants were recruited via email and were provided a brief overview of the study; the scope of the interview with sample questions focused on the current state of value-based purchasing in pharmacy and its recent and projected evolution; and the nature of KNG Health's relationship as contractor to Elevance Health Public Policy Institute in producing this report. Interviews occurred between October 6 and November 18, 2022. All interviews were recorded and summarized. The authors then synthesized the findings.

Limitations of the interviews should be considered when reviewing our findings. Specifically, due to the limited project scope, we interviewed a small number of individuals to speak about their experience in the areas of value-based purchasing, quality measurement, and pharmacy services. Therefore, the information collected during the interviews may not be generalizable.

Interview Participants

We interviewed eight stakeholders with expertise in value-based purchasing, quality measurement, and pharmacy-related services: director and pharmacist at a pharmacy benefit manager; physician executive for a health plan; a physician executive with expertise in quality measure development; policy and VBP-related executives from an insurance trade association; and an academic researcher with expertise in VBP and pharmacy services.

Appendix D. Data Analysis

Purpose of this Analysis

The data analysis aims to document the types of measures that are used in public VBP programs, to provide some context as to the levels of performance on those measures, and to illustrate ways in which performance on one measure may contribute to better performance on others.

Methods

We reviewed publicly available data from CMS regarding the Star Ratings program, Medicaid, and by provider type for measures related to drug treatment and pharmacy-related services (e.g., vaccinations). We limited the measures to those for adult populations (see Exhibit D.1) and focused on clinical and outcome-based variables with direct or indirect ties to pharmacy measures.

Exhibit D.1 Reviewed Data Sets

Accountable entity	Program
Health Plan	MA Part C and D Star Ratings
Facility	Hospitals
Facility	Inpatient rehabilitation facilities
Facility	Long-term care hospitals
Facility	Nursing Homes
Facility	Dialysis Facilities
Agency/Organization	Home Health
Physicians/Practices	Doctors and Clinicians
State	Medicaid Adult Core Set

Based on our review, we selected pharmacy related measures (see Exhibit D.2) from the following data sets:

- MA Part C and D. 2020-2023 Editions (2018-2021 performance year) .[3] Medicare Part C and D had the most complete set of pharmacy-related measures, allowing us to look at patterns over time as well as relationships among measures, such as between adherence and intermediate outcomes (e.g., diabetes adherence and A1c control). The reporting periods partially overlap with the COVID-19 Public Health Emergency (PHE). We added the 2023 data, which was released

[3] The 2023 Part C and D Star Ratings are reported in October 2022 using data submitted in 2022 about performance in 2021. Thus, the data represent services provided between 2018 and 2021.

during the project's analysis window, because it reintroduced the Controlling Blood Pressure measure, permitting us to examine an additional adherence-outcome relationship.

- Medicaid Adult Core Set. 2019-2020 (performance years 2018-2019). We used the most recently available (October 1, 2022) Adult Core Set data, which were all prior to the COVID PHE. However, not all measures were available for both years.
- Home Health 2022 (performance year Oct. 2020-Sept. 2021). We used only the most recently available data (October 1, 2022, released in July 2022 and reported in April 2022 for the performance period of Oct.2020-2021) because there were fewer pharmacy measures and several of the available measures were "topped out" (i.e., high mean near the maximum performance and limited variation in performance). We limited analysis to state-level aggregated results.

For measures in each data set, we reported the number of entities reporting the measure and the means and percentiles of performance. For the adherence measures in the Medicare Part C and D programs and Medicaid Adult Core Set, we also estimated a simple least squares regression (i.e., linear probability model) to test for relationships between medication adherence and other measures. These are merely to show the potential utility of these measures in VBP programs rather than representing a more definitive explanatory model that accounts for health plan, member, and community attributes that may influence performance.

Results

Summary Statistics

Exhibit D.2-1 presents summary statistics based on data from the 2020-2023 editions of the Medicare Star Ratings for Part C and D health plans. Generally, health plans improved in their performance on medication adherence measures and, to a lesser extent, medication management measures.

Among the measures directly targeting pharmacy-related treatments in Medicare, we found that for health plans:

- Medication adherence for diabetes improved from an average of 82.8 to 85.9 over the four-year period (median: 80.0 to 84.0).
- Medication adherence for hypertension (RAS antagonists) improved from an average of 84.8 to 87.4 over the four-year period (median: 85.0 to 88.0).
- Mediation adherence for statins improved from an average of 82.5 to 86.3 over the four-year period (median: 83.0 to 87.0).
- Medication Therapy Management (MTM) program completion rate for Comprehensive Medication Review (CMR) improved from an average of 73.5 to 80.6 over the four-year period (median 78.0 to 84.0).
- Medication reconciliation post-discharge improved from an average of 64.6 to 67.4 over the four-year period (median 65.0 to 67.0).

Across all health plans, average performance on the diabetes poor control measure, which should be influenced by better medication adherence, declined from 80.4 to 78.5 percent. Change over time was

small for the arthritis measures and annual flu vaccine use. Blood pressure control was only reported in the data for 2023 (mean=71.1).

Exhibit D.2-2 shows summary statistics derived from the Medicaid Adult Core Set, which contains data aggregated at the state level. The statistics obtained were somewhat more limited because data were not available in some years for some variables.

For the Medicaid medication measures at the state level, we found that from 2019 to 2020:

- Antidepressant Medication Management follow up at six months increased from an average of 34.4 to 35.9 (median 34.4 to 37.3)
- The asthma medication ratio decreased from an average of 55.3 to 53.4 (median 54.6 to 53.7)
- The indicator variable for controlling high blood pressure decreased from an average of 57.8 to 56.6 (median 60.0 to 59.2).
- The average rate of adherence to antipsychotic medications for individuals with schizophrenia was relatively constant but the median increased from 59.1 to 62.3.
- The comprehensive diabetes care hemoglobin A1c poor control measure increased from 41.3 to 44.0 on average (median 38.8 to 39.0).
- The proportion of adults with high blood pressure under control decreased from an average of 57.8 to 56.6 (median 60.0 to 59.2).

The final group of measures based on the Medicaid Adult Core data relates to admissions. Over the two-year period, there is an increase in the average admission rate for short term diabetes complications, heart failure and asthma. Overall, the state level medication variables related to the Medicaid population suggest improvements in outcomes, although the short timeframe limits the observable trends in the core data set.

Exhibit D.2-3 presents the home health data descriptive statistics related to medication use. For Home Health, the main finding was that drug education and drug regimen review were topped-out. At the state level, the drug education rate had near 100% performance, with variation between the 25th and 75th percentiles of less than 1 percentage point (mean= 98.3, 25th percentile= 98.1, 75th percentile=98.9). Drug regimen review likewise had very high average performance with little variation (mean=95.3, 25th percentile=94.4, and 75th percentile=96.7, respectively).

Regression Results

The regressions using Star ratings data are shown in Exhibits D.4-1 to 4-5.

- A one percent increase in the adherence rate for RAS antagonist medication was associated with a 1.28 percent increase in the likelihood that beneficiary blood pressure was under control (Table D.4-1).
- A one percent increase in diabetes medication adherence resulted in a 0.82 unit increase in the likelihood of beneficiaries having blood sugar under control (Table D.4-2). This is somewhat notable because blood sugar control performance was declining over this period.

- Medication Therapy Management (MTM) and medication reconciliation post-discharge had small to no effect on medication adherence for diabetes (Table D.4-3), hypertension (Table D.4-4), or cholesterol (Table D.4-5) medications.

The Medicaid regression results for state-level performance found a positive but non-significant relationship between high blood pressure controls and annual monitoring for patients (Exhibit D.5-1). In the home health data, we found the strongest positive correlations in the relationships between drug regimen review and drug education, drug regimen review with drug medication improvement, and between drug education and influenza immunization take-up (Exhibit D.6-1).

Exhibit D.2-1 Variable descriptions and interpretations for measures used in the Medicare Star Ratings analyses.

Variable name	Variable description
Medicare Star Ratings	
Medication adherence for diabetes medications	Percent of plan members with a prescription for diabetes medication who fill their prescription often enough to cover 80% or more of the time they are supposed to be taking the medication. One of the most important ways people with diabetes can manage their health is by taking their medication as directed. The plan, the doctor, and the member can work together to find ways to do this. ("Diabetes medication" means a biguanide drug, a sulfonylurea drug, a thiazolidinedione drug, a DPP-IV inhibitor, an incretin mimetic drug, a meglitinide drug, or an SGLT2 inhibitor. Plan members who take insulin are not included.)
Medication adherence for hypertension (RAS antagonists)	Percent of plan members with a prescription for a blood pressure medication who fill their prescription often enough to cover 80% or more of the time they are supposed to be taking the medication. One of the most important ways people with high blood pressure can manage their health is by taking medication as directed. The plan, the doctor, and the member can work together to do this. ("Blood pressure medication" means an ACE (angiotensin converting enzyme) inhibitor, an ARB (angiotensin receptor blocker), or a direct renin inhibitor drug.)
Medication adherence for cholesterol (statins)	Percent of plan members with a prescription for a cholesterol medication (a statin drug) who fill their prescription often enough to cover 80% or more of the time they are supposed to be taking the medication.
Statin use in persons with diabetes	To lower their risk of developing heart disease, most people with diabetes should take cholesterol medication. This rating is based on the percent of plan members with diabetes who take the most effective cholesterol-lowering drugs. Plans can help make sure their members get these prescriptions filled.
Statin Therapy for patients with cardiovascular disease	This rating is based on the percent of plan members with heart disease who get the right type of cholesterol-lowering drugs. Health plans can help make sure their members are prescribed medications that are more effective for them.
Rheumatoid Arthritis Management	Percent of plan members with rheumatoid arthritis who got one or more prescriptions for an anti-rheumatic drug.
MTM Program Completion Rate for CMR	Some plan members are in a program (called a Medication Therapy Management program) to help them manage their drugs. The measure shows how many members in the program had an assessment of their medications from the plan. The assessment includes a discussion between the member and a pharmacist (or other healthcare professional) about all the member's medications. The member also receives a written summary of the discussion, including an action plan that

	recommends what the member can do to better understand and use his or her medications.
Medication Reconciliation Post-Discharge	This shows the percent of plan members whose medication records were updated within 30 days after leaving the hospital. To update the record, a doctor or other healthcare professional looks at the new medications prescribed in the hospital and compares them with the other medications the patient takes. Updating medication records can help to prevent errors that can occur when medications are changed.
Care for Older Adults - Medication Review	Percent of plan members whose doctor or clinical pharmacist reviewed a list of everything they take (prescription and non-prescription drugs, vitamins, herbal remedies, other supplements) at least once a year.
Annual Flu Vaccine	Percent of plan members who got a vaccine (flu shot).
Diabetes Care - Blood Sugar Controlled	Percent of plan members with diabetes who had an A1C lab test during the year that showed their average blood sugar is under control. (Available via CMS in higher is better form)
Controlling Blood Pressure	Percent of plan members with high blood pressure who got treatment and were able to maintain a healthy pressure. (Available via CMS in higher is better form)

Exhibit D.2-2 Variable descriptions and interpretations for measures used in the Medicaid Adult Core Set analyses.

Medicaid Adult Core Data	
Adherence to antipsychotic medications for individuals with Schizophrenia	Percentage of beneficiaries ages 19 to 64 with schizophrenia or schizoaffective disorder who were dispensed and remained on an antipsychotic medication for at least 80 percent of their treatment period during the measurement year.
Concurrent Use of Opioids and Benzodiazepines	Percentage of beneficiaries aged 18 and older with concurrent use of prescription opioids and benzodiazepines. Beneficiaries with a cancer diagnosis or in hospice are excluded. (Reported as lower is better and inverted for analysis)
Antidepressant Medication Management – 12 weeks follow up	Percentage of beneficiaries aged 18 and older who were treated with antidepressant medication, had a diagnosis of major depression, and who remained on an antidepressant medication treatment. Two rates are reported: • Effective Acute Phase Treatment. Percentage of beneficiaries who remained on an antidepressant medication for at least 84 days (12 weeks) • Effective Continuation Phase Treatment. Percentage of beneficiaries who remained on an antidepressant medication for at least 180 days (6 months)
Asthma Medication Ratio	The percentage of beneficiaries ages 19 to 64 who were identified as having persistent asthma and had a ratio of controller medications to total asthma medications of 0.50 or greater during the measurement year.
Annual Monitoring for patients on persistent medications	Percentage of beneficiaries aged 18 and older who received at least 180 treatment days of ambulatory medication therapy for a select therapeutic agent during the measurement year and at least one therapeutic monitoring event for the therapeutic agent in the measurement year. Report each of the two rates separately and as a total rate. • Annual monitoring for beneficiaries on angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) • Annual monitoring for beneficiaries on diuretics • Total rate (the sum of the two numerators divided by the sum of the two denominators) (Used total rate only)

Flu Vaccinations for adults	Percentage of beneficiaries ages 18 to 64 who received a flu vaccination between July 1 of the measurement year and the date when the CAHPS 5.0H Adult Survey was completed.
Medical assistance with smoking and tobacco use cessation	Discussing Cessation Medications. A rolling average represents the percentage of beneficiaries aged 18 and older who were current smokers or tobacco users and who discussed or were recommended cessation medications during the measurement year.
Controlling high blood pressure	Percentage of beneficiaries ages 18 to 85 who had a diagnosis of hypertension and whose blood pressure (BP) was adequately controlled (< 140/90 mm Hg) during the measurement year.
Diabetes screening for people with Schizophrenia or bipolar disorder who are using antipsychotic medications	Percentage of beneficiaries ages 18 to 64 with schizophrenia, schizoaffective disorder, or bipolar disorder who were dispensed an antipsychotic medication and had a diabetes screening test during the measurement year.
Comprehensive Diabetes Care Hemoglobin A1c Poor Control	Percentage of beneficiaries ages 18 to 75 with diabetes (type 1 and type 2) who had hemoglobin A1c (HbA1c) in poor control (> 9.0%). (Reported as lower is better and inverted for analysis)

Exhibit D.2-3 Variable descriptions and interpretations for measures used in the Home Health analyses.

Home Health Data	
Influenza Immunization	How often the home health team determined whether patients received a flu shot for the current flu season.
Drug education	Percentage of home health quality episodes during which patient/caregiver was instructed on how to monitor the effectiveness of drug therapy, how to recognize potential adverse effects, and how and when to report problems (at the time of or at any time since the most recent SOC/ROC assessment).
Drug improvement	How often patients got better at taking their drugs correctly by mouth.
Drug regimen review	How often physician-recommended actions to address medication issues were completely timely.

Exhibit D.3-1 Star Ratings Data Descriptive Statistics, Performance Years 2018-2021.

Variable	Year	N	Mean	P25	P50	P75
Medication adherence for diabetes medications	2018	488	82.8	80	83	85
	2019	527	84.4	82	85	87
	2020	588	85.9	84	86	88
	2021	638	85.9	84	86	88
Medication adherence for hypertension (RAS antagonists)	2018	504	84.8	83	85	87
	2019	547	85.4	83	86	88
	2020	610	87.3	86	88	90
	2021	671	87.4	86	88	90
Medication adherence for cholesterol (statins)	2018	505	82.5	80	83	86
	2019	549	84.0	82	85	87
	2020	611	86.3	84	87	89
	2021	674	86.3	84	87	89
Statin use in persons with diabetes	2018	491	80.0	78	80	82
	2019	533	81.7	79	82	84
	2020	596	82.8	81	83	85
	2021	643	84.6	82	84	87
Statin Therapy for patients with cardiovascular disease	2018	358	80.9	78	81	84
	2019	353	80.9	78	81	84
	2020	432	83.8	82	84	86
	2021	453	84.5	82	85	87
Rheumatoid Arthritis Management	2018	331	78.9	75	79	83
	2019	325	78.9	76	79	83
	2020	382	79.5	76	80	84
	2021	N.A.	N.A.	N.A.	N.A.	N.A.
MTM program completion rate for CMR	2018	485	73.5	69	78	83
	2019	528	77.8	73	82	87
	2020	579	81.6	79	84	90
	2021	627	80.6	77	84	89
Medication Reconciliation Post-Discharge	2018	410	64.6	54	65	76
	2019	404	64.6	55	65	76
	2020	495	67.9	57	69	81
	2021	539	67.4	56	67	82
Care for Older Adults Medication Review	2018	200	92.4	90	94	97
	2019	195	92.5	90	94	97
	2020	254	91.8	89	95	99
	2021	292	90.7	88	95	98
Annual Flu Vaccine	2018	406	73.0	69	74	78
	2019	398	73.1	69	74.5	78
	2020	477	74.1	69	75	80
	2021	507	72.9	68	74	79
Diabetes care blood sugar controlled	2018	422	80.4	77	83	87
	2019	414	80.4	77	83	87
	2020	507	78.1	75	81	85
	2021	550	78.5	75	81	85
Controlling blood pressure	2018	N. A	N.A.	N.A.	N.A.	N.A.
	2019	N. A	N.A.	N.A.	N.A.	N.A.
	2020	N. A	N.A.	N.A.	N.A.	N.A.
	2021	542	71.1	66	72	77

Exhibit D.3-2 Adult Core Data Descriptive Statistics, Performance Years 2018-2019.

Variable	Year	N	Mean	P25	P50	P75
Adherence to antipsychotic medications for individuals with Schizophrenia	2018	37	61.1	56.3	59.1	67.7
	2019	42	61.1	56.6	62.3	67
Concurrent Use of Opioids and Benzodiazepines	2018	N.A.	N.A.	N.A.	N.A.	N.A.
	2019	27	15.4	11.2	16.3	21.6
Antidepressant Medication Management – 12 weeks follow up	2018	37	51.3	47.9	51.3	53.5
	2019	43	52.9	47.5	53.1	57.4
Antidepressant Medication Management – 6 months follow up	2018	37	34.4	29.7	34.4	38.5
	2019	42	35.9	29.9	37.3	41.1
Asthma Medication Ratio	2018	39	55.3	51.6	54.6	58.6
	2019	42	53.8	50.9	53.7	56.4
Annual Monitoring for patients on persistent medications	2018	40	87.3	86.2	87.4	89
	2019	N.A.	N.A.	N.A.	N.A.	N.A.
Flu Vaccinations for adults	2018	N.A.	N.A.	N.A.	N.A.	N.A.
	2019	28	44.6	40.9	44.8	47.9
Medical assistance with smoking and tobacco use cessation	2018	N.A.	N.A.	N.A.	N.A.	N.A.
	2019	28	53.5	50.5	53.7	57.4
Controlling high blood pressure	2018	32	57.8	51	59.9	64.7
	2019	33	56.6	52.6	59.2	64.7
Diabetes screening for people with Schizophrenia or bipolar disorder who are using antipsychotic medications	2018	37	79.9	76.8	79.8	81.9
	2019	43	80.1	77.4	80.3	82.5
Comprehensive Diabetes Care Hemoglobin A1c Poor Control	2018	29	41.3	34.7	38.8	45.5
	2019	31	44	34.9	39	47.8

Exhibit D.3-3 Home Health Data Descriptive Statistics, Performance Year 2021

Variable	Year	N	Mean	P25	P50	P75
Influenza Immunization	2021	51	78.0	75.9	78.4	80.2
Drug education	2021	51	98.3	98.1	98.6	98.9
Drug improvement	2021	51	79.2	76.9	79.5	81.4
Drug regimen review	2021	51	95.3	94.4	95.6	96.7

Exhibit D.4-1 Effect of Hypertension Medication Adherence on Controlling Blood Pressure, Medicare Advantage, 2023 Edition of Star Ratings

Medication adherence for hypertension	1.28 (.11) ***
Constant	-41.24 (9.25) ***
R^2	.22
N	534
Standard errors report in parentheses. *, **, *** indicates significance at the 0.05, 0.01, and 0.001 levels	

Exhibit D.4-2 Effect of Diabetes Medication Adherence on HbA1c Control, Medicare Advantage, 2020-2023 Editions of Star Ratings.

Medication adherence for Diabetes	.82 (.06) ***
2021	-1.31 (.65) *
2022	-5.01 (.64) ***
2023	-4.33 (.63) ***
Constant	12.63 (4.93) *
R^2	.10
N	1859
Standard errors report in parentheses. *, **, *** indicates significance at the 0.05, 0.01, and 0.001 levels	

Exhibit D.4-3 Effect of Medication Management-related Measures on HbA1c Control, Medicare Advantage, 2020-2023 Editions of Star Ratings.

Medication reconciliation post discharge	.06 (.004) ***
MTM program completion rate	-.008 (.008)
2021	1.71 (.24) ***
2022	3.21 (.24) ***
2023	3.16 (.23) ***
Constant	79.51 (.77) ***
R^2	.18
N	1790
Standard errors report in parentheses. *, **, *** indicates significance at the 0.05, 0.01, and 0.001 levels	

Exhibit D.4-4 Effect of Medication Management-related Measures on Medication Adherence for Hypertension Medications, Medicare Advantage, 2020-2023 Editions of Star Ratings.

Medication reconciliation post discharge	.07 (.004) ***
MTM program completion rate	-.006 (.007)
2021	.79 (.21) ***
2022	2.78 (.21) ***
2023	2.73 (.20) ***
Constant	80.32 (.66) ***
R^2	.26
N	1790
Standard errors report in parentheses. *, **, *** indicates significance at the 0.05, 0.01, and 0.001 levels	

Exhibit D.4-5 Effect of Medication Management-related Measures on Medication Adherence for Cholesterol Medications, Medicare Advantage, 2020-2023 Editions of Star Ratings.

Medication reconciliation post discharge	.08 (.005) ***
MTM program completion rate	-.03 (.009) **
2021	1.91 (.25) ***
2022	4.13 (.25) ***
2023	3.96 (.24) ***
Constant	78.94 (.8) ***
R^2	.27
N	1790
Standard errors report in parentheses. *, **, *** indicates significance at the 0.05, 0.01, and 0.001 levels	

Exhibit D.5-1 Effect of Monitoring for Patients on Persistent Medications on Blood Pressure Control, Medicaid, 2019-2020 Editions of Adult Core Set Data.

Annual Monitoring for patients on persistent Medications	.39 (.83)
Constant	23.03 (72.5)
R^2	-0.03
N	30
Standard errors report in parentheses. *, **, *** indicates significance at the 0.05, 0.01, and 0.001 levels Annual Monitoring for patients on persistent Medications data only available for 2019	

Exhibit D.6-1 Correlation: Influenza Immunization, Drug education, Drug Medication Improvement, Drug Regimen Review, Home Health.

Table D.6-1 Correlation: Influenza Immunization, Drug education, Drug Medication Improvement, Drug Regimen Review				
	Influenza Immunization	Drug Education	Drug Medication Improvement	Drug Regimen Review
Influenza Immunization	1			
Drug Education	.318	1		
Drug Medication Improvement	.121	.215	1	
Drug Regimen Review	.26	.471	.27	1