Quality Incentive Payment Program (QIPP) Evaluation

Final Evaluation for QIPP SFY 2022

(Year 5)

January 30, 2024

Texas External Quality Review Organization

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Abbreviations

CY	Calendar Year
CDC	Centers for Disease Control and Prevention
CHOW	change of ownership
CMS	Centers for Medicare and Medicaid Services
COVID-19	coronavirus disease of 2019
DID	Difference-in-differences methodology
EQRO	External Quality Review Organization
EQ	evaluation question
FPN	Federal Provider Number
HHSC	(Texas) Health and Human Services Commission
HP	hypothesis
ID	identification number
MDS	Minimum Data Set
N	population size
NF	nursing facility
NPI	National Provider Identifier
NSGO	Non-state government owned nursing facility
Pandemic	The COVID-19 pandemic that affected Texas during 2020
PIP	performance improvement project
PO	privately-owned nursing facility
PPE	personal protective equipment
PT	physical therapist
Q	quarter
QAPI	quality assurance/performance improvement
QIPP	Quality Incentive Payment Program
RN	registered nurse
SD	standard deviation
SFY	(Texas) state fiscal year
UTI	urinary tract infection
YR	Year of QIPP program

Executive Summary

This document presents the final evaluation results for the fifth year (YR5) of the Quality Incentive Payment Program (QIPP), State Fiscal Year 2022 (SFY 2022), updating the previous SFY2022 interim evaluation report. For this evaluation, the Texas Health and Human Services Commission (HHSC) defined the following three evaluation questions (EQs) and four specific hypotheses (HPs) and corresponding evaluation measures and procedures.

Evaluation Questions, Hypotheses, Measures, and Key Findings

Key conclusions of the QIPP SFY 2022 final evaluation immediately follow each measure.

Evaluation Question 1. Does QIPP keep patients free from harm?

- Hypothesis 1.1. QIPP will reduce the rate of avoidable complications or adverse healthcare events

  To evaluate QIPP's progress according to HP 1.1, HHSC identified the following four measures, based on data from the Centers for Medicaid and Medicare Services (CMS), Nursing Home Compare website, Minimum Data Set and Claims Data:

1.1.1 Percent of High-Risk Long-Stay Residents with Pressure Ulcers, Including Unstageable Pressure Ulcers.

Key findings: For privately-owned nursing facilities (POs), regression analyses comparing annual cohorts of QIPP-enrolled nursing facilities (NFs) to NFs that never enrolled in QIPP showed that NFs that never participated in QIPP had higher pressure ulcer rates in YR5 (October 2021-September 2022) compared to POs enrolled in QIPP since the first program year (YR1). Similarly, for Non-State Government Owned nursing facilities (NSGOs), regression analyses showed that NSGOs that never enrolled in QIPP had a higher proportion of residents with pressure ulcers than NFs enrolled in QIPP.

1.1.2. Percent of Long-Stay Residents who Received an Antipsychotic Medication.

Key findings: For both POs and NSGOs, regression analyses showed that proportions of residents who received antipsychotic medication in YR5 (October 2021-September 2022) was not statistically significantly different between NFs that never enrolled in QIPP and NSGOs enrolled since 2018.

1.1.3. Percent of Long-Stay Residents whose Ability to Move Independently Worsened.

Key findings:
For both POs and NSGOs, regression analyses showed that the NFs that never participated in QIPP had statistically significantly higher proportions of residents whose ability to move independently worsened in SFY 2022 (September 2021-August 2022) compared to POs that had enrolled since the first program year.

1.1.4. Percent of Long-Stay Residents with a Urinary Tract Infection.

Key findings: For POs, regression analyses comparing NF annual QIPP enrollment cohorts showed that enrollment in QIPP since the first program year was associated with statistically significantly lower rates of residents with a urinary tract infection (UTI) compared to POs that never enrolled in QIPP. NSGOs never enrolled did not present significantly different UTI rates compared to NSGOs enrolled since 2018.

- Hypothesis 1.2. QIPP will reduce rate of avoidable hospitalizations for NF residents

  To evaluate QIPP's progress according to Hypothesis 1.2, HHSC identified the following measure:

  1.2.1. Number of Hospitalizations per 1,000 Long-Stay Nursing Home Resident Days

  Key findings: For both POs and NSGOs, regression analyses suggested that NFs never enrolled in QIPP did not present statistically significantly different rates of hospitalization in YR5 compared to NFs that participated in QIPP since year one.

Evaluation Question 2. Does QIPP promote effective practices for people with chronic, complex, and serious conditions?

- Hypothesis 2.1. QIPP will reduce rate of avoidable hospital and emergency department visits for individuals with medical complexity

  To evaluate HP 2.1, HHSC selected the following measures:

  2.1.1 Percent of Long-Stay Residents Assessed and Appropriately Given the Pneumococcal Vaccine

  Key findings: For privately-owned nursing facilities (POs), regression analyses showed that NFs never enrolled in QIPP had significantly lower rates of pneumococcal vaccination compared to POs continuously enrolled in QIPP since YR1. For NSGOs, we found the similar result that QIPP participation since YR1 was statistically significantly associated with higher pneumococcal vaccination rates, compared to NFs that had never enrolled.

  2.1.2 Percent of Long-Stay Residents Assessed and Appropriately Given the Seasonal Influenza Vaccine

  Key findings: For both POs and NSGOs, regression analyses showed that facilities that were never enrolled in QIPP had statistically significantly lower rates of influenza vaccinations than NFs enrolled in QIPP since the first program year.

Evaluation Question 3. Does QIPP attract and retain high-performing Medicaid providers?

- Hypothesis 3.1. QIPP will encourage providers to actively monitor patient outcomes and perspectives to address their needs and improve healthcare delivery

  To evaluate HP 3.1, HHSC established that the relevant metrics of success consist of complying with or attesting to the following items 3.1.1-3.1.6. Metrics 3.1.1, 3.1.3, 3.1.4, and 3.1.5 applied only to NSGOs. For each metric, HHSC verified and reported compliance/attestation with either month- or quarter (Q)-specific frequency.

  For NSGOs only:

  3.1.1 Submission of a PIP on a Long-stay MDS Measure

  3.1.3 Submission of documentation demonstrating evidence-based antibiotic stewardship elements

  3.1.4 Submission of documentation of infection control policies demonstrating data-driven analysis of NF performance and evidence-based methodologies for intervention

3.1.5 Evidence of completion of CMS and CDC's 'Nursing Home Infection Preventionist Training Course' by Nursing Facility Administrator (NFA) and Director of Nursing (DON) (Q2)

For all NF ownership types:

3.1.2 Submission of a Workforce development focused Performance Improvement Projects (PIP)

3.1.6 Self-reported direct-care Registered Nurse (RN) staffing hours

A series of regression analyses estimated if meeting all incentive payment components listed in Evaluation Question 3 was associated with higher performance in terms of the health outcomes that HHSC selected to evaluate HP 1.1 and HP 1.2 in SFY 2022, compared to facilities that did not comply with all the metrics.

Key findings: Among NSGOs, the proportion of NFs that met all EQ3 incentive components was 84 percent in quarter one (Q1), 77 percent in Q2, 84 percent in Q3 and 42 percent in Q4. Among POs, 79 percent met all the eligible components in Q1, 78 percent in Q2, 78 percent in Q3, and 78 percent in Q4. For both POs and NSGOs, meeting all incentive components for which a nursing facility was eligible resulted in higher performance for all HP 1.1 measures. NFs that met all their eligible components had a significantly lower proportion of residents with pressure ulcers, who received antipsychotic medications, whose ability to move independently worsened, and who had a UTI during QIPP YR5. For NSGOs only, meeting EQ3 metrics was also associated in a statistically significant way with a smaller number of hospitalizations (HP 1.2).

Inspection of feasibility for causal inference analysis

The EQRO also examined the feasibility of performing a causal inference analysis to determine whether QIPP participation improved outcomes. Causal inferences are stronger than the statistical associations reported in these interim analyses because they imply that participation in QIPP *caused* a certain difference in performance rather than just that participation is *associated* with a different in performance.

Key findings: Our analyses concluded that causal inferences based on a difference-in-differences (DID) approach would be feasible for the following outcomes measures: 1.1.2 (antipsychotic medication), 1.1.4 (UTI), and 2.1.1 (pneumococcal vaccination with appropriate assessment). These variables had a consistent definition and data collection methodology between 2015 and 2022 and displayed relatively parallel trends between enrolled and non-enrolled nursing facilities before the QIPP program started. These are necessary conditions for a DID approach. While the QIPP evaluation plans that HHSC wrote and CMS approved for QIPP YR5 and YR6 did not include a causal inferential approach, future plans for the evaluation of QIPP should consider the implementation of causal inference with a DID analysis upon feasibility. The "difference-in-differences" causal inference methodology will rely on data starting before the introduction of the QIPP program. It will not be feasible to include measures that change definition and measurement methodology over the years, such as a) 1.1.1 pressure ulcers, b) 1.2.1, hospitalizations, and c) 2.1.2, influenza vaccinations.

Introduction and Background

In State Fiscal Year (SFY) 2018, the Texas Health and Human Services Commission (HHSC) introduced a performance-based Quality Incentive Payment Program (QIPP) for nursing facilities (NFs), under federal regulatory authority 42 Code of Federal Regulations Section 438.6(c). Based on the SFY2022 Preprint, QIPP is committed to advancing Quality Strategy Goals and Objectives identified in response to Question (Q) 42, which HHSC articulated in three evaluation questions and hypotheses in response to preprint Q44a and b, in the Attachment I document (SFY2022 Preprint). The objective of the QIPP program is to incentivize nursing facilities to enhance quality of care by providing reward payments if they meet or exceed established performance targets for metrics in structure, process, and health outcome improvements. QIPP's aim reflects HHSC's overarching goal of promoting effective health care practices for beneficiaries with chronic, complex, and serious conditions, and promoting patient safety.

Every QIPP program year, HHSC defines the criteria for performance achievement and the incentive payment arrangement. These rely on (a) nursing facility data from the Centers for Medicare and Medicaid Services' (CMS) validated Minimum Data Set (MDS) Long-Stay Quality Measures, (b) nursing facilities' self-reported data on direct-care staffing hours, (c) attestation or submission of compliant documentation demonstrating use of evidence-based Quality Assurance Performance Improvement (QAPI) practices and the development of Performance Improvement Projects (PIPs) to monitor patient outcomes and improve healthcare delivery and workforce development, and (d) attestation or submission of compliant documentation demonstrating use of an evidence-based infection control program and improved outcomes in vaccination rates and antibiotic stewardship. Success and payment assessment criteria range from attestation and submission of appropriate documentation to meeting or exceeding program-wide and facility-specific performance targets on quality metrics.

In SFY 2022 (or "Year 5", or YR5, henceforth), QIPP included four performance components with specific metrics and eligibility rules open to different classes of nursing facilities, depending on their ownership type. HHSC distinguished two classes of nursing facility providers in Texas: (1) a Non-State Government Owned (NSGO) NF - a network nursing facility where a non-state governmental entity located in the state of Texas holds the license and is a party to the NF's Medicaid provider enrollment agreement with the state and (2) a Privately Owned (PO) NF - a network nursing facility not owned by a governmental entity which is located in the state of Texas, and holds a license. In SFY 2022, eligibility for QIPP was open to all NSGOs and to POs with a Medicaid utilization rate of 65 percent.

Table 1 summarizes YR5 QIPP components, indicating the corresponding eligible NF type, performance measures, frequency of performance payment, data source for performance monitoring, and criteria to assess target achievement.

Table 1. QIPP Program Incentive Components in SFY 2022 (Year 5)

Eligible Provider	Target Measure	Payment Frequency	Data source	Target Assessment Criteria
Component one: Holding a QAPI Meeting each month and submitting a meeting attestation and data demonstrating a NF-specific performance improvement project (PIP) based on a Long-Stay Minimum Data Set (MDS) quality measure of relevance to the NF				

Eligible Provider	Target Measure	Payment Frequency	Data source	Target Assessment Criteria
NSGO	Hold a QAPI meeting every month and submit PIP report and data	Monthly	NF records and reports	Attestation (submission sufficient)
Component two: Performance incentive payment based on achievement of quality metrics focused on workforce development				
All	Metric 1: NF maintains four additional hours of registered nurse (RN) staffing coverage per day, beyond the CMS mandate.	Monthly	NF staffing reports and self-attestation to exceeding CMS staffing mandate	Reported RN staffing per day ≥ CMS mandate plus 4 hours (12 total) on at least 90 percent of the days within reporting period
All	Metric 2: NF maintains eight additional hours of RN staffing coverage per day, beyond the CMS mandate.	Monthly	NF staffing reports and self-attestation to exceeding CMS staffing mandate	Reported RN staffing per day ≥ CMS mandate plus 8 hours (16 total) on at least 90 percent of the days within reporting period
All	Metric 3: NF has a workforce development program in the form of a PIP that includes a self-directed plan and monitoring outcomes.	Monthly	NF PIP portfolio	Attestation (submission sufficient)
Component three: Meeting program-wide and facility-specific targets on Long-Stay MDS quality measures				
All	Metric 1: (CMS N015.03) Percent of high-risk residents with pressure ulcers, including unstageable pressure ulcers.	Quarterly	Long-Stay MDS data from CMS	Program-wide and facility-specific quantitative target (defined quarterly)
All	Metric 2: (CMS N031.03) Percent of residents who received an antipsychotic medication.	Quarterly	Long-Stay MDS data from CMS	Program-wide and facility-specific quantitative target (defined quarterly)
All	Metric 3: (CMS N035.03) Percent of residents whose ability to move independently has worsened.	Quarterly	Long-Stay MDS data from CMS	Program-wide and facility-specific quantitative target (defined quarterly)
All	Metric 4: (CMS N024.02) Percent of residents with a urinary tract infection.	Quarterly	Long-Stay MDS data from CMS	Program-wide and facility-specific quantitative target (defined quarterly)
Component four: Demonstrating evidence of an active infection control program that includes pursuing improved outcomes in vaccination rates and antibiotic stewardship				

Eligible Provider	Target Measure	Payment Frequency	Data source	Target Assessment Criteria
NSGO	NFs attest to whether their antibiotic stewardship program meets specific requirements and submit supporting documentation on Antibiotic prescription policies, Hand Hygiene audit documentation, Personal Protective Equipment (PPE) audit documentation (Q1, Q3); infection control training certificates, updated infection control policies and procedures (Evidence of completion of Preventionist Training, Q2); In Q4, NFs must meet or exceed program-wide and facility-specific quantitative targets for Long-Stay MDS data from CMS on Pneumococcal Vaccine (CMS N020.02) and Seasonal Influenza Vaccine (CMS N016.03) measures.	Quarterly	NF records	Attestation

This document presents the evaluation that the External Quality Review Organization (EQRO) implemented in response to HHSC's request to evaluate QIPP by following the questions, hypotheses, and evaluation measures that HHSC selected and described in the Evaluation Plan for QIPP in the document Attachment I (Question 44b, 42 CFR §438.340) as approved by CMS.

Evaluation Questions, Hypotheses, and Measures

To evaluate the performance of QIPP in SFY 2022 in promoting effective care and patient safety for nursing facilities' beneficiaries with chronic, complex, and serious conditions, HHSC defined the following three evaluation questions (EQs), articulated in four specific hypotheses (HPs), as outlined in HHSC's document Attachment I, in response to preprint Q44a and b (Attachment I, Question 44b, 42 CFR §438.340).

Evaluation Question 1. Does QIPP keep patients free from harm?

- Hypothesis 1.1. QIPP will reduce the rate of avoidable complications or adverse healthcare events

  To evaluate QIPP's progress according to Hypothesis 1.1, HHSC identified the following four measures:

  1.1.1. (CMS N015.03) Percent of high-risk long-stay residents with pressure ulcers, including unstageable pressure ulcers
  1.1.2. (CMS N031.03) Percent of long-stay residents who received an antipsychotic medication
  1.1.3. (CMS N035.03) Percent of long-stay residents whose ability to move independently has worsened
  1.1.4. (CMS N024.02) Percent of long-stay residents with a urinary tract infection

- Hypothesis 1.2. QIPP will reduce rate of avoidable hospitalizations for NF residents

  To evaluate QIPP's progress according to Hypothesis 1.2, HHSC identified the following measure:

  1.2.1 Number of hospitalizations per 1,000 Long-Stay Nursing Home Resident Days

Evaluation Question 2. Does QIPP promote effective practices for people with chronic, complex, and serious conditions?

- Hypothesis 2.1. QIPP will reduce rate of avoidable hospital and emergency department visits for individuals with medical complexity

  To evaluate HP 2.1, HHSC selected the following measures:

  2.1.1 (CMS N020.02) Percent of long-stay Residents Assessed and Appropriately Given the Pneumococcal Vaccine
  2.1.2 (CMS N016.03) Percent of long-stay Residents Assessed and Appropriately Given the Seasonal Influenza Vaccine

Evaluation Question 3. Does QIPP attract and retain high-performing Medicaid providers?

- Hypothesis 3.1. QIPP will encourage providers to actively monitor patient outcomes and perspectives to address their needs and improve healthcare delivery

  To evaluate HP 3.1, HHSC established that the relevant metrics of success consist in complying with or attesting the following items (note that the enumeration here follows that in HHSC's Attachment I document).
  For NSGOs only:

  3.1.1 Submission of a PIP on a Long-stay MDS Measure
  3.1.3 Submission of documentation demonstrating evidence-based antibiotic stewardship elements
  3.1.4 Submission of a documentation of infection control policies demonstrating data-driven analysis of NF performance and evidence-based methodologies for intervention.
  3.1.5 Evidence of completion of CMS and CDC's 'Nursing Home Infection Preventionist Training Course' by Nursing Facility Administrator (NFA) and Director of Nursing (DON)

  For all NF types:

  3.1.2 Submission of a Workforce development focused PIP
  3.1.6 Self-reported direct-care RN staffing hours as described in Table 1

The EQRO analyzed QIPP using the measures that HHSC selected (see the next section for further details).

Data and Methods

Data Sources and Data Limitations

Long-Stay Minimum Data Set (MDS)

The CMS-validated MDS Long-Stay Quality Measures dataset contains values for evaluation measures 1.1.1 through 1.1.4, 2.1.1, and 2.1.2 for all operative nursing facilities in Texas. The data has quarterly frequency. CMS publishes the data five months after the end of each calendar quarter. This generates a one-month mismatch with the QIPP SFY quarters (e.g., Sept-Nov 2021 in QIPP versus Oct-Dec 2021 in the MDS file). The latest available data for the Final QIPP Evaluation analysis covers July-September 2022 (the closest to Q4 of SFY 2022). Each nursing facility has a unique identifier, the Federal Provider Number (FPN). The file of the first quarter of QIPP SFY 2022 (i.e., Oct-Dec 2021 in the data) includes data for 1201 nursing facilities. Ninety-four-point 5 percent of them have at least one of the MDS measure values in the period corresponding to SFY 2022.

QIPP Facility Enrollment by Year (HHSC - QIPP file)

This data source (version SFY 2022 - "Final QIPP Facility Enrollment", 2023-11-08) contains information for 910 unique federal provider numbers associated with a nursing facility's first year of enrollment in QIPP, enrollment pattern over program years (i.e., whether a facility was enrolled at the beginning and at the end of each QIPP fiscal year), and an indication of the HHSC-defined NF type (PO or NSGO).[1]

This source, inclusive of past QIPP years enrollment files, should include all NFs ever enrolled in QIPP. However, the file does not include all NFs operating in Texas. Some NFs were present in MDS files but did not have correspondence in the Enrollment file. To retrieve information regarding the HHSC-defined NF type and to increase the size of comparative cohorts of POs and NSGOs, the EQRO also included information from the Enrollment file of YR6 (only for four NFs), using the FPN and the "Eligibility" dataset for YR5 using a name-based matching algorithm (see next paragraph).

The EQRO considered NFs' ownership type as "unknown" if a facility in MDS did not have corresponding information in any of the Enrollment files or the Eligibility file (i.e., 46 NFs) and considered those NFs as never enrolled in QIPP. Enrollment information for SFY 2022 also needed to be cross-checked with CMS' MDS dataset to identify active versus closed/inactive facilities during the fiscal year. The analysis excluded facilities listed in the Enrollment file but not present in the MDS data because they were not active in the corresponding period of time.

Eligibility data (HHSC – QIPP file)

This data source is a program file that HHSC produces every year. The YR5 Eligibility file contains a list of 1,214 NFs with unique NF identifiers ("Facility ID", defined by QIPP), data on eligibility for QIPP either as NSGO or PO and the share of Medicaid utilization, but no federal provider numbers. The dataset contains a larger list of NFs than the Enrollment file. The EQRO used this dataset in addition to the Enrollment file in order to retrieve a nursing facility's ownership type if missing from the Enrollment file. The EQRO identified 212 NFs that were listed in the MDS file but not in the Enrollment file.

To retrieve federal provider codes for the above 212 NFs, the EQRO matched the data with the MDS file through an algorithm based on the correspondence of facility names in the two files. We found a perfectly corresponding name pair for 169 NFs (seven of them had unknown ownership type in eligibility file) and an almost-perfectly corresponding pair for four others. for a total of 173 retrieved federal provider codes. The remaining NFs (listed in the Eligibility file only) were not utilizable in the evaluation because they do not have corresponding data in the MDS files.

Table 2 reports the number and proportion of nursing facilities whose IDs (either Facility ID or "Federal Provider Number") the EQRO located in the Enrollment, Eligibility, or both files, versus only in the MDS file. The table specifies the source that the EQRO used to infer the facility ownership type. The table distinguishes between NSGOs, POs, and Unknown facility types in separate columns.

QIPP Scorecards

The EQRO used HHSC's QIPP YR5 scorecards to collect and summarize data on the number of nursing facilities that met each metric of the four QIPP program components, by program quarter.

[1] Eighteen facilities had a unique federal provider code but a homonymous Facility ID in the YR5 Enrollment file (for a total of nine pairs). For those NFs, the EQRO merged the information on the enrollment pattern and retained one observation.

Provider Information (CMS)

This data source includes the following relevant information at the nursing facility level that regression analyses included as additional covariates:

- Number of Certified Beds
- Average Number of Residents per Day
- Total Nurse Staffing Hours per Day
- Physical Therapy Staffing Hours per Resident per Day

CMS provides this data with quarterly frequency.

The EQRO noted that the information in the variable *Ownership Type* in the Provider Information CMS dataset may not correspond with *ownership type listed with HHSC* in the Eligibility or Enrollment file (which HHSC uses to classify NFs as NSGO or Privately Owned. The EQRO recommends that HHSC should improve its reconciliation process between the two data files.

Table 2. Sources of data and definition of nursing facility ownership type in the QIPP YR5 evaluation

Data source	Number of NFs by ownership type		
	NSGO	Privately Owned	Unknown
Nursing facilities (NFs) present only in MDS files	0	0	39
NFs with type inferred from "Enrollment" file	602	297	0
Facility IDs retrieved by matching MDS and "Eligibility" files by NF name	0	166	7
NFs not active in SFY2022 (not in MDS)	76	46	0
NFs enrolled in SFY2022 but did not have MDS scores	7	4	0

Change of ownership

Table 3 reports the number and percentage of nursing facilities that had a Change of Ownership (CHOW) in the previous 12 months, by ownership type as defined in YR5. The EQRO compared ownership types of NFs in the YR5 Eligibility file with those in the YR4 (SFY2021) Eligibility file and attributed an ownership change to NFs that had different ownership types over the two years. Sixty-one nursing facilities changed ownership type between SFY2021 and SFY2022. Sixty of them changed from PO to NSGO and one changed from NSGO to PO. Among the 61 NFs, four were continuously enrolled since 2018, seven since SFY2020. Forty-four enrolled in SFY 2022 for the first time and six participated in SFY2022 and had different past enrollment patterns. The EQRO did not perform additional regression analyses by CHOW because the frequency of occurrence of CHOWs across types of facilities by participation status did not vary sufficiently to allow for statistically meaningful comparisons across the three dimensions of enrollment, type, and CHOW.

Table 3. Change of Ownership by type: facilities not enrolled in QIPP in SFY 2022

Ownership Type and Cohort	Number	Proportion
From PO to NSGO	60	98.4%
From NSGO to PO	1	1.6%

Ownership Type and Cohort	Number	Proportion
Total	61	100%
By QIPP enrollment cohort		
Enrolled since 2018	4	6.6%
Enrolled since SFY 2020	7	11.5%
Enrolled only in SFY 2022	44	72.1%
Enrolled in SFY2022, inconsistent enrollment pattern	6	9.8%
Total	61	100%

Methods

The sections below summarize the empirical and methodological approaches that the EQRO undertook to address each Evaluation Question, Hypothesis, and measure that HHSC selected for the evaluation of QIPP Year 5 (SFY 2022), according to the evaluation methods and procedures outlined in HHSC's SFY2022 Preprint as approved by CMS.

Definition of comparative cohorts

Because QIPP participation expanded each year over the 2018-2022 period, the analysis considered facilities that enrolled at different times as separate enrollment cohorts, one for each year, in addition to facilities that never enrolled, for comparative purposes. The EQRO identified a feasible cohort classification using information on ownership type and enrollment patterns over QIPP program years. The EQRO classified 46 NFs with a "federal provider number" or name that did not match with those included in the "Enrollment" or "Eligibility" data sources (i.e., were present only in the MDS data), or name matched to NFs in eligibility file with missing ownership information as of *Unknown* type and hypothesized that they were never enrolled in QIPP. Table 4 presents the NF enrollment profiles between SFY2022 and SFY2018, including the beginning and the end of each SFY. A one in the enrollment pattern indicates enrollment in QIPP at that time (beginning or ending of the fiscal year) while zero in the enrollment pattern indicates that the NF was not enrolled at that time. The time points in the enrollment pattern go from most recent on the left (i.e., end of SFY2022) to the oldest on the right (i.e., beginning of SFY2018). For example, the enrollment pattern "0000000111" indicates enrollment in QIPP at the beginning and ending of SFY2018 and the beginning of SFY2019, but no enrollment subsequently.

The table shows all enrollment profiles by ownership type and enables the reader to identify key patterns. Table 4 also shows that 469 NFs enrolled in QIPP at the beginning of SFY2018 and remained enrolled ever since (see last row in table). Identifying cohorts with stable enrollment patterns over time is helpful for monitoring and evaluating progress in the selected measures over time. Reading from the bottom of the table, we see that 62 NFs enrolled at the beginning of SFY2019, 222 at the beginning of SFY2020, 78 at the beginning of SFY2021, and 47 at the beginning of SFY 2022 and remained continuously enrolled until QIPP YR5. The table shows that the majority of NFs had consistent enrollment patterns and remained enrolled in QIPP after joining the program (or non-enrolled), with some differences between POs and NSGOs.

Of the 282 NFs that never joined QIPP, 180 were POs, 56 NSGOs, and 46 Unknown. Forty-four NSGOs and 33 POs joined QIPP continuously since the beginning of 2022, 39 NSGOs and 39 POs joined in 2021, 79 NSGOs and 143 POs joined in 2020, 37 NSGOs and 25 POs joined in 2019. 399 NSGOs and 70 PO facilities joined QIPP

continuously since 2018. Some NFs did not display consistent enrollment patterns across QIPP years. For example, three NFs unenrolled from QIPP before the end of SFY 2021 and 32 unenrolled and re-enrolled at least once before participating in QIPP in SFY 2022. Inconsistent enrollment patterns may be indicative of changes in governance or restructuring, making those facilities not comparable to the majority of consistently enrolled NFs.

To determine a useful classification of NF cohorts with consistent enrollment status over QIPP program years, the EQRO considered the following comparative cohorts of, separately, A) Privately Owned facilities and B) Non-State Government Owned:

A. Never enrolled in QIPP
B. Continuously enrolled in QIPP since 2018
C. Continuously enrolled in QIPP since 2019
D. Continuously enrolled in QIPP since 2020
E. Continuously enrolled in QIPP since 2021
F. Continuously enrolled in QIPP since 2022
G. NFs with other enrollment patterns: enrolled in SFY 2022
H. NFs with other enrollment patterns: not enrolled in SFY 2022

Table 4. Enrollment profile of nursing facilities over QIPP program years (from the end of SFY 2022 on the left to the beginning of SFY 2018 on the right) by ownership type.

Enrollment pattern (End of SFY2022 to beginning of SFY 2018)	NSGO	Privately Owned	Unknown	Total	Cohort
0000000000	56	180	46	282	A
0000000011	5	2	0	7	H
0000000100	0	1	0	1	H
0000000111	4	0	0	4	H
0000010000	0	5	0	5	H
0000011100	0	2	0	2	H
0000011111	3	0	0	3	H
0000110000	5	11	0	16	H
0000111100	0	1	0	1	H
0000111111	1	2	0	3	H
0001000000	0	2	0	2	H
0001110000	0	1	0	1	H
0001111100	0	1	0	1	H
0001111111	0	3	0	3	H
0011110000	0	1	0	1	H
1100000000	44	3	0	47	F
1100110000	6	0	0	6	G
1111000000	39	39	0	78	E
1111000011	0	3	0	3	G
1111001100	0	1	0	1	G

Enrollment pattern (End of SFY2022 to beginning of SFY 2018)	NSGO	Privately Owned	Unknown	Total	Cohort
1111001111	4	1	0	5	G
1111110000	79	143	0	222	D
1111110011	1	16	0	17	G
1111111100	37	25	0	62	C
1111111111	399	70	0	469	B
Total	683	513	46	1,242	N.A.

Source: EQRO's elaboration from HHSC's Enrollment file, version 2023-11-08, Eligibility file version 2022-03-21, and MDS data (QIPP Year 5 evaluation, covering CY2021Q4 – CY2022Q3).

Descriptive analysis

The EQRO estimated and reported descriptive statistics (i.e., population size, means, medians, and measures of dispersion (standard deviation of the mean) for each EQ1 and EQ2 measure that HHSC selected, and CMS approved in SFY 2022 (precisely, Q4 of calendar year 2021 and Q1--Q3 of calendar year 2022). For the descriptive analysis, the EQRO produced mean values over the four quarters of SFY2022 for NFs that, in YR5, were a) enrolled or b) not enrolled, by ownership type. The distinction between NFs in the descriptive analysis reflects exclusively their enrollment status in QIPP YR5 and does not consider past patterns of enrollment in QIPP. For measure 1.2.1 (hospitalizations), which CMS reports with annual frequency, the descriptive analysis reports the annual value that corresponds to calendar year (CY) 2022.

The EQRO also produced descriptive statistics reporting the number and percentage of NFs that met the criteria for incentive payment in SFY 2022, for each EQ3 HP 3.1 measure, by ownership type and program quarter. The population included all the component-eligible NFs that participated in QIPP in SFY 2022.

Visual trend analysis

The EQRO plotted the pre-program and program quarterly mean values for selected comparative cohorts with a sufficient number of units of analysis. Visual trend analyses included the 2018 enrollment cohort of POs, 2018 enrollment cohort of NSGOs, and never enrolled NFs regardless of ownership. The YR5 Final Evaluation extended the analysis up to Q4 of SFY2022, or September of CY 2022. The trend analysis displays differences in mean values of EQ1 and in EQ2 measures that HHSC selected for the SFY 2022 evaluation between NF cohorts from the final calendar quarter of 2015 to the third calendar quarter of 2022. For measure 1.2.1 (Number of hospitalizations per 1,000 long-stay resident days), which has annual frequency, the data was only available starting from SFY 2018 and the EQRO plotted yearly values up to 2022.

The visual trend analysis facilitates a comparison of the differences in overall rates over time in the selected measures between PO and NSGO facilities that participated in QIPP since its first edition and NFs that never joined QIPP. To improve interpretability, the analyses included cohorts that joined QIPP in correspondence with the introduction of the program and excluded cohorts of NFs that joined or left QIPP at intermediate times. The visual trend analysis did not consider statistical significance in differences between cohorts.

Regression analysis

1. The EQRO conducted a set of regression analyses that related quarterly values of EQ1 and EQ2 measures (1.1.1-1.1.4, 1.2.1, and 2.1.1-2.1.2) in SFY 2022 as outcomes and cohorts of QIPP-enrolled facilities with different lengths of participation in QIPP. The regressions compared cohorts that never enrolled in QIPP

with cohorts that enrolled later. The analyses included the following nursing facility characteristics: number of certified beds, average number of residents per day, total nurse hours and physical therapist hours per resident per day, and service area. The regression analyses included only the NFs that maintained continuous participation in QIPP after joining the program and excluded cohorts with intermittent patterns due to small cohort sizes.[2] The EQRO estimated separate regressions for NSGOs and POs.

Interpretation. This regression analysis suggests whether different cohorts of enrollment in QIPP had statistically significantly different performances in terms of the selected EQ1 and EQ2 measures, compared with NFs continuously enrolled since YR1.

2. In another set of regression analyses, the EQRO estimated the association between EQ1 measures, as dependent variables, and a variable that indicates whether the NF met all the criteria for incentive payment for the component metrics that HHSC selected in EQ3. The EQRO expressed compliance with EQ3 metrics as a binary yes/no variable indicating that the facility complied with all ("yes") or less than all ("no") the payment components of EQ3. Additional covariates included: number of certified beds, average number of residents per day, total physical therapist hours per resident per day, and service area. The EQRO estimated separate sets of regressions by ownership type because POs are not eligible for the same set of criteria that apply to NSGOs. The EQRO excluded EQ2 measures from the analysis (Pneumococcal and Influenza vaccination) because they were one of EQ3 incentive metrics (Component Four in Q4), and hence, would have been part of both the explanatory variable and the outcome. The population for these estimations included only facilities that participated in QIPP in SFY 2022 and were eligible for each measure in EQ3 HP 3.1.

   Interpretation. EQ1 variables are the dependent variables and meeting the criteria for incentive payment in EQ3 is the regressor. This analysis suggests whether meeting all EQ3 metrics was associated with better performance in terms of measures from EQ1.

Inspection of feasibility for causal inference

The EQRO conducted an analysis of the necessary conditions to make causal inferences about the effect of QIPP through quasi-natural experimental methodologies. Specifically, the EQRO conducted a visual pre-program trend analysis (in SFY 2016 and SFY 2017) of the measures that HHSC selected for EQ1 and EQ2. The analysis assessed the presence or absence of any differences in pre-program trends between NFs that did/did not join QIPP for relevant comparative cohorts. This analysis informs (1) the possibility to perform a causal evaluation of the QIPP using a "difference-in-differences" approach and (2) which cohorts and measures are suitable for a causal inference analysis. The EQRO identified appropriate classes of comparator nursing facilities (i.e., QIPP participating "treated" NFs versus "controls" of NFs not participating in QIPP) and program evaluation measures that are suitable for a causal inference evaluation. The rationale of a "difference-in-differences" (DID) causal analysis is to compare the evolution of outcome measures between participating and non-participating facilities both before and after the QIPP program implementation. Provided that the comparator groups evolve at similar rates before the program started, additional differences observed between participating and non-participating facilities after the QIPP program started can be attributed to the program. A necessary condition for the

[2] In several cohorts, the number of nursing facilities was too small to produce reliable inferences. As shown in Table 4, among NSGOs, only six participated in SFY 2022 and displayed irregular patterns of enrollment since 2018, and only 18 displayed irregular patterns and ended with non-enrollment in SFY 2022. Among POs, cohorts with small population sizes included POs enrolled since 2022 (three NFs). Because small population numbers warn against making inferences from descriptive results for those cohorts due to limited interpretability, the EQRO excluded NFs belonging to those cohorts from the regression analysis. The regressions did not include CHOW in the previous 12 months as covariate due to insufficient variation across NF types.

feasibility of a DID analysis is that NFs enrolled vs not enrolled in the program had similar performance trends that remained relatively stable before the introduction of the program.

Results

The following tables display descriptive statistics for each YR5 EQ1 HP 1.1, HP 1.2 and EQ2 HP 2.1 measures, by ownership type and enrollment status in SFY 2022. The descriptive statistics include SFY2022 four-quarter mean and median values, the standard deviation (SD) of the mean, and the number of nursing facilities (N) in each type and cohort with a non-missing measure score. After each descriptive table, this section reports visual trend analyses of mean measure values over quarters (SFY 2016 to SFY 2022) for NSGOs and POs enrolled and NFs not enrolled in QIPP in SFY2022. The section concludes with multivariable regression analyses for each set of measures by evaluation question.

Evaluation Question 1: Does QIPP keep patients free from harm?

Hypothesis 1.1. QIPP will reduce the rate of avoidable complications or adverse healthcare events

Percentage of High-Risk Long-Stay Residents with Pressure Ulcers, Including Unstageable Pressure Ulcers

Descriptive analysis

Among NSGOs enrolled in YR5, over the four quarters of SFY 2022, the mean proportion of high-risk residents with pressure ulcers was 6.7 percent. Among NSGOs that were not enrolled, the mean proportion of residents with pressure ulcers was 7.6 percent. Among POs, facilities enrolled had a mean of 7.4 percent, across SFY 2022 quarters, and POs not enrolled had a mean of 10.1 percent of residents with pressure ulcers. Twenty-nine NFs of unknown ownership type, not enrolled, had a mean of 9.3 percent high-risk residents with pressure ulcers across SFY 2022 quarters.

Table 5. Measure 453 – Percentage of High Risk Long-Stay Residents with Pressure Ulcers, Including Unstageable Ulcers

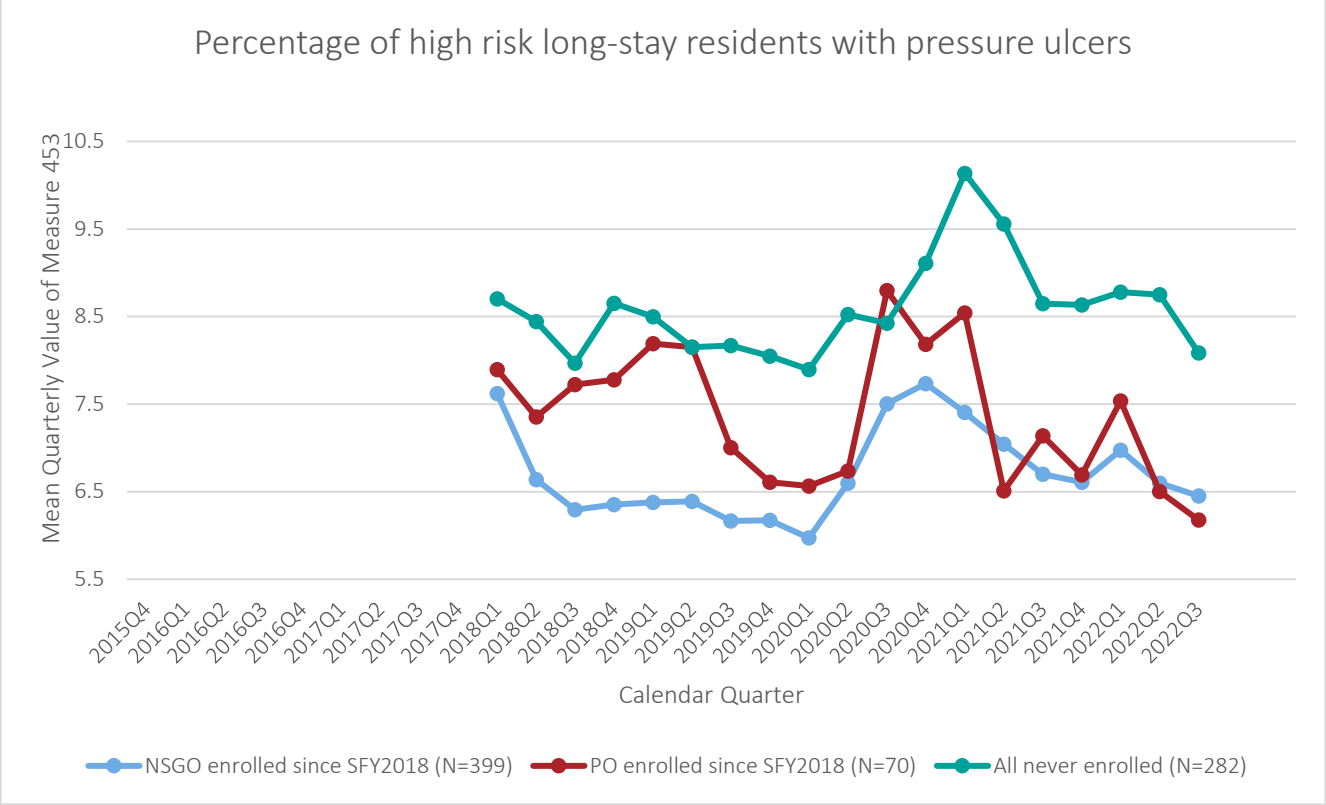
Enrollment status and ownership type	SFY 2022 Value			
	N	Mean	Median	SD
NSGO Enrolled	600	6.7	6.1	3.9
PO Enrolled	297	7.4	6.7	4.3
NSGO Not Enrolled	64	7.6	7.4	3.8
PO Not Enrolled	183	10.1	8.6	6.9
Unknown Ownership Type (Not Enrolled)	29	9.3	8.5	6.4

Visual trend analysis

Figure 1 shows that (1) NSGOs enrolled since program outset (2018) generally had the lowest mean rates, (2) NFs that never enrolled generally had the highest mean rates, and (3) POs enrolled since 2018 had pressure ulcer rates in between these two groups. With respect to never-enrolled nursing facilities, cohorts of NSGOs enrolled since 2018 and POs enrolled since 2018 performed better in terms of percentage of high-risk long-stay residents with pressure ulcers throughout the entire 2018-2022 period, with the exception of an overlapping mean value in the third calendar quarter of 2020. In correspondence of the COVID-19 pandemic, performance deteriorated (i.e., pressure ulcer rates increased) for all nursing facilities. NSGOs and POs enrolled since 2018 concluded the time series with the lowest (best performing) value. Never-enrolled facilities reverted to the

initial (2018 Q1) value in Q2 of SFY 2022 and concluded the fiscal year with a lower value. The mean proportion of high risk long-stay residents with pressure ulcers was lower in Q3 of 2022 than the previous period for all NFs.

Figure 1. Percentage of High Risk Long-Stay Residents with Pressure Ulcers, Including Unstageable Ulcers



Percentage of Long-Stay Residents Who Received an Antipsychotic Medication

Descriptive analysis

Over the four quarters of YR5, the proportion of long-stay residents who received an antipsychotic medication was 9.5 percent among enrolled NSGOs, 10.3 percent among not enrolled NSGOs, 12.4 percent among enrolled POs, 11.2 percent among not enrolled POs, and 11.2 percent among not enrolled NFs of unknown type.

Table 6. Percentage of Long-Stay Residents Who Received an Antipsychotic Medication (Measure 419)

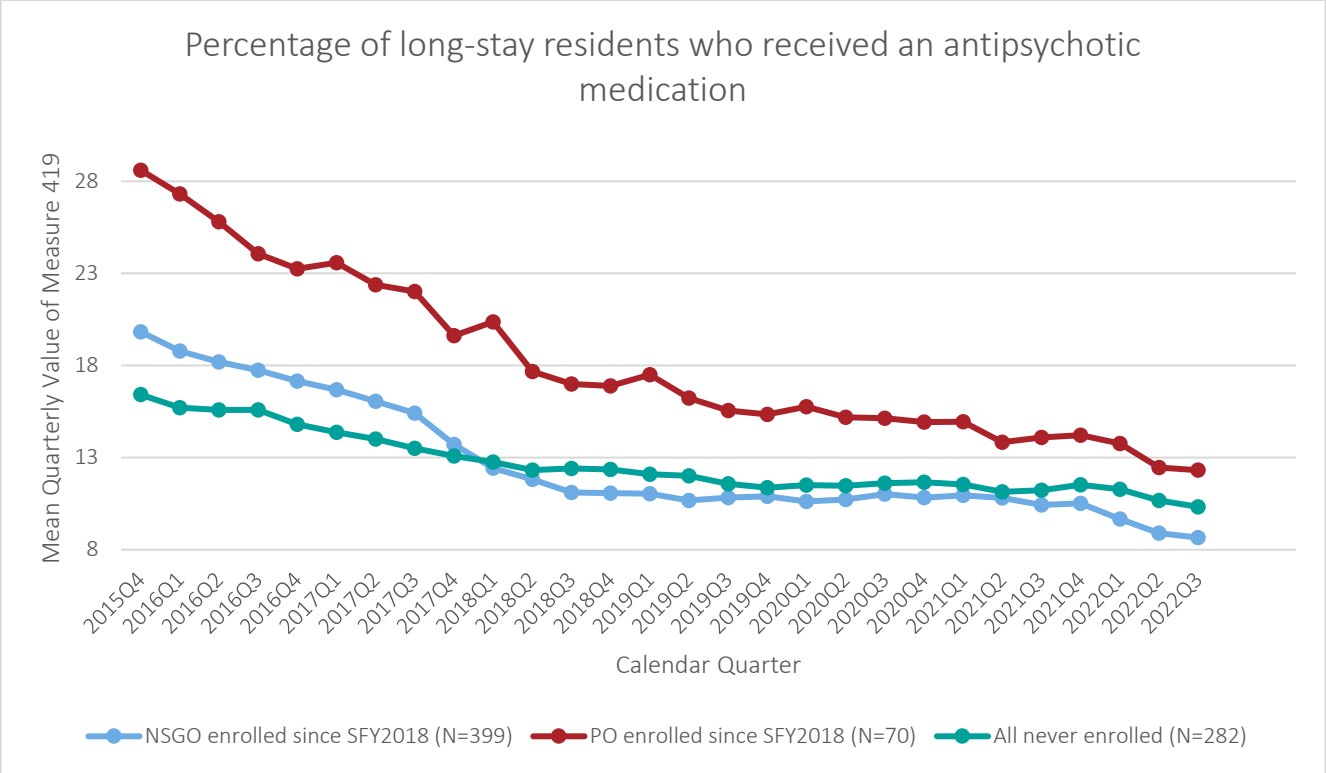
Enrollment status and ownership type	SFY 2022 Value			
	N	Mean	Median	SD
NSGO Enrolled	601	9.5%	8.6%	6.1
PO Enrolled	297	12.4%	11.0%	8.2
NSGO Not Enrolled	64	10.3%	9.2%	6.6
PO Not Enrolled	185	11.2%	9.8%	7.0
Unknown Ownership Type (Not Enrolled)	30	11.1%	11.3%	5.1

Visual Trend Analysis

Figure 2 shows mean values of the percentage of long-stay residents who received an antipsychotic medication across calendar quarters by nursing facility cohorts. Lower values correspond to a better relative performance. POs enrolled since the start had the highest relative declines while NFs never enrolled showed the smallest

declines, consistent with enrollment in QIPP being associated with a better performance. Never-enrolled POs were performing better than all other NFs in 2015, with the lowest mean percentage of residents who received antipsychotic medications. NSGOs that participated in QIPP since 2018 displayed higher mean values than never-enrolled POs in 2015. Starting from the first quarter of SFY 2018, enrolled NSGOs achieved and maintained lower mean values than non-enrolled NFs. POs enrolled in QIPP since 2018 experienced the largest relative reduction in the share of residents who received an antipsychotic medication across calendar year, from approximately 29 percent to about 13 percent. The cohort of POs enrolled in 2018 started from higher values than never-enrolled POs and converged after SFY 2018. All nursing facility cohorts experienced decreasing trends already before the beginning of the QIPP program in SFY 2018.

Figure 2. Percentage of Long-Stay Residents Who Received an Antipsychotic Medication



Percentage of Long-Stay Residents Whose Ability to Move Independently Worsened

Descriptive analysis

Over the four quarters of SFY 2022, the mean rate of long-stay residents whose ability to move independently worsened was 13.4 percent among enrolled NSGOs, 15.6 percent among non-enrolled NSGOs, 13.9 percent among enrolled POs, 18.5 percent among non-enrolled POs, and 14.4 percent among 26 NFs of unknown type.

Table 7. Measure 451 - Percentage of Long-Stay Residents Whose Ability to Move Independently Worsened

Enrollment status and ownership type	SFY 2022 Value			
	N	Mean	Median	SD
NSGO Enrolled	601	13.4%	12.7%	6.7
PO Enrolled	297	13.9%	13.0%	7.4

Enrollment status and ownership type	SFY 2022 Value			
NSGO Not Enrolled	64	15.6%	15.3%	7.1
PO Not Enrolled	171	18.5%	18.0%	8.4
Unknown Ownership Type (Not Enrolled)	26	14.4%	14.7%	6.4

Visual trend analysis

Measure 451 (Percentage of residents whose ability to move independently has worsened) became a program metric for QIPP at the beginning of Year 3 (SFY 2020). Figure 3 shows that all nursing facilities had similar performances before HHSC introduced measure 451 as a program metric. In correspondence of the introduction of the measure as a QIPP target (i.e., fourth calendar quarter of year 2019), facilities enrolled in QIPP started performing better than the never-enrolled NFs. The trend analysis suggests an association of the pandemic with a general worsening in performance for all NFs. This results in the figure as a distinctive spike between the second calendar quarter of 2020 and the second calendar quarter of 2021. After Q3 of 2020, facilities continuously enrolled in QIPP experienced a decreasing trend and outperformed their pre-pandemic values. Non-enrolled facilities reported a re-increasing trend after Q2 of 2021 and decreasing after Q1 of 2022. Never-enrolled facilities had highest percentage mean values in SFY 2022 than the enrolled cohorts of both POs and NSGOs.

Figure 3. Percentage of Long-Stay Residents Whose Ability to Move Independently Worsened

Percentage of Long-Stay Residents with a Urinary Tract Infection

Descriptive Analysis

On average, during the four quarters of SFY 2022, the proportion of residents with a urinary tract infection (UTI) was 1.1 percent among enrolled NSGOs, 1.5 among non-enrolled NSGOs, 1.2 among enrolled POs, 2.8 among non-enrolled POs, and 1.7 among unknown type NFs.

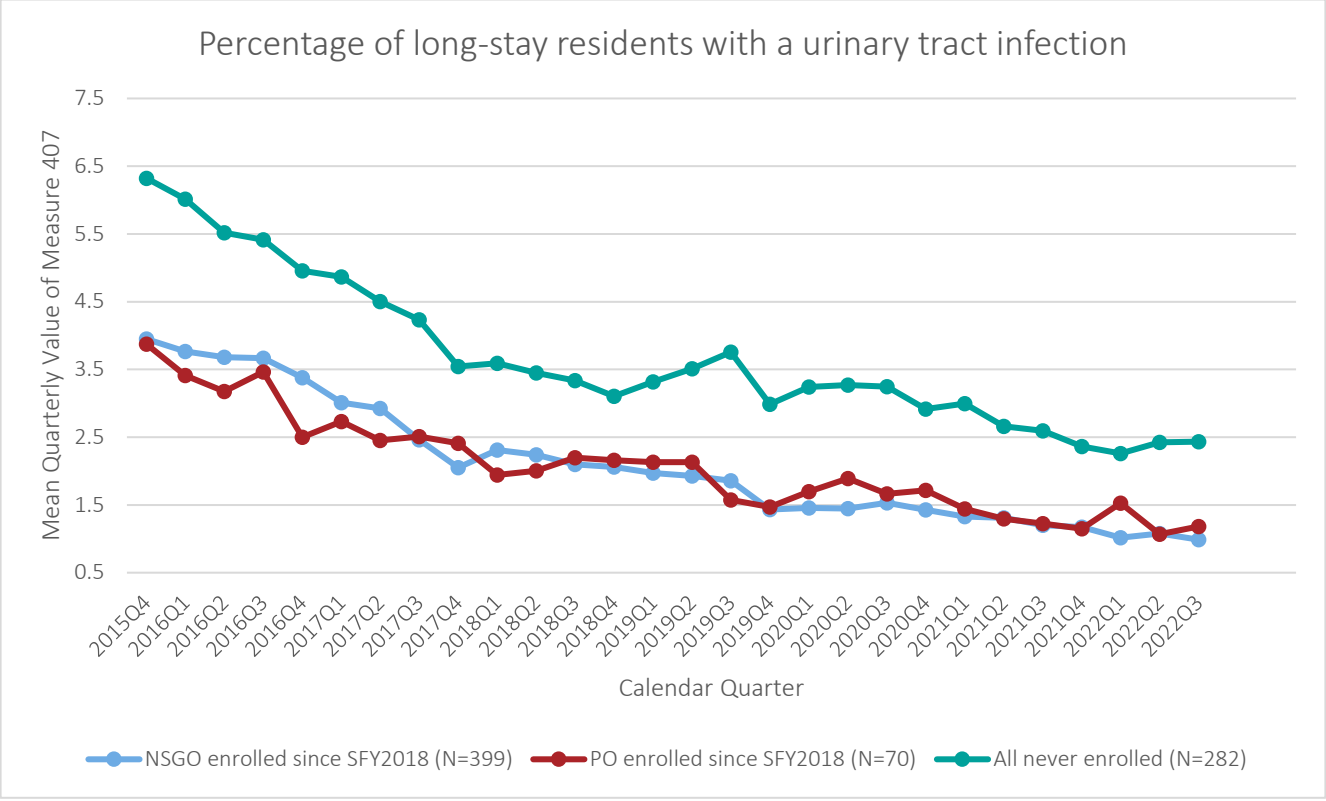
Table 8. Measure 407 - Percentage of Long-Stay Residents with a Urinary Tract Infection

Enrollment status and ownership type	SFY 2022 Value			
	N	Mean	Median	SD
NSGO Enrolled	601	1.1	0.5	1.9
PO Enrolled	297	1.2	0.6	1.9
NSGO Not Enrolled	64	1.5	0.8	2.1
PO Not Enrolled	185	2.8	1.7	3.3
Unknown Ownership Type (Not Enrolled)	30	1.7	0.8	2.1

Visual trend analysis

Measure 407 (Percentage of long-stay residents with a urinary tract infection) became a program metric in YR3 (SFY 2020, or Q3 of CY 2019). Facilities enrolled in QIPP and those that never enrolled had substantially different performances in terms of measure 407 already in 2015. In 2015, the percentage of residents with a UTI was about 6.5 among non-enrolled POs and about four among POs and NSGOs that enrolled in QIPP in the following program years. All NFs display decreasing trends over time, or an improving performance. Never-enrolled facilities scored relatively worse also towards the end of SFY 2022.

Figure 4. Percentage of Long-Stay Residents with a Urinary Tract Infection



Hypothesis 1.2. QIPP will reduce rate of avoidable hospitalizations for NF residents

Number of Hospitalizations per 1000 Long-Stay Resident Days

Descriptive Analysis

Measure 551 (Hospitalizations per 1,000 Long-Stay Resident Days) is not a targeted QIPP performance payment measure. HHSC selected this measure to explore differences between enrolled and not-enrolled facilities in the evaluation of QIPP. On average, the number of hospitalizations during 2022 was 1.8 per 1,000 long-stay resident days among NSGOs enrolled in QIPP in YR5, two among non-enrolled NSGOs, 1.9 among enrolled POs, 1.7 among non-enrolled POs, and 1.5 among non-enrolled NFs of unknown type.

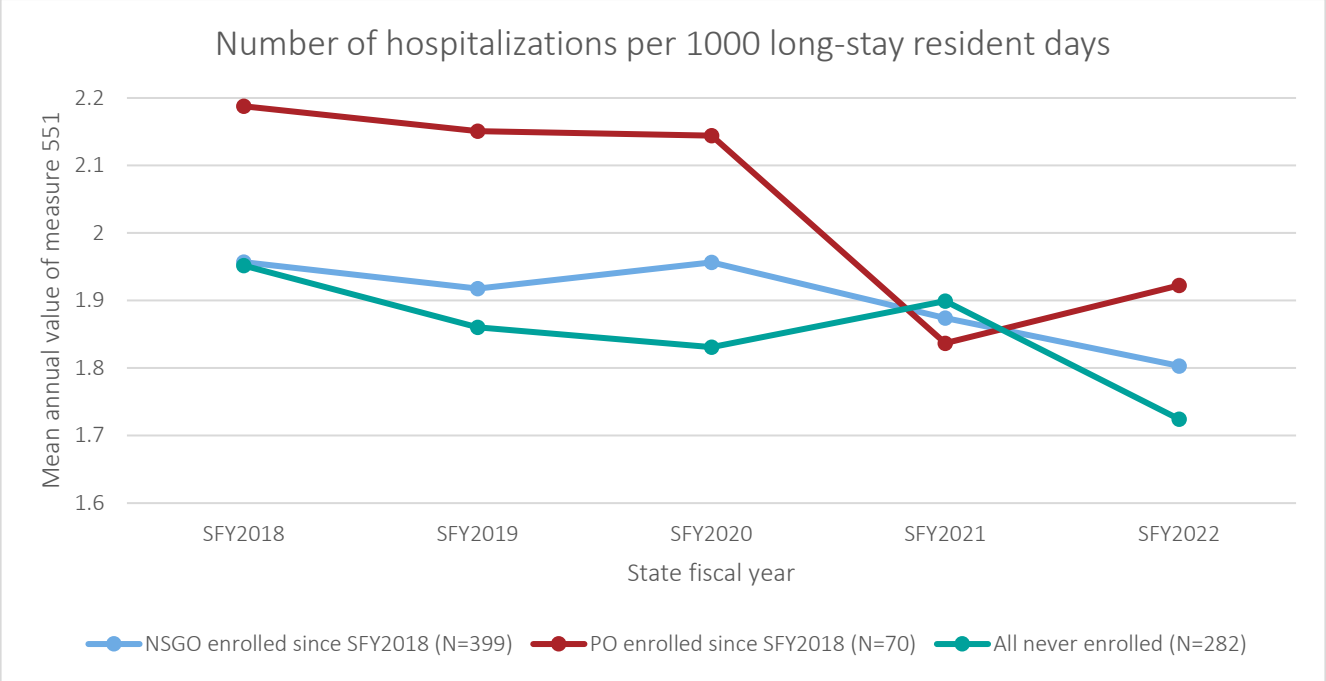
Table 9. Measure 551 - Number of Hospitalizations per 1000 Long-Stay Resident Days

Enrollment status and ownership type	SFY 2022 Value			
	N	Mean	Median	SD
NSGO Enrolled	516	1.8	1.7	0.8
PO Enrolled	226	1.9	1.7	1.0
NSGO Not Enrolled	59	2.0	1.9	0.9
PO Not Enrolled	136	1.7	1.6	0.8
Unknown Ownership Type (Not Enrolled)	24	1.5	1.4	0.8

Visual trend analysis

NSGOs enrolled in QIPP since SFY 2018 and those that never enrolled had a very similar mean number of hospitalizations at the beginning of the program. For those two groups of NFs, the number of hospitalizations was approximately two per 1,000 resident days. Conversely, this proportion was higher among POs that enrolled in SFY2018, corresponding to 2.2 hospitalizations per 1,000 resident days. All NFs reported lower hospitalizations in SFY2022. NFs that never enrolled had the lowest point estimate mean number of hospitalizations at the end of the time series (approximately 1.7 per 1,000 resident days).

Figure 5. Number of Hospitalizations per 1,000 Long-Stay Resident Days



Regression analysis

Table 10 reports the coefficients of the estimation of multivariable ordinary least squares linear regressions of the association between each EQ1 HP 1.1 QIPP program metrics, with quarterly frequency, and the enrollment profile of NSGOs over QIPP program years. The regressions also included the following variables: number of certified beds, average number of residents per day, total nurse hours and physical therapist hours per resident per day, and service area. The table reports the results of each regression in a separate column for each measure, including the coefficient estimate, the standard error (in parenthesis), and the p-value. The analyses included only nursing facilities that participated in QIPP with a constant profile over years.

Overall, the results suggest that, with respect to NSGOs continuously enrolled in QIPP since 2018, NSGOs that never participated in QIPP had a significantly higher proportion of high-risk residents with pressure ulcers (by 1.4 percentage points) and a significantly higher proportion of long-stay residents whose ability to move independently worsened (by 2.1 percentage points). For the other measures (antipsychotic medication, UTI, and hospitalizations), the positive sign of the coefficients suggested that never-enrolled NSGOs had worse health outcomes compared to NSGOs enrolled since YR1, although the difference was not statistically significant at conventional levels (i.e., one percent or five percent significance level). Except for the rate of hospitalizations for NSGOs enrolled in YR5 (-0.4), enrollment in QIPP since other program years did not present statistically significant differences for the evaluated program metrics, compared with NSGOs enrolled since YR1.

Table 10. Regression analysis by enrollment cohort for NSGOs

VARIABLES	% of residents with pressure ulcers (453)	% of residents who received antipsychotic medication (419)	% of residents whose ability to move independently worsened (451)	% of long-stay residents with a UTI (407)	Number of hospitalizations per 1,000 resident days

Enrollment cohort					
Enrolled since 2018 (reference group)	-	-	-	-	
A: Never Participated	1.405 (0.567) P: 0.0132	1.045 (0.931) P: 0.2618	2.150 (0.908) P: 0.0180	0.263 (0.194) P: 0.1740	0.174 (0.113) P: 0.1240
C: Enrolled Since 2019	-0.005 (0.627) P: 0.9930	0.618 (0.904) P: 0.4940	1.184 (1.066) P: 0.2665	0.374 (0.253) P: 0.1394	-0.011 (0.147) P: 0.9404
D: Enrolled Since 2020	0.467 (0.510) P: 0.3594	-0.107 (0.645) P: 0.8678	-0.238 (0.751) P: 0.7512	-0.165 (0.207) P: 0.4260	-0.039 (0.101) P: 0.7020
E: Enrolled Since 2021	0.210 (0.576) P: 0.7160	0.061 (0.737) P: 0.9345	-1.276 (1.265) P: 0.3130	-0.001 (0.239) P: 0.9953	-0.204 (0.139) P: 0.1438
F: Enrolled Since 2022	0.606 (0.682) P: 0.3744	-0.674 (0.806) P: 0.4027	1.021 (1.020) P: 0.3167	-0.360 (0.218) P: 0.0981	-0.418 (0.132) P: 0.0016
Intercept	7.219 (1.401) P: <.0001	8.446 (1.892) P: <.0001	10.572 (2.071) P: <.0001	0.106 (0.475) P: 0.8241	2.540 (0.296) P: <.0001
Number of Observations	2,287	2,446	2,262	2,472	557
Mean of Dependent Var	6.8	9.4	13.2	1.0	1.8
SD	4.9	6.5	8.7	2.0	0.8

Robust standard errors in parentheses. Additional regressors: number of certified beds, average number of residents per day, total nurse and physical therapist hours per resident per day, and service area.

Table 11 reports the results of the estimation of multivariable ordinary least squares linear regressions of the association between each EQ1 HP 1.1 QIPP program metrics and the enrollment profile of POs over QIPP program years, as described for NSGOs above.

The results suggest that there were some statistically significant differences in mean SFY 2022 values by different enrollment cohorts with respect to POs that enrolled in QIPP since the first program year (2018). The proportion of residents with pressure ulcers was higher by 1.8 percentage points among never-enrolled POs and by 4.2 percentage points among those who joined QIPP only in YR5. The proportion of residents whose ability to move independently worsened was higher by 5.2 percentage points among POs that never enrolled and by 3.4 percentage points among POs that enrolled in YR4 (2021). The proportion of long-stay residents with a UTI was 1.5 percentage points-higher for those POs that never participated in QIPP compared to those POs that enrolled in YR1, and was 1.6 percentage points lower among POs that enrolled in YR5 compared with POs enrolled since YR1. The latter finding contrasts with the hypothesis that longer enrollment time in QIPP would be associated with better performance and calls for a cautionary interpretation. For example, facilities joining QIPP in later years may have changed ownership status over time and thus differ along traits that do not relate to the duration of participation in QIPP.

Table 11. Regression analysis by enrollment cohort for POs

VARIABLES	% of residents with pressure ulcers (453)	% of residents who received antipsychotic medication (419)	% of residents whose ability to move independently worsened (451)	% of long-stay residents with a UTI (407)	Number of hospitalizations per 1,000 resident days
Enrollment cohort					

VARIABLES	% of residents with pressure ulcers (453)	% of residents who received antipsychotic medication (419)	% of residents whose ability to move independently worsened (451)	% of long-stay residents with a UTI (407)	Number of hospitalizations per 1,000 resident days
Enrolled since 2018 (reference group)	-	-	-	-	
A: Never Participated	1.799 (0.624) P: 0.0040	-1.960 (1.187) P: 0.0988	5.188 (1.135) P: <.0001	1.532 (0.380) P: <.0001	-0.192 (0.167) P: 0.2520
C: Enrolled Since 2019	-0.123 (0.891) P: 0.8903	-1.066 (1.611) P: 0.5082	2.009 (1.533) P: 0.1900	0.095 (0.451) P: 0.8331	-0.144 (0.256) P: 0.5728
D: Enrolled Since 2020	0.657 (0.597) P: 0.2710	-2.296 (1.108) P: 0.0383	-1.462 (1.005) P: 0.1460	-0.033 (0.345) P: 0.9230	-0.056 (0.163) P: 0.7303
E: Enrolled Since 2021	0.670 (0.711) P: 0.3461	1.840 (2.220) P: 0.4071	3.448 (1.439) P: 0.0166	-0.076 (0.484) P: 0.8745	0.056 (0.210) P: 0.7885
F: Enrolled Since 2022	4.256 (1.129) P: 0.0002	-6.823 (4.733) P: 0.1494	-1.908 (1.505) P: 0.2048	-1.580 (0.481) P: 0.0010	0.514 (0.908) P: 0.5713
Intercept	5.562 (1.571) P: 0.0004	18.959 (2.990) P: <.0001	15.545 (2.801) P: <.0001	2.221 (1.206) P: 0.0655	2.527 (0.411) P: <.0001
Number of Observations	1376	1521	1273	1530	335
Mean of Dependent Var	7.74	11.72	14.65	1.71	1.81
SD	5.41	8.28	9.91	3.09	0.95

Robust standard errors clustered at the nursing facility level in parentheses (except for hospitalizations). Additional regressors: number of certified beds, the average number of residents per day, total nurse and physical therapist hours per resident per day, and service area.

Evaluation Question 2. Does QIPP promote effective practices for people with chronic, complex, and serious conditions?

Hypothesis 2.1. QIPP will reduce rate of avoidable hospital and emergency department visits for individuals with medical complexity

Percentage of Long-Stay Residents Assessed and Appropriately Given the Pneumococcal Vaccine

Descriptive analysis

Overall, the proportion of long-stay residents assessed and appropriately given pneumococcal vaccines during the four quarters of SFY 2022 were high for all NFs. Four-quarter mean values were 98 percent among 601 NSGOs that were enrolled in YR5, 91 percent among non-enrolled NSGOs, 93.5 percent among 297 enrolled POs, 92.5 percent among non-enrolled POs, and 94 percent among NFs of unknown type.

Table 12. Measure 415 - Percentage of Long-Stay residents Assessed and Appropriately Given the Pneumococcal Vaccine

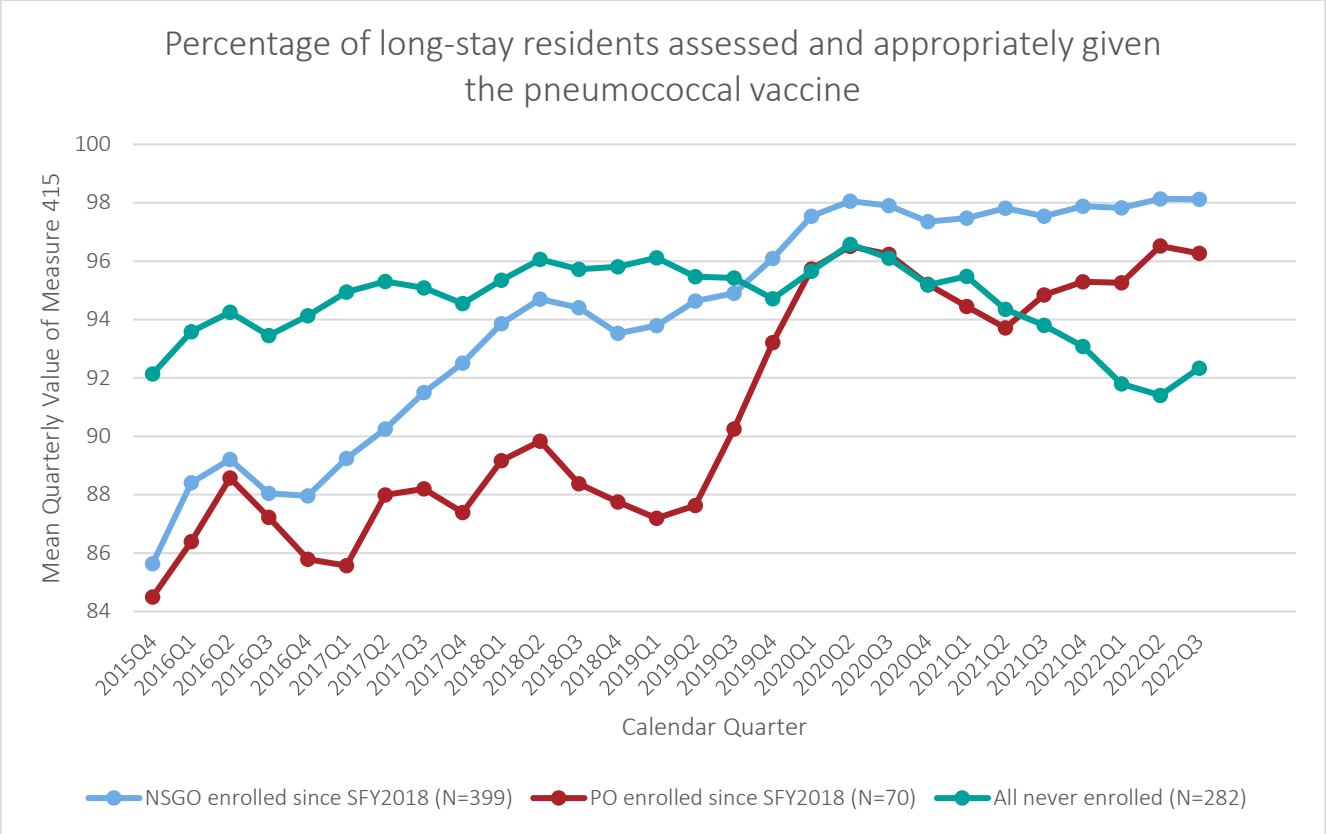
Enrollment status and ownership type	SFY 2022 Value			
	N	Mean	Median	SD
NSGO Enrolled	601	98.0%	99.7%	5.1
PO Enrolled	297	93.5%	99.2%	14.3

Enrollment status and ownership type	SFY 2022 Value			
NSGO Not Enrolled	64	91.0%	99.0%	17.1
PO Not Enrolled	185	92.5%	98.9%	13.2
Unknown Ownership Type (Not Enrolled)	30	94.1%	98.5%	10.8

Visual trend analysis

Measure 415 was not a QIPP program metric until SFY 2020, when HHSC introduced it as a target metric for NSGOs. Across calendar years, NSGOs had the most increasing trend in the percentage of residents assessed and appropriately given the pneumococcal vaccine. Enrolled NSGOs started as the second lowest ranking cohort in 2015 and were the best performing in calendar Q3 of 2022 (98 percent of long-stay residents assessed and given the pneumococcal vaccine). Enrolled NSGOs and never-enrolled NFs started displaying a steep increase in pneumococcal assessment and vaccination rates already before joining QIPP (i.e., between Q4 of 2016 and Q4 of 2017). POs enrolled since 2018 had the lowest rate in 2015 and experienced a significant increase since Q2 of 2019. Never-enrolled NFs started with the highest rate before the program began and ended with the lowest vaccination rate. All NF cohorts experienced a drop in the values of metric 415 rates in correspondence with the pandemic, although this was minimal amongst NSGOs. Conversely, NFs not enrolled continued a downward trend during the pandemic.

Figure 6. Percentage of Long-Stay Residents Assessed and Appropriately Given the Pneumococcal Vaccine



Percentage of Long-Stay Residents Assessed and Appropriately Given the Seasonal Influenza Vaccine

Descriptive analysis

Overall, the proportion of long-stay residents assessed and appropriately given a Seasonal Influenza vaccination was high among all NFs. On average, the proportion was 98 percent among enrolled NSGOs, 95 percent among non-enrolled NSGOs, 96 percent among enrolled POs, 93 percent among non-enrolled POs, and 93 percent among unknown type NFs.

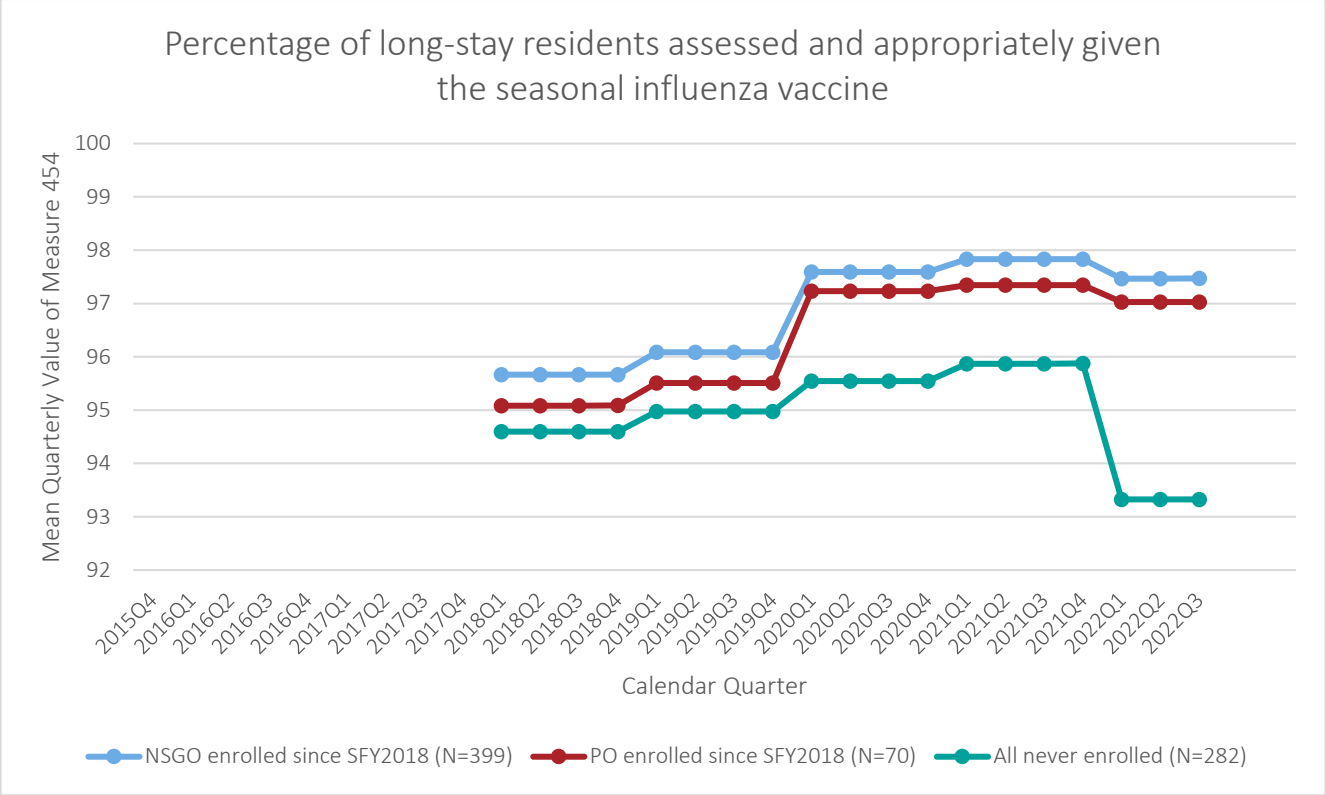
Table 13. Measure 454 - Percentage of Long-Stay Residents Assessed and Appropriately Given the Seasonal Influenza Vaccine

Enrollment status and ownership type	SFY 2022 Value			
	N	Mean	Median	SD
NSGO Enrolled	602	97.8%	99.0	3.9
PO Enrolled	297	96.0%	98.4	6.2
NSGO Not Enrolled	64	94.9%	97.4	10.3
PO Not Enrolled	186	93.1%	97.3	11.0
Unknown Ownership Type (Not Enrolled)	30	92.9%	96.0	8.8

Visual trend analysis

Measure 454 reveals a yearly pattern. Quarter-specific values change in correspondence with the first calendar quarter of each year and remain the same until the following year. This suggests that the measure is calculated yearly rather than quarterly. Overall, all NFs had increasing rates of residents assessed and appropriately given the seasonal influenza vaccine over time. However, all NF cohorts display a jump downwards in correspondence of the first calendar quarter of 2022. NSGOs that participated in QIPP since 2018 started and ended the period of 2018 through 2021 with the best relative performance. Enrolled POs started and ended in a second last position. NFs that never participated in QIPP started with the lowest rate of vaccination and ended with the lowest rate. The figure suggests that, in correspondence of the COVID-19 pandemic in 2020, the performance of NFs for this metric improved, independently of enrollment status. While enrolled NFs ended with a higher rate than their first measurement, NFs that never enrolled had a worsened rate at the end of the time series.

Figure 7. Percentage of Long-Stay Residents Assessed and Appropriately Given the Seasonal Influenza Vaccine



Regression analysis

Table 14 reports the coefficients of multivariable ordinary least squares regressions of the association between QIPP program metrics in EQ2 and patterns of enrollment in QIPP across program years for NSGOs and POs. The analyses included NFs with consistent enrollment patterns over time and excluded cohorts with different enrollment patterns due to an insufficient sample size. Additional regressors included the number of certified beds, the average number of residents per day, total nurse and physical therapist hours per resident per day, and the nursing facility's service area. The results suggest that there was no statistically significant difference between NSGOs enrolled 2018 and NSGOs enrolled in different years for EQ2 measures in SFY 2022, except for a higher rate of influenza vaccination among NSGOs enrolled in 2020.

However, the notable finding is that NSGOs that never enrolled in QIPP had statistically significantly lower rates of both pneumococcal and influenza vaccination than NSGOs enrolled since YR1, by 0.1 and 2.6 percentage points, respectively.

Among POs, enrollment in QIPP since 2018 was associated with better performance both in terms of percentage of residents assessed and appropriately given the pneumococcal vaccine (measure 415) and the seasonal influenza vaccine (measure 454) with respect to POs that never enrolled in QIPP. Respectively, POs that never enrolled in QIPP showed 0.04 and 3.4 higher percentage points of pneumococcal and influenza vaccinations, respectively, than POs enrolled since YR1. Except for pneumococcal and influenza vaccinations among POs enrolled since 2020 (-0.04 and +0.8 percentage points, respectively), the other cohorts of POs that enrolled in later program years did not show the presence of statistically significant differences in SFY 2022 mean values with respect to NFs enrolled since the first program year.

Table 14. Regression analysis by enrollment cohort for NSGOs and POs (EQ2)

VARIABLES	% of Residents Appropriately Given the Pneumococcal Vaccine (415)	% of Residents Appropriately Given the Seasonal Influenza Vaccine (454)	% of Residents Appropriately Given the Pneumococcal Vaccine (415)	% of Residents Appropriately Given the Seasonal Influenza Vaccine (454)
	NSGO NFs		Privately Owned NFs	
Enrollment cohort				
Enrolled since 2018 (reference group)	-	-	-	-
A: Never Participated	-0.082 (0.027) P: 0.0021	-2.629 (1.180) P: 0.0258	-0.037 (0.016) P: 0.0245	-3.419 (1.089) P: 0.0017
C: Enrolled Since 2019	-0.005 (0.011) P: 0.6563	0.257 (0.798) P: 0.7471	-0.013 (0.021) P: 0.5307	-0.939 (1.351) P: 0.4870
D: Enrolled Since 2020	-0.002 (0.006) P: 0.7255	0.789 (0.340) P: 0.0201	-0.037 (0.017) P: 0.0309	-1.091 (0.905) P: 0.2281
E: Enrolled Since 2021	-0.011 (0.013) P: 0.3793	0.393 (0.499) P: 0.4308	-0.025 (0.022) P: 0.2535	-1.477 (1.411) P: 0.2952
F: Enrolled Since 2022	0.005 (0.005) P: 0.3282	0.524 (0.455) P: 0.2497	0.039 (0.040) P: 0.3304	0.772 (1.985) P: 0.6974
Intercept	4.574 (0.021) P: <.0001	97.338 (1.227) P: <.0001	4.504 (0.045) P: <.0001	94.969 (2.462) P: <.0001
Number of Observations	2,483	2,486	1,548	1,554
Mean of Dependent Var	97.29	97.49	93.38	95.38
SD	8.67	5.35	14.49	8.52

Robust standard errors in parentheses. Additional regressors: number of certified beds, the average number of residents per day, total nurse and physical therapist hours per resident per day, and service area.

Feasibility for causal inference

Parallel trends inspection and trends over program years

Figure 8 shows the time trends for cohorts of NSGOs enrolled since SFY2018 and POs enrolled since SFY2018, along with never-enrolled NFs, between Q4 of CY 2015 and the introduction of the QIPP program in SFY2018. The analysis included only measures that have a consistent reporting methodology over QIPP program years until SFY 2022. Difference-in-differences estimations cannot involve measures that change methodology over time because of the longitudinal dimension of the analysis, which includes years before the inception of QIPP.

Pre-program trends convey important information about the feasibility of using difference-in-differences estimation to make causal inferences about the impacts of QIPP. Under difference-in-differences, the differences between the treatment and comparison groups prior to enrollment in QIPP measure the "intrinsic differences" or "selection bias" between comparison groups that can potentially bias the estimated treatment effect resulting from enrollment in QIPP. If the differences between the treatment and comparison groups are stable and predictable prior to enrollment in QIPP, these pre-program differences can be used to estimate the effects of selection bias. By "subtracting" pre-program from post-program differences and focusing on the remaining post-program difference, this methodology can remove (or at least lessen) selection biases and

estimate the effect of enrolling in QIPP. Given this background, parallel trends across time for the treatment and comparison groups prior to QIPP enrollment provide the strongest support for difference-in-differences, while stable, predictable trends for the treatment and control groups (even if the trends are not identical) provide some assurance that these trends can be extended into the enrollment period to provide estimates of the selection bias between the two groups. These projected estimates of the selection bias can then be used to remove the bias from the post-enrollment treatment-comparison difference to yield a more accurate measure of the true impact of the QIPP intervention.

Figure 8 below presents trends for the following cohorts:

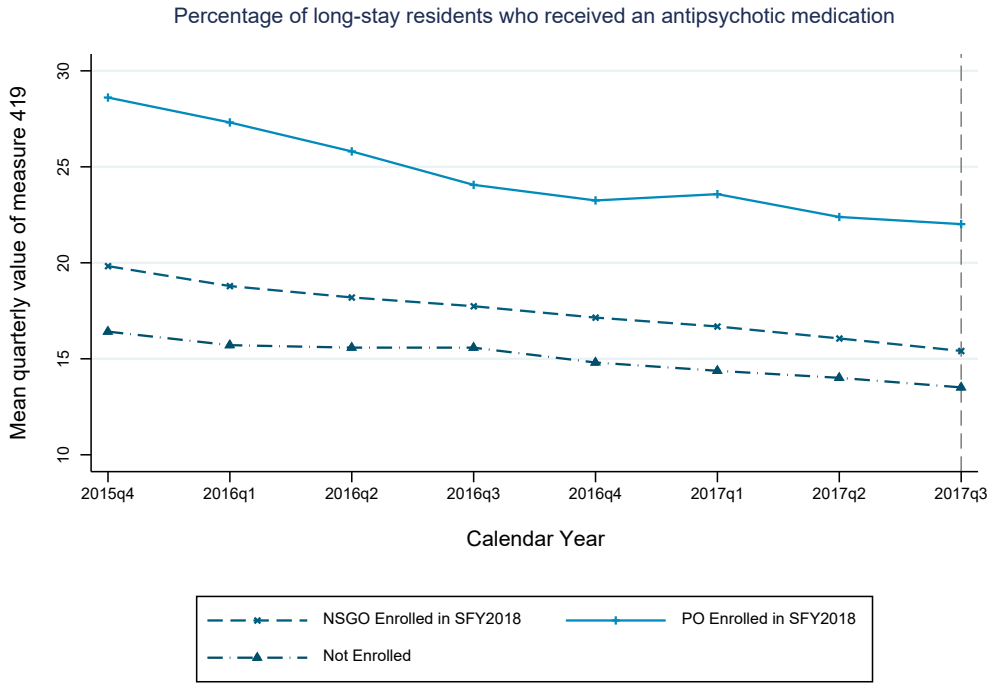
a) NSGOs continuously enrolled since 2018 (cohort B)
b) POs continuously enrolled since 2018 (cohort B)
c) NFs never enrolled in QIPP (cohort A)

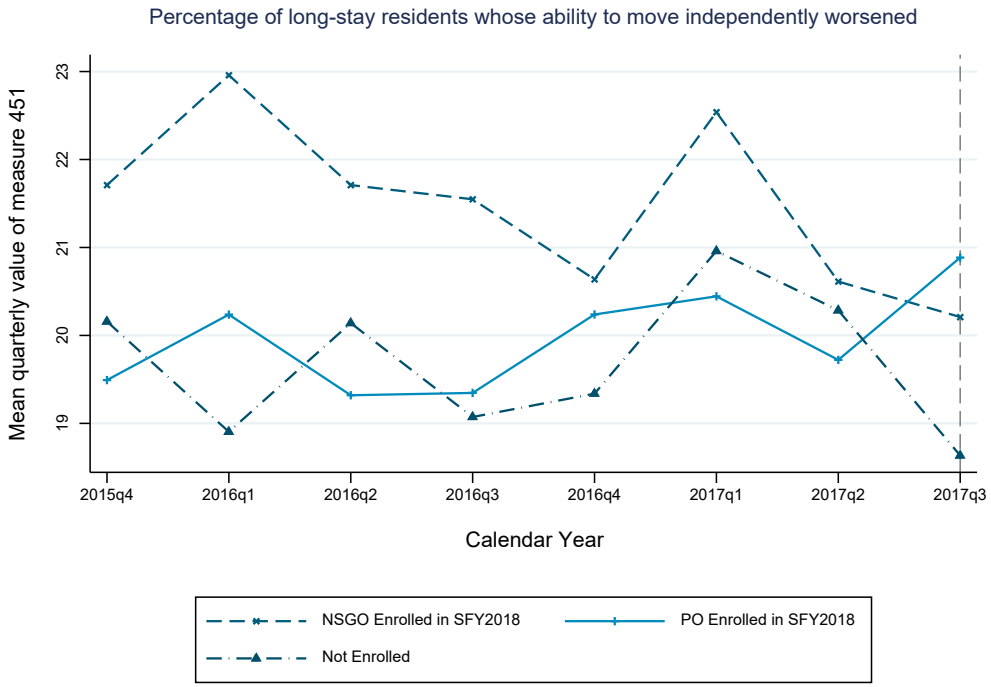
The analyses could not include the following measures, because CMS does not provide this data before SFY2018:

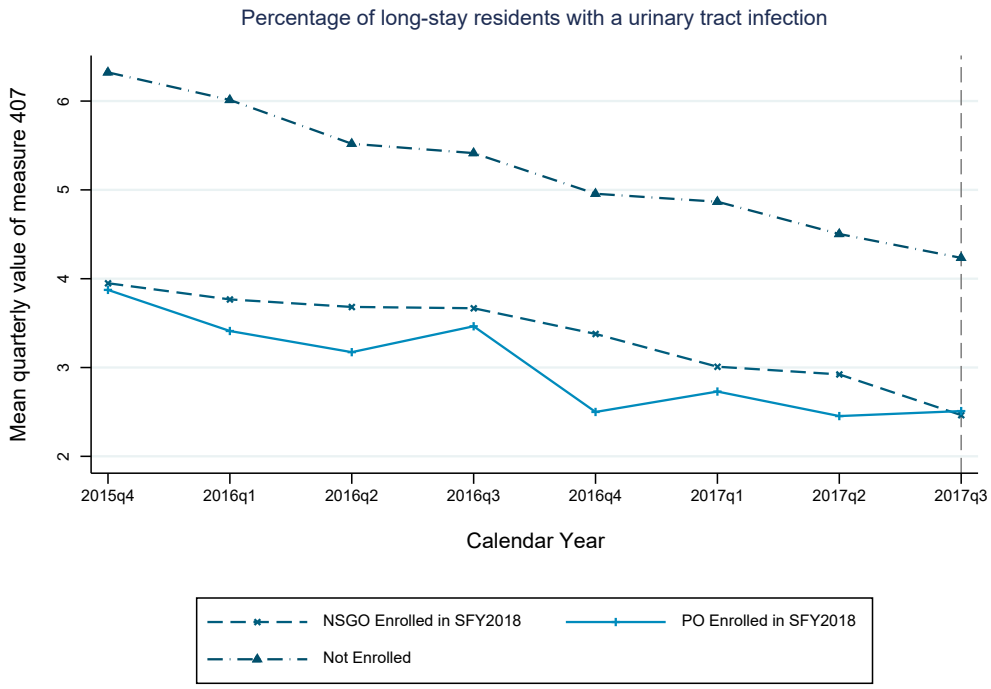
- Percentage of High-Risk Residents with Pressure Ulcers (1.1.1)
- Percentage of Residents Appropriately Given the Seasonal Influenza Vaccine (2.1.2)
- Number of hospitalizations per 1,000 Long-Stay Nursing Home Resident Days (1.2.1)

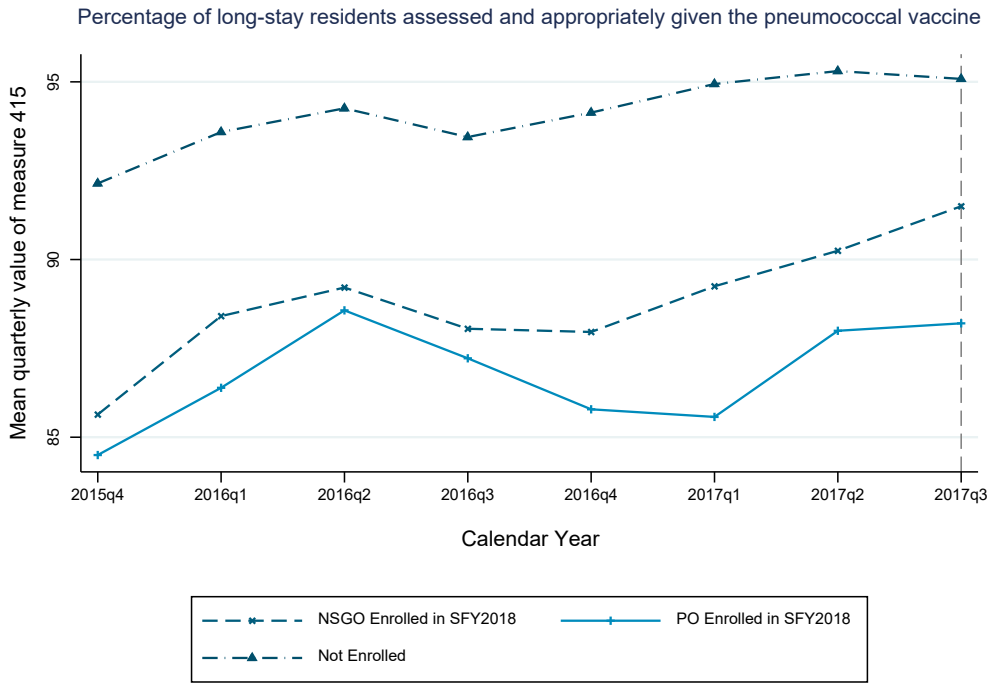
The visual analysis of pre-program measures generally shows stable trends for the treatment and comparison groups through time. For the measures of pneumococcol vaccinations, urinary tract infections, and antipsychotic medications, the time trends appear reasonably parallel. Based on this evidence, it appears that using difference-in-differences estimation to make causal inferences about the impact of QIPP for measures with consistent recording methodologies over program years is generally feasible. DID estimations could compare performance in these measures between each enrolled cohort with respect to the cohort that never enrolled in QIPP.

Figure 8. Pre-program time trends for QIPP Year 5 evaluation measures (SFY2022)









Evaluation Question 3. Does QIPP attract and retain high-performing Medicaid providers?

Hypothesis 3.1. QIPP will encourage providers to actively monitor patient outcomes and perspectives to address their needs and improve healthcare delivery

To evaluate HP 3.1, HHSC established that the relevant metrics of success consist of complying with or attesting to the following items (note that the enumeration here follows that in HHSC's Attachment I document):

For NSGOs only:

- 3.1.1 Submission of a PIP on a Long-stay MDS Measure
- 3.1.3 Submission of documentation demonstrating evidence-based antibiotic stewardship elements
- 3.1.4 Submission of a documentation of infection control policies demonstrating data-driven analysis of NF performance and evidence-based methodologies for intervention.
- 3.1.5 Evidence of completion of CMS and CDC's 'Nursing Home Infection Preventionist Training Course' by Nursing Facility Administrator (NFA) and Director of Nursing (DON)

For all NF types:

- 3.1.2 Submission of a Workforce development focused PIP
- 3.1.6 Self-reported direct-care RN staffing hours as described in Table 1

The source of data for these measures is information that NFs self-report and/or submit to HHSC.

Descriptive analysis: NFs that met EQ3 HP 3.1 targets

Table 15 presents the number and percentage of NFs that met the criteria for incentive payment in SFY 2022, for each EQ3 HP 3.1 measure, based on the QIPP YR5 Scorecards. The population includes all the component-eligible NFs that participated in QIPP in SFY 2022. Almost the entirety of NSGOs that participated in QIPP met the criteria for incentive payment across QIPP YR5 quarters for Component One, or Holding a QAPI and Submission of a PIP on a Long-stay MDS Measure (98.8 to 99.3 percent of NSGOs). Almost all NSGOs and POs met Component Two, metric 3.1.2, Submission of a Workforce development focused PIP (99-100 percent of POs and about 99 percent of NSGOs). For Component Two, metric 3.1.6, Four Hours of Self-reported Direct-Care RN Staffing Hours (4RN), 87-89 percent of NSGOs and 80-81 percent of POs met the metric across YR5 quarters. For metric 3.1.6, Eight Hours of Self-reported Direct-Care RN Staffing Hours (8 RN), 65-85 percent of NSGOs and 78-79 percent of POs met the metric target.

For Component Four, open only to NSGOs, between 95 and 96 percent of NFs met the submission of documentation demonstrating evidence-based antibiotic stewardship elements and infection control policies in Q1 and Q3 of YR5. Eighty-seven percent of the NSGO facilities met the metric 3.1.5 Evidence of completion of CMS and CDC's 'Nursing Home Infection Preventionist Training Course' by Nursing Facility Administrator and Director of Nursing. Finally, in Q4 of YR5, 48 percent of the NSGO facilities met the criteria for incentive payment based on metrics 2.1.1-2.1.2 Pneumococcal – Influenza Vaccination.

Table 15. Number and Percentage of Nursing Facilities that Met the Criteria for Incentive Payment SFY 2022 (EQ3 measures)

Number and Percentage of Nursing Facilities that Met the Criteria for Incentive Payment in SFY 2022					
		Q1	Q2	Q3	Q4
	Ownership type	N (%)	N (%)	N (%)	N (%)
Component One					

Number and Percentage of Nursing Facilities that Met the Criteria for Incentive Payment in SFY 2022					
		Q1	Q2	Q3	Q4
	Ownership type	N (%)	N (%)	N (%)	N (%)
3.1.1 Holding a QAPI and submission of a PIP on a long-stay MDS measure	NSGO	605 (99.3%)	605 (99.3%)	602 (98.8%)	602 (98.8%)
Component Two					
3.1.2 Submission of a workforce development focused PIP	NSGO	607 (99.7)	607 (99.7%)	606 (99.5%)	606 (99.5%)
	PRIVATE	301 (100%)	300 (99.7%)	298 (99.0%)	298 (99.0%)
3.1.6 (4RN) Self-reported direct-care RN staffing hours as described in Table 1	NSGO	539 (88.5%)	530 (87.0%)	544 (89.3%)	540 (88.7%)
	PRIVATE	243 (80.7%)	245 (81.4%)	242 (80.4%)	244 (81.1%)
3.1.6 (8RN) Self-reported direct-care RN staffing hours as described in Table 1	NSGO	522 (85.7%)	518 (85.1%)	527 (86.5%)	524 (86.0%)
	PRIVATE	238 (79.1%)	236 (78.4%)	235 (78.1%)	237 (78.8%)
Component Four					
3.1.3 – 3.1.4 Submission of documentation demonstrating evidence-based antibiotic stewardship elements & infection control policies (including Pneumococcal & Influenza Vaccination in Q4)	NSGO	581 (95.4%)		583 (95.7%)	294 (48.3%)
3.1.5 Evidence of completion of CMS and CDC's 'Nursing Home Infection Preventionist Training Course' by Nursing Facility Administrator (NFA) and Director of Nursing (DON)	NSGO		531 (87.2%)		

Note: The correlation coefficient between 3.1.6 4RN and 3.1.6 8RN was 0.9.

Next, the EQRO computed the number and proportion of NSGOs that met zero through all five of the incentive payment metrics of EQ3 and the number and proportion of POs that met zero through all two of the incentive payment metrics of EQ3, in each quarter (Table 16). Among NSGOs, 84 percent met all metrics in Q1, 77 percent in Q2, and 84 percent in Q3. For Q4, the percentage of NSGOs that met all metrics was lower, 42 percent, due to a low number of facilities meeting the pneumococcal/influenza vaccination metric. Among POs, 78-79 percent of NFs met all the EQ3 metrics in each quarter.[3]

[3] Due to high correlation between 3.16 4RN and 3.1.6 8RN (0.9), the EQRO combined the two.

Table 16. Number of nursing facilities compliant with EQ3 metrics (for 311, 312, 313/314, 315, and 316 8RN)

Number of NSGO by number of EQ3 metrics met (311, 312, 313/314, 315, and 316 8RN)								
	Q1		Q2		Q3		Q4	
	N	Percent	N	Percent	N	Percent	N	Percent
Met zero EQ3 metrics	1	0.16%	2	0.33%	3	0.49%	3	0.49%
Met one EQ3 metric	1	0.16%	1	0.16%	0	0.00%	0	0.00%
Met two EQ3 metrics	12	1.97%	24	3.94%	11	1.81%	38	6.24%
Met three EQ3 metrics	61	10.02%	56	9.20%	54	8.87%	40	6.57%
Met four EQ3 metrics	24	3.94%	56	9.20%	27	4.43%	270	44.33%
Met five (all) EQ3 metrics	510	83.74%	470	77.18%	514	84.40%	258	42.36%
Number of PO by number of EQ3 metrics met								
	N	Percent	N	Percent	N	Percent	N	Percent
Met zero EQ3 metrics	0	0.00%	1	0.33%	3	1.00%	3	1.00%
Met one EQ3 metric	63	20.93%	64	21.26%	63	20.93%	61	20.27%
Met two (all) EQ3 metrics	238	79.07%	236	78.41%	235	78.07%	237	78.74%

Regression analysis (heterogeneity analysis)

Table 17 presents the results of linear regression analyses that examined the associations between the performance of NFs across EQ3 measures (i.e., meeting all EQ3 metrics, compared with meeting less than all) and the evaluation outcome measures of EQ1, for NSGOs enrolled in QIPP in YR5. The regressions also included the following nursing facility characteristics: the number of certified beds, the average number of residents per day, physical therapist staffing hours per resident per day, and service area.

For NSGOs, meeting all EQ3 component metrics was statistically significantly associated with better performance in all measures, except for pressure ulcers. NSGOs that met all metrics had a lower percentage of residents who received antipsychotic medication (-0.8 percentage points), a lower percentage of residents whose ability to move worsened (-1.3 percentage points), a lower percentage of long-stay residents with a UTI (-0.5 percentage points), and a lower number of hospitalizations (-0.2 per 1,000 resident days).

Regarding the other regressors, the average number of residents per day and number of registered beds were not significantly associated with the outcomes. The number of physical therapist hours per resident per day was significantly associated with a lower percentage of residents receiving antipsychotic medication (-15 percentage points) and with a lower proportion of residents with a UTI (by three percentage points).

Table 17. Regression Results: Association between EQ1 measures and meeting EQ3 incentive criteria: NSGOs

Explanatory Variables	% of residents with pressure ulcers (453)	% of residents who received antipsychotic medication (419)	% of residents whose ability to move independently worsened (451)	% of long-stay residents with a UTI (407)	Hospitalizations per 1,000 resident days (551)
Facility met all EQ3 Metrics	-0.345 (0.296) P: 0.2437	-0.762 (0.373) P: 0.0413	-1.336 (0.502) P: 0.0078	-0.475 (0.111) P: <.0001	-0.184 (0.067) P: 0.0060

Explanatory Variables	% of residents with pressure ulcers (453)	% of residents who received antipsychotic medication (419)	% of residents whose ability to move independently worsened (451)	% of long-stay residents with a UTI (407)	Hospitalizations per 1,000 resident days (551)
Number of Certified Beds	0.010 (0.006) P: 0.1122	-0.010 (0.008) P: 0.1924	0.004 (0.011) P: 0.6891	0.001 (0.002) P: 0.7970	0.001 (0.001) P: 0.6655
Number of Residents/Day	-0.004 (0.009) P: 0.6547	0.003 (0.010) P: 0.7907	-0.029 (0.015) P: 0.0553	-0.006 (0.003) P: 0.0591	-0.003 (0.002) P: 0.0904
Physical Therapist Hours per Resident/Day	-2.009 (2.539) P: 0.4289	-15.461 (3.393) P: <.0001	-0.214 (4.567) P: 0.9627	-2.838 (1.080) P: 0.0086	0.287 (0.627) P: 0.6476
Intercept	8.350 (1.014) P: <.0001	10.745 (1.189) P: <.0001	15.369 (1.359) P: <.0001	0.737 (0.392) P: 0.0599	2.523 (0.177) P: <.0001
Number of observations	2,116	2,263	2,110	2,293	513
Mean of outcome	6.75	9.31	13.04	0.98	1.77
SD	4.81	6.46	8.66	1.98	0.78

Robust standard errors in parentheses. Additional regressors: service area.

Table 18 presents the analogous regression results for PO facilities enrolled in QIPP YR5. For POs, meeting both EQ3 metrics, as opposed to one or none, was statistically significantly associated with better performance in all EQ1 metrics, except for the number of hospitalizations. Specifically, it was associated with a lower proportion of residents with pressure ulcers by -1.2 percentage points, with a three percentage points-lower proportion of residents receiving antipsychotic medication, a 4.7-percentage points lower proportion of residents whose ability to move independently worsened, and a -0.8-percentage points lower proportion of residents with a UTI.

Table 18. Regression Results: Association between EQ1 measures and meeting EQ3 incentive criteria: POs.

Explanatory Variables	% of residents with pressure ulcers (453)	% of residents who received antipsychotic medication (419)	% of residents whose ability to move independently worsened (451)	% of long-stay residents with a UTI (407)	Hospitalizations per 1,000 resident days
Facility met all EQ3 Metrics	-1.201 (0.609) P: 0.0487	-3.006 (1.412) P: 0.0332	-4.700 (1.136) P: <.0001	-0.885 (0.153) P: <.0001	-0.039 (0.176) P: 0.8253
Number of Certified Beds	0.002 (0.007) P: 0.7435	-0.012 (0.012) P: 0.3044	0.007 (0.011) P: 0.5326	-0.003 (0.003) P: 0.2972	0.005 (0.002) P: 0.0189
Number of Residents/Day	-0.011 (0.010) P: 0.2627	-0.034 (0.022) P: 0.1099	0.021 (0.017) P: 0.2124	-0.006 (0.004) P: 0.1402	-0.006 (0.003) P: 0.0789
Physical Therapist Hours per Resident/Day	4.046 (4.233) P: 0.3392	7.614 (7.698) P: 0.3226	-14.983 (8.678) P: 0.0842	-0.944 (2.474) P: 0.7028	-0.590 (1.339) P: 0.6597
Intercept	10.978 (1.060) P: <.0001	16.575 (2.598) P: <.0001	18.596 (1.823) P: <.0001	1.665 (0.437) P: 0.0001	2.597 (0.318) P: <.0001
Number of observations	991	1074	993	1094	222
Mean of outcome	7.12	12.21	13.39	1.14	1.91
SD	5.09	8.78	9.37	2.29	1.03

Robust standard errors in parentheses. Additional regressors: service area.