

# HHVBP Evaluation Final Report



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## **NOTICE**

The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of the Centers for Medicare & Medicaid Services. Arbor Research Collaborative for Health assumes responsibility for the accuracy and completeness of the information contained in this report.

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## Acronym List

Acronym	Term
ACO	Accountable Care Organization
APM	Alternative Payment Model
CDC	Centers for Disease Control and Prevention
CMMI	Center for Medicare & Medicaid Innovation
CMS	Centers for Medicare and Medicaid Services
CY	Calendar Year
D-in-D	Difference-in-Differences
D-in-D-in-D	Difference-in-Difference-in-Differences
DME	Durable Medical Equipment
ED	Emergency Department
EHR	Electronic Health Record
ESRD	End-Stage Renal Disease
FFS	Fee-for-Service
HCC	Hierarchical Condition Category
HHCAHPS	Home Health Consumer Assessment of Healthcare Providers and Systems
HH PPS	Home Health Prospective Payment System
HHS	Health and Human Services
HHVBP	Home Health Value-Based Purchasing
OASIS	Outcome and Assessment Information Set
PDGM	Patient-Driven Groupings Model
PHE	Public Health Emergency
SNF	Skilled Nursing Facility
TNC	Total Normalized Composite
TPS	Total Performance Score

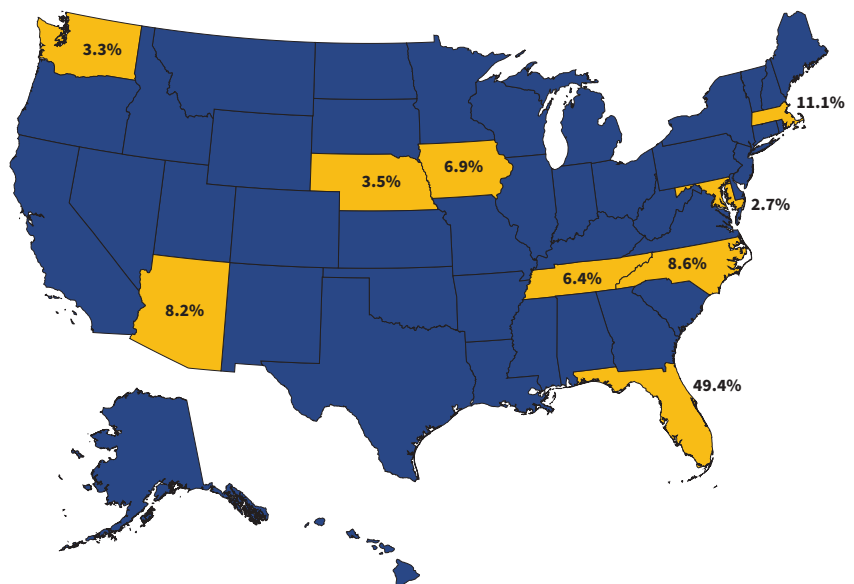


## HHVBP Model Background and Evaluation

The Centers for Medicare & Medicaid Services (CMS) implemented the original Home Health Value-Based Purchasing (HHVBP) Model from January 2016 through December 2021 in nine geographically diverse, randomly selected states with mandatory participation by all home health agencies. Under Medicare’s home health prospective payment system (HH PPS), CMS pays agencies a predetermined amount for each episode of care with adjustments for patient case-mix and other factors, but does not adjust for the quality of care. By tying quality to payment through value-based purchasing, the model was expected to improve the beneficiaries’ experience and outcomes and, in turn, lead to a more sustainable payment system that rewards improved quality and penalizes poor performance (HHS, 2015).

CMS designed the original HHVBP Model to test the impact of providing financial incentives to home health agencies for improvements in quality of care by adjusting HH PPS claims payments upward or downward based on their Total Performance Score (TPS), a composite score of an agency’s quality achievement and improvement. Designed to establish payment adjustments that were budget neutral, the original HHVBP Model redistributed Medicare payments among agencies within a state to reward agencies with relatively higher achieved or improved quality and reduce payments to agencies with lower levels of performance.

**Distribution (%) of Home Health Agencies in HHVBP Model States, 2021**



Using a mixed methods framework, this evaluation integrated quantitative and qualitative data to understand how the financial incentives under the model influenced agency behavior and, in turn, impacted health outcomes and Medicare spending. This summative final report focuses on an assessment of the cumulative effects of the entire HHVBP Model from 2016-2021, presenting impacts across key outcomes of utilization of services, quality of care, and patient experience, as well as examining the model’s effect on access to care, health equity, and Medicare spending.

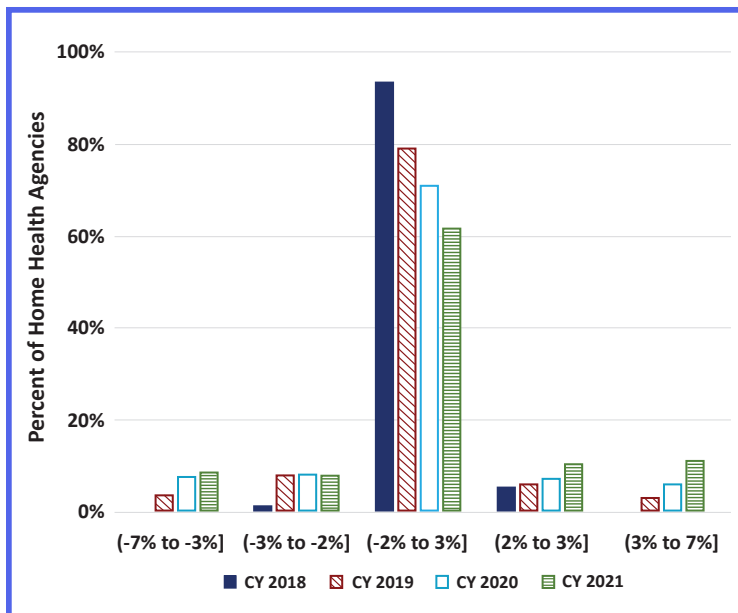


## Key Evaluation Findings



### TPS were Consistently Higher in HHVBP States than Non-HHVBP States

Over the six years of the original model, TPS values ranged between 3.7 percent and 7.9 percent higher among agencies in HHVBP states relative to those in the comparison states. We found no overall patterns



in agency performance based on patient social risk factors that might indicate risks to quality of or access to care, but did find underlying state-specific differences that have implications for health equity.

### Most Agencies in HHVBP States Received a -2% to +2% Payment Adjustment for Each Payment Year

CMS first adjusted Medicare payments by up to  $\pm 3$  percent in 2018, using agencies' 2016 TPS. Payment adjustments increased each year, peaking at up to  $\pm 7$  percent in 2021, the last year of the original model. Despite the growing financial implications over time, most agencies continued to receive payment adjustments in the  $\pm 2$  percent range (e.g., 93 percent of

agencies in 2018 and 62 percent in 2021). In 2019, where the maximum payment adjustments were up to  $\pm 5$  percent – which corresponds to the payment adjustment CMS will apply in 2025 (based on 2023 performance) to all agencies in the expanded HHVBP Model – 79 percent of agencies received a payment adjustment between -2 percent and +2 percent. The HHVBP payment adjustments were largely budget neutral for each of the four payment years, representing less than 0.06 percent of Medicare spending for home health services in the nine HHVBP states.



### HHVBP Had Modest Intended Impacts on Unplanned Hospitalizations and Most OASIS-Based Quality Measures on Clinical and Functional Status

The table below shows the cumulative (2016-2021) impacts of the model on the 12 HHVBP performance measures that were used in the last year of the model. We found evidence of relative reductions in unplanned hospitalizations, an unintended increase in outpatient ED use, improvements in all but one of the OASIS-based quality measures, and unintended but modest impacts on some aspects of patient experience. Each measure domain is discussed below with additional detail provided in the Quality Measures chapter.





Measure Domain	Performance Measure	Intended Direction	Cumulative D-in-D Estimate and HHVBP Model Effect	Relative Change (%) *
<b>Utilization</b>	Unplanned Hospitalization among First FFS HH Episodes	↓	↓ -0.19%	-1.2%
	ED Use (no Hospitalization) among First FFS HH Episodes	↓	↑ 0.24%	2.1%
<b>Quality Measures</b>	Discharged to Community	↑	↑ 1.08%	1.5%
	Total Normalized Composite Change in Self Care	↑	↑ 0.04	2.9%
	Total Normalized Composite Change in Mobility	↑	↑ 0.01	2.3%
	Improvement in Management of Oral Medications	↑	↑ 2.26%	4.4%
	Improvement in Dyspnea	↑	↔ -0.38% (N.S.)	-0.6%
<b>Patient Experience</b>	Professional Care	↑	↓ -0.27%	-0.3%
	Communication	↑	↓ -0.31%	-0.4%
	Discussion of Care	↑	↓ -0.41%	-0.5%
	Overall Care	↑	↔ -0.09% (N.S.)	-0.1%
	Likely to Recommend	↑	↔ -0.07% (N.S.)	-0.1%

Note: Cumulative effect reflects CY 2016-CY 2021. N.S. = not significant. Statistical significance identified with p-values ≤ 0.10.

\* Relative change in reference to baseline (2013-2015) average in HHVBP states. Does not include the three self-reported measures that were only available for agencies in HHVBP states.

### **Intended HHVBP Impact of Lower Unplanned Hospitalizations, with an Unintended Increase in Outpatient ED Use**

For the two FFS claims-based utilization measures, we observed intended impacts on unplanned hospitalizations among home health patients (1.2 percent reduction from baseline) and an unintended impact on ED use among home health patients without hospitalization (2.1 percent increase).

To get a more complete picture of utilization by FFS beneficiaries receiving home health services, we examined additional utilization measures and found HHVBP led to cumulative declines in SNF use and ED use followed by inpatient admission, but there was no cumulative impact of HHVBP on overall ED use (that is, regardless whether ED use resulted in an inpatient hospital stay). Together, these results suggest that the increase in outpatient ED use attributed to HHVBP is related to the reduced likelihood of ED use followed by an inpatient hospital stay. We also examined whether agencies' response to HHVBP incentives for unplanned hospitalizations and SNF use also applied to the growing Medicare Advantage population. We found similar reductions in unplanned hospitalizations but did not see a spillover effect for SNF use among home health patients with Medicare Advantage (see the Quality Measures chapter below for additional findings).

**The Quality Measures chapter presents findings on how frontloading visits during home health episodes that follow an inpatient stay are a potential mechanism used by agencies to reduce unplanned hospitalizations under the model.**



### HHVBP Led to Modest Improvement in Functional Status

We found a consistent pattern of intended effects on the OASIS-based outcome measures throughout the model. The largest impact in relative terms occurred with Improvement in Management of Oral Medications (cumulative 4.4 percent increase from baseline). The percent of patients discharged to the community and improvements in self-care and mobility showed smaller impacts (ranging between a 1.5 percent and 2.9 percent increase from baseline), and we observed no effect of HHVBP on Improvement in Dyspnea.

### HHVBP Had Small Negative Impact on Some Aspects of Patient Experience

There was evidence of slightly lower ratings for three of the five patient experience measures for home health patients due to HHVBP (0.3 percent to 0.5 percent reduction from baseline). While unintended, these findings do not translate to an especially meaningful impact of HHVBP, given the high overall values of these measures which ranged from 83 percent to 89 percent.

Together, these findings show the original HHVBP Model's cumulative achievement of intended impacts on many of its performance measures with unintended impacts on a few measures that were generally small in magnitude.

### Agencies Viewed the HHVBP Model as an Intensifier of Performance Improvement Activities Driven by Many Factors

Findings from agency surveys and interviews throughout the six years of the evaluation informed how the model influenced agency operations and provided real-world context to interpret trends derived from secondary data. We found few differences in quality improvement approaches between agencies in the original nine HHVBP states and 41 comparison states with agency staff noting that HHVBP intensified activities. Agency staff also described market and industry factors motivating their operational decisions and their efforts to demonstrate performance and maintain referral sources. Challenges related to training and retaining staff also heightened since 2016, as did expectations around the total number of home health visits in light of the increasing prevalence of Medicare Advantage and CMS' introduction of PDGM in January 2020. Pressures to avoid unnecessary hospitalizations and admissions to SNFs and to treat patients in the home were further exacerbated by COVID-19. Agency characteristics, particularly chain affiliation and agency size, appeared to influence performance improvement. For example, chains and large non-chain agencies were more likely than small, independent agencies to describe structured strategies that often involved full-time staff dedicated to quality improvement.

Through interviews with home health agencies throughout the evaluation, we learned that performance improvement efforts focused on three areas:

1. Data analytics and monitoring to support improvement work and benchmarking activities, including adoption of electronic health records (EHRs) and use of increasingly sophisticated predictive and analytic software
2. Staffing and training, particularly on accurate initial OASIS assessments and collection of functional improvement
3. Clinical strategies including timing of care to avoid hospitalizations and ED visits, increasing communication with patients to reduce avoidable admissions, and working with other post-acute care providers to offer more services in the home



We have had a quality improvement team for many, many years, so Value-Based Purchasing was just another add-on to that.”





## Cumulative (2016-2021) HHVBP Impact Translates to \$1.38 Billion in Medicare Savings

	Total	Inpatient	Outpatient ED and Observation Stays	Skilled Nursing Facility	Home Health
Cumulative	-\$1.38 B**	-\$807.0 M**	\$99.6 M**	-\$235.8 M**	-\$283.0 M*
Average Annual	-\$230 M	-\$134 M	\$17 M	-\$39 M	-\$47 M
Cumulative D-in-D	-\$2.63**	-\$1.54**	\$0.19**	-\$0.45**	-\$0.54*
% Impact	-1.9%	-3.4%	6.1%	-3.9%	-1.3%

\*  $p < 0.10$ , \*\*  $p < 0.05$ . Cumulative D-in-D reflects impact of Medicare spending per day during and within 30 day following home health episodes for FFS beneficiaries receiving home health care. Cumulative estimate is a weighted average of the yearly D-in-D estimates with 2016-2019 HHVBP impacts estimated from one regression model and 2020-2021 impact estimated from another regression model that reflects a post-PDGM approach to defining the spending measure. The percent impact reflects the estimated change in spending among HHVBP states relative to the comparison group; negative values reflect savings.

Medicare spending on FFS beneficiaries using home health services increased throughout the baseline period (2013-2015) and during the model itself in both HHVBP states and non-HHVBP states, although the increase was slower in HHVBP states. This slower increase in spending in HHVBP states translated to \$1.38 billion in Medicare savings over the six years of the model, a 1.9 percent decrease from average HHVBP spending in the baseline period (2013-2015). Throughout the model, the overall savings to Medicare were largely driven by reductions in spending for inpatient services (\$807.0 million cumulative savings) and SNF services (\$235.8 million cumulative savings), and were partially offset by an increase in Medicare spending for outpatient ED use and observation stays (\$99.6 million cumulative increase). In the later years of the model, home health services also contributed to total Medicare savings (\$283 million cumulative savings).



## No Adverse Impacts on Beneficiary Access to Home Health Care

We observed ongoing declines in home health utilization in both HHVBP and non-HHVBP states that pre-dated the HHVBP Model, but the model did not affect the percentage of FFS beneficiaries receiving home health care nor the number of home health days per FFS beneficiary. We also found no evidence that agencies were avoiding patients at risk of limited improvements in functioning or patients who otherwise had higher levels of clinical severity. Together, our analyses do not suggest an adverse impact of HHVBP on beneficiary access to home health care.



## Widening Disparities for Medicaid Patients and Differential Impacts Based on Race and Ethnicity

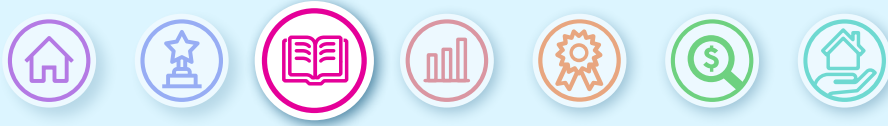
Although the original HHVBP Model was not designed explicitly to address health disparities, we considered whether the HHVBP Model has implications for health equity. We found evidence of modest growth in disparities for patients with Medicaid coverage, who experienced higher unplanned hospitalizations and lower functional improvement both before and after implementation of HHVBP. Meanwhile, we found home health patient outcomes varied among racial and ethnic minority groups, with larger gains under the model among Black patients compared to White non-Hispanic patients, but smaller gains among Hispanic patients relative to outcomes for White non-Hispanic patients (see the Quality chapter for more details).



In a separate analysis, we did not find evidence of an HHVBP impact on pre-existing racial and ethnic inequities in the use of lower quality agencies. Building on these findings, we spoke with a small, purposefully selected sample of home health agencies in early 2023 from five counties where racial and ethnic minority patients experienced equitable use of higher quality agencies relative to other counties to examine if there were community-level factors that better positioned agencies for improved equity. The four higher performing counties tended to have more agencies with higher Star Ratings and were primarily urban compared to the lower performing county. However, no single factor emerged to explain why certain counties performed well with regard to both quality and equity.

## Conclusions

Through the six years of the original HHVBP Model (2016-2021), Medicare spending for FFS beneficiaries using home health care grew more slowly in the nine HHVBP states, translating to cumulative Medicare savings of \$1.38 billion, a 1.9% decline relative to the 41 non-HHVBP states. There were declines in most aspects of utilization for these home health patients — including unplanned hospitalizations, skilled nursing facility use, and ED use followed by inpatient admission — offset by an unintended increase in outpatient ED visits. We also observed gains in functional status including patient mobility and self-care due to HHVBP. The slight decline in some aspects of patient experience was unexpected but also not impactful, given the high measure values. All of these changes occurred without unintended, adverse impacts on overall access to home health care and with agencies viewing the model as an intensifier of their existing performance improvement activities. While the HHVBP Model was designed to improve overall quality of care, we also evaluated whether the model had implications for health equity. We found a pattern of pre-existing inequities involving patients with Medicaid coverage and racial and ethnic minority patients that largely persisted throughout the model, and in certain instances widened or narrowed over time. HHVBP was designed to lead to a more sustainable payment system that rewards improved quality and penalizes poor performance. The evaluation suggests, despite a few unintended impacts and uneven equity impacts, the original HHVBP Model did reduce unplanned hospitalizations, reduced the number of ED visits leading to hospitalization, and increased quality as measured through the TPS for beneficiaries requiring home health services.



## Overview of the Original HHVBP Model

In January 2016, the Centers for Medicare & Medicaid Services (CMS) initiated the original Home Health Value-Based Purchasing (HHVBP) Model in nine randomly selected states based on geographic location, utilization, demographics, and clinical characteristics: Arizona, Florida, Massachusetts, Maryland, Nebraska, North Carolina, Tennessee, and Washington. All Medicare-certified home health agencies in these nine states were required to participate in the model (HHS, 2015). To support efforts that improve the delivery of health care and spend dollars more wisely, CMS designed the model to maintain or enhance the quality of home health care by providing financial incentives to agencies for improvements in the quality of care being delivered without negatively impacting overall use of home health care.

Medicare's home health benefit covers skilled nursing, physical, occupational, and speech therapies, personal aide services, and medical social work services for patients confined to their homes or needing intermediate care. In 2021, approximately three million Medicare fee-for-service (FFS) beneficiaries used home health, about a quarter of which resided in HHVBP states (Arbor Research, 2023a). The goal is for Medicare home health patients to be treated in the home setting where they feel most comfortable and familiar, and to support their ability to regain or maintain independence. Home health services are paid for under Medicare's Home Health Prospective Payment System (HH PPS), which pays home health agencies a predetermined amount for each episode of care that is adjusted for case-mix, service use, geographic variation in wages, and other factors contributing to low or high resource use.

Within the original HHVBP Model, the maximum payment adjustment to an agency's Medicare payments under HH PPS increased each year between 2018 and 2021 (Exhibit 1) based on an agency's total performance score (TPS). The TPS is a composite score of achievement or improvement on Outcome and Assessment Information Set (OASIS)-based, claims-based, and Home Health Consumer Assessment of Healthcare Providers and Systems (HCAHPS)-based outcome measures two years prior, as well as submission of three agency-reported measures. The HHVBP incentives were designed to be budget neutral within a state, redistributing Medicare payments to reward agencies with relatively higher achieved quality or improved quality and reduce payments to agencies with lower levels of performance.

## Overview of the Evaluation and Framework

The intent of the original HHVBP Model was to test the use of adjustments to the Medicare HH PPS rates by tying payment to quality performance with an overarching goal to achieve the highest possible quality and efficiency. Thus, the effectiveness of the model was contingent on home health agencies modifying their operations and care delivery in ways that maintained or improved the quality of home health care provided to Medicare beneficiaries, while controlling or reducing costs to Medicare. Our mixed methods evaluation over the course of a six-year period emphasized the collection, analysis, and synthesis of information that was most relevant to how home health agencies in the nine model states responded to the HHVBP Model, in comparison to equivalent non-model agencies throughout the same time period. The random selection of states and requirement for all home health agencies located within the nine model states ensured that there was no self-selection bias, competing agencies were representative of all home health agencies nationally, and there was sufficient participation to generate meaningful results to help CMS decide whether to scale or make modifications to the model over time.



**Exhibit 1. Original HHVBP Model Payment Adjustment Amounts, 2016-2021**

Calendar Year	Payment Adjustment?	Maximum Payment Adjustment
2016	No	--
2017	No	--
2018	Yes, based on 2016 TPS	±3%
2019	Yes, based on 2017 TPS	±5%
2020	Yes, based on 2018 TPS	±6%
2021	Yes, based on 2019 TPS	±7%

*The model was originally planned to operate through 2022, but in November 2021, CMS finalized its plans to expand the HHVBP Model nationally in January 2023 and ended the original HHVBP Model one year early with 2021 being the final year for HHVBP payment adjustments (HHS, 2021).*

By comparing outcomes from agencies in HHVBP states with those of agencies in the 41 non-model states, our evaluation focused on answering the key empirical question:

**What would have occurred in the HHVBP agencies and for their patients if the HHVBP Model had not been implemented?**

First, we revisited the initial conceptual framework of the original HHVBP Model that guided our evaluation approach at the onset and informed how we addressed key research questions over time. The conceptual framework in Exhibit 2 highlights key pathways for change under the original HHVBP Model, while recognizing that, over time, various contextual factors influenced home health agency behaviors and their overall response to the model’s incentives. As a result, our quantitative and qualitative findings in tandem present a more complex narrative of the original HHVBP Model. Leveraging a variety of secondary data sources, we found significant differences between home health agencies in HHVBP states and non-HHVBP states in Medicare spending and many of the measures used to calculate the TPS. Meanwhile, we learned that the model’s ability to incentivize changes in agencies’ approaches (in both model and non-model states) on care delivery or operations needed to factor in other motivators and facilitators. From agencies’ perspective, the model was an ‘intensifier’ more so than a key driving force, in their ability to improve performance and make intended changes in care delivery. Thus, our conceptual framework reflects how these contextual factors potentially influenced both the home health agency response in the short-term, but also the longer-term effects of the model on outcomes and Medicare spending.

**HHVBP Model Inputs**

As Exhibit 2 shows, key model inputs for the HHVBP Model included a payment methodology aimed to financially incentivize agencies to improve or otherwise maintain high levels of performance on the measures that determined their TPS. The design of the model encouraged agencies to review their performance on measures used to construct the TPS. Thus, the primary theory of action for this framework would suggest any adjustments made to an agency’s payment (based on its individual TPS results) would incentivize them to make changes or enhancements in agency operations or care delivery designed to raise performance in certain areas. As shown in

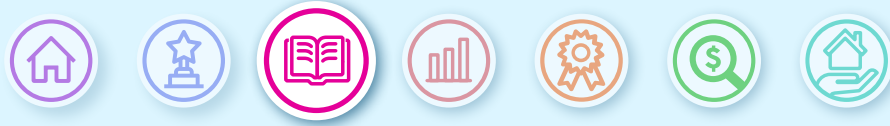


Exhibit 2. HHVBP Conceptual Framework

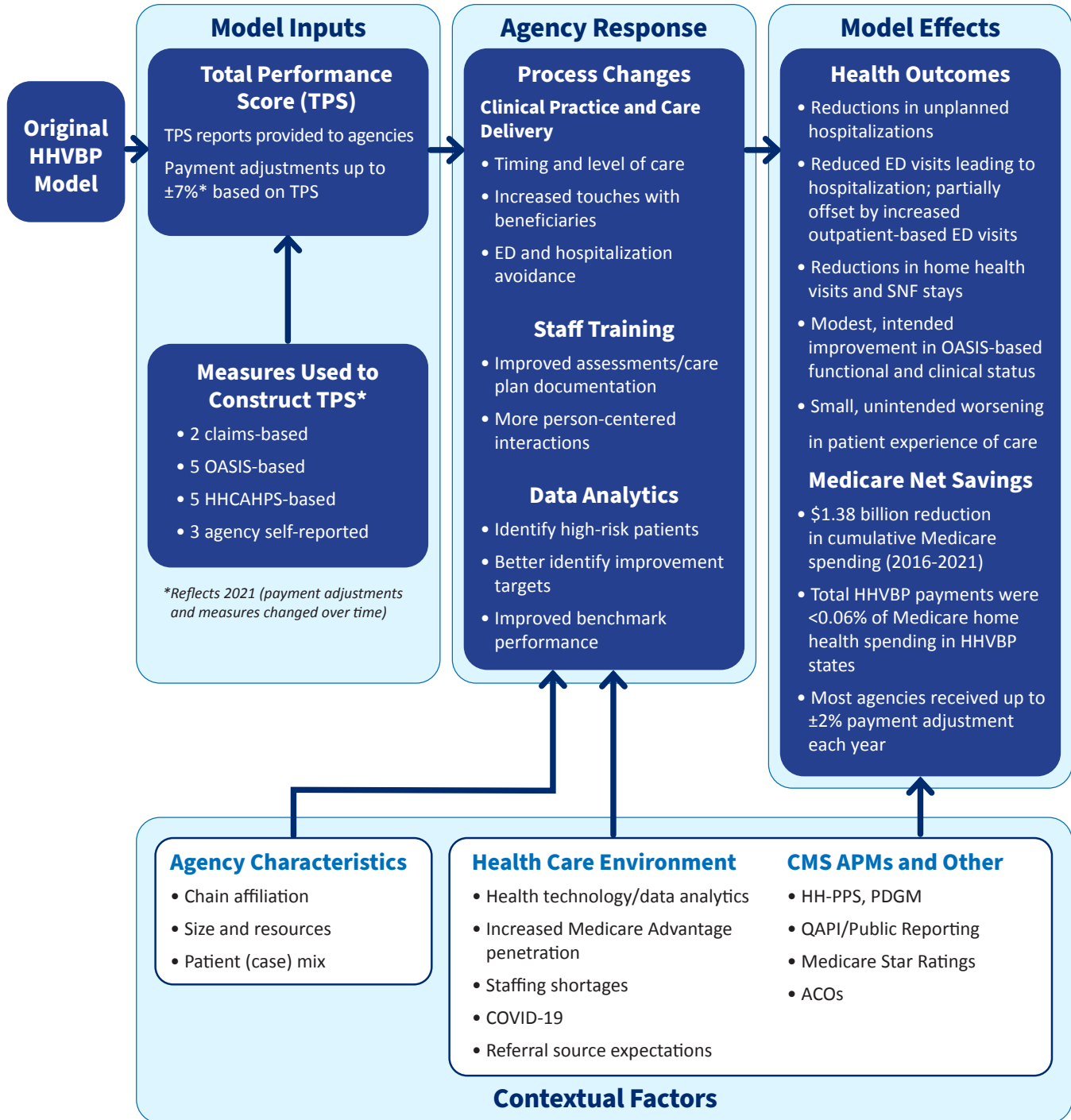




Exhibit 1, the maximum adjustment range to an agency's Medicare payment amount increased annually between 2018 and 2021, where payment rates applied in the first two years of the model (2016 and 2017) establish payment rates used later in the model. Starting in 2018, each eligible home health agency in the nine model states had its Medicare payments adjusted by up to  $\pm 3$  percent based on the relative TPS it achieved in 2016. By the last year of the model, the payment adjustments had a maximum range of  $\pm 7$  percent based on home health agency quality performance levels achieved during 2019.

### Home Health Agency Response, Including Changes in Care Processes and Use of Data

We hypothesized early on in the evaluation that varying types of agency responses to HHVBP — particularly process changes in practice patterns or delivery of home health services — could also have implications for other forms of utilization. This included utilization of resource-intensive services that may depend on the quality of home health care being provided, such as hospitalizations and post-acute care in skilled-nursing facilities (SNF).

Examples of home health agency responses to HHVBP included, but were not necessarily limited to, changes to their clinical practice and care delivery process (e.g., timing and frequency of home health visits, staff training, and improved data analytics (see second panel of Exhibit 2).

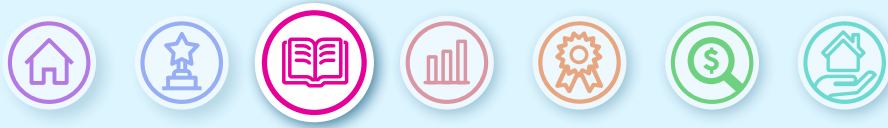
Importantly, we hypothesized that home health agencies may respond differently to the HHVBP Model. For example, agencies could differ in their perceptions of the financial risks and opportunities related to HHVBP and their readiness to adopt new processes that were designed to improve performance. Some types of agencies may have more limited experience and/or resources to undertake quality improvement initiatives. As Exhibit 2 shows, there are important contextual factors worth consideration in their response to HHVBP incentives, including agency-specific characteristics such as chain affiliation, size and degree of resources, the types of populations they serve (e.g., case-mix), and their geographical location.

Of note, the HHVBP Model and its financial incentives may have an unintended differential impact on certain beneficiary subgroups if the model systematically penalizes agencies that care for patients for whom it is more difficult to achieve quality performance levels that are tied to HHVBP payment adjustments. For example, home health agencies might avoid initiating episodes for subgroups of beneficiaries they perceived as being too high-risk for complications or unlikely to improve in the home health setting. And although the model was not designed to address health disparities (but rather focused on improving home health quality overall), it is possible for the quality incentives under HHVBP to either positively or negatively influence health equity. For example, if quality incentives encourage greater gains among beneficiary subgroups with historically worse outcomes and greater opportunities for quality improvements, the HHVBP Model could lead to greater health equity. However, as with other VBP programs, HHVBP could exacerbate existing inequities if factors limited quality improvement or access to home health care to historically underserved populations.

### Model Effects on Health Outcomes and Medicare Spending

In addition to home health agencies making changes in clinical processes or practice patterns in response to the model, changes in the delivery of home health services could have both intended and unintended effects on key health outcomes in utilization, quality, patient experience, health equity, and Medicare spending (see third panel of Exhibit 2). For instance, if the quality of care provided by agencies improves, this may reduce the need





for utilization of certain resource-intensive services, such as unplanned hospitalizations and improve a patient's functional status. Although the original HHVBP Model was not designed to address health disparities among home health patients, we examined potential implications of the model for health equity by analyzing whether HHVBP affected patient outcomes or aspects of care delivery differently based on Medicaid coverage or patient race and ethnicity.

We expected cumulative model impacts to differ between agencies, given that they may respond differently to model incentives at different points in time depending on their individual circumstances or contextual factors, such as those identified in Exhibit 2. For example, agencies could have differed in their readiness to adopt new processes designed to improve performance, and some agencies had more limited experience and/or resources to successfully undertake quality improvement initiatives. We also took into account salient exogenous factors to aid in the interpretation of the model's impacts, including the introduction of the Patient-Driven Groupings Model (PDGM) and the onset of the COVID-19 Public Health Emergency (PHE) in 2020.

### **Scope of this Report**

This final evaluation report provides a summation of our findings regarding the original HHVBP Model, using data from 2013-2021 which includes the three-year baseline period (2013-2015) used in our analyses and the six years of the model (2016-2021). To evaluate the original HHVBP Model, we employed a mixed methods research design that incorporated quantitative and qualitative data throughout the evaluation and used a difference-in-differences (D-in-D) framework to compare changes over time in the nine original HHVBP states with those in the comparison group. Additional details on our methodology, data, and analytic approach are available in the Technical Appendix. Below, we summarize cumulative findings on the TPS and HHVBP payment adjustments followed by the model's cumulative impact on quality measures, Medicare spending, and access to home health care.



## Agency TPS and Payment Adjustments

CMS designed the original HHVBP Model to test the impact of providing financial incentives to home health agencies for improvements in quality of care by adjusting Medicare payments upward or downward based on their Total Performance Score (TPS), a composite score of an agency’s quality achievement/improvement on the HHVBP measure set. The adjustments were designed to be budget neutral within a state (or state cohort), redistributing Medicare payments among eligible agencies to reward agencies with relatively higher achieved quality or improved quality and reduce payments to agencies with lower levels of performance (HHS, 2015).

The TPS represents a broad measure of agency performance under HHVBP, with higher scores reflecting higher quality. As such, we expected HHVBP to have a positive effect on TPS. To evaluate the impact of the original HHVBP Model on overall agency performance, we compared calendar year (CY) 2016-CY 2021 TPS in model states with those in non-model states using a cross-sectional regression analysis, with adjustments for agency size, chain status, ownership type, age, and freestanding versus hospital-based, as well as indicators of patient demographic characteristics, and insurance type.<sup>1</sup>

### Higher TPS in HHVBP States than Comparison States in all Six Years of the Original HHVBP Model

In each of the six years of the original model, TPS values were higher among home health agencies in original HHVBP states relative to those in non-model states (Exhibit 3), with higher TPS values among the HHVBP agencies largely due to higher scores for the OASIS-based outcome measures (Arbor Research, 2023a). The relationship between HHVBP and non-HHVBP TPS values persisted after multivariate linear regression accounted for observed differences in agency characteristics and patient sociodemographic factors between the two groups. For each of the six years of the model, agency TPS values were significantly higher (ranging from 1.6 to 3.2 percentage points higher) in HHVBP states than in non-HHVBP states (Exhibit 3).

The upward shift in the agency TPS distribution we observed for agencies in both HHVBP and non-HHVBP states between 2016 and 2018 can be interpreted as ongoing improvement in agency performance as the TPS methodology remained largely constant. Conversely, the downward shift observed between 2018 and 2019 likely reflects the major change in TPS methodology starting in 2019 rather than a decrease in overall agency performance. See the Technical Appendix for additional information on TPS methodology.

Most agencies in the original HHVBP Model were eligible for a TPS and received a HHVBP payment adjustment during the model period, providing over 98 percent of home health episodes in HHVBP states.

**Payment Year**    **HHVBP Agencies Receiving a TPS**

2018	77%
2019	79%
2020	81%
2021	79%

*Agencies eligible for a TPS were larger and older compared to agencies ineligible to receive a TPS.*



See the Quality Chapter for more information about the OASIS-based HHVBP measures.

<sup>1</sup> A D-in-D approach was not used since the TPS already captures changes over time in an agency’s performance. Furthermore, the methodology for computing TPS has changed over time, making TPS values from different HHVBP payment years less comparable since changes in TPS values across payment years may reflect changes in the components of the TPS rather than changes in agency performance. See the Technical Appendix for additional detail.



**Exhibit 3. Original HHVBP Model Payment Adjustment Amounts, 2016-2021**

Year	Average TPS <sup>a</sup>		HHVBP Agencies	Effect Size <sup>b</sup>
	HHVBP Agencies	Non-HHVBP Agencies	Estimated Coefficient (Percentage Points)	
2016	37.1	34.9	1.6*	4.6%
2017	42.6	40.0	2.0*	5.0%
2018	45.4	42.9	1.6*	3.7%
2019	38.9	36.6	2.9*	7.9%
2020	46.1	43.4	3.2*	7.4%
2021	46.8	44.2	2.6*	5.9%

<sup>a</sup> TPS values account for the risk adjustment method used for each of the individual HHVBP performance measures that comprise the TPS.

<sup>b</sup> Calculated as estimated coefficient/average TPS among non-HHVBP agencies. \* Differences are statistically significant at  $p < 0.001$ , adjusting for patient sociodemographic factors and agency characteristics.

The results of the comparisons between HHVBP and non-HHVBP agencies in Exhibit 3 are in contrast to a similar comparison we made between the two groups in the years immediately prior to the start of the model. When simulating a TPS for each agency prior to HHVBP using a similar methodology, we found that average agency scores were similar for the two groups in each year from 2013-2015 (Arbor Research, 2023b). As with the results for many individual utilization and quality measures, comparisons of agency TPS values indicate higher performance among HHVBP agencies starting in 2016. Sustained impacts of HHVBP starting in the first year of the model may reflect effects of the model’s performance incentives as agencies were aware that starting in 2016, their performance would affect their future payments.

Between August and November of each year of the model, CMS provided a TPS report to each agency in the HHVBP states, including information on their achievement and improvement scores, the extent to which agencies reported data needed for the TPS calculation, and the agency’s payment adjustment for the following calendar year. When we spoke to agencies in HHVBP states in 2018 to understand how they used their TPS reports, most agencies reported reviewing the TPS reports primarily to understand their HHVBP scores and found the data to be generally consistent with other reports for quality and performance improvement activities (Arbor Research, 2019). However, many agencies we interviewed did not use the TPS reports to identify and monitor quality and performance improvement activities, since the data were generally months behind the internal data available within their information systems, which were often cited as being more useful in determining future activities than TPS data.

Over the course of the HHVBP Model, home health agency staff increasingly reported relying on internal, sophisticated technology developed to help agencies better identify quality improvement areas and make more timely, data-driven decisions. For example, these data analytic tools could identify areas where documentation was poor or incomplete as well as produce individual staff scorecards on pre-post assessment results. Agencies also reported shifting to more widely adopted EHRs to facilitate recruiting and onboarding new staff who were already familiar with commonly used software systems.



The thing that is the most difficult is that...they are looking at [HHVBP] numbers from a long time ago. So you put things in place to improve those things and you are not seeing the fruition of your efforts.”



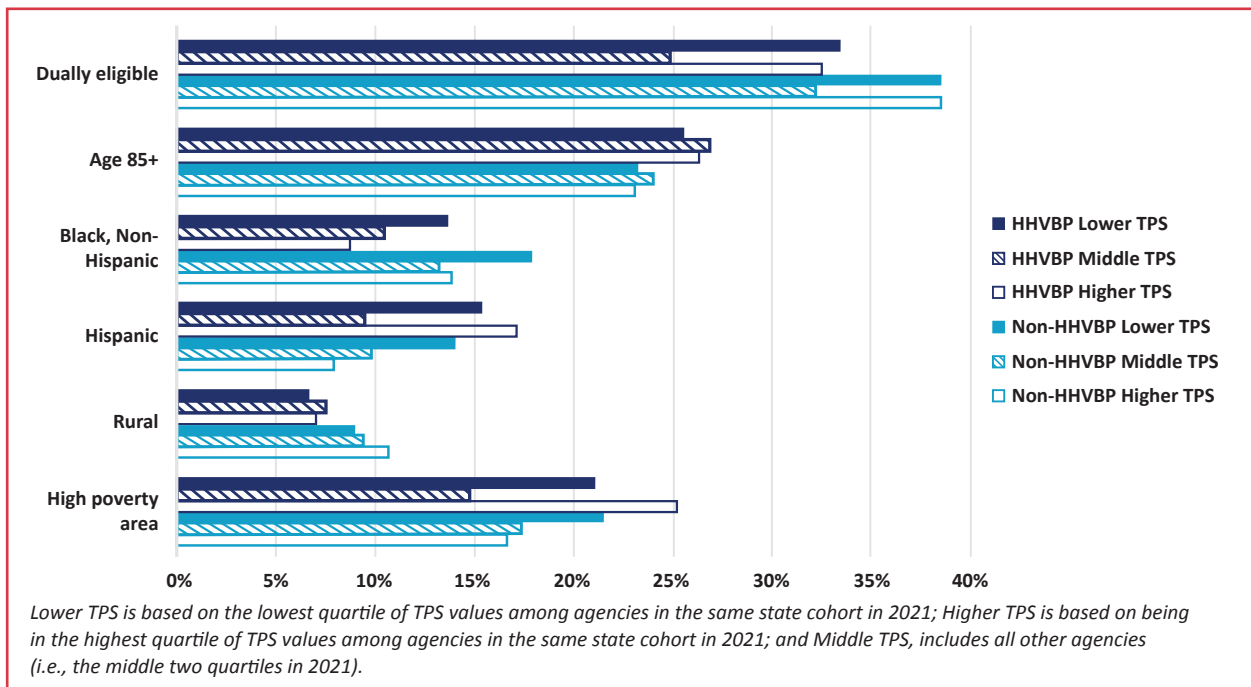
## Lower TPS Was Not Associated with a Disproportionate Share of Patients with Social Risk Factors Across all HHVBP States, but There are Underlying State-Specific Differences

As with other value-based purchasing programs, there is potential under HHVBP for some providers to face greater challenges in responding to quality performance incentives, such as providers caring for beneficiary populations with greater social risk factors. For example, the model could adversely affect access to care for some beneficiaries if agencies that care for a disproportionately large share of patients with social risk factors consistently have lower levels of performance and perceive that their poorer results are influenced by factors beyond their control. This was a concern voiced by several agencies in HHVBP that we spoke with in 2018 who felt that the methodology used to calculate the TPS unfairly penalizes them since it does not take into consideration the demographics of their patient populations (Arbor Research, 2019). We examined the extent to which HHVBP agencies with a larger proportion of beneficiaries in certain demographic or social risk factor groups were more likely to have a lower TPS, but did not find a pattern of beneficiary social risk factors being more common among HHVBP agencies with a lower TPS compared to higher performing agencies throughout the HHVBP Model. Results for the last year of the model (2021) are shown in Exhibit 4.



Unlike the results discussed in the Quality chapter that indicate patterns of worse outcomes for patients with Medicaid coverage across selected measures, we did not find evidence that HHVBP agencies with a larger share of dually eligible patients have lower overall performance under the model (i.e., top bars of Exhibit 4). Given potentially important variation across states in factors such as Medicaid programs and patient populations, we also explored

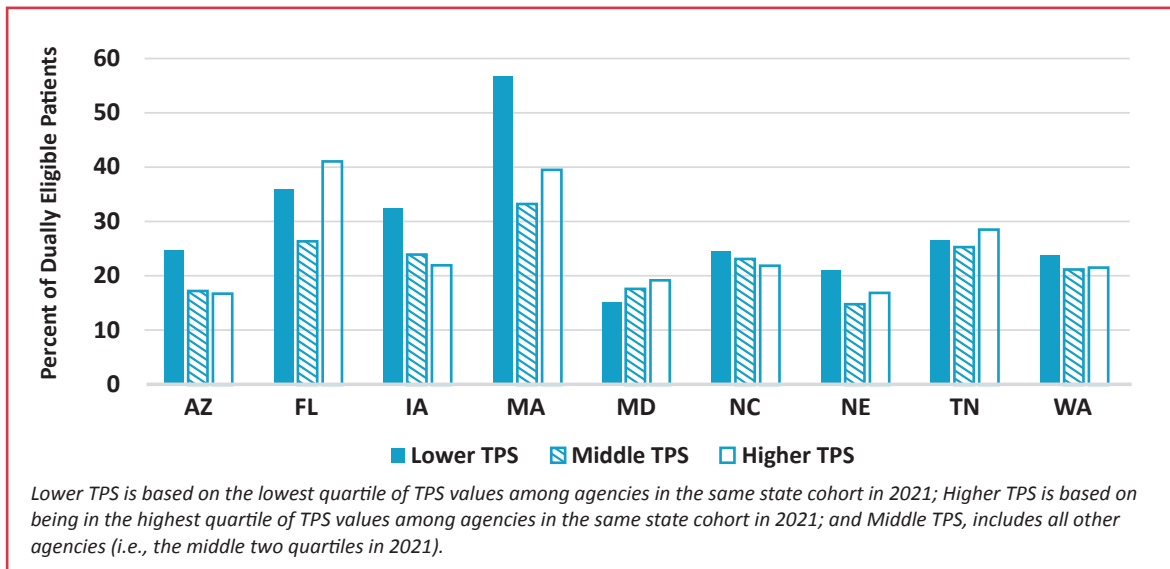
**Exhibit 4. No Pattern in Agency TPS Values and Percentage of Patients with Social Risk Factors among Agencies in HHVBP States in 2021**





whether there was a relationship between TPS values and share of dually eligible patients individually for each of the nine HHVBP states. For six of the nine HHVBP states (i.e., Arizona, Iowa, Massachusetts, North Carolina, Nebraska, and Washington), there is a larger proportion of dually eligible patients among agencies with lower TPS values compared to agencies within the state that had higher TPS values (Exhibit 5). We note that this pattern is not observed in Florida, which is by far the largest of the HHVBP states and an important driver of the findings for all HHVBP states combined. These results suggest that in addition to national comparisons, it is also important to consider performance gaps among agencies within individual states or regions that may have implications for health equity.

**Exhibit 5. Share of Dually Eligible Patients is Highest among Lower TPS Agencies in Six of Nine HHVBP States in 2021**



**Most Agencies Received HHVBP Payment Adjustments within ±2 Percent Despite Increasing Maximum Payment Adjustments over the Four Payment Years**

As discussed in the Background Chapter, the HHVBP Model design included an annual increase in the maximum potential payment adjustments to agencies from ±3 percent in 2018 to ±7 percent in 2021. Despite the growing financial implications of the model for agencies over time, most agencies received more modest payment adjustments. For example, 62 percent of agencies in 2021 and 93 percent in 2018 received an adjustment between -2 percent and +2 percent (Exhibit 6). In 2019, the maximum payment adjustments was ±5 percent, which corresponds to the payment adjustment CMS will apply in 2025 (based on 2023 performance) to all agencies in the expanded HHVBP Model; nearly four out of five (79 percent) agencies received a payment adjustment between -2 percent and +2 percent, and just 6.8 percent received a payment adjustment at the tails (i.e., between -5 and -4 percent or between +4 and +5 percent; Exhibit 6).

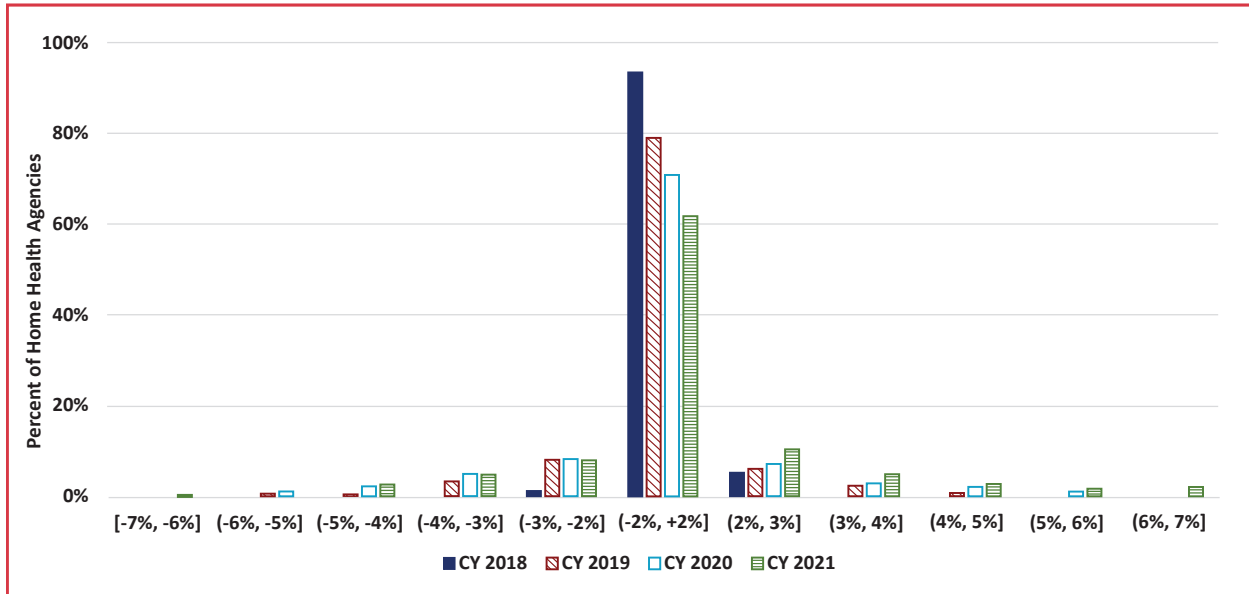
When speaking to agencies in HHVBP states in 2018 about their first payment adjustment, the decrease or increase they received that year (which was reflective of their performance in 2016) was not typically mentioned as the reason for implementing changes (Arbor Research, 2019). A few agencies also reported that the potential payment



*See Exhibit 1 in the Background Chapter for more information on the annual HHVBP payment adjustments.*



**Exhibit 6. A Majority of Agencies in HHVBP States Received Between a -2 to +2 Percent Payment Adjustment for Each of the Four Payment Years of the Model (2018-2021)**



adjustment of up to  $\pm 3$  percent was not large enough to warrant making changes. This sentiment also may have been reflective of agencies’ actual payment adjustments that year, where two-thirds of agencies received a payment adjustment of up to only  $\pm 1$  percent.

Agency characteristics and other contextual factors may also influence how agencies view their payment adjustments. For example, larger or chain-affiliated agencies may be able to weather payment reductions more easily, or are better able to leverage data analytics and quality improvement resources to identify best practices that will yield improvements.

Although the magnitude of the potential HHVBP payment adjustments increased each year and is relatively high compared to other CMS VBP programs (e.g., Medicare’s end-stage renal disease [ESRD] Quality Incentive Program is only a potential reduction of up to two percent [CMS, 2022a]), it is also important to consider the adjustments within the home health industry where freestanding home health agency average marginal profits were 26 percent (MedPAC, 2023).<sup>3</sup> With such a high average level of profitability among



[The low TPS is] a yellow alarm. It was certainly something where we said, okay, right now it is up to minus 2%,<sup>2</sup> but it may change up to plus/minus 8% in the next few years, and that’s something which will impact operations of our agency significantly. [The low score] motivates us, not necessarily drives us, to change our performance.”

<sup>2</sup> While the interviewee referenced a two percent adjustment, the maximum payment adjustment in 2018 was  $\pm$  three percent. CMS had planned up to a  $\pm$  eight percent payment adjustment for 2022, but did not apply any adjustments that year after ending the original HHVBP Model in 2021, one year earlier than initially planned (HHS, 2021).

<sup>3</sup> Of note, MedPAC recommends reducing the 2023 home health base rate by seven percent for home health services in 2024 (MedPAC, 2023).





agencies, the effect of even large HHVBP payment adjustments may be dampened. In this way, the effectiveness of the financial incentives under HHVBP may also depend in part on the market environments in which agencies operate.

### HHVBP Payment Adjustments were Largely Budget Neutral for Each Payment Year

Finally, we examined the distribution and budget neutrality of all CMS HHVBP payment adjustments to agencies in each of the four payment years of the original HHVBP Model (2018-2021). The average (mean) annual HHVBP payment adjustment per agency ranged from -\$96 in 2019 to \$1,489 in 2021, while the sum of the HHVBP payment adjustments among all agencies in the nine HHVBP states ranged from -\$146,898 in 2019 to \$2.2 million in 2021 (Exhibit 7). While not strictly budget neutral, the HHVBP payment adjustments represent a relatively small percentage of Medicare spending for home health services in the nine HHVBP states (less than 0.06 percent).



The good thing is that we are part of [Chain], so those changes in reimbursement are watered down nationwide.”

#### Exhibit 7. Total HHVBP Payment Adjustments Accounted for Less than 0.06 Percent of Medicare Spending for Home Health Services in HHVBP States in Each of the Four Payment Years of the Model (2018-2021)\*

	Payment Year			
	2018	2019	2020	2021
HHVBP payment adjustment	up to ±3%	up to ±5%	up to ±6%	up to ±7%
N of agencies receiving a payment adjustment	1,524	1,525	1,519	1,457
Distribution of total HHVBP payment adjustments across agencies:				
25th percentile	-\$8,127	-\$11,060	-\$8,971	-\$14,524
Mean	\$322	-\$96	\$816	\$1,489
Median	-\$211	-\$149	-\$14	\$208
75th percentile	\$8,326	\$12,067	\$12,603	\$17,792
Total HHVBP payment adjustments	\$490,870	-\$146,898	\$1,238,964	\$2,169,312
Total Medicare spending on home health services in 9 HHVBP states	\$4,037,610,469	\$4,088,390,643	\$3,822,322,141	\$3,724,569,488
Proportion that was HHVBP payment adjustments	0.012%	N/A	0.032%	0.058%

\*Among Medicare beneficiaries with fee-for-service (FFS) coverage or traditional Medicare coverage.



## Quality Measures

This chapter presents findings for the measures that comprised the original HHVBP Model measure set as well as several related measures for home health patients.<sup>4</sup> CMS designed the HHVBP Model to pose minimal burden to agencies in terms of additional data collection. With the exception of three home health agency self-reported process measures, the measures included in the original HHVBP measure set were previously collected from Medicare claims, OASIS data, or the HHCAHPS survey designed to measure the experiences of patients receiving home health care from Medicare-certified home health agencies. Additionally, most of the measures were publicly reported on CMS' Compare site and included in the CMS Star Ratings prior to the start of the model. Below, we present findings for the claims-based, OASIS-based, and HHCAHPS-based measures sets as well as analyses on how the model affected health disparities.

### HHVBP Had Modest Impacts— Both Intended and Unintended— on Medicare Utilization by Home Health Patients Throughout its Six Years

Since the model's inception, CMS has included two claims-based measures in the HHVBP measure set that is used to calculate the TPS: unplanned hospitalizations and outpatient ED use. Both measures are also used in CMS' Quality of Patient Care Star Rating. Lower values are interpreted as better performance; as such, we expected HHVBP to have a negative impact on these measures.

Prior to the HHVBP Model, values were relatively similar between the HHVBP states and non-HHVBP states for the utilization measures. Over the six years of the model, unadjusted measure rates converged between the two groups for the two HHVBP measures:

- Rates of unplanned hospitalizations in HHVBP states and non-HHVBP states both decreased, converging to approximately 15 percent during 2016-2021
- Rates of outpatient ED use in HHVBP states increased slightly to rates observed in non-HHVBP states — approximately 12.5 percent during 2016-2021

**Exhibit 20 in the Technical Appendix displays average annual measure rates for the utilization measures.**

Among the other utilization measures, unplanned hospitalizations and SNF use among all episodes declined in both groups over time. Total ED use and ED use followed by an inpatient admission increased slightly in HHVBP states and decreased slightly in non-HHVBP states post-implementation.

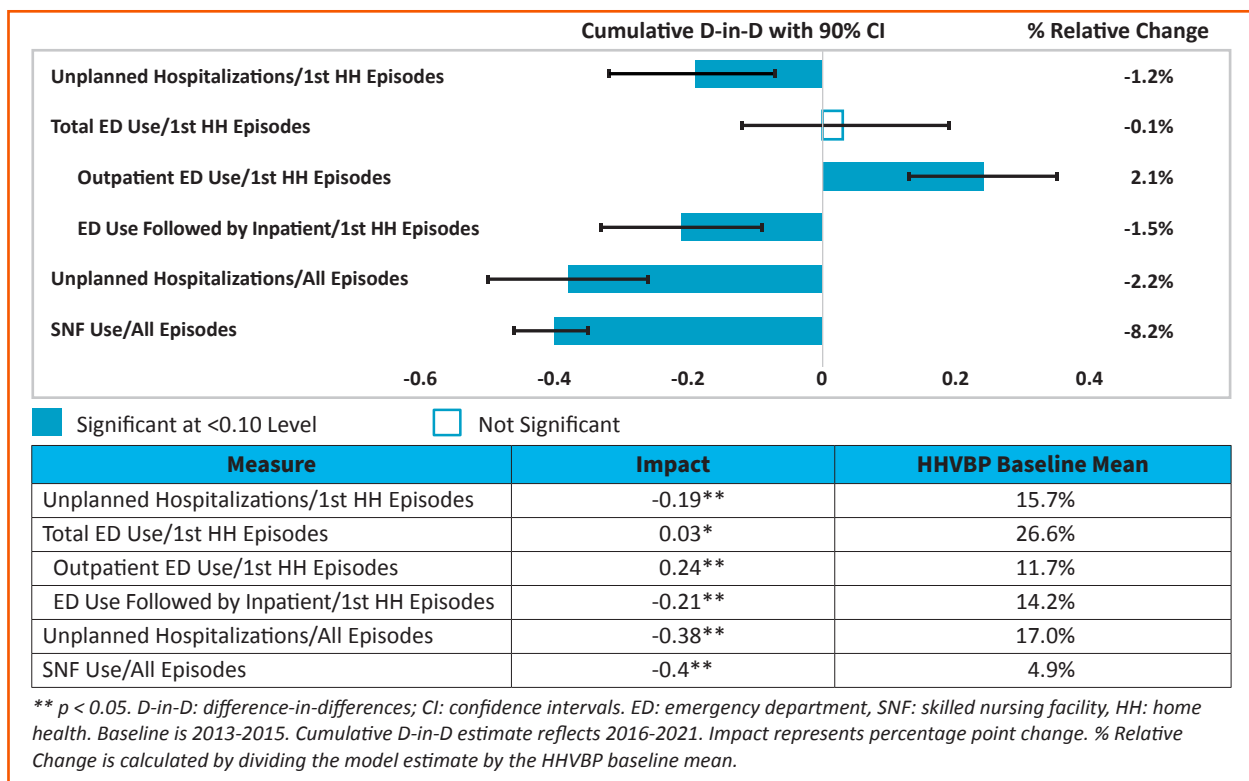
Overall, we found a cumulative (2016-2021) decrease for most measures of utilization among FFS patients receiving home health in HHVBP states compared to non-HHVBP states, but we also found a relative increase in outpatient ED use (Exhibit 8). For the two HHVBP measures, we observed a 1.2 percent decrease in unplanned hospitalizations in HHVBP states relative to 15.7 percent average during the baseline period, and a 2.1 percent increase in outpatient ED use relative to the baseline average of 11.7 percent. In contrast to outpatient ED use, we observed

<sup>4</sup> The HHVBP measure set changed over the model's duration, specifically among the OASIS-based measures. For example, in 2018 and 2019, the three process measures were removed, and three outcomes were replaced with two composite measures. Additional information is available in our Sixth Annual Report (Arbor Research, 2023b).



a 1.5 percent *decrease* in ED utilization followed by inpatient admission relative to the baseline average of 14.2 percent — consistent with the findings for impact on hospitalizations. The total ED use measure, which combines outpatient ED utilization with ED visits that result in an inpatient admission, showed no cumulative impact in HHVBP states compared with non-HHVBP states during 2016-2021 (Exhibit 8). This null finding for total ED use is consistent with the opposite directions of the estimated HHVBP impacts for the two constituent measures that make up the total ED use measure.

**Exhibit 8. HHVBP Led to Cumulative (2016–2021) Reductions in Unplanned Hospitalization, SNF Use, and ED Use Followed by an Inpatient Admission, but Increased Outpatient ED Use**



As with the HHVBP measure that includes unplanned hospitalizations during first episodes only, we estimated a similar reduction for unplanned hospitalizations among *all* home health episodes, with a 2.2 percent reduction in HHVBP states relative to the baseline period rate of 17.0 percent. We also found a reduction in SNF use among home health FFS beneficiaries in HHVBP states compared with those in non-HHVBP states, with an 8.2 percent decline relative to the 4.9 percent baseline rate.

Our findings of slower growth in most utilization measures by home health patients suggest that agencies respond to the HHVBP incentives by making changes to their operations and practices to prevent some unplanned hospitalizations. Furthermore, anecdotal reports from our interviews with home health chain organizations and agencies in 2019 cited the use of timely initiation of care and frequent visits early in the episode of care, practices collectively referred to as *frontloading*, as strategically important to achieve HHVBP-related goals (Arbor Research, 2020). Frontloading is a concept that is widely discussed in the home health industry as a means to provide high



quality care to home health patients. Although it lacks a universally accepted definition, broadly, it refers to the practice of shifting the distribution of skilled nursing and therapy visits to occur earlier (e.g., the first few weeks) in the home health episode.

Relative to non-HHVBP states, we found that agencies in HHVBP states increased frontloading of skilled nursing visits and therapy visits during the first two weeks of home health episodes that follow an institutional stay, such as an inpatient or SNF stay. These findings are consistent with the conceptual framework that posits frontloading — adjusting the number, timing, and types of visits within a home health episode — as a clinical practice and care delivery mechanism in response to HHVBP’s performance-based financial incentives.

Our findings that the original HHVBP Model decreased unplanned hospitalizations, ED use resulting in inpatient admission, and SNF use aligns with policymakers’ intentions to incentivize home health agency activities that reduce unnecessary acute care use. However, the evidence of an offsetting increase to outpatient ED use attributable to HHVBP indicates possible substitution of outpatient ED services for acute inpatient care despite the model incentivizing agencies to reduce both outpatient ED visits and inpatient hospitalizations. Findings from our interviews with agencies suggest that they use similar strategies to decrease both types of utilization (Arbor Research, 2020). One potential explanation consistent with our findings is that HHVBP reduced the severity of conditions for which home health patients received emergency services while having little impact on the likelihood of an ED visit, thereby reducing the frequency of inpatient hospital admissions by visiting the ED, but also leading to an increase in the frequency of outpatient ED visits.

### **HHVBP Produced a Small Reduction in Unplanned Acute Care Hospitalizations Among Medicare Advantage Home Health Users During 2016-2020**

The slower growth in claims-based utilization attributable to HHVBP reported above raises the question of whether relevant agency responses to HHVBP incentives narrowly targeted care for their Medicare FFS patients or are more general in nature — extending to patients covered by other payer types. To better understand whether HHVBP impacts on healthcare utilization by home health patients covered by Medicare FFS spillover to other patients, we analyzed home health utilization and unplanned hospitalizations for home health users with Medicare Advantage coverage — the private plan alternative to traditional FFS Medicare.

The prominence of Medicare Advantage has steadily grown throughout the original HHVBP Model. From 2016 to 2021, the share of all eligible Medicare beneficiaries enrolled in Medicare Advantage increased from 33 to 46 percent (KFF, 2022). We also found an increase in Medicare Advantage patients with home health episodes (derived from OASIS data), from 24 percent in 2016 to 36 percent in 2021 (Arbor Research, 2023b). Given the

**Exhibit 21 in the Technical Appendix provides additional detail on our frontloading findings.**



We realize that we have 48 hours to admit a patient, but we typically almost always [admit them] within 24 hours... and then we obviously try to get our therapist out there in that same timeframe... if skilled nursing is ordered, then we’re trying to see them more often at first based on what their condition is... and then you can reassess as you go and maybe you spread your visits out.”

— Description of frontloading by a home health agency operating in an HHVBP state



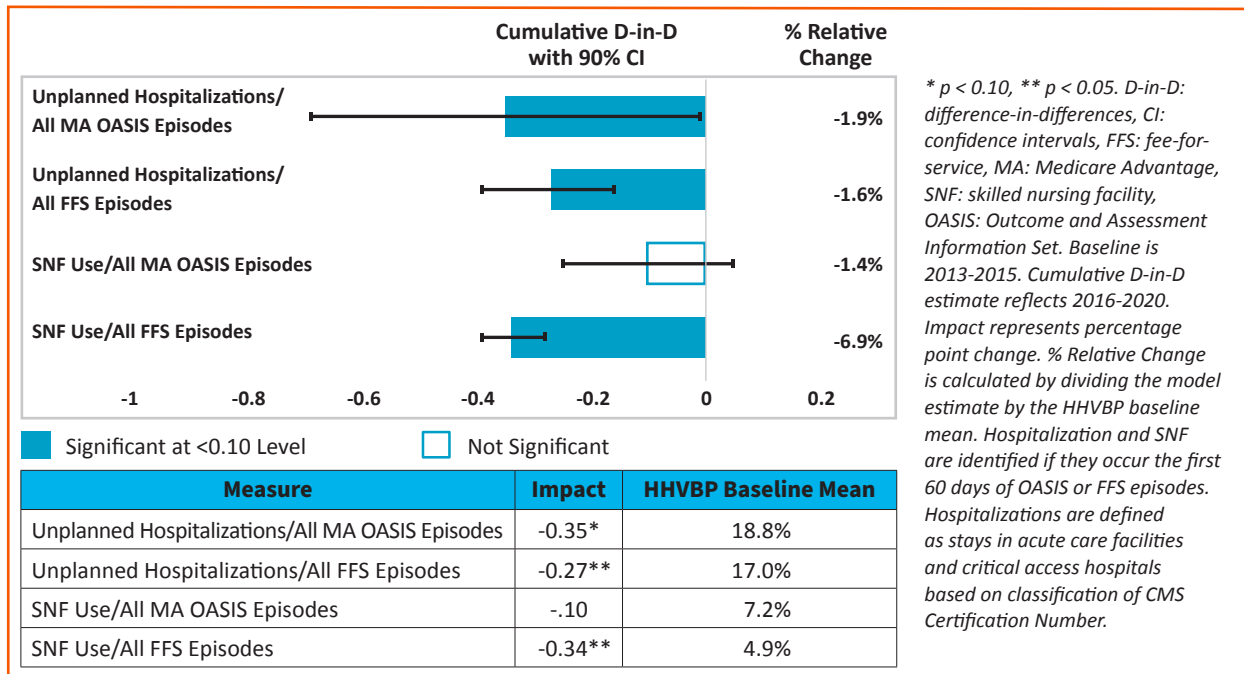
growth in the prevalence of Medicare Advantage beneficiaries, examination of possible impacts of HHVBP on quality and costs of care in the Medicare Advantage population provides insight into the impact of HHVBP on the broader Medicare program.

Through the first five years of the HHVBP Model, we observed a 0.35 percentage point reduction in unplanned hospitalizations among home health patients with Medicare Advantage in HHVBP states relative to non- HHVBP states (Exhibit 9),<sup>5</sup> translating to a 1.9 percent reduction relative to the baseline average unplanned hospitalization rate of 18.8 percent. This impact estimate is similar to the 0.27 percentage point reduction found for unplanned hospitalizations among home health episodes for Medicare FFS beneficiaries during the same time period (Exhibit 9). In contrast to these findings, we found no evidence of significant spillover in the impacts on SNF use for home health episodes of Medicare Advantage beneficiaries (Exhibit 9).



I think that the emphasis on [hospitalization rates] isn't necessarily new, but definitely with the advent of the new VBP metrics, it takes on an even higher significance, because you can be at or just below national average and not really get points for that anymore.”

**Exhibit 9. Original HHVBP Model Associated with Modest Reduction in Unplanned Hospitalizations, but No Impact on SNF Use Among Medicare Advantage Beneficiaries over the First Five Years of the Model (2016-2020)**



<sup>5</sup> Due to a lag in data availability, we were only able to include the data through 2020 in our impact analysis among Medicare Advantage beneficiaries. See the Technical Appendix for more details about the impact measures used in our Medicare Advantage analysis.



Because HHVBP impacts on unplanned hospitalizations affected Medicare Advantage home health episodes, we explored the possibility that the share of OASIS home health episodes for Medicare Advantage beneficiaries in an agency influenced the degree to which the agency experiences HHVBP impacts. However, we found no evidence of a different impact of HHVBP among agencies with a large share of home health episodes for Medicare Advantage beneficiaries relative to those with a smaller share (see Exhibit 22 in the Technical Appendix).<sup>6</sup> Further research is needed to determine the influence of agency characteristics on impacts across populations with payers other than Medicare FFS.

### **HHVBP Produced Modest Improvements in OASIS-Based Outcome Quality Measures**

Agencies use OASIS to conduct a comprehensive assessment of their adult home health patients. Additionally, agencies must complete and submit OASIS assessments for all their Medicare and Medicaid beneficiaries, as well as patients with other insurance coverage. These data are integral to home health quality measurement, including CMS’ Care Compare site, CMS’ Star Ratings program, and for measuring agency performance under HHVBP. The OASIS-based measures used to calculate the TPS have evolved over time, accounting for 10 of the 20 measures at the model’s inception in 2016. In 2021, there were half as many OASIS-based measures included in the TPS calculation: four measures of improvement in functional status (including the two composite measures CMS introduced in 2019) and a measure of home health patients discharged to the community (Arbor Research, 2023b). Higher values are interpreted as better performance; as such, we expected HHVBP to have a positive impact on these measures, given the financial incentives inherent to the model.

Values for the five OASIS-based measures that were part of the HHVBP measure set in 2021 increased over time in both HHVBP and non-HHVBP states — a trend that began prior to HHVBP implementation. Increases were larger for the two functional status measures of management of oral medications and dyspnea compared to patients discharged to the community (e.g., improvement in management of oral medications increased by over 28 percentage points in both HHVBP and non-HHVBP states vs. less than a 2 percentage point increase for the share of patients discharged to the community), and resulted in relatively high measure values (74 to 87 percent in 2021). Performance scores also increased for the two composite measures.<sup>7</sup>

We found a modest, positive cumulative impact of HHVBP for all but one of the five OASIS-based outcome measures. Examining the three single-item OASIS measures (Exhibit 10), we found a 1.5 percent relative

**Exhibit 23 in the Technical Appendix displays average annual measure rates for the OASIS-based measures.**



I do an OASIS review and competency test annually for my clinicians...the questions really focus on things that are important for VBP and the Star Ratings and Home Health Compare.”

<sup>6</sup> We identified agencies with greater than 50 percent of Medicare beneficiaries with Medicare Advantage coverage relative to Medicare FFS in a given year as “high Medicare Advantage share” agencies; all other agencies were identified as “low Medicare Advantage share” agencies. We compared HHVBP impacts on unplanned hospitalizations between the two types of agencies using a difference-in-difference-in-differences (D-in-D-in-D) modeling approach. See the Technical Appendix for additional details.

<sup>7</sup> For each TNC measure, the change in a patient’s status between start/resumption and end of care in each of the underlying areas of functioning is standardized to be worth up to ±1 point towards the total composite change score. As such, the range for each of the episode-level composite measures reflects the number of underlying OASIS items: the TNC Change in Mobility score ranges from -3 to +3 points, and the TNC Change in Self-Care score ranges from -6 to + 6 points (Arbor Research, 2023a).





increase in the share of patients discharged to community and a 4.4 percent increase in improvement in management of oral medications over baseline values. The relative change for the two Total Normalized Composite (TNC) measures fell between these values, with increases in average baseline scores of 2.9 percent for changes in self-care and 2.3 percent in changes in mobility (Exhibit 11). These gains occurred in the context of increases in measure rates that were already occurring in both HHVBP and non-HHVBP states prior to the launch of HHVBP and may in part reflect the response of agencies to other public reporting initiatives.

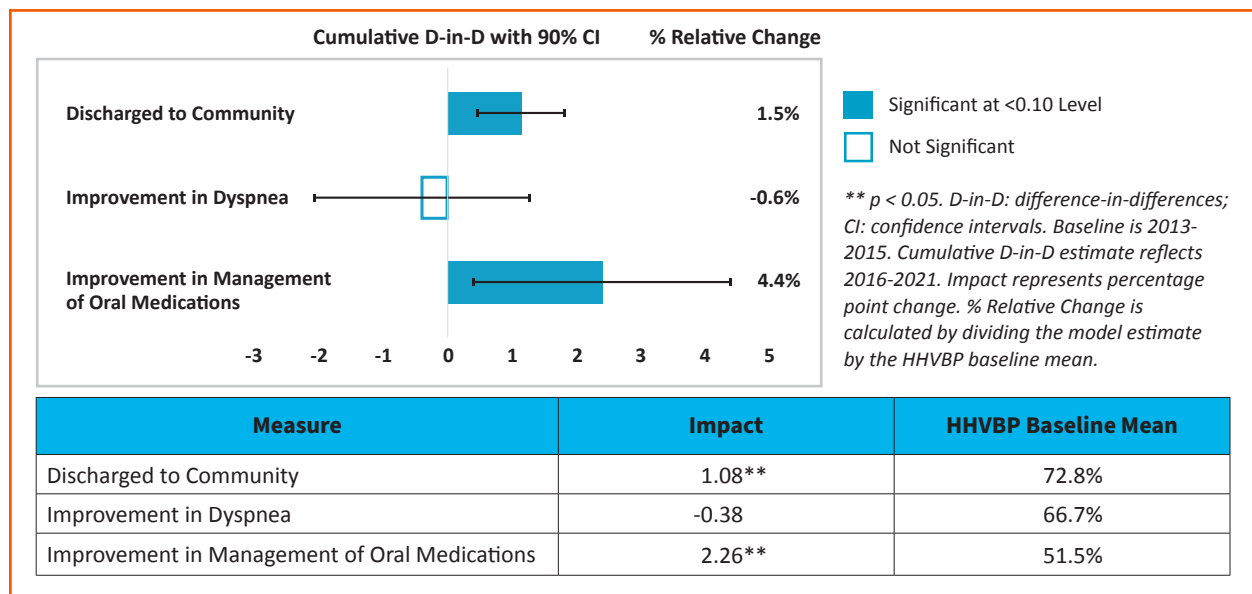
Unlike the other HHVBP measures that are derived from FFS claims or HHCAHPS survey data, these OASIS-based quality measures are derived from assessments completed by agency staff. As such, there are more mechanisms that can affect the OASIS-based measure values. For example, quality improvement efforts for OASIS assessment were reported as a central and consistent focus (Arbor Research, 2018; 2019; 2020; 2021, 2023b). Agencies reported designing training to help staff understand the intent of OASIS questions and ensured that their clinicians more accurately and completely described the patient’s functional status. Additionally, agencies noted an increased focus on maintaining consistency in who completes the assessment (i.e., having the same individual complete the initial and final assessments) and considering what type of staff (e.g., nurse, physical therapist) administers the OASIS assessment.

These increased training efforts and revised approaches to completing OASIS assessments could have an effect on the measures through changes in coding practices or the administration of the assessment, rather than on the care provided, echoing what we heard from some agencies in HHVBP states. While HHVBP increased attention to OASIS



The VBP items for the initiative are not that much different than the items that we look at for Home Health Compare and all of the other things that we’re doing. Those all relate across the board.”

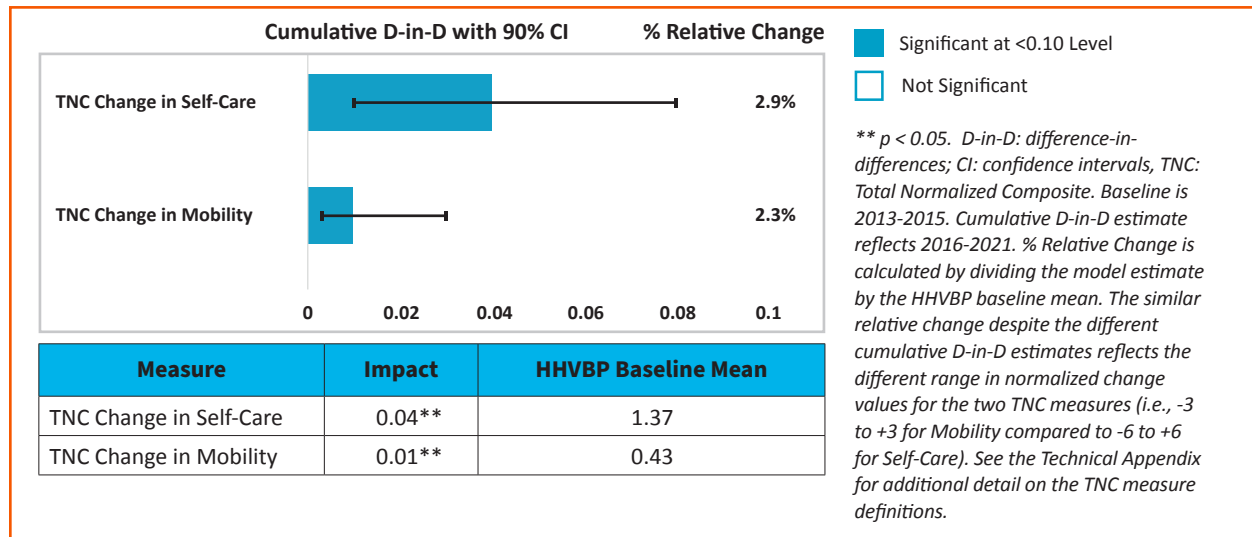
**Exhibit 10. HHVBP Had a Cumulative (2016-2021) Modest Positive Impact on Rates of Discharge to Community and Improvement in Managing Oral Medications**





documentation of the care delivered, it may not have resulted in significant changes to patient care itself. In ancillary analyses, functional status reported on the OASIS assessment at the start of the episode declined over time, and changes in health-related beneficiary characteristics did not fully explain the changes in functional status reported on the OASIS assessment (Arbor Research, 2020; 2021). These declines were greater in HHVBP states than in non-HHVBP states.

**Exhibit 11. HHVBP Had a Cumulative (2016-2021) Modest Impact on the Two Total Normalized Composite (TNC) Measures of Change**



Underlying the accuracy of the measures is the objectivity and validity of the OASIS data themselves. If documentation is subject to teaching, or related to the level of available resources of a particular agency, then caution is needed when interpreting results. However, OASIS-based measures examine dimensions of care not captured elsewhere, so their continued inclusion in performance measurement is important. As the HHVBP Model is expanded nationally, it will be important to continue to monitor to understand how the values change to ensure that the measured quality of care reflects the quality of care delivered to home health patients.



**Modest Growth in Disparities for Patients with Medicaid Coverage, but Differential Impacts Based on Race and Ethnicity on Patient Outcomes**

While VBP programs are designed to promote quality of care, they may not necessarily achieve this goal equally for all populations. If VBP programs do not succeed in encouraging improvements in quality of care for populations who were already predisposed to having worse outcomes, there is a risk that they could lead to wider gaps in quality of care. Alternatively, if VBP programs have the effect of encouraging greater gains among populations for whom there is the most need for improvement, they could result in a narrowing of gaps in quality of care. As a result, VBP programs could have either positive or negative implications for health equity among Medicare beneficiaries.

As such, it is important to consider whether the HHVBP Model has implications for health equity even though it was not designed explicitly to address health disparities. While we find evidence of overall improvements in quality under the



original HHVBP Model, these gains may not necessarily be occurring uniformly among different beneficiary subgroups. To assess whether the implications of the model are different for patients with Medicaid coverage or certain racial or ethnic minority groups, we examined the two HHVBP claims-based measures (unplanned hospitalization and outpatient ED use) and the two OASIS-based composite measures of improvement in mobility and improvement in self-care.

Prior to HHVBP, patients with Medicaid or who were dually eligible tended to have worse outcomes than those without Medicaid, including more frequent outpatient ED visits and less improvement in self-care and mobility (Arbor Research, 2023b).<sup>8</sup> We found significantly lower unplanned hospitalizations due to HHVBP among FFS beneficiaries who are not dually eligible, but no HHVBP impact for beneficiaries who are dually eligible (Exhibit 12). To examine whether the measured disparities for dually eligible patients during the baseline period worsened or improved under HHVBP, we compared D-in-D estimates for the patient subgroups<sup>9</sup> and found a significant difference between dually eligible and non-dually eligible beneficiaries for both measures in Exhibit 12. This suggests that the overall improvements in unplanned hospitalizations that are occurring under HHVBP (shown in Exhibit 8) are largely occurring among patients without Medicaid coverage.

We observed a similar pattern for the two OASIS-based composite measures of changes in functioning, where we found evidence of an HHVBP effect on greater improvements in self-care and mobility for patients without Medicaid coverage, but not for patients with Medicaid coverage (Exhibit 13).<sup>10</sup> Like the claims-based measures, our comparison of the D-in-D estimates for these subgroups<sup>9</sup> also indicate that Medicaid patients are falling behind other patients under HHVBP with regard to their improvements in functioning while receiving home health services.

<sup>8</sup> Throughout the original HHVBP Model, dually eligible, Medicare FFS beneficiaries accounted for 25-35 percent of home health episodes (Arbor Research, 2023b).

<sup>9</sup> Also referred to as difference-in-difference-in differences (D-in-D-in-D); see the Technical Appendix for details regarding our methods for estimating the D-in-D-in-D model.

<sup>10</sup> As with other measures that are based on OASIS, these measures are not limited to Medicare FFS beneficiaries; they also include data for beneficiaries enrolled in Medicare Advantage as well as patients with Medicaid coverage only (that is, they are not also covered by Medicare).



Many, many hours on OASIS training...When new home staff are hired, the training they receive on OASIS is extensive.”



We’ve started really looking at the OASIS questions specifically, and looking at the guidance to say, ‘are we answering these questions correctly?’ or ‘do we need to reevaluate how we’re assessing these patients?’ ”

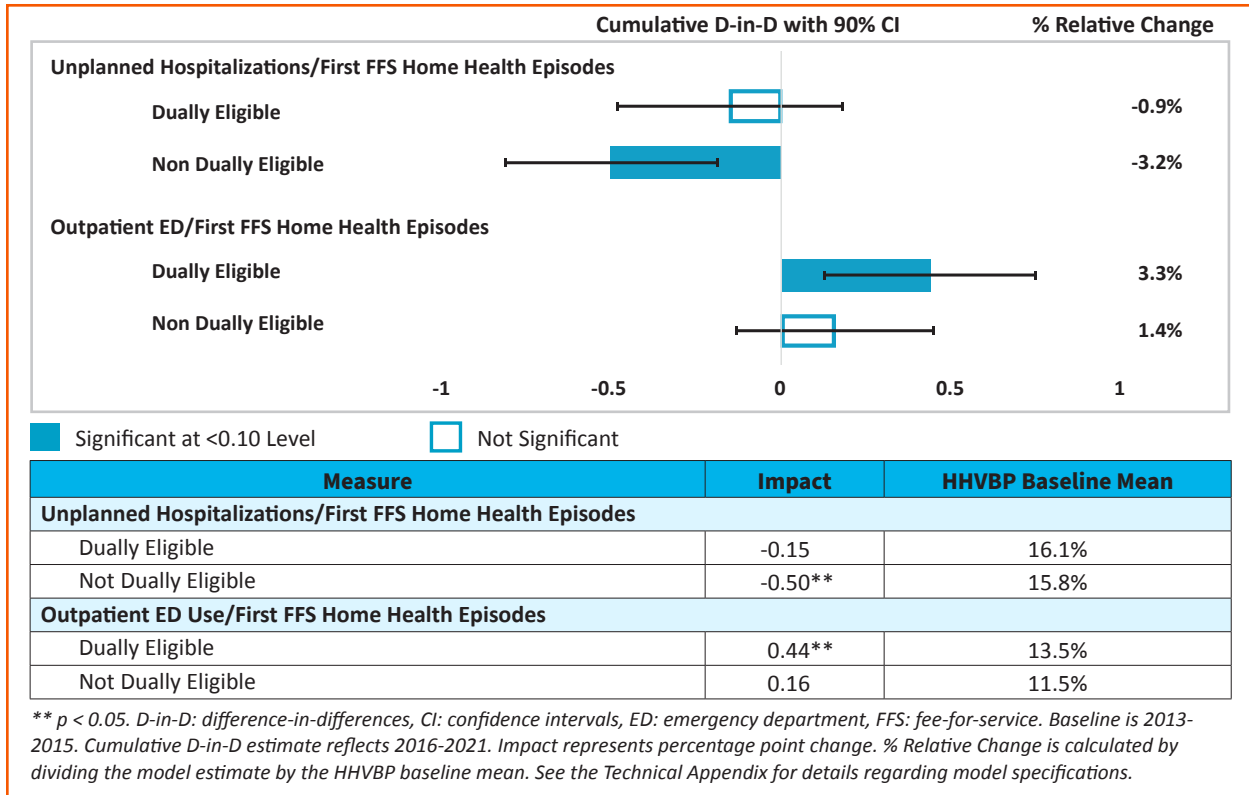


What we found, with many of our indicators, is that we were giving our patients too much credit for what they were doing, and not accurately scoring them to begin with so they didn’t have any room to improve.”

**Exhibit 24 in the Technical Appendix displays measure rates by dual eligibility status or Medicaid coverage.**



**Exhibit 12. No Cumulative (2016-2021) Evidence of Improvements in Unplanned Hospitalizations among Dually Eligible Home Health Patients**

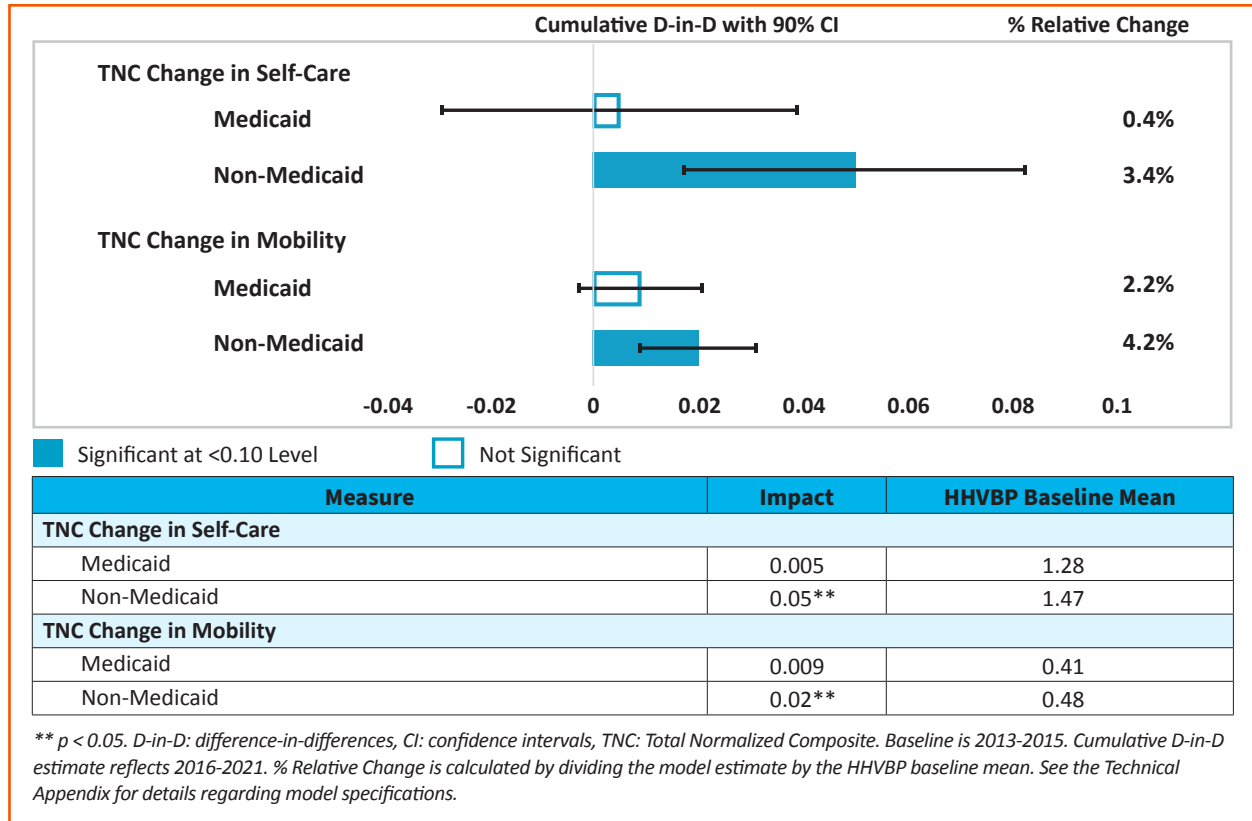


Exhibits 12 and 13 show that Medicaid and dually eligible home health patients do not do as well under the model as patients without Medicaid or who are not dually eligible, but they do not address how pre-existing disparities changed under the model. To answer this question, we plotted adjusted measure rates using estimates from the D-in-D-in-D analyses for the TNC Self-Care measure (Exhibit 14). Panel a shows trends during 2013-2021 by HHVBP status and Medicaid status, and panel b shows trends in the difference in outcomes between patients with and without Medicaid coverage, separately for HHVBP states and non-HHVBP states. In particular, Exhibit 14 shows a disparity between Medicaid and non-Medicaid patients that widens over time, and more so in HHVBP states:

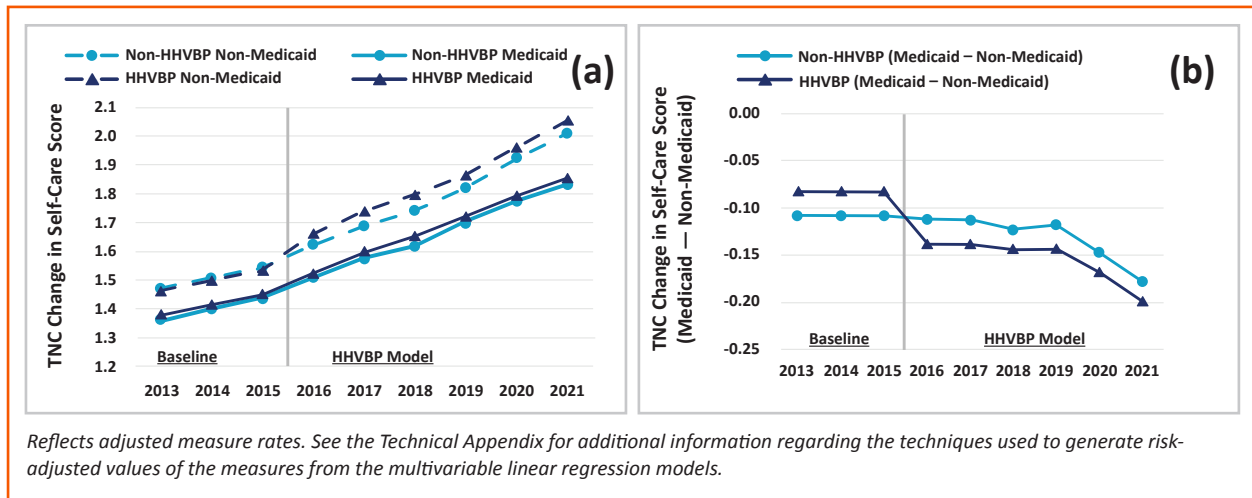
- There were larger improvements in self-care over time among patients without Medicaid coverage compared to those with Medicaid coverage (panel a).
- A larger gap between patients with and without Medicaid emerged over time in HHVBP states compared with non-HHVBP states (panel a).
- This larger gap translated to a slightly larger widening in the disparity over time in HHVBP states (panel b).



**Exhibit 13. No Cumulative (2016-2021) Evidence of Improvements in Composite Measures of Change in Functioning due to HHVBP among Home Health Patients with Medicaid Coverage**



**Exhibit 14. For the TNC Change in Self-Care Measure, there is a Slower Increase among Medicaid Patients Compared to Non-Medicaid Patients (Panel a) and Slightly Widening Disparity in HHVBP States Relative to Non-HHVBP States (Panel b), 2013-2021**





Evidence of these somewhat widening disparities in health outcomes based on Medicaid status under the model may reflect greater challenges with quality improvement among home health patients covered by Medicaid. Patients with Medicaid coverage had somewhat worse outcomes across a range of key outcomes before model implementation, and then lagged slightly further behind other patients in those same outcomes under the model. However, we found HHVBP to be positively associated with providing early intensive home health visits (also known as frontloading) among post-institutional dually eligible patients in a manner similar to those who were non-dually eligible (Arbor Research, 2023b). Yet, there may be other differences across patients in the delivery or effectiveness of home health care. Home health patients with Medicaid also had higher levels of acuity and may face greater barriers in access across care settings. These factors may pose additional challenges for agencies seeking to improve outcomes for this population, whether in response to HHVBP, public reporting of quality measures, or other quality initiatives.

### HHVBP Impacts Vary by Patient Race and Ethnicity

Unlike Medicaid coverage which was associated with consistently worse outcomes relative to patients without Medicaid, patterns differed by racial and ethnic groups prior to HHVBP. For example, both Hispanic and Black home health patients had lower rates of unplanned hospitalization compared to White non-Hispanic patients while outpatient ED use was lower (i.e., better) for Hispanic patients compared with White patients but higher (i.e., worse) for Black patients (Arbor Research, 2023b). Compared to White patients, Black patients showed smaller improvements in self-care and mobility based on the OASIS-based TNC measures, whereas we found no consistent differences between Hispanic and White patients for these two measures.

Relative to White non-Hispanic patients, we found lower (i.e., better) unplanned hospitalizations for Black home health patients, but higher (i.e., worse) rates for Hispanic patients (Exhibit 15) due to HHVBP. Our comparison of the D-in-D estimates for White non-Hispanic patients with Black patients<sup>9</sup> found a more favorable impact of HHVBP on unplanned hospitalizations rates, whereas we found a less favorable impact of HHVBP on unplanned hospitalizations rates for Hispanic home health patients relative to White non-Hispanic patients. In contrast to differences in impacts on unplanned hospitalization by race and ethnicity, we found no difference by race and ethnicity in the impact of HHVBP on outpatient ED use (Exhibit 15).



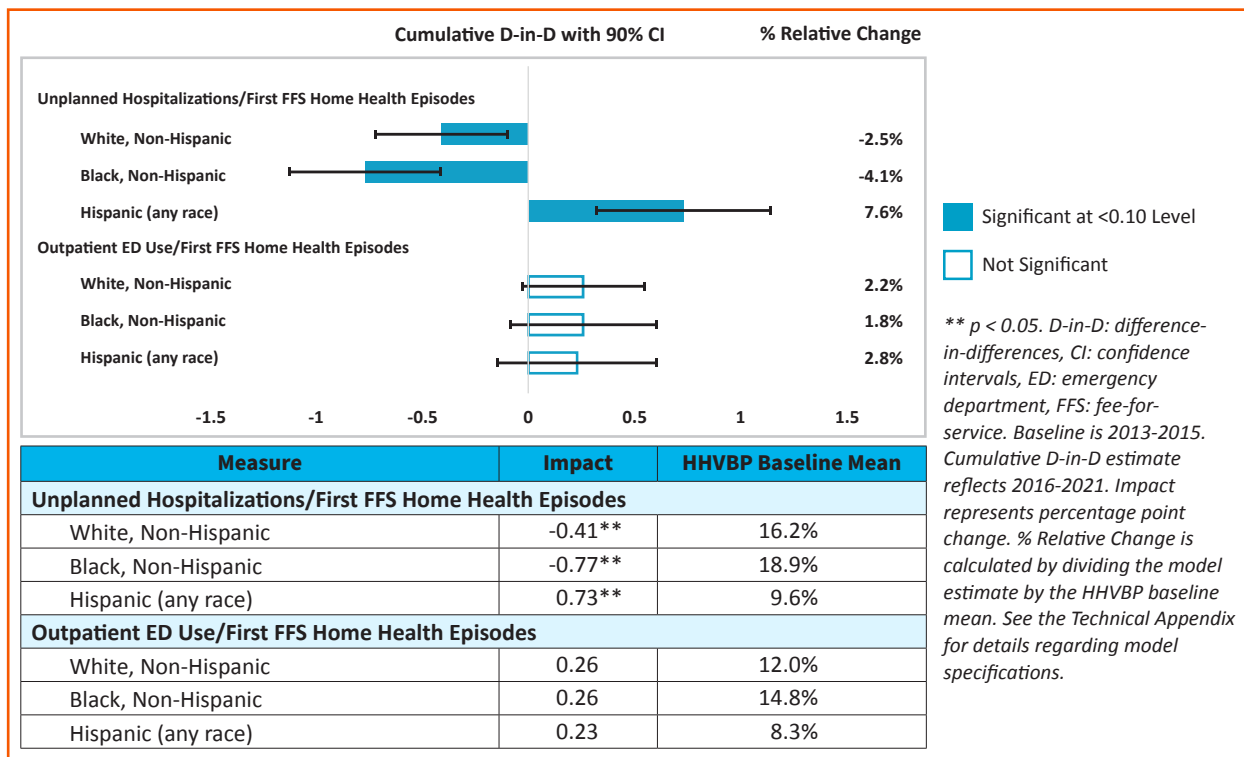
We literally talk with the patient [about] how often you go [to the hospital], why you go, and the symptoms you have when you normally have to go. We write those symptoms down, so they are identifiable to that patient. We get into a lot more detail in how we are going to manage the patient, not only with the staff, but with the patient themselves and the caregiver... We are talking about patient care with a specific focus on outcomes achievement.”

**Exhibit 25 in the Technical Appendix displays measure rates by race and ethnicity categories.**





**Exhibit 15. Cumulative (2016-2021) Evidence of Larger Improvements in Unplanned Hospitalizations for Black versus White Non-Hispanic Beneficiaries and No Improvements for Hispanic Patients**



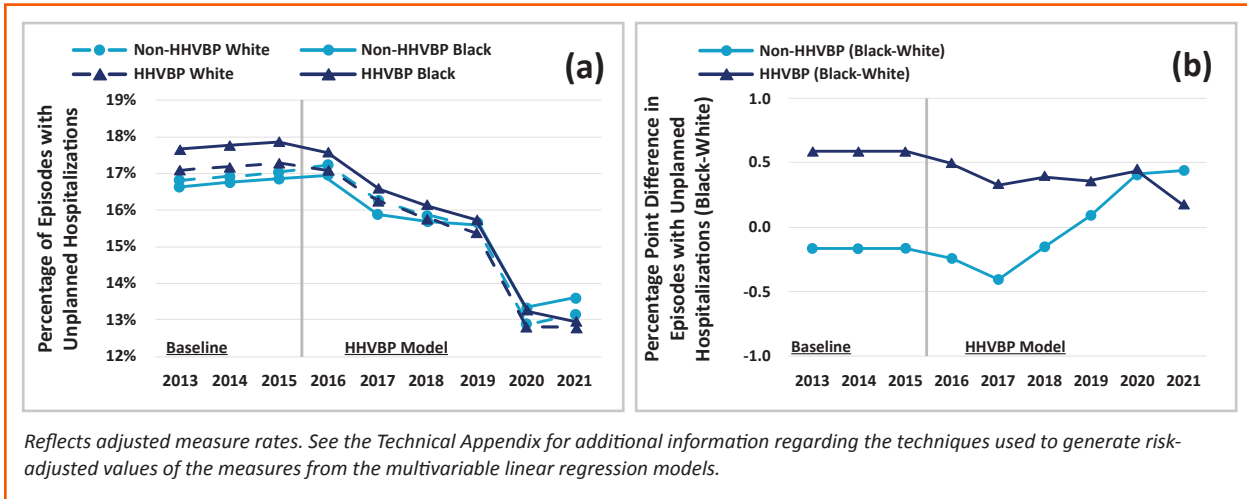
Similar to Exhibit 14 which helps interpret the relative trends for patients based on Medicaid coverage, Exhibit 16 shows the adjusted unplanned hospitalization rates from the D-in-D-in-D analyses to better understand the relative trends for White non-Hispanic vs. Black non-Hispanic patients we see in Exhibit 15. In particular, although we see a favorable impact of HHVBP on unplanned hospitalization rates for Black vs. White non-Hispanic patients, this finding is not due to the racial disparity narrowing over time in HHVBP states, but rather because of what appears to be an emerging racial disparity in non-HHVBP states (Exhibit 16):

- Unplanned hospitalizations declined during much of the HHVBP Model for both Black and White non-Hispanic beneficiaries in both HHVBP and comparison states (panel a).
- Rates remained higher for Black compared to White non-Hispanic beneficiaries and declined at similar rates during the post-HHVBP period (panel a).
- These trends translate to a relatively stable racial disparity in hospitalization rates in HHVBP states of approximately 0.5 percentage points and a trend towards an emerging racial disparity in non-HHVBP states (panel b).

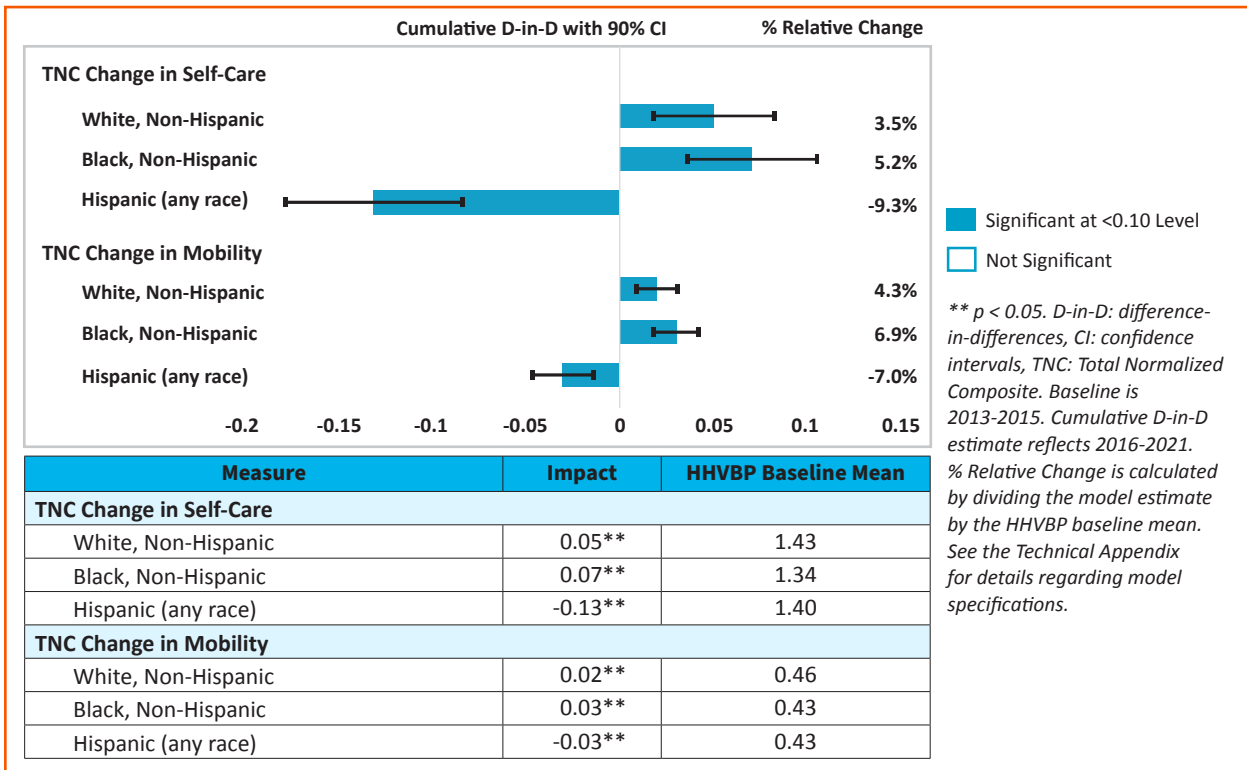
For the two TNC measures of changes in functioning, we observed larger increases in self-care and mobility for Black non-Hispanic patients compared to White non-Hispanic patients (Exhibit 17). Conversely, we observed a negative impact of HHVBP on these two measures for Hispanic patients. Our comparison of the D-in-D



**Exhibit 16. For Adjusted Unplanned Hospitalization Rates, there is a Decline among Both Black and White Non-Hispanic Beneficiaries (Panel a) and a Persisting Disparity in HHVBP States (Panel b), 2013-2021**



**Exhibit 17. Cumulative (2016-2021) Evidence of Larger Improvements in Self-Care and Mobility and Outcomes for Black versus White Non-Hispanic Beneficiaries and No Improvements for Hispanic Beneficiaries**





estimates across race and ethnicity groups for these two measures<sup>9</sup> mirror what we observed for unplanned hospitalizations: relative to outcomes for White non-Hispanic patients, HHVBP was associated with larger gains among Black non-Hispanic patients and smaller gains among Hispanic patients.

The original HHVBP Model was not designed explicitly to address health inequities and was also implemented in a context where there were existing disparities in outcomes such as unplanned hospitalizations and changes in functioning based both on Medicaid status and/or race and ethnicity. As the HHVBP Model is expanded nationally, evidence of persisting quality gaps based on Medicaid status as well as race and ethnicity under the original HHVBP Model suggests a need for more targeted initiatives to reduce these pre-existing inequities among home health patients and to align with CMS' Framework for Health Equity (CMS, 2022b).

### HHVBP Had Modest Unintended Impacts on Some Measures of Patient Experience

As part of the ongoing development of quality measurement and quality incentive programs, there have been growing efforts to incorporate patient perspectives on their care. The design of the original HHVBP Model reflects this initiative, with five of the 12 performance measures used to calculate the agency TPS reflecting patient experience based on the HHCAHPS survey; these five measures are also used to calculate CMS' Patient Survey Star Rating. Given the two motivating factors, we expected HHVBP to have a positive impact on patient experience of care.

The measure values remained relatively high (77 percent to 89 percent) throughout the baseline period (2013-2015) and model implementation for both HHVBP and non-HHVBP states; the values declined slightly (i.e., 0.2 to 1.2 percentage points) in both groups over time. We found no effect of HHVBP for the two global measures of patient experience with care — patients' ratings of overall care from the agency and likelihood of recommending the agency (Overall Care and Likely to Recommend, respectively, in Exhibit 18).

Many of the agencies in HHVBP states that we interviewed mentioned making changes to processes to improve HHCAHPS scores throughout the course of the model. We did not interview agencies in non-HHVBP states until 2022, but we can speculate that agencies in the 41 non-HHVBP states were similarly focused on improving their HHCAHPS scores, motivated by their Quality of Patient Care Star Rating that is derived from these measures and have been publicly reported on CMS' Compare site since July 2015. Similarly, in 2022 — when the original HHVBP Model had officially ended and CMS had announced national expansion of the model to begin in 2023 — agencies in both HHVBP and comparison states cited the model as bringing more attention to performance metrics that are also part of public reporting requirements, including the HHCAHPS-based measures (Arbor Research, 2023b). This response is also supported by our 2018 and 2022 agency survey findings where we found comparable proportions of agencies in HHVBP and non- HHVBP

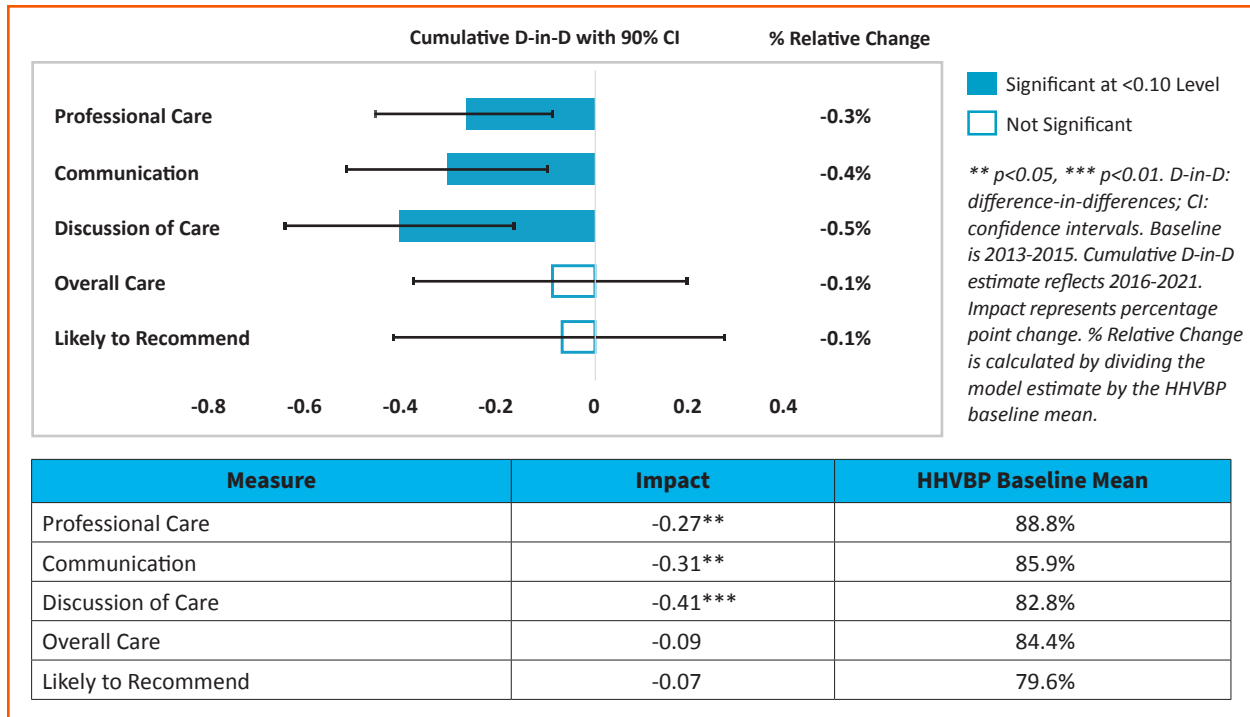
**Exhibit 26 in the Technical Appendix displays average annual measure rates for the patient experience measures.**



We started paying close attention to the HHCAHPS because they were part of the score. And previously, I can't say we did as much as we should have with the HHCAHPS.”



**Exhibit 18. HHVBP had a Cumulative (2016-2021) Modest, Negative, or No Impact on Home Health Patient Experience of Care**



states reporting similar quality improvement initiatives for HHCAHPS measures (Arbor Research, 2019 and 2023b). Agency chain affiliation is another contextual factor that can help interpret the null findings. Through interviews with chain-affiliated agencies and representatives from home health chain organizations, we learned that chains generally applied the same approach to quality improvement throughout the organization, regardless of whether the agency was in an HHVBP state. Although diffusion of quality improvements for HHCAHPS due to HHVBP positively affects home health patients, this potential HHVBP spillover effect through chains that operate in both HHVBP and non-HHVBP states could also dampen the model’s apparent effects.

For the three composite measures of patient experience — Professional Care, Communication, and Discussion of Care — we found that HHVBP had a negative effect, corresponding to a 0.3 percent to 0.5 percent relative decrease from baseline (Exhibit 18). Although unintended, these cumulative impact estimates correspond to a small relative decrease in baseline measure rates, which does not suggest a meaningful impact of HHVBP, especially when viewed in context of the relatively high measure values (e.g., 83 to 89 percent; Exhibit 18).

Broadly, we would not expect a meaningful negative impact of HHVBP on patient experience based on our findings from the agency interviews and surveys, as discussed above. The cumulative negative findings were driven largely by results from the last three years of the model (2019-2021) which also coincided with several important changes involving HHVBP and the broader health care environment. To better understand the minor but nevertheless unintended impacts, we considered how these changes could have impacted experience of care among home health patients.



For example, CMS' major changes to the TPS measure set and methodology in 2019 may have prompted agencies to focus more of their efforts on the other HHVBP measures (see text box). CMS did not require HHCAHPS surveys to be reported from October 2019 through June 2020 so agencies could instead allocate resources to patient care during the COVID-19 PHE and held the data constant on their Compare site instead of refreshing the data for each of the four 2021 quarterly refresh periods (CMS, 2020). We observed a decrease in the number of surveys completed per agency, but there was no noticeable change in the HHCAHPS-based measure values over time, and we observed similar trends in the percentage of home health episodes associated with COVID-19 diagnoses in HHVBP and non-HHVBP states (Arbor Research, 2023b).

### **Changes to the TPS in 2019 (HHS, 2018) included:**

- Three outcome and two process measures derived from OASIS dropped
- Two new OASIS-based composite measures added
- Large increase in weight applied to the two claims-based measures (12.5 percent to 35 percent)
- Minor decrease in weight applied to the HHCAHPS-based measures (31.25 percent to 30 percent)



## Medicare Spending for Home Health Patients

From its initiation in 2016, the original HHVBP Model incentivized enhanced quality care with increased efficiency, which could be achieved through reduced health care utilization that, in turn, would lead to a reduction in Medicare spending. To evaluate the impact of the model on spending, we examined CMS’ Medicare Part A and Part B spending for FFS beneficiaries receiving home health care in HHVBP states compared to non-HHVBP states from 2016 through 2021. Our primary measure of total Medicare spending for FFS beneficiaries receiving home health care encompasses two time periods: Medicare Part A and Part B expenditures that occurred (1) *during* the home health episode and (2) up to 30 days *following* the time period that patients are considered to be under the active care of a home health agency. Together, they allow us to capture Medicare spending both during and shortly after home health services are being provided, including spending associated with any hospitalizations, post-acute care, or other utilization occurring shortly after a home health episode ends.<sup>11</sup> To better understand the drivers of any changes in total Medicare FFS spending, we also examined several major components of spending:

- Home health
- Inpatient
- Outpatient Institutional
  - ED and observational stays
  - Other
- Skilled-nursing facility
- Hospice
- Part B Non-institutional

### HHVBP Slowed the Rate of Growth in Medicare Spending

While average Medicare spending for FFS beneficiaries using home health services has been increasing since the baseline period (2013-2015) in both HHVBP and non-HHVBP states, the increase was smaller in HHVBP states than non-HHVBP states during the model (Exhibit 19).<sup>12</sup>

Based on our cumulative D-in-D model, this slower increase in spending in HHVBP states translated to a \$2.63 reduction in average Medicare spending per day during and following home health episodes (Exhibit 20). This reduction in spending among FFS beneficiaries receiving home health services corresponded to a 1.9 percent decrease from average HHVBP spending in the baseline period (2013-2015).<sup>13</sup> This impact of HHVBP reflects a decrease in Medicare spending during the home health episode (rather than within the 30 days following the episode).<sup>14</sup>

<sup>11</sup> Additional details on measure specification, including how the introduction of PDGM in 2020 impacted the measure definition, is available in the Technical Appendix.

<sup>12</sup> The average number of days were similar between HHVBP and comparison states for both the baseline period and post-implementation periods as well as the pre-PDGM and post-PDGM periods (Arbor Research, 2023a).

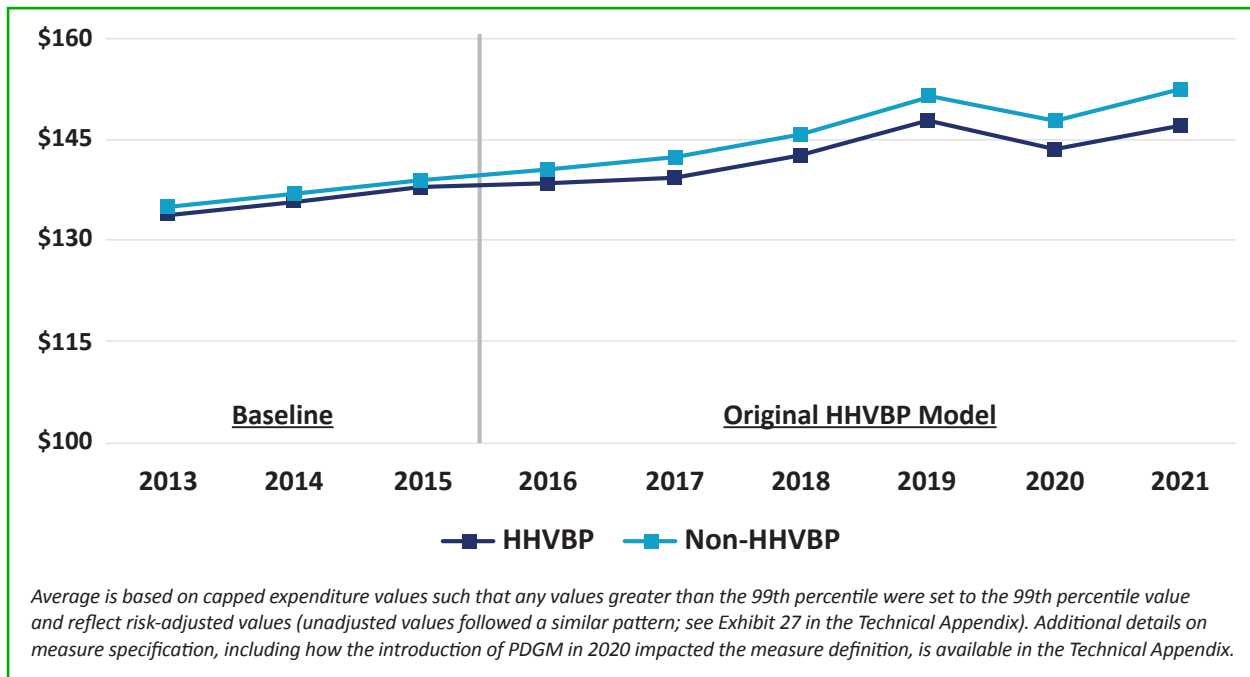
<sup>13</sup> The cumulative estimate is a weighted average of the yearly D-in-D estimates with 2016-2019 HHVBP impacts estimated from one regression model, and 2020-2021 impacts estimated from a separate regression model that incorporates the post-PDGM approach. See the Technical Appendix for more detail on measure definition.

<sup>14</sup> Cumulative impacts of Medicare spending during the home health episode vs. following the home health episode are available in Exhibit 28 in the Technical Appendix.





**Exhibit 19. Annual (2013-2021) Average Medicare Spending per Day for FFS Beneficiaries Receiving Home Health Services Increased at a Slower Rate in HHVBP States versus Non-HHVBP States during the Model**



### Slower Growth in Medicare Spending throughout HHVBP Model Largely Reflects HHVBP Impacts on Inpatient and Skilled Nursing Facility Spending

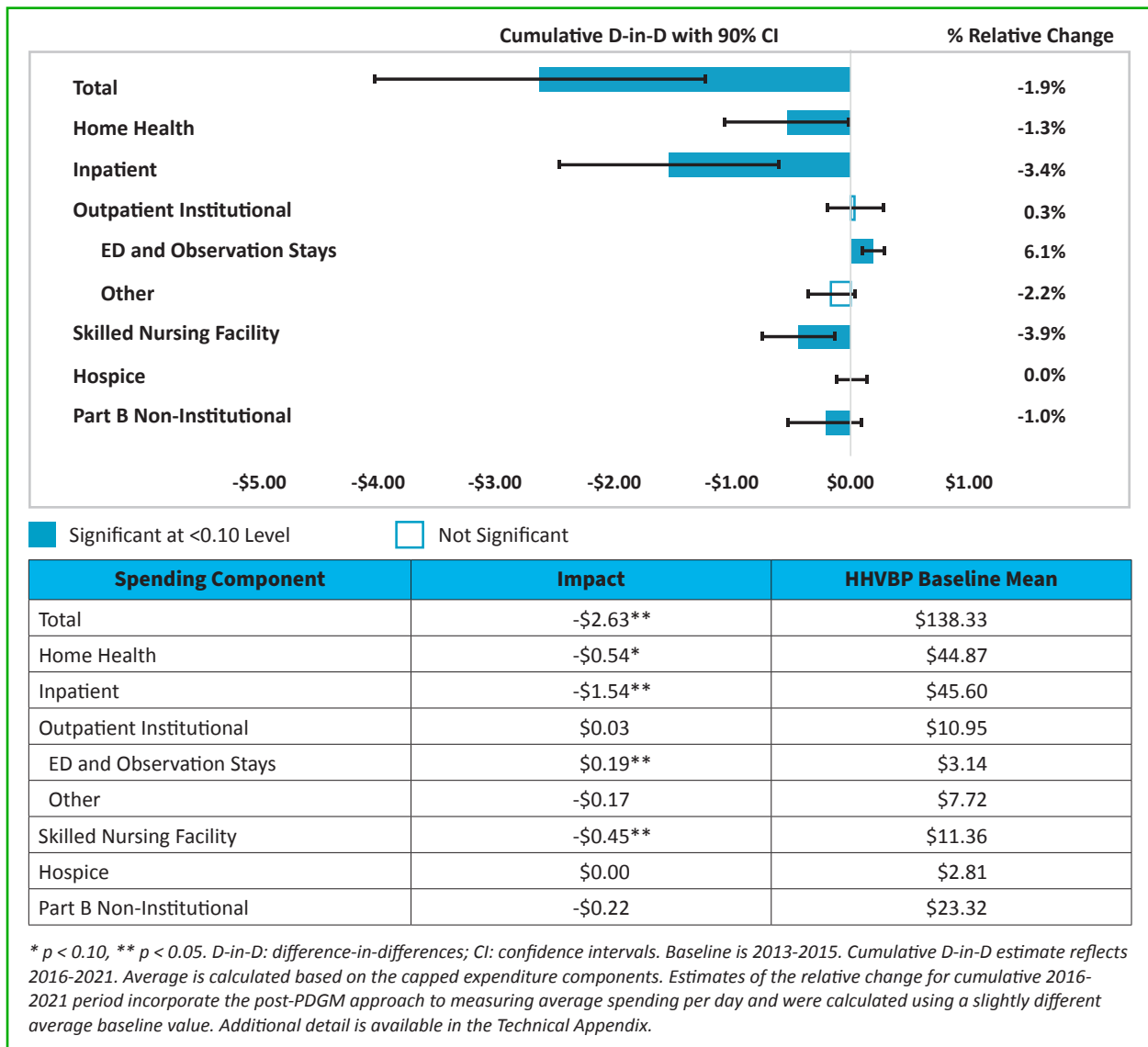
The distribution of components of Medicare Part A and Part B spending were largely similar for both HHVBP and non-HHVBP states. About one-third of total Medicare expenditures during and following home health episodes for FFS beneficiaries receiving home health care were for inpatient services, with another third for home health services. Part B non-institutional services, such as outpatient office visits and procedures, comprised around 17 percent of total spending, and the remaining components were all less than nine percent.

Throughout the HHVBP Model, impacts on spending for inpatient and SNF services were drivers of the overall reduction in average daily Medicare spending. The cumulative D-in-D estimates indicated that HHVBP led to a \$1.54 reduction in average daily spending for inpatient services, which corresponded to a 3.4 percent decline relative to baseline average measure values. For SNFs, we observed a \$0.45 reduction in average daily spending, translating to a 3.9 percent decline from baseline levels. In contrast, we found a small positive impact of HHVBP on outpatient ED and observation stay expenditures (\$0.19/day), which corresponds to a 6.1 percent increase compared to pre-HHVBP levels (Exhibit 20).

**Exhibit 29 in the Technical Appendix provides additional detail on each component's share of total Medicare spending for FFS home health patients.**



**Exhibit 20. Cumulative (2016-2021) Reductions in Average Medicare Spending per Day during and following FFS HH Episodes of Care in HHVBP States Were Driven by Inpatient, Skilled Nursing Facility Use, and Home Health**





These findings of HHVBP impacts on Medicare spending align with our findings of HHVBP impacts on the utilization of services presented in the previous chapter. Our findings of increased expenditures for outpatient ED visits and observation stays are also consistent with our observed increases in outpatient ED use, although in an unintended direction. Together, our findings of decreased use and spending for inpatient hospital services and increased use and spending for outpatient ED visits and observation stays imply that outpatient ED services were substituting for costlier inpatient hospitalizations. While the increase in spending for outpatient ED visits and observation stays slightly offsets the savings related to inpatient hospitalizations, this increase has a limited impact due to the relatively small share of overall spending for outpatient ED visits and observation stays.

HHVBP did not have an impact on other major components of Medicare spending except for home health spending, where, like inpatient and skilled nursing services, we observed a reduction under HHVBP. The cumulative average expenditures per day for home health services decreased by \$0.54, a 1.3 percent decline relative to average home health spending during the baseline period (Exhibit 20), although it was narrowly statistically significant ( $p=0.09$ ) and was driven by changes occurring only in the last two years of the model (2020 and 2021). In exploring whether this result may reflect salient events that were external to the model, we did not find evidence that this finding was explained by either the introduction of the PDGM in 2020 or by the COVID-19 PHE (Arbor Research, 2023b). Further, as we discuss in the next chapter, we did not find evidence of a change in overall home health use due to HHVBP. In sum, the mechanism(s) by which HHVBP would generate efficiencies in home health spending in only its last two years are not fully understood.

### Cumulative Savings to CMS of \$1.38 Billion Over the HHVBP Model Duration (2016-2021)

To gain a fuller understanding of how these average daily estimates translate to overall savings to Medicare, we multiplied the D-in-D estimate by the total number of eligible days in the HHVBP states.<sup>11</sup> The HHVBP Model led to a cumulative (2016-2021) reduction in total Medicare spending (during and within 30 days following home health episodes for FFS beneficiaries receiving home health care) of \$1.38 billion relative to spending that would have occurred in the absence of HHVBP. This estimate corresponds to an average annual reduction of \$230 million over the six years (Exhibit 21).

As discussed above, the overall savings occurring throughout the HHVBP Model were largely driven by reductions in spending for inpatient services (\$807.0 million cumulative savings) and SNF services (\$235.8 million cumulative savings). These cumulative estimates correspond to an estimated annual savings to Medicare of \$134 million for inpatient services and \$39 million for SNF services. Unlike in the early years of the model, home health services also contributed to total Medicare savings, with a cumulative savings estimate of \$283 million (average annual savings of \$47 million). The total Medicare savings attributable to HHVBP were offset slightly by the increase in Medicare spending for outpatient ED use and observation stays, with a cumulative (2016-2021) increase in spending of \$99.6 million and an average annual increase of \$17 million.

**Declines in inpatient hospital and SNF services and related spending suggest that HHVBP incentivized quality improvements that reduced the need for more resource-intensive forms of care.**



**Exhibit 21. Cumulative (2016-2021) HHVBP Impact Translates to \$1.38 Billion in Medicare Savings**

	Total	Inpatient	Outpatient ED and Observation Stays	Skilled Nursing Facility	Home Health
Cumulative	-\$1.38 billion**	-\$807.0 million**	\$99.6 million**	-\$235.8 million**	-\$283.0 million*
Average Annual	-\$230 million	-\$134 million	\$17 million	-\$39 million	-\$47 million
Cumulative D-in-D	-\$2.63**	-\$1.54**	\$0.19**	-\$0.45**	-\$0.54*
% Impact	-1.9%	-3.4%	6.1%	-3.9%	-1.3%

*\* p < 0.10, \*\* p < 0.05. Reflects total Medicare Parts A and B Spending among Home Health FFS Beneficiaries During and Following Home Health Episodes. Cumulative D-in-D reflects per day impact. Cumulative estimate is a weighted average of the yearly D-in-D estimates with 2016-2019 HHVBP impacts estimated from one regression model and 2020-2021 impact estimated from another regression model that reflects a post-PDGM approach to defining the spending measure. The percent impact reflects the estimated change in spending among HHVBP states relative to the comparison group; negative values reflect savings.*

Over the six years of the model, HHVBP led to increasingly larger reductions in Medicare spending for Medicare FFS beneficiaries receiving home health services (Arbor Research, 2023b). Our findings for certain utilization measures presented in the previous chapter suggest that the recent spending impacts may indeed reflect growing improvements associated with HHVBP. For instance, the larger declines observed in measures of unplanned hospitalizations in the most recent years could indicate that the original HHVBP Model has led to greater efficiency gains over time, specifically regarding the utilization of inpatient hospitalizations.



## No Evidence That the Original HHVBP Model Adversely Impacted Overall Access to Home Health Care

As an ongoing part of the evaluation, we considered whether the original HHVBP Model had implications for beneficiary access to home health care. There was potential for the model to affect access to care either negatively or positively. In seeking to meet or exceed quality performance standards under the model, which have financial implications for home health agencies, HHVBP may have had the unintended consequence of discouraging agencies from serving populations that they perceived as limiting their likelihood of success under the model. Alternatively, by establishing financial incentives for the delivery of higher quality care, there was potential for the model to improve beneficiary access to high quality home health care. Therefore, we assessed whether the HHVBP Model led to changes in the overall use of home health services among FFS beneficiaries and whether there was evidence of an adverse impact on beneficiary access to home health care.

### No Impact of Original HHVBP Model on Overall Utilization of Home Health Care by FFS Beneficiaries

CMS launched the original HHVBP Model in an environment where the number of home health agencies in operation and the utilization of home health services among Medicare FFS beneficiaries had been declining over time nationally. As one approach to assessing whether HHVBP may have affected beneficiary access to care, we examined whether HHVBP led to a change in the utilization of home health care among Medicare FFS beneficiaries.

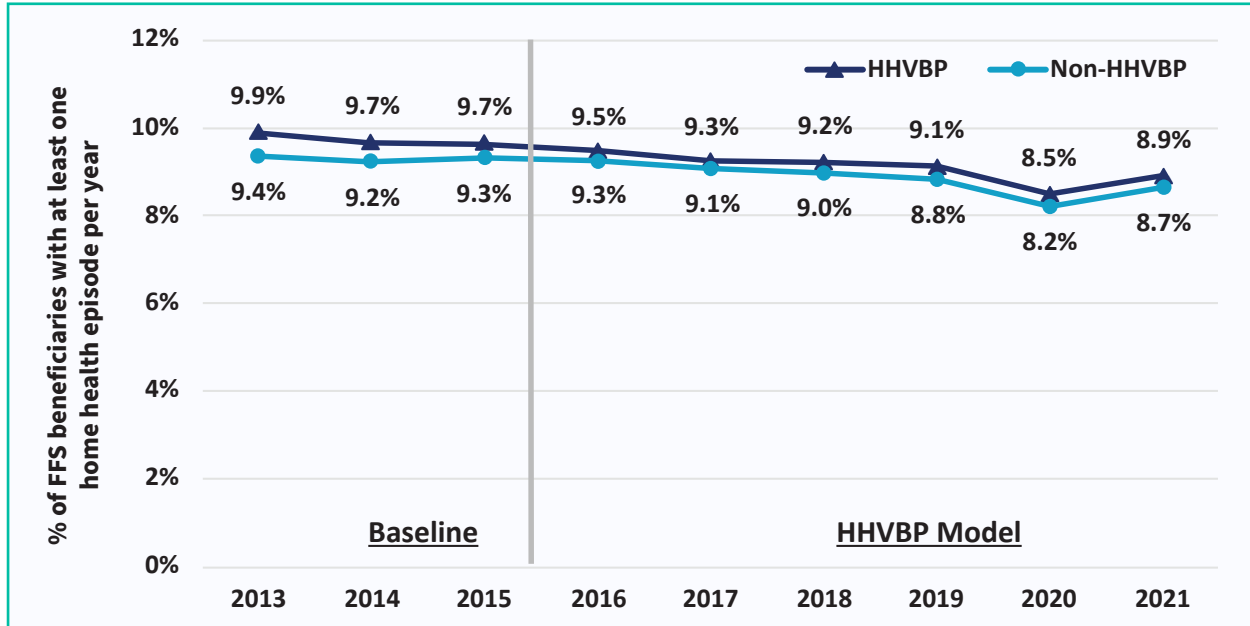
In both HHVBP and non-HHVBP states, just under 1 in 10 Medicare FFS beneficiaries received home health services sometime during the year (Exhibit 22). The percentage of the Medicare FFS population receiving home health services declined throughout much of the model implementation period (2016-2021) in both HHVBP and non-HHVBP states, which appeared to reflect a continuation of declines observed in earlier years. The steeper declines occurring in 2020 followed by increases in 2021 are likely due to effects of the COVID-19 PHE. We also observed similar ongoing declines in the average number of home health days of care per Medicare FFS beneficiary in both HHVBP and non-HHVBP states (Arbor Research, 2023b), which reflects a combination of the frequency and duration of home health episodes and represents another measure of home health utilization that is applicable both before and after the introduction of PDGM.<sup>15</sup>

**The use of home health services among FFS beneficiaries continued to decline over time in both HHVBP and non-HHVBP states, building on declines that pre-dated the HHVBP Model.**

<sup>15</sup> Given the introduction of the PDGM in 2020—which changed the length of home health episodes from 60 days to 30 days under the Medicare home health PPS—we used a measure of the average number of home health days per FFS beneficiary as a measure of the volume of home health services that was comparable in both pre- and post-PDGM years.



**Exhibit 22. Slight Decline in Home Health Utilization Among Medicare FFS Beneficiaries in Both HHVBP and Non-HHVBP States, 2013-2021**



We also found no evidence of an impact of HHVBP on utilization of home health services based on D-in-D analyses that included adjustments for several FFS beneficiary characteristics and geographic factors.<sup>16</sup> These analyses did not indicate a statistically significant difference in the changes over time between HHVBP and non-HHVBP states in either the percentage of FFS beneficiaries using home health services during the year or in the number of days of home health care during the year (Exhibit 23).

When looking at individual HHVBP states, trends in home health utilization were generally similar to their regional comparison groups, and we found no evidence of an effect of HHVBP on home health utilization in most individual states based on adjusted D-in-D analyses.<sup>17</sup>

We also considered whether there may have been a different impact in rural areas. Beneficiaries living in rural areas may face greater barriers in access to home health care and may therefore be more vulnerable to any unintended impacts of HHVBP in further limiting access to care. While FFS beneficiaries living in rural counties were less likely to use home health services (e.g., 6.9 percent of beneficiaries in rural areas vs. 10.7 percent of beneficiaries in urban areas in HHVBP states in 2013), there was a similar decline over time in the percentage of rural beneficiaries using home health services in both groups.<sup>18</sup>

<sup>16</sup> See the Technical Appendix for covariates included in the regression model.

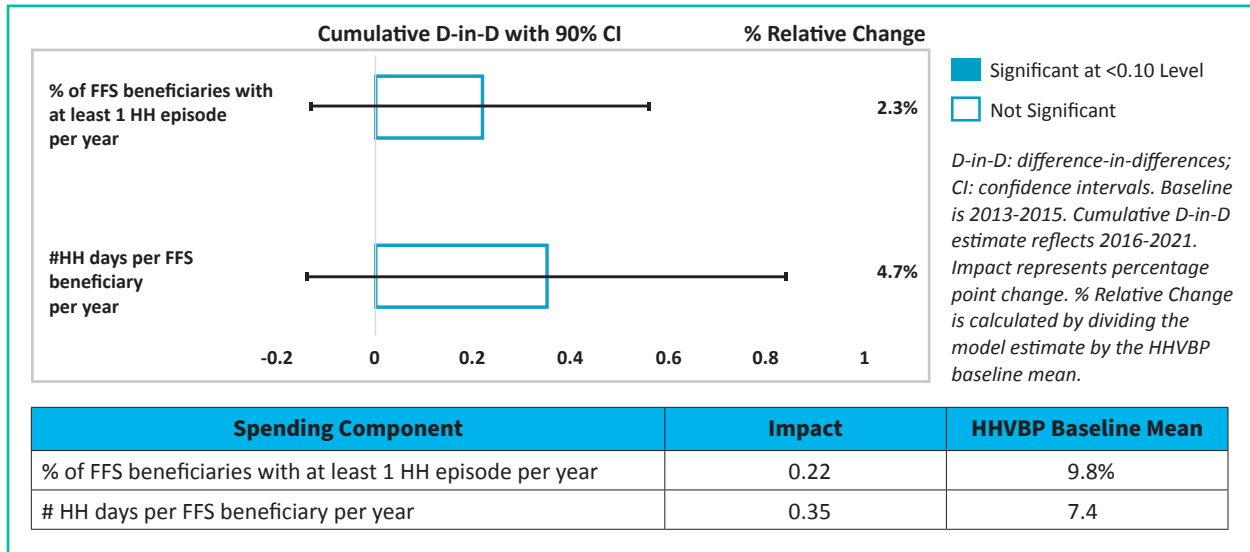
<sup>17</sup> The exceptions included Iowa, Nebraska, and Tennessee, where there was evidence of a relative increase in home health utilization compared with their regional groupings (Arbor Research, 2023b).

<sup>18</sup> Details regarding this analysis and other analyses of beneficiaries in rural and urban areas are available in Sections 3.3 and 3.4 of the Fourth Annual Report (Arbor Research, 2021).





**Exhibit 23. Difference-in-Differences Analyses Reveal No Cumulative (2016-2021) Impact of HHVBP on Home Health Utilization Among FFS Beneficiaries**



**Analyses of Beneficiary Case-Mix Do Not Suggest that the Original HHVBP Model Led Home Health Agencies to Avoid Patients with Greater Clinical Severity**

In a context where home health agencies in HHVBP states face financial incentives to improve patient outcomes, there is a risk that some agencies may employ a strategy of admitting patients with a more favorable case-mix. For example, a shift towards caring for patients who have a lower likelihood of being hospitalized or a higher likelihood of improving their level of functioning might enable agencies to achieve a higher TPS. Such patient selection would be contrary to the intended impacts of HHVBP if this behavior reduced access to home health care for some patients, especially those who may be in most need of care.

During interviews that we conducted with agency staff throughout the evaluation, some agencies acknowledged concerns about the implications of admitting patients perceived as higher-risk patients under the model. To test whether HHVBP may have affected agencies' acceptance of patients based on their risk for health complications, we conducted analyses of the case-mix of beneficiaries using home health services, which we summarize below.



We all look at our patients before we accept them, and these kind of weight factors put us in a difficult position [for] a patient who has a history of non-compliance or a history of high utilization of the hospital. You could get to the point where home health agencies maybe don't want to take the patient on. ”

— Response of home health agency operating in an HHVBP state in light of increased weighting of the unplanned hospitalization measure in the TPS calculation that began in 2019



### **No Impact of HHVBP on Use of Home Health Services among FFS Beneficiaries at Risk of Limited Improvement in Functioning**

A potential unintended consequence of HHVBP is that it may lead agencies to be reluctant to admit patients who may not be expected to improve their functional status, and consequently make it more difficult for agencies to achieve a higher TPS. The risk adjustment methodology for the two OASIS-based TNC change measures was designed to account for instances where the goal of home health care is to maintain the patient's current condition or prevent or slow further deterioration (HHS, 2021). However, it remains an empirical question whether the risk adjustment of these HHVBP measures adequately mitigates incentives that agencies may face to avoid patients who are unlikely to improve.

To consider this possibility, we examined trends in the percentage of FFS beneficiaries with at least one home health episode during the year based on whether they had conditions that we found to be associated with limited improvement in functional status. We used all diagnoses found in Part B professional carrier, inpatient, and outpatient claims to identify HCCs that are associated with lower average baseline TNC change in self-care and change in mobility measure values.

We found that the percentage of at-risk beneficiaries who had at least one home health episode in a year remained approximately constant at 28 and 26 percent in HHVBP and non-HHVBP states, respectively, during 2013 to 2021. Further, a D-in-D-in-D analysis did not indicate an impact of the HHVBP Model on the probability of home health care use within either the at-risk or not at-risk beneficiary subgroups (Arbor Research, 2023b).

### **No Impact of HHVBP on Three of Four Measures of the Case-mix of Beneficiaries Using Home Health Services**

To further understand how HHVBP may affect agencies' acceptance of patients based on their risk for health complications, we examined four measures of the case-mix of home health patients:

1. HCC risk score during the year prior to the start of the earliest episode in a sequence — which we refer to as “HCC risk score at the start of care” — based on Medicare claims.
2. A composite measure of mobility at the start of care, which includes OASIS information about ambulation/locomotion, toilet transferring, and bed transferring. This is the start of care measure used in the TNC change in mobility measure.
3. A composite measure of self-care at the start of care, which includes OASIS information about ability to groom, to dress upper and lower body, bathing, toileting hygiene, and eating. This is the start of care measure used in the TNC change in self-care measure.
4. The count of HCC conditions present at the start of care, using primary and secondary diagnosis codes reported in OASIS.

Analyses of all four case-mix measures showed increasing overall clinical severity among home health patients between the baseline and post-HHVBP periods.<sup>19</sup> For three of the four measures (measures 1-3 above), D-in-D analyses indicated that these changes over time were similar in HHVBP and non-HHVBP states. For the fourth

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<sup>19</sup> For each case-mix measure, we also conducted D-in-D analyses that included adjustments for a variety of factors including agency-level and county-level characteristics, state fixed effects, and state-specific linear trends. See the Technical Appendix for additional detail.



measure, HCC risk score at the start of care, D-in-D analyses indicated relatively slower growth in patient severity based on HCC risk score in HHVBP states relative to non-HHVBP states (Arbor Research, 2023b). Overall, the results of these analyses do not suggest a strong response to the model among home health agencies in HHVBP states to select patients based on their case-mix. Despite the concerns raised by some agencies that there would be an increase in “cherry-picking” or in targeting lower-risk patients for home health care by other agencies, it does not appear that this became a substantially more pervasive practice under HHVBP.

**We do not find strong evidence of a widespread agency response to select patients for home health care based on their case-mix.**



### **No Evidence of Overall Change in Existing Racial and Ethnic Inequities in the Use of Lower Quality Agencies Under the Original HHVBP Model**

While the original HHVBP Model was intended to improve home health quality overall, there was also a risk that it could contribute to inequities in beneficiary access to higher quality home health care. For example, if HHVBP led to smaller gains in quality among agencies serving historically underserved or disadvantaged populations, it could potentially be a source of growing inequities in access to higher quality care and, in turn, growing inequities in patient outcomes.

To investigate whether HHVBP affected racial and ethnic differences in utilization of lower quality home health agencies, we examined beneficiary use of agencies with a lower Quality of Patient Care Star Rating (i.e., a Star Rating of 3 or below). We used logistic regressions to estimate odds ratios of utilizing lower quality agencies among racial and ethnic minority subgroups relative to their White counterparts, separately for HHVBP and non-HHVBP states and during pre-HHVBP and post-HHVBP periods.

For all analyses (e.g., Models 1 and 2), we included adjustments for dual eligibility status, age, sex, rurality, HCC score, Health and Human Services (HHS) region<sup>20</sup>, the Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (CDC, 2020), and the Racial Dissimilarity Index (U.S. Census Bureau, 2022)<sup>21</sup> associated with the county in which home health care was delivered. To understand whether racial and ethnic minority groups may be more likely to use lower quality home health agencies because they disproportionately reside in areas where higher quality agencies are scarce, in Model 2 we also adjusted for whether higher quality agencies served beneficiaries in the county.

Overall, there was a pattern of racial and ethnic inequities in the use of lower quality agencies that persisted under the original HHVBP Model, with racial and ethnic minority beneficiaries generally having higher odds of using



We don't pick and choose our referrals like a lot of agencies do because they want to stay out of the ones that are high acuity and going to affect their bottom line with the outcomes. We're sticking to providing home health, no matter what the cost is going to be.”

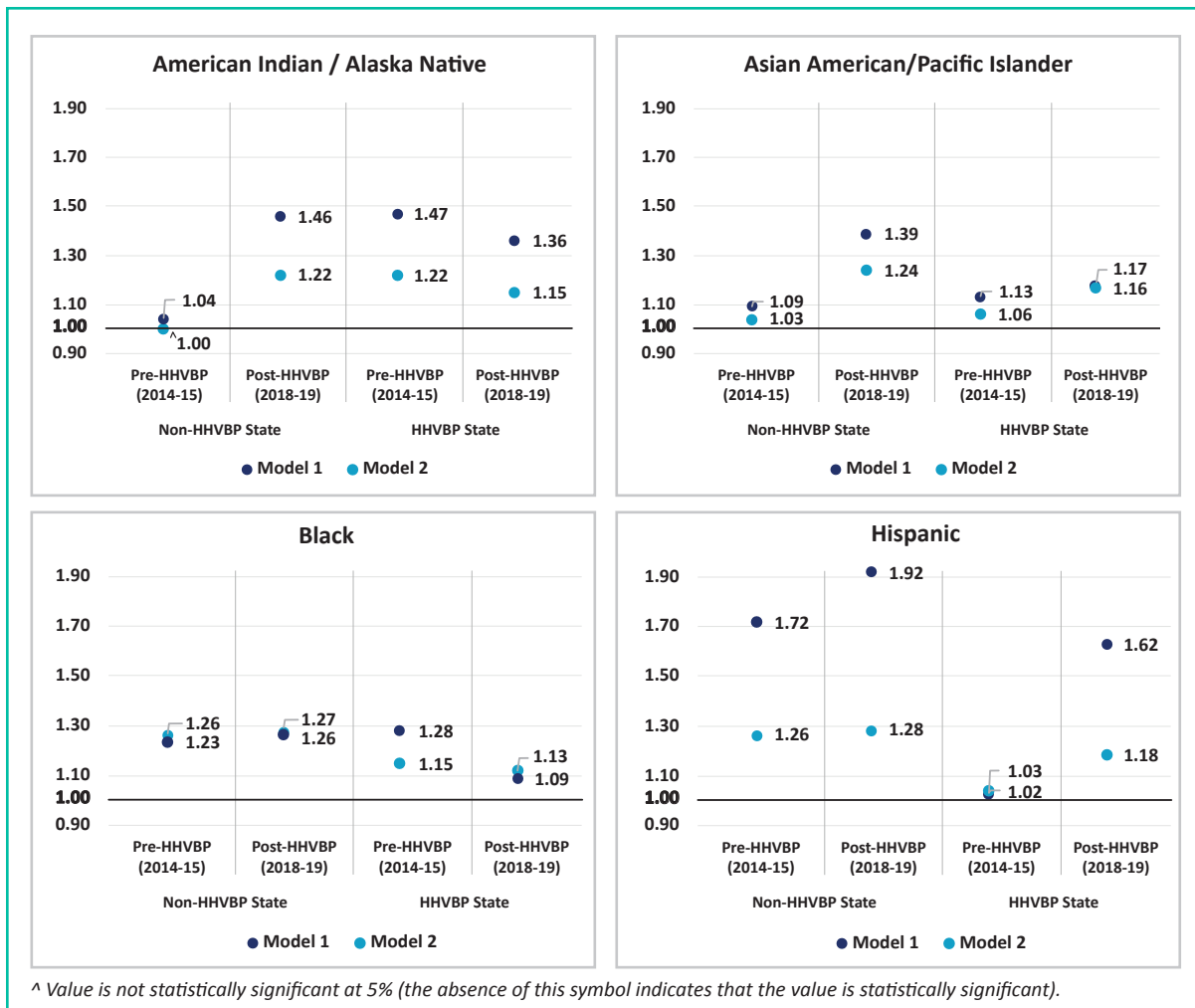
<sup>20</sup> There are 10 HHS regions that directly serve select states for that region to better address the needs of communities served through HHS programs, including HHVBP.

<sup>21</sup> The Racial Dissimilarity Index measures the percentage of the non-Hispanic White population in a county which would have to change census tracts to equalize the racial distribution between White and non-White population groups across a county.



lower quality agencies than White beneficiaries, in both non-HHVBP and HHVBP states. For example, compared to White beneficiaries, Black beneficiaries had higher odds of using an agency with a lower Star Rating, in both non-HHVBP and HHVBP states (23-26 percent higher odds in non-HHVBP states and 9-28 percent higher odds in HHVBP states; Exhibit 24, Model 1). While there are exceptions, patterns were generally similar for other racial and ethnic minority beneficiaries relative to White beneficiaries (Exhibit 24).

**Exhibit 24. Compared to 2014-2015, Odds Ratios of Using Lower Quality Agencies (as Measured by Quality of Patient Care Star Ratings) in 2018-2019 Were Higher among Racial and Ethnic Minority Beneficiaries Relative to White Beneficiaries; these Patterns were Attenuated but Mostly Unchanged after Adjusting for the Presence of Higher Quality Agencies Serving the County**





When also adjusting for whether higher quality home health agencies served beneficiaries in the county (Exhibit 24, Model 2), we generally observed similar patterns by race and ethnicity, although the differences were often attenuated (i.e., odds ratios closer to 1.00). These results suggest that differences in the availability of higher quality agencies appear to partly explain racial and ethnic inequities in the use of lower quality agencies. However, we did not find a pattern of these racial and ethnic inequities changing over time in HHVBP states relative to non-HHVBP states (Exhibit 24). Findings were similar when we used selected HHVBP performance measures to identify lower quality agencies.<sup>22</sup> These analyses do not provide evidence of an overall impact of the original HHVBP Model on racial and ethnic inequities in the use of lower quality agencies and suggest a need for more targeted initiatives to reduce these inequities.

**The greater use of lower quality agencies by racial and ethnic minorities— which predated HHVBP— appeared to be partly due to differences in the availability of higher quality agencies serving the beneficiary’s county.**

### **Case Studies of Five Counties Do Not Point to One Factor in Particular that May Mitigate Racial and Ethnic Inequities in the Use of Higher Quality Agencies across Communities**

In the above analyses, we found that racial and ethnic minority home health patients were more likely to use lower quality agencies both before and after implementation of the HHVBP Model, even when higher quality agencies were available in the area. In a related analysis of racial and ethnic inequities in the use of lower quality agencies at the county level, we found no change in the overall pattern of inequities among counties in HHVBP and non-HHVBP states under the model, and evidence that these inequities were not uniform across counties (Arbor Research, 2023b). For example, these access inequities narrowed over time in some counties, and access to higher quality agencies was persistently favorable for racial and ethnic minority patients in other counties, relative to their White counterparts.

To improve our understanding of the observed variation in access inequities and of factors that may mitigate these inequities, we conducted case studies of local communities where racial and ethnic minority patients experienced equitable use of higher quality agencies relative to other communities. We aimed to highlight any community, market, home health agency, or other characteristics that may have played a role in mitigating these inequities. We selected four counties in HHVBP and non-HHVBP states where access inequities narrowed over time or were not present, and one county in an HHVBP state where inequities were persistent. For each of these counties, the evaluation team conducted a detailed assessment through environmental scanning, data analysis, and home health agency interviews in early 2023.

Based on the data that were collected and analyzed for these case studies, no single factor emerged to explain why certain counties performed well with regard to both quality (based on Star Ratings and other metrics) and equity. However, two characteristics were consistently present in the four higher performing counties, and far less so in the lower performing comparison county:

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<sup>22</sup> We performed similar analyses using three HHVBP measures to identify lower quality agencies, based on: (1) agencies in the top tercile of risk-adjusted unplanned hospitalization rates for the calendar year; (2) agencies in the top tercile of outpatient emergency department rates for the calendar year; and (3) agencies in the bottom tercile of the HHCAHPS-based Overall Care measure for the calendar year. Results are in Exhibits B-79 – B-84 of the HHVBP Sixth Annual Report Appendix (Arbor Research, 2023a).



- A “critical mass” (of approximately one-quarter or more) of home health agencies with Quality of Patient Care Star Ratings of 4 or more served the county. In contrast, only 1 in 10 agencies serving the lower performing county had a Star Rating of 4 or more. This pattern suggests a possible threshold effect, such that shares of higher quality agencies beyond a certain “threshold” (e.g., a quarter or more of agencies serving a county) can start to yield impacts on access or protect against access inequities to higher quality agencies;
- A primarily urban (approximately 90% urban and 10% rural) geographic landscape. In contrast, the lower performing county was approximately 20% rural, twice as rural as the higher performing counties; it also happened to be the largest county by area in its state.

There were otherwise no consistent, observable, differences between higher and lower performing counties in the other characteristics assessed, including overall population health (relative to the state or nation), distributions of racial and ethnic groups, Medicare Advantage penetration, rates of uninsured residents, dominance (or lack thereof) in the county by a health care system, or shares of Medicare FFS home health episodes affiliated with chain or for-profit agencies. The findings from these case studies do not point to any single common factor that clearly mitigates racial and ethnic inequities in access to quality home health care across counties. Further details regarding our methods and findings from each of the five counties that we studied are provided in the Case Study Appendix.



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