Quality Incentive Payment Program (QIPP) Evaluation

Interim Evaluation Analyses for QIPP SFY 2022

(Year 5)

January 30, 2023

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Abbreviations

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

Executive Summary

This document presents the interim evaluation results for the fifth year of the Quality Incentive Payment Program (QIPP), State Fiscal Year 2022 (SFY 2022). 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.

Evaluation Questions, Hypotheses, Measures, and Key Findings

Key conclusions of the QIPP SFY 2022 interim 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 Hypothesis (HP) 1.1, HHSC identified the following four measures:

    1.1.1. (CMS N015.03) Percent of high-risk 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 enrolled NFs had lower pressure ulcer rates in SFY 2022 (September 2021-June 2022) compared to those POs that never enrolled in QIPP. For Non-State Government Owned nursing facilities (NSGOs), regression analyses comparing annual enrollment cohorts showed that NSGO cohorts that enrolled in later years did not present statistically significantly different rates of pressure ulcers than NSGOs enrolled since the inception of QIPP in 2018.[1]

    1.1.2. (CMS N031.03) Percent of residents who received an antipsychotic medication.

    Key findings:
    For POs, regression analyses showed that NFs enrolled in QIPP since 2021 had statistically significantly higher rates of antipsychotic medication administration in SFY 2022 (September 2021-June 2022) compared to NSGOs enrolled since 2018.

    1.1.3. (CMS N035.03) Percent of residents whose ability to move independently has worsened.

    Key findings:
    For POs, regression analyses showed that the 2018 and 2020 QIPP enrollment cohorts had statistically significantly lower proportions of residents whose ability to move independently worsened in SFY 2022 (September 2021-June 2022) compared to POs that never enrolled. NSGOs enrolled after 2018 did not

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[1] Our regression analyses compared PO annual enrollment cohorts to POs that never enrolled in QIPP. Because virtually all NSGOs eventually enrolled in QIPP over 2018-2022, our regression analyses compared NSGO annual enrollment cohorts to the first NSGO enrollment cohort in 2018.

present significantly different proportions compared to NSGOs enrolled since 2018.

1.1.4. (CMS N024.02) Percent of residents with a urinary tract infection.

Key findings:
For POs, regression analyses comparing NF annual QIPP enrollment cohorts to NFs that never enrolled in QIPP showed that QIPP enrollment was associated with statistically significantly lower urinary tract infection (UTI) rates compared to those POs that never enrolled in QIPP. NSGOs enrolled after 2018 did not present significantly different proportions 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

Note: Data for measure 1.2.1 were not available for these interim analyses, so this report does not include results for Hypothesis 1.2. We anticipate that the final SFY 2022 QIPP Evaluation analysis will include this Hypothesis.

• **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 Residents Assessed and Appropriately Given the Pneumococcal Vaccine

Key findings:
For privately-owned nursing facilities (POs), regression analyses comparing NF annual QIPP enrollment cohorts to NFs that never enrolled in QIPP showed that NFs enrolled in QIPP since 2018 had statistically significantly higher rates of pneumococcal vaccination compared to those POs that never enrolled in QIPP. We found no statistically significant differences in pneumococcal vaccination rates between cohorts of NSGOs that enrolled in QIPP in different years.

2.1.2 (CMS N016.03) Percent of Residents Assessed and Appropriately Given the Seasonal Influenza Vaccine

Key findings:
For POs, regression analyses showed that the 2018 QIPP enrollment cohort had statistically significantly higher rates of seasonal influenza vaccinations compared to those POs that never enrolled in QIPP. We found no statistically

significant differences for NSGOs enrolled in 2018 and NSGOs enrolled over the following years.

- 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 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. Regression analyses estimated if complying or attesting each of the following program metrics was associated with the six health outcomes that HHSC selected to evaluate HP 1.1 and HP 2.1 in SFY 2022.

    For NSGOs only:

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

    Key findings:
    93.5 percent of the enrolled NFs submitted a PIP on a long-stay MDS measure in SFY 2022. Regression analyses showed that the submission of the PIP was associated with statistically significantly lower rates of UTIs and higher rates of assessment and appropriate administration of pneumococcal vaccinations for NSGOs.

    ### 3.1.3 Submission of documentation demonstrating evidence-based antibiotic stewardship elements

    Key findings:
    96.2 percent of the enrolled NFs submitted documentation demonstrating evidence-based antibiotic stewardship. Regression analyses showed that the submission of this documentation was associated with statistically significantly lower UTIs and higher assessments and administrations of pneumococcal vaccinations among NSGOs.

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

    Key findings:
    96.1 percent of the enrolled NFs submitted this documentation. Regression analyses showed that the submission of documentation demonstrating data-driven evidence-based infection control was associated with statistically significantly lower rates of UTIs and higher rates of assessment and administration of pneumococcal vaccinations for NSGOs.

    ### 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)

    Key findings:
    87.7 percent of the enrolled NFs submitted evidence of completion of the course. Regression analyses showed that course completion was associated with (1) lower antipsychotic medication administration, (2) lower proportions of residents whose

independent movement worsened, (3) lower rates of UTIs, and (4) higher rates of appropriate assessment and administration of flu vaccinations for NSGOs.

For all NF ownership types:

3.1.2 Submission of a Workforce development focused PIP

Key findings:
91 percent of NSGOs and 85.1 percent of enrolled POs submitted a workforce development focused PIP. Regression analyses showed that submission of a workforce development focused PIP was associated with statistically significantly lower rates of UTIs for NSGOs. For POs, the regression analysis did not show statistically significant associations with HP 1.1 and HP 2.1 measures.

3.1.6 Self-reported direct-care RN staffing hours as described in Table 1

Key findings:
Among NSGOs, 88.9 (86.2) percent self-reported an increase in four (eight) hours of direct-care registered nurse (RN) staffing. 81.2 (78.9) percent of POs self-reported four (eight)-hour increases. Regression analyses showed that compliance with an increase in self-reported direct-care RN staffing hours by eight hours was associated with statistically significantly lower rates of UTIs for NSGOs. For POs, compliance with an eight-hour increase in staffing hours was associated with statistically significantly lower rates of (1) pressure ulcers, (2) worsening of independent movement, and (3) UTIs, and (4) statistically significantly higher seasonal influenza vaccinations.

Inspection of feasibility for causal inference analysis

We 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 generally concluded that causal inferences were feasible for the majority of outcomes measures addressed in this evaluation based on comparing separately each cohort of a) POs enrolled in QIPP since 2018, b) POs enrolled in QIPP since 2020, and c) NSGOs enrolled in QIPP since 2018, with the cohort of POs that never enrolled in QIPP. Future plans for the evaluation of QIPP should consider the implementation of a "difference-in-differences" analysis where feasible. The "difference-in-differences" causal inference methodology will rely on data starting from at least two years before the introduction of the QIPP program. The analysis will exclude measures that change definition and measurement methodology over the years, such as a) 1.1.1 pressure ulcers and b) 2.1.2 seasonal influenza vaccine.

Introduction and Background

In State Fiscal Year (SFY) 2018, 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). Since 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 Y5, henceforth), QIPP included four components with specific metrics and eligibility rules, i.e., open to different classes of nursing facilities, depending on their ownership type. There are two classes of nursing facility providers in Texas: (1) 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) Privately Owned (PO) NF - A network nursing facility not owned by a governmental entity 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 Y5 QIPP components, indicating the corresponding eligible NF type, performance measures, frequency of reward 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, PPE audit documentation (Q1, Q3); infection control training certificates, updated infection control policies and procedures (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
NSGO	Evidence of completion of Preventionist Training	Q2	NF records	Attestation

This document presents the evaluation approaches 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) and CMS approved.

Evaluation Questions, Hypotheses, and measures

To evaluate the performance of QIPP in SFY 2022 in promoting effective care for nursing facilities' beneficiaries with chronic, complex, and serious conditions and patient safety, 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 residents with pressure ulcers, including unstageable pressure ulcers
    1.1.2. (CMS N031.03) Percent of residents who received an antipsychotic medication
    1.1.3. (CMS N035.03) Percent of residents whose ability to move independently has worsened
    1.1.4. (CMS N024.02) Percent of 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 Residents Assessed and Appropriately Given the Pneumococcal Vaccine
        2.1.2 (CMS N016.03) Percent of 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 QIPP Evaluation interim analysis covers April-June 2022 (the closest to Q3 of SFY 2022). Each nursing facility has a unique identifier, the Federal Provider Number (FPN). The file includes data for 1208 nursing facilities in the first quarter of QIPP SFY 2022 (i.e., Oct-Dec 2021 in the data). 95% of them include MDS measure values.

Eligibility data (HHSC – QIPP file)

This source contains a list of 1,214 NFs with NF identifiers ("Facility ID"s, defined by QIPP) but no federal provider codes, and data on eligibility for QIPP either as NSGO or private (PO) and based on the share of Medicaid utilization. Facility IDs are unique codes.

100 NFs do not have data on the share of Medicaid utilization. Two of them are NSGOs, the rest are POs. The data file defines POs with no information on Medicaid utilization as not eligible for QIPP.

There are six facilities with a homonymous NF (i.e., three cases of homonymity). They have unique Facility IDs and different owners.

To retrieve *federal provider numbers* for NFs in this data file (which are necessary for a merge with MDS data), it is necessary to merge this file with the file "QIPP Facility Enrollment by Year" (henceforth also "Enrollment" file, see below for a description) using Facility IDs. The Enrollment file contains both the Facility ID and the federal provider code. 318 facilities do not have a matching facility entry in the Enrollment file through the Facility ID code (after removing 19 facilities with a duplicate Facility ID – but different provider codes - in the Enrollment file). To retrieve federal provider codes for the above 318 NFs, we 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 243 NFs and an almost-perfectly corresponding pair for 9 others. We manually found the corresponding facility for 9 more, for a total of 261 retrieved federal provider codes. The remaining NFs are not utilizable in the evaluation due to a lack of data on MDS measures.

Note that four NFs are classified as "closed" (ID and name: 264 Wellington Oaks Nursing & Rehabilitation, 4544 Poteet Nursing And Rehabilitation LP, 5038 Lake Worth Nursing Home, 5114 Vista Del Mar Health & Rehabilitation).

Thirty-one facilities (24 of which without change of ownership or "CHOW") enrolled in QIPP in 2018 despite having a share of Medicaid activity smaller that the threshold eligibility value (77.89 percent). Table 2 shows the mean (and standard deviation, SD), minimum, and maximum values of the share of Medicaid activity among POs enrolled in QIPP in SFY 2018 (panel A) and among the subset of those continuously enrolled in QIPP since SFY 2018 (panel B). Information on the share of Medicaid activity was registered in 2018. In both sets of NFs, the minimum value recorded as share of Medicaid activity was 66.28 percent. 31 POs enrolled since 2018 and 20 of the continuously enrolled had shares of Medicaid activity below the minimum eligibility threshold of 77.89 percent.

Table 2. Descriptive statistics of the Share of Medicaid Activity for Privately Owned facilities enrolled in QIPP in 2018.

Variable	N of Obs	Mean	SD	Min	Max	N with Medicaid share < threshold
Panel A - Population: all PO NFs enrolled in 2018						
Medicaid %	87	79.7%	6.1	66.3%	91.2%	31
Panel B – Population: all PO NFs continuously enrolled since 2018						
Medicaid %	66	80.8%	5.7	66.3%	91.2%	20

QIPP Facility Enrollment by Year (HHSC- QIPP file)

This source contains data for 931 unique federal provider numbers. The dataset includes information on the first year of enrollment in QIPP, the 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 (privately owned or NSGO). HHSC compiled the file at the end of SFY 2022 and it should include all facilities that were ever enrolled in QIPP throughout the program's existence, even if not enrolled in SFY 2022. Enrollment information for SFY 2022 needs 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.

18 facilities have unique federal provider codes but a homonymous Facility ID (for a total of 9 pairs).

Some name-based matched NFs were in the Eligibility and MDS files but not in the Enrollment file. After merging the Eligibility, Enrollment, and MDS files, the EQRO considered NFs' eligibility as "unknown" if a facility on MDS did not have corresponding data on eligibility and type (164 NFs). We considered those NFs as never enrolled in QIPP. If a facility was in the Eligibility file and not in the Enrollment file, we classified it as: never enrolled.

Merging the Enrollment file with the Eligibility file and adding federal provider codes based on the name match of the Eligibility and the MDS file created a list of nine NFs with homonymous federal provider code (for a total of 18 observations). Eight of them also had a duplicate Facility ID in the Enrollment file. In cases of duplicate IDs, we kept the occurrences in the original Enrollment list for the sake of prioritizing the information that we received from HHSC and for consistency with the main matching procedure (which is based on the provider code listed in the Enrollment file, merged with the CMS file). This resulted in dropping nine facilities that have a corresponding named NF in the MDS file. After merging the Eligibility/Enrollment list with MDS data, we also dropped one facility because it did not have correspondence in the MDS file. This may indicate that the facility was not active since 2015, or its code in the Enrollment/Eligibility file was incorrect. The EQRO classified as "unknown" type all nursing facilities that did not have eligibility, enrollment, and type data from the Eligibility/Enrollment file and considered them as never enrolled in QIPP.

The EQRO recommends HHSC to double check lists of Facility IDs, names, and ownership information because some facility names in the Enrollment list do not correspond to facility names in the MDS file despite having the same provider code.

Table 3 reports the number and proportion of nursing facilities whose IDs (either Facility ID or "Federal Provider Number") were 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. 165 nursing facilities did not have a corresponding Facility ID and, hence, did not have information on type. The EQRO classified them as "Unknown".

Provider Information (CMS)

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

- Number of Certified Beds
- Average Number of Residents per Day
- Whether the provider serves Medicare, Medicaid, or both
- Provider Changed Ownership in Last 12 Months

CMS releases Provider Information data with quarterly frequency (called "processing date") on 3/1, 6/1, 9/1, and 12/1 of each calendar year. The variable "processing date" creates a correspondence between MDS and Provider Information files and allows to merge the two datasets. In the MDS dataset, a "processing date" of March 1st, 2022 corresponds to Q4 of 2020. Following this criterion, the evaluation of QIPP in SFY2022 should include Provider Information data with processing dates of 12/1/2021 for 2021Q3, 3/1/2023 for 2021Q4, and 6/1/2023 for 2022Q1. Because CMS has not yet released data corresponding to those processing dates as of today, the EQRO did not include additional data from the Provider Information file for the interim evaluation of SFY 2022. HHSC classifies as NSGOs all NFs listed as either "city", "county", or "hospital district/authority" in the variable *ownership type listed with HHSC.* 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 file (which HHSC uses to classify NFs as NSGO or Privately Owned) as they represent different point-in-time data. This poses limitations in the interpretability of ownership type information. The EQRO recommends that HHSC should improve its reconciliation process between the two data files.

Table 3. Data sources and source of information on nursing facility ownership type in SFY 2022

	NSGO		Privately Owned		Unknown type	
	Proportion	N	Proportion	N	Proportion	N
Presence in "Enrollment" and "Eligibility" files that HHSC provided						
NF is listed only in the Enrollment file	1.3%	8	2.3%	13	0%	0
Only in Eligibility file	0.5%	3	4.3%	243	0%	0
Both in Enrollment and in Eligibility files	98.2%	606	54.2%	303	0%	0
Facility (federal provider number) is present only in MDS file						
Only in MDS file	0%	0	0%	0	1%	165
Facility ID was retrieved by matching MDS and "Eligibility" file through NF's name						
"Facility ID" inferred through name-based match	1.3%	8	44.7%	250	N.A.	N.A.
Facility type (NSGO or PO) inferred from HHSC's "Enrollment" file						
Type inferred from enrollment file	98.7%	609	55.3%	309	N.A.	N.A.

Methods

The material below summarizes 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).

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 58 NFs with a "federal provider code" 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) as of *Unknown* type and hypothesized that they were never enrolled in QIPP. Table 4 presents the NF

enrollment profiles by the beginning and ending of each SFY from 2018 to 2022. 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 lack of enrollment at that time. The time points in the enrollment pattern go from most recent on the left (ending SFY2022) to the oldest on the right (beginning 2018). So, 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 possible enrollment profiles by ownership type and enables the reader to identify key patterns. Table 4 also shows that 458 NFs enrolled in QIPP at the beginning of SFY2018 and remained enrolled ever since (see last row in table). Reading from the bottom of the table, we see that 65 NFs enrolled at the beginning of SFY2019, 214 at the beginning of SFY2020, 82 at the beginning of SFY2021, and 46 at the beginning of SFY 2022 and remained continuously enrolled until present. The table shows that the majority of NFs had consistent enrollment patterns and remained enrolled (or non-enrolled) in QIPP after joining the program, with relevant differences between POs and NSGOs. Of the 305 NFs that never joined QIPP, 243 were POs, only 4 NSGOs, and 58 Unknown. 43 NSGOs and 4 POs joined QIPP continuously since the beginning of 2022, 38 NSGOs (44 POs) joined in 2021, 78 NSGO and 136 POs joined in 2020, 36 and 25 in 2019. 392 NSGOs and 66 PO facilities joined QIPP continuously since 2018. Some NFs did not display consistent enrollment patterns across QIPP years. For example, 5 NFs unenrolled from QIPP before SFY 2022 and 34 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 maintain a consistent classification of NF cohorts over QIPP program years, the EQRO defined the following comparative cohorts of, separately, A) Privately Owned facilities and B) Non-State Government Owned:

 A. Never enrolled in QIPP (note: applies to POs only for the analysis, due only four NSGOs never enrolling)
 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 inconsistent enrollment patterns: enrolled in SFY 2022
 H. NFs with inconsistent enrollment patterns: not enrolled in SFY 2022

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

Enrollment pattern (End of SFY2022 to beginning of SFY 2018)	NSGO	Privately Owned	Unknown	Total
0000000000	4	243	58	305
0000000111	2	0	0	2
0011001111	1	0	0	1
0011110000	0	1	0	1
0011111111	1	0	0	1

Institute for Child Health Policy, University of Florida

Enrollment pattern (End of SFY2022 to beginning of SFY 2018)	NSGO	Privately Owned	Unknown	Total
1100000000	43	3	0	46
1100110000	5	1	0	6
1100111111	0	1	0	1
1111000000	38	44	0	82
1111000011	0	3	0	3
1111001100	1	1	0	2
1111001111	4	1	0	5
1111110000	78	136	0	214
1111110011	1	16	0	17
1111111100	36	25	0	61
1111111111	392	66	0	458
Total	606	541	58	1,205

Source: EQRO elaboration from HHSC' Eligibility and Enrollment files (QIPP Year 5 evaluation).

Descriptive analysis

We 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 for each comparison cohort in SFY 2022 (precisely, Q4 of calendar year 2021 and Q1 and Q2 of calendar year 2022). For the descriptive analysis, the EQRO produced mean values over the three available quarters.

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. The population included all the component-eligible NFs that participated in QIPP in SFY 2022.

Visual trend analysis

The EQRO plotted the pre-enrollment and enrollment quarterly mean values for selected comparative cohorts with a sufficient number of units of analysis. Visual trend analyses included the 2018 and 2020 enrollment cohorts of POs, 2018 enrollment cohort of NSGOs, and never enrolled POs. The interim evaluation extended the analysis up to that portion of SFY 2022 for which data was available (i.e., October 2021 through March or June 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 (as identified in 1) between the final calendar quarter of 2015 to the second calendar quarter of 2022. The analysis facilitates a comparison of the differences in overall rates and trends in the selected measures between PO and NSGO facilities that enrolled in QIPP (by cohort) and POs that never joined QIPP. To improve interpretability, the analyses included cohorts that joined QIPP in correspondence with the introduction of new eligibility rules and excluded cohorts of NFs that joined QIPP at intermediate times. The analyses included cohorts of NSGOs continuously enrolled in QIPP since 2018, POs continuously enrolled in QIPP since 2018 (i.e., the first program year, with an eligibility rule based on a share of Medicaid activity greater or equal than 77.89%), POs enrolled since 2020 (corresponding to an eligibility rule of 65%), and POs that never enrolled in QIPP. The rationale of the inclusion criteria was to a) compare cohorts that

joined QIPP due to changes in program eligibility rather than other unobservable factors, b) include cohorts with relevantly large population sizes, and c) include facilities with consistent enrollment patterns over time. The objective of the inclusion criteria was to minimize comparative biases that reflected unobservable differences between nursing facilities in terms of, e.g., organizational, managerial and inherent characteristics, rather than differences associated with enrollment in the QIPP program and its changing rewards structure over time. The visual trend analysis did not consider statistical significance in differences between cohorts.

Regression analysis

1. The EQRO designed and conducted a regression analysis that related cohorts of QIPP-enrolled facilities with different lengths of participation in QIPP and mean values of measures 1.1.1-1.1.4 and 2.1.1-2.1.2 in SFY 2022 as outcomes. The regression analysis included only the NFs that maintained continuous participation in QIPP since after joining the program. The analysis excluded cohorts with intermittent patterns due to small sizes. The analyses estimated separate regressions for NSGOs and POs. For NSGO, the regression compared cohorts of NFs enrolled in QIPP since 2018 with cohorts enrolled later. For POs, the regression compared POs that never enrolled in QIPP with cohorts that enrolled later.

Interpretation. This analysis suggests whether different cohorts of enrollment in QIPP had statistically significantly different performances in terms of the selected EQ1 and EQ2 measures.

2. In another regression analysis, the EQRO estimated the association between EQ1 and EQ2 measures, as dependent variables, and a variable that, for each nursing facility, indicates whether the NF met the criteria for incentive payment for the component metrics that HHSC selected for EQ3 (i.e. a binary yes/no variable), for each criterion. The EQRO estimated two separate sets of regressions by ownership type because POs are not eligible for the same set of criteria that apply to NSGOs. 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 and EQ2 variables are the dependent variables and the meeting of the criteria for an incentive payment in EQ3 is the regressor. This analysis suggests whether meeting a metric was associated with a different NFs performance in terms of measures from EQ1 and EQ2.

3. A cross-sectional regression analysis that related each measure in 1.1.1-1.1.4, 1.2.1, and 2.1.1 and 2.12 (as of SFY 2022 interim values) to NF cohort/type and CHOW by SFY 2022 was not feasible due to population sizes of nursing facilities in different groups being too small (see also Table 15 and Table 16)

Inspection of feasibility for causal inference

The EQRO conducted an analysis of the necessary conditions to make causal inferences about the effect of QIPP, such as a pre-program trend analysis of EQ1 measures in SFY 2016 and SFY 2017. The analysis assessed the presence or absence and magnitudes of any differences in pre-program trends between NFs that did/did not join QIPP for relevant comparative cohorts. This analysis informs (i) the possibility to perform a causal evaluation of the QIPP and (ii) which program years and which cohorts 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 years 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 after QIPP started can be attributed to the program. A necessary

condition for the feasibility of a DID analysis is that NFs enrolled vs not enrolled in the program had statistically similar performance trends that remained relatively stable before the program kick-off.

Results

The following tables display descriptive statistics of each EQ1 HP 1.1 measure and EQ2 HP 2.1 measure, by nursing facility cohort and ownership type, in SFY 2022. The descriptive statistics include 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 descriptive analysis tables, this section reports visual trend analyses of mean measure values over quarters (SFY 2016 to SFY 2022). Regression analyses for all measures (by evaluation question) follow immediately after.

In several cohorts, the number of nursing facilities was too small to produce reliable inferences. Among NSGOs, only four never enrolled in QIPP, ten participated in SFY 2022 and displayed irregular patterns of enrollment since 2018, and only three displayed irregular patterns and ended with non-enrollment in SFY 2022. Among POs, cohorts with small population sizes included POs enrolled since 2022 (two NFs) and the non-enrolled with irregular patterns (one NF). Small population numbers warn against making inferences from descriptive results for those cohorts due to limited interpretability.

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

Percent of high-risk residents with pressure ulcers, including unstageable pressure ulcers

Descriptive analysis

Among NSGOs, cohorts enrolled in 2019 and in 2022 had 7.8 and 7.9 percent mean proportions of residents with pressure ulcers. For NSGOs enrolled in 2018 the mean value was 6.8 percent. For 2020 and 2021 cohorts, the mean value was 6.7 percent. Among POs, facilities enrolled since 2019 had a mean value of 5.6 percent average across SFY 2022 quarters, followed by POs enrolled since 2018 (6.3 percent) and POs participating in 2022 with different patterns (6.9 percent), POs enrolled since 2018 (7 percent), since 2021 (7.2 percent), and since 2020 (7.7 percent). POs that never enrolled had a mean of 9 percent high-risk residents with pressure ulcers across SFY 2022 quarters.

Table 5. Measure 453 – Percentage of high-risk residents with pressure ulcers, including unstageable

	NSGO				PO			
	Mean	**Median**	**SD**	**N**	**Mean**	**Median**	**SD**	**N**
Never Enrolled	4.3%	4.5%	3.7	4	9%	8.2%	5.7	196
Enrolled since 2018	6.8%	6.1%	4	367	7%	6.5%	3.6	61
Enrolled since 2019	7.8%	6.3%	4.4	31	6.3%	5.6%	3.6	23
Enrolled since 2020	6.7%	6.3%	4.1	73	7.7%	7.1%	5	125
Enrolled since 2021	6.7%	6.4%	3.9	37	7.2%	6.7%	3.8	40
Enrolled since 2022	7.9%	6.8%	5.2	41	12.2%	12.2%	1.4	2
Enrolled – different patterns	7.8%	7.7%	5.4	10	6.5%	6.9%	4	21
Not enrolled – different patterns	2.6%	2.9%	0.7	3	5.8%	5.8%	-	1

		NSGO				PO		
Total		6.9%	6.3%	4.1	566	8%	7.3%	5	469

Visual trend analysis

Figure 1 shows that (1) NSGOs enrolled since program outset (2018) generally had the lowest mean rates, (2) POs that never enrolled generally had the highest mean rates, and (3) POs enrolled since 2019 and 2020 had pressure ulcer rates in between these two groups. With respect to never-enrolled nursing facilities (POs), cohorts of NSGOs enrolled since 2018 and POs enrolled since 2018 and 2020 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 for all nursing facilities. NSGOs and POs enrolled since 2018 concluded the time series with the lowest (best performing) value. The final value was lower than the initial one. POs enrolled since 2020 reverted to the lowest pre-pandemic value in SY 2022. Never-enrolled facilities reverted to the initial (2018 Q1) value.

Figure 1. Percentage of high risk long-stay residents with pressure ulcers, including unstageable ulcers
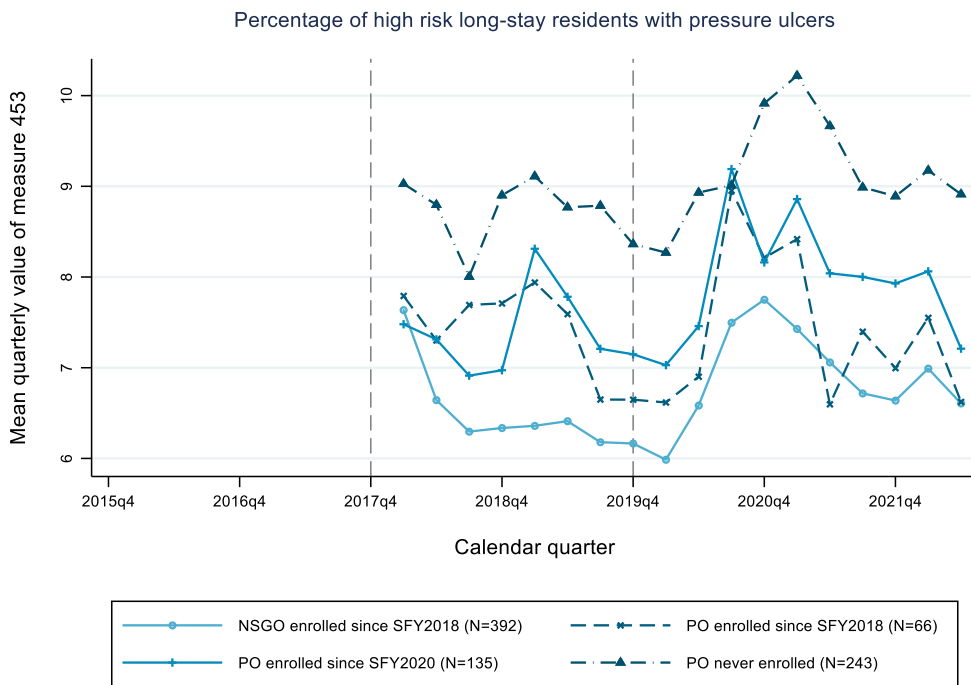
Percent of residents who received an antipsychotic medication
Descriptive analysis

On average, 594 NSGOs had a rate of residents who received an antipsychotic medication of 12.3 percent in SFY 2022. Among NSGOs, the cohort enrolled since 2020 had a value of 8.9 percent, followed by similar values among the cohorts of 2022 (9 percent) and 2021 (9.2 percent). The 2018 NSGO cohort had a rate of 9.6 percent and the cohort of 2019 had a rate of 10.6 percent. Among POs, never-enrolled NFs had a rate of 11.3 percent, followed by the 2020 enrollment cohort (11.6 percent), the 2019 cohort (12.8 percent), the 2018 cohort (13.6

percent), and POs participating in QIPP in 2022 with different enrollment patterns (14.6). 43 POs enrolled since 2021 had a rate of 15.5. percent.

Table 6. Percentage of residents who received antipsychotic medication (Measure 419)

	NSGO				PO			
	Mean	Median	SD	N	Mean	Median	SD	N
Never Enrolled	12.3%	11.6%	6	4	11.3%	10.4%	6.8	208
Enrolled since 2018	9.6%	8.3%	6.4	384	13.6%	11.5%	8.5	65
Enrolled since 2019	10.6%	10.2%	5.2	35	12.8%	12.8%	5.6	24
Enrolled since 2020	8.9%	8.3%	5.8	78	11.6%	10.4%	7.9	133
Enrolled since 2021	9.2%	8.6%	4.5	37	15.5%	12.7%	11.9	43
Enrolled since 2022	9%	8.1%	5.3	42	6.5%	6.5%	9.3	2
Enrolled – different patterns	13.3%	12.3%	5.2	10	14.6%	14.3%	7.1	22
Not enrolled – different patterns	11.8%	11.9%	10.5	4	11.2%	11.2%	-	1
Total	9.6%	8.6	6.1	594	12.3%	11.2%	7.9	498

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 POs never enrolled showed the smallest declines, consistent with QIPP being effective. 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 (see first vertical dashed line), the former achieved and maintained lower mean values than the latter. 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. The relative decrease from SFY 2018 to SFY 2022 was smaller amongst never-enrolled POs enrolled facilities.

Figure 2 Percentage of long-stay residents who received an antipsychotic medication

Percentage of long-stay residents who received an antipsychotic medication
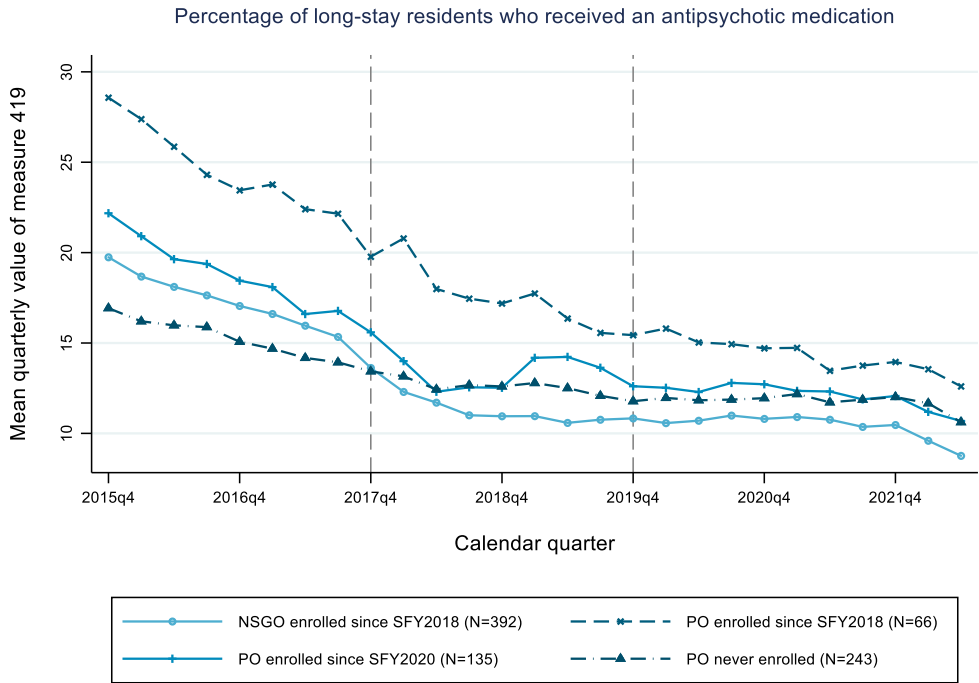
Percent of residents whose ability to move independently has worsened

Descriptive analysis

NSGOs had a 13.6-percent mean rate of residents whose ability to move independently worsened in SFY 2022. On average, POs had a 15.6-percent rate. Mean values ranged between 11.5 percent (cohort of 2021) and 15.4 (cohort enrolled in 2022) among NSGOs. Among POs, the cohorts enrolled in 2020 and 2018 had rates of, respectively, 13.1 and 13.6 percent. The cohort of POs never enrolled had a rate of 17.7 percent.

Table 7. Measure 451 - Percentage of residents whose ability to move independently worsened

	NSGO				PO			
	Mean	Median	SD	N	Mean	Median	SD	N
Never Enrolled	13.8%	17.9%	7.8	3	17.7%	16.8%	9.3	170
Enrolled since 2018	13.6%	12.7%	7.3	363	13.6%	11.7%	7.2	63
Enrolled since 2019	14.7%	14.5%	6	33	15.3%	15.6%	6.6	23
Enrolled since 2020	12.6%	12.1%	5.8	77	13.1%	12.9%	7.1	130
Enrolled since 2021	11.5%	11.1%	6.6	36	17.9%	15.2%	8.6	41
Enrolled since 2022	15.4%	15.2%	7.6	41	16.9%	16.9%	3.3	2
Enrolled – different patterns	16.9%	17.5%	8	10	15.7%	15.6%	8.5	22
Not enrolled – different patterns	15.1%	15.4%	1.6	3	20.1%	20.1%	-	1
Total	13.6%	12.8%	7.1	566	15.6%	14.6%	8.4	452

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 with its introduction (second vertical dashed line, 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 Q2 of 2020, facilities continuously enrolled in QIPP experienced a decreasing trend and outperformed their pre-pandemic performance. Non-enrolled facilities reported a similarly decreasing trend. Yet, never-enrolled facilities had highest percentage mean values in SFY 2022 than all other groups.

Figure 3. Percentage of residents whose ability to move independently has worsened
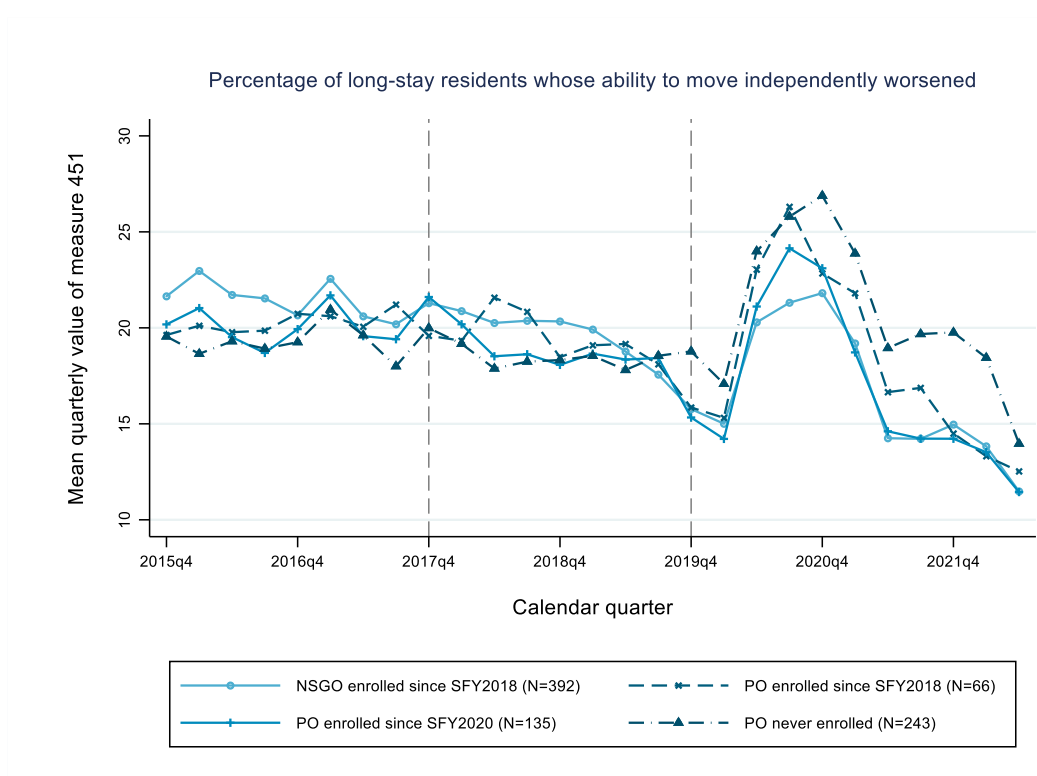
Percent of residents with a urinary tract infection

Descriptive Analysis

On average, NSOGs in the first three quarters of SFY 2022 had a rate of 1.1 residents with a urinary tract infection (UTI) out of 100 residents. For Pos, on average, the rate was 1.7 percent. NSGOs enrolled since 2020 and since 2022 had a rate of 0.8 percent. For NSGOs enrolled since 2021, the mean rate was 0.9 percent. For cohorts enrolled since 2018 and 2019, rates were 1.1 and 1.7 percent. Enrolled POs had rates of 0.9 percent (enrolled since 2018), 1.1 percent (enrolled with irregular patterns), 1.2 percent (cohorts of 2019 and 2020) and 1.4 percent (cohort of 2021). POs never enrolled in QIPP had a mean rate of 2.4 percent.

Table 8. Measure 407 - Percentage of residents with a urinary tract infection

	NSGO				PO			
	Mean	Median	SD	N	Mean	Median	SD	N
Never Enrolled	1.4%	1.5%	1.1	4	2.4%	1.4%	3.3	208
Enrolled since 2018	1.1%	0.5%	1.7	390	0.9%%	0.6%	1.2	65
Enrolled since 2019	1.7%	0.8%	2.4	35	1.2%	0.8%	1.4	25
Enrolled since 2020	0.8%	0.2%	1.3	78	1.2%	0.5%	2	134
Enrolled since 2021	0.9%	0%	1.6	37	1.4%	0.7%	2.4	43
Enrolled since 2022	0.8%	0.4%	1	42	0%	0%	0	2
Enrolled – different patterns	0.9%	0.9%	1	11	1.15	1.1%	1.3	23
Not enrolled – different patterns	2.5%	1.1%	3.7	4	0.9%	0.9%	-	1
Total	1.1%	0.5%	1.7	601	1.7%	0.8%	2.6	501

Visual trend analysis

Measure 407 (Percentage of residents with a urinary tract infection) became a program metric in Year 3 (SFY 2020). 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 among non-enrolled POs and ranged between 4 and 4.5 among NFs that enrolled in QIPP in following program years. All NFs display decreasing trends over time. Never-enrolled facilities scored relatively worse also towards the end of SFY 2022.

Figure 4. Percentage of residents with a urinary tract infection
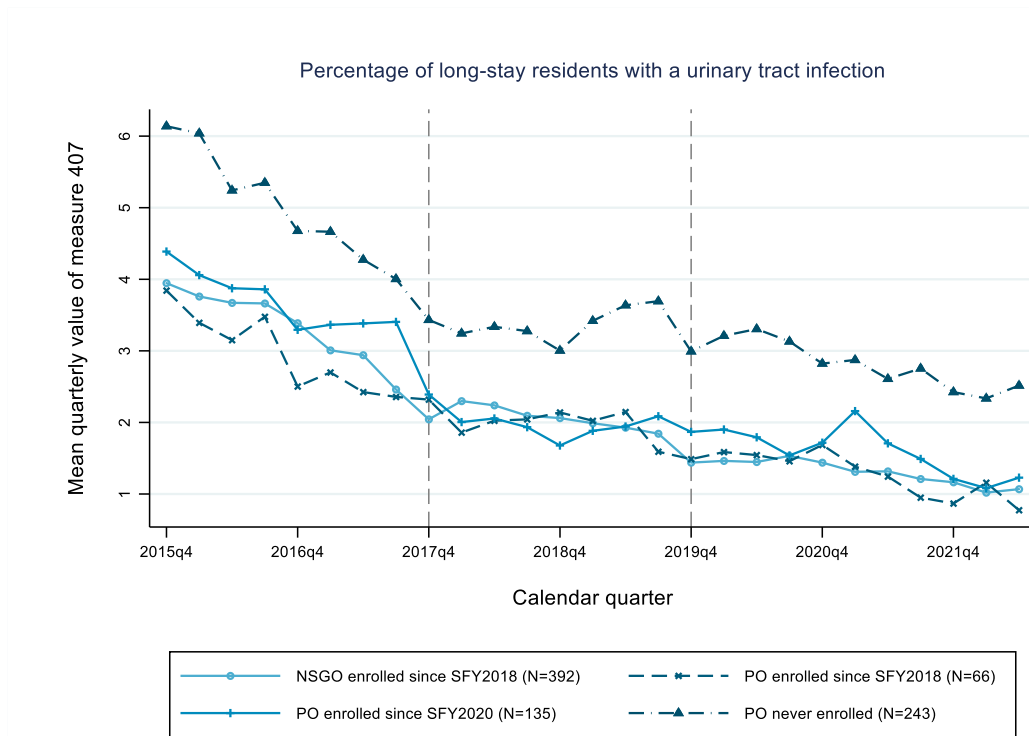
Regression analysis

Table 9 reports the coefficients of the estimation of ordinary least squares linear regressions of the association between each EQ1 HP 1.1 QIPP program metrics and the enrollment profile of NSGOs over QIPP program years. The table reports the results of each regression in a separate column for each measure. The analyses included only nursing facilities that participated in QIPP with a constant profile over years. The analyses excluded four NSGOs that never enrolled in QIPP due to the insufficient population size.

Overall, the results suggest that NSGOs continuously enrolled in QIPP since 2018 and since different program years did not present statistically significant differences in mean values of metrics 453, 419, 451, and 407 in SFY 2022 at conventional levels (1 percent or 5 percent significance level).

Table 9. 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)
Enrollment cohort				
Enrolled since 2018 (baseline)	-	-	-	-
Enrolled since 2019	0.692	1.0	1.0	0.6
	(0.705)	(0.9)	(1.1)	(0.4)
Enrolled since 2020	0.036	-0.7	-0.8	-0.3*
	(0.526)	(0.7)	(0.8)	(0.2)
Enrolled since 2021	-0.032	-0.4	-1.9*	-0.1
	(0.636)	(0.8)	(1.2)	(0.3)
Enrolled since 2022	1.292	-0.6	2.3*	-0.3*
	(0.855)	(0.9)	(1.2)	(0.2)
Constant	6.744***	9.6***	13.4***	1.1***
	(0.200)	(0.3)	(0.4)	(0.1)
Observations	1,577	1,717	1,578	1,737
Mean	6.882	9.511	13.41	1.047
SD	4.858	6.540	8.934	2.130

Robust standard errors in parentheses. Significance level legend: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 10 reports the results of the estimation of 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. The table reports the results of each regression in a separate column. The analysis includes nursing facilities that maintained a consistent participation profile over QIPP program years (i.e., continuously enrolled or never enrolled). The results suggest that there were some statistically significant differences in mean QIPP metric values in SFY 2022 by enrollment cohort for POs. For measure 453, the share of residents with pressure ulcers, enrollment in 2018 was associated with a lower share by 1.9 percentage points. Enrollment since 2019 with -2.6 percentage points, enrollment since 2020 with -1.3 percentage points and -1.9 percentage points among POs enrolled since 2021, with respect to POs that never enrolled in QIPP. Similarly, enrollment since 2018 was

associated with -1.5 percentage points in the share of long-stay residents with a UTI (and -1.2 for the 2019 cohort, -1.3 for the 2020 cohort and -1 pp for the 2021 cohort) with respect to POs that never enrolled in QIPP.

For measure 451, the percentage of residents whose ability to move independently worsened, facilities enrolled in QIPP since 2018 and 2020 had, respectively, lower rates by 3.9 and 4.3 percentage points that POs that never enrolled in QIPP. For measure 419 (percentage of residents who received an antipsychotic medication), enrollment in 2020 was associated with a higher share by 4.1 percentage points. The former result contrasts with the general evidence and calls for a cautionary interpretation.

Table 10. 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)
Enrollment cohort				
PO never enrolled (baseline)	-	-	-	-
PO Enrolled since 2018	-1.938***	1.9*	-3.9***	-1.5***
	(0.609)	(1.1)	(1.1)	(0.3)
PO Enrolled since 2019	-2.616***	1.3	-1.9	-1.2***
	(0.834)	(1.2)	(1.5)	(0.4)
PO Enrolled since 2020	-1.261**	-0.1	-4.3***	-1.3***
	(0.602)	(0.8)	(0.9)	(0.3)
PO Enrolled since 2021	-1.872***	4.1**	0.2	-1.0**
	(0.708)	(1.9)	(1.5)	(0.4)
Constant	8.993***	11.4***	17.4***	2.4***
	(0.398)	(0.5)	(0.7)	(0.2)
Observations	1,257	1,390	1,173	1,398
Mean	8.058	12.11	15.37	1.703
SD	5.813	8.231	10.22	3.053

Robust standard errors in parentheses. Significance level legend: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

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 Residents Assessed and Appropriately Given the Pneumococcal Vaccine

Descriptive analysis

Overall, assessment and vaccination rates of pneumococcal vaccines in the first three quarters of SFY 2022 were high for all NFs. Values ranged between 98.4 percent among 43 NSGOs enrolled since 2022 and 91.9 percent among 134 POs enrolled since 2020. On average, NSGOs had a mean rate of 97.9 percent and POs had a mean rate of 93.1 percent.

Table 11. Measure 415 - Percentage of residents Assessed and Appropriately Given the Pneumococcal Vaccine

	NSGO				PO			
	Mean	Median	SD	N	Mean	Median	SD	N
Never Enrolled	87%	100%	25.9	4	92.8%	99.2%	13.5	209
Enrolled since 2018	97.9%	100%	5.2	390	95.8%	100%	9.2	65
Enrolled since 2019	97.5%	100%	6.6	35	96%	99.6%	7.1	25
Enrolled since 2020	97.8%	99.6%	5.4	78	91.9%	99.1%	18	134
Enrolled since 2021	98.3%	100%	3	37	92.2%	98.1%	11.8	43
Enrolled since 2022	98.4%	100%	3.9	43	93.9%	93.9%	7.5	2
Enrolled – different patterns	98.9%	99.6%	1.2	11	92.5%	98.5%	19.5	23
Not enrolled – different patterns	99.6%	100%	0.7	4	99.2%	99.2%	-	1
Total	97.9%	100%	5.4	602	93.1%	99.2%	14.3	502

Visual trend analysis

Measure 415 was not a QIPP program metric until SFY 2020. Across calendar years, NSGOs had the most increasing trend in the percentage of residents assessed and appropriately given the pneumococcal vaccine. NSGOs started as the second lowest ranking cohort in 2015 and were the best performing in calendar Q2 of 2022. NSGOs 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. POs enrolled since 2020 performed very similarly to never-enrolled POs until 2020 and experienced a larger drop during the pandemic. Since the beginning of the COVID-19 pandemic, never-enrolled POs performed relatively better but the two cohorts converged in 2022. All NF cohorts experienced a drop in the values of metric 415 rates in correspondence with the pandemic. The drop was minimal amongst NSGOs.

Figure 5. Percentage of residents Assessed and Appropriately Given the Pneumococcal Vaccine
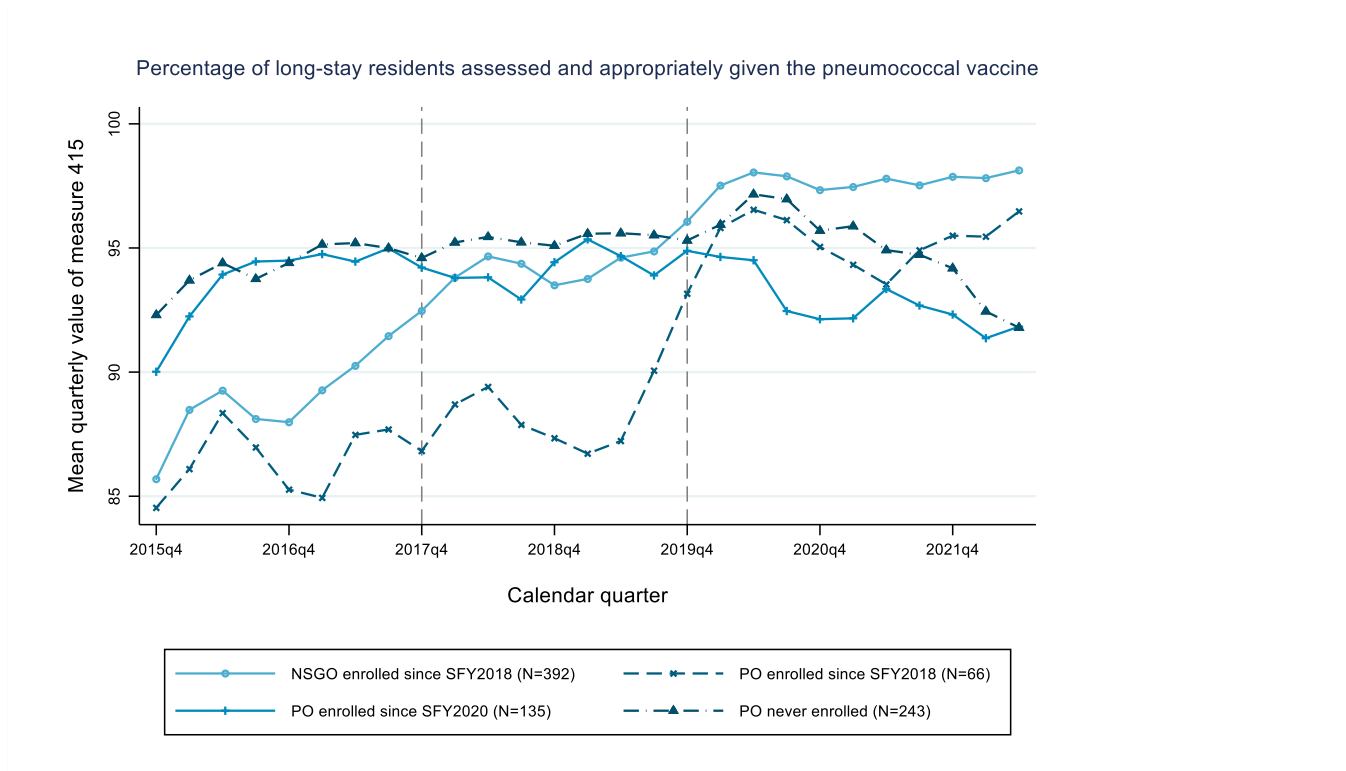
Percentage of long-stay residents assessed and appropriately given the pneumococcal vaccine

Percentage of Residents Assessed and Appropriately Given the Seasonal Influenza Vaccine

Descriptive analysis

Percentage rates of assessment and vaccination for Seasonal Influenza were high, overall, among all NFs. On average, NSGOs had a mean rate of 97.8 percent. POs had a mean rate of 95.6 percent. Among NSGOs, rates ranged between 97.2 percent (cohort enrolled since 2019) to 98.4 (cohort enrolled since 2020). Never-enrolled POs had a 95 percent-rate. Other POs had values that ranged between 95.3 (cohort of 2021) and 97.1 (cohort of 2018).

Table 12. Measure 454 - Percentage of residents Assessed and Appropriately Given the Seasonal Influenza Vaccine

	NSGO				PO			
Enrollment cohort	**Mean**	**Median**	**SD**	**N**	**Mean**	**Median**	**SD**	**N**
Never Enrolled	96.9%	98.8%	4.3	4	95%	97.5%	7.7	214
Enrolled since 2018	97.6%	98.9%	3.9	391	97.1%	98.7%	5.2	65
Enrolled since 2019	97.2%	99%	4.8	36	96.3%	98.7%	5.4	25
Enrolled since 2020	98.4%	99%	2	78	96.1%	98.2%	5.7	135
Enrolled since 2021	98.3%	99.3%	2.3	37	95.3%	97.7%	7	43
Enrolled since 2022	98%	98.9%	2.7	43	97%	98.8%	4.2	3
Enrolled – different patterns	98.5%	98.7%	1.2	11	94.9%	98.7%	6.8	23
Not enrolled – different patterns	96.1%	98.2%	5.4	4	98.9%	98.9%	-	1
Total	97.8%	98.9%	3.6	604	95.6%	98.1%	6.7	509

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 influence vaccine over time. However, all NF cohorts display a jump downwards in correspondence of the first calendar quarter of 2022. This either suggests a decrease in performance in 2022 or that CMS reassesses and provides updated values at the end of the calendar year. NSGOs that participate in QIPP since 2018 started and ended the period of 2018 through 2021 with the best relative performance. Never enrolled POs started from a second last position and ended last. The figure suggests that the COVID-19 pandemic did not make the performance of NFs for this metric worse, independently of enrollment status.

Figure 6. Percentage of residents Assessed and Appropriately Given the Seasonal Influenza Vaccine
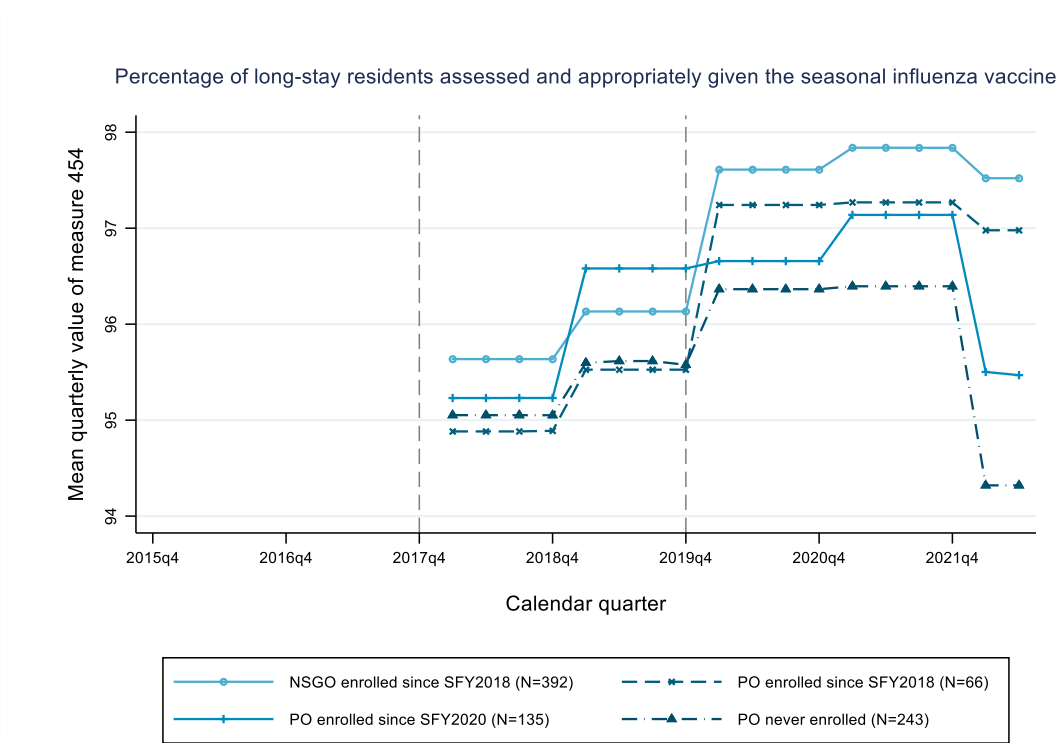
Regression analysis

Table 13 reports the coefficients of ordinary least squares regressions of the association between QIPP program metrics in EQ2 and patterns of enrollment in QIPP across program years for NSGOs. The analyses excluded four NSGOs that never participated in QIPP due to an insufficient sample size and included NSGOs with consistent enrollment patterns over time. The results suggest that there is no statistically significant difference between NSGOs enrolled 2018 and NSGOs enrolled in different years for EQ2 measures in SFY 2022. The only statistically significant difference was with NSGOs enrolled since 2020 for outcome measure 454 (percentage of residents assessed and appropriately given the seasonal influenza vaccine). Among the latter, the regression suggests a higher percentage by 0.8 percentage points.

Table 13. Regression analysis by enrollment cohort for NSGOs (EQ2)

VARIABLES	% of residents Appropriately Given the Pneumococcal Vaccine (415)	% of residents Appropriately Given the Seasonal Influenza Vaccine (454)
Enrollment cohort		
Enrolled since 2018 (baseline)	-	-
Enrolled since 2019	-0.5 (1.1)	-0.5 (0.8)
Enrolled since 2020	-0.2 (0.7)	0.8*** (0.3)
Enrolled since 2021	0.4 (0.6)	0.6 (0.4)
Enrolled since 2022	0.4 (0.7)	0.3 (0.5)
Constant	97.9*** (0.3)	97.6*** (0.2)
Number of observations	1,743	1,748
Mean	97.94	97.77
SD	6.051	4.420

Robust standard errors in parentheses. Significance level legend: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 14 shows that enrollment in QIPP since 2018 was associated with better performance both in terms of percentage of residents assessed and appropriately given the influenza vaccine (measure 415) and the seasonal influenza vaccine (measure 454) with respect to POs that never enrolled in QIPP. Respectively, POs enrolled in QIPP since 2018 showed 3 and 2.1 higher percentage points in measures 415 and 545 than POs that never enrolled. For the other cohorts, the results did not show the presence of statistically significant differences in SFY 2022 mean values.

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

VARIABLES	% of residents Appropriately Given the Pneumococcal Vaccine (415)	% of residents Appropriately Given the Seasonal Influenza Vaccine (454)
Enrollment cohort		
PO never enrolled (baseline)	-	-
PO Enrolled since 2018	3.0** (1.5)	2.1** (0.8)

PO Enrolled since 2019	3.1* (1.7)	1.2 (1.2)
PO Enrolled since 2020	-1.0 (1.8)	1.0 (0.7)
PO Enrolled since 2021	-0.6 (2.0)	0.3 (1.2)
Constant	92.8*** (0.9)	95.0*** (0.5)
Number of observations	1,409	1,418
Mean	93.05	95.67
SD	15.06	7.800

Robust standard errors in parentheses. Significance level legend: *** p<0.01, ** p<0.05, * p<0.1

Other results

Change of ownership

Table 15 and Table 16 report the number and percentage of nursing facilities that had a Change of Ownership (CHOW) in 2020 or in 2021 by ownership type in SFY 2022. Among facilities that do not participate in QIPP in SFY 2022, only one private facility had a CHOW in 2021. The rest of NFs did not have CHOWs in 2021 or 2022. Among facilities that participate in QIPP in SFY 2022, only 3 NSGOs had a CHOW in 2021 (0.5%) and 15 in 2021. 17 POs had a CHOW in 2020 (5.7%) and 40 had a CHOW in 2021 (13.5%). 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 15. Change of Ownership by type: facilities not enrolled in QIPP in SFY 2022

	Nursing facility had a CHOW (by SFY)			
	None	2020	2021	Total
Ownership type				
NSGO	8 (100%)	0 (0%)	0 (0%)	8 (100%)
Private	243 (99.6%)	0 (0%)	1 (0.4)	244 (100%)
Total	310 (99.7%)	0 (0%)	1 (0.3%)	311 (100%)

Table 16. Change of Ownership by type: facilities enrolled in QIPP in SFY 2022

	Nursing facility had a CHOW (by SFY)			
	None	2020	2021	Total
Ownership type				
NSGO	578 (96.98%)	3 (0.5%)	15 (2.52%)	596 (100%)
Private	239 (80.7%)	17 (5.7%)	40 (13.5%)	296 (100%)
Total	817 (91.6%)	20 (2.2%)	55 (6.2%)	892 (100%)

Feasibility for causal inference

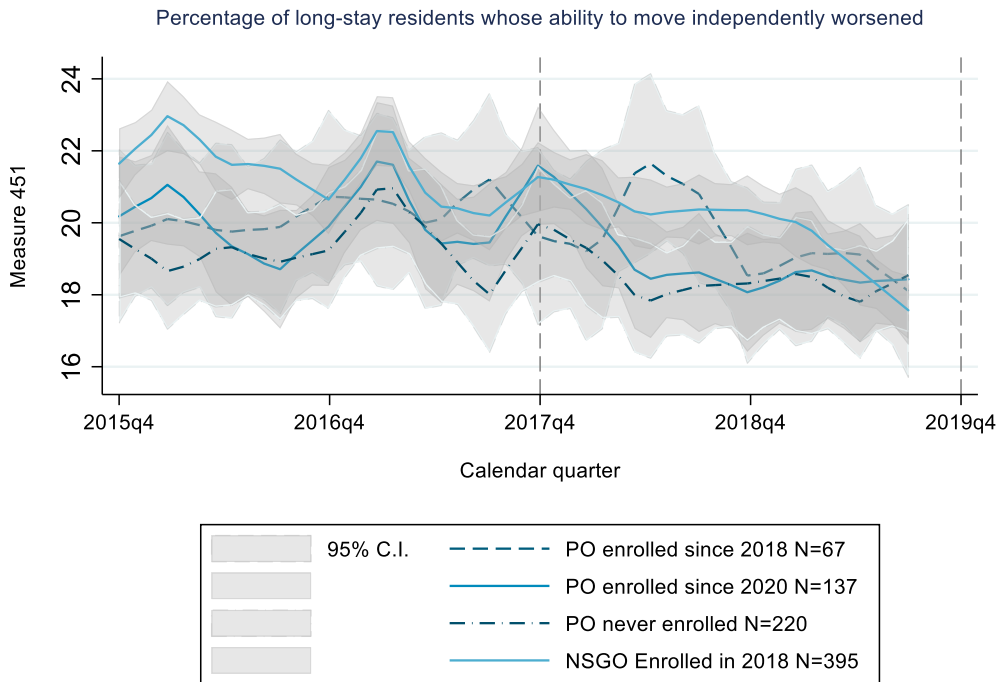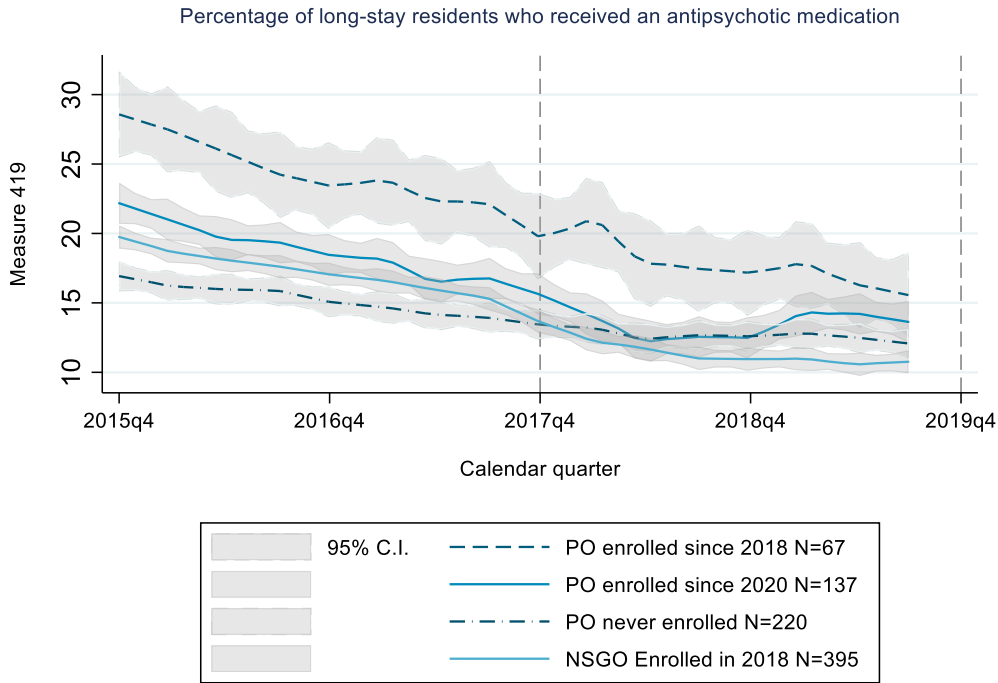### Parallel trends inspection and trends over program years

Figure 7 shows the time trends for each annual enrollment cohort along with the never-enrolled cohort for each of the four EQ1 and EQ2 MDS measures that have a consistent reporting methodology over QIPP program years until SFY 2022. Difference-in-differences estimations cannot include measures that change methodology over time because of the longitudinal dimension of the analysis, which includes years before the inception of QIPP. These 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.
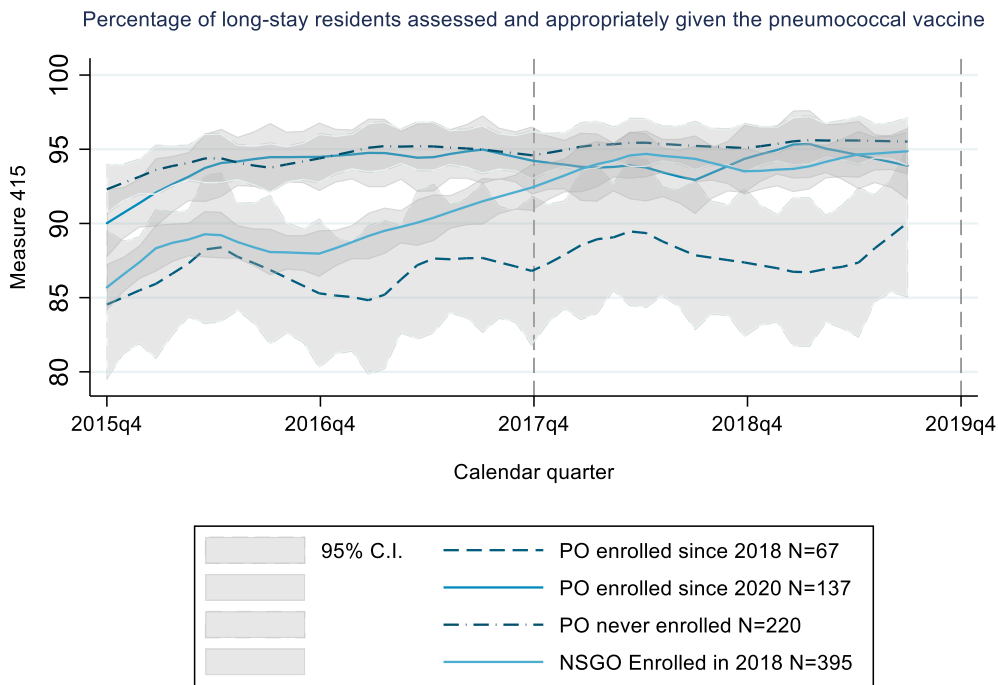
Figure 7 below presents trends for the following cohorts:

a) POs continuously enrolled since 2018
b) POs continuously enrolled since 2020
c) POs never enrolled in QIPP
d) NSGOs continuously enrolled since 2018

Fortunately, the following trends generally show stable trends for the treatment and comparison groups through time. For pneumococcol vaccine, urintary 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 those measures between each of the enrolled cohorts with respect to the cohort of POs than never enrolled in QIPP.

Figure 7- Time Trends for Evaluation Measures for QIPP Year 5 (SFY2022)

Percentage of long-stay residents who received an antipsychotic medication

Percentage of long-stay residents whose ability to move independently worsened

Percentage of long-stay residents with a urinary tract infection

Percentage of long-stay residents assessed and appropriately given the pneumococcal 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 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 17 below presents the number and percentage of NFs that met the criteria for incentive payment in SFY 2022, for each EQ3 HP 3.1 measure. The population includes all the component-eligible NFs that participated in QIPP in SFY 2022.

Table 17. Number and Percentage of Nursing Facilities that Met the Criteria for Incentive Payment SFY 2022

Number and Percentage of Nursing Facilities that Met the Criteria for Incentive Payment SFY 2022					
		Yes		Not Met	
	Ownership	Number	Percent	Number	Percent
NSGOs Only					
3.1.1 Submission of a PIP on a Long-stay MDS Measure	NSGO	563	93.5%	39	6.5%
3.1.3 Submission of documentation demonstrating evidence-based antibiotic stewardship elements	NSGO	579	96.2%	23	3.8%
3.1.4 Submission of a documentation of infection control policies demonstrating data-driven analysis of NF performance and evidence-based methodologies for intervention.	NSGO	579	96.2%	23	3.8%

Number and Percentage of Nursing Facilities that Met the Criteria for Incentive Payment SFY 2022					
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	528	87.7%	74	12.3%
All Nursing Home Types					
3.1.2 Submission of a Workforce development focused PIP	NSGO	548	91%	54	9%
	PRIVATE	258	85.1%	45	14.8%
3.1.6 (4RN) Self-reported direct-care RN staffing hours as described in Table 1	NSGO	535	88.9%	67	11.1%
	PRIVATE	246	81.2%	57	18.8%
3.1.6 (8RN) Self-reported direct-care RN staffing hours as described in Table 1	NSGO	519	86.2%	83	13.8%
	PRIVATE	239	78.9%	64	21.1%

Note: The correlation coefficient between 4RN and 8RN is 0.9

Regression analysis (heterogeneity analysis)

Table 18 presents the regression analyses that examine the associations between the QIPP performance measures, and the evaluation outcome measures for NSGOs. The models detected several statistically significant effects of measure compliance on outcomes. Submission of a PIP on a long-stay outcome was associated with reduced UTIs and increased pneumococcal vaccinations, while submission of a workforce development-focused PIP was associated with reduced UTIs. Antibiotic stewardship and infection control policies were associated with decreased UTIs and increased pneumococcal and seasonal influenza vaccination. Completion of prevention training was associated with reduced (a) pressure ulcers, (b) antipsychotic medications, (c) worsening of independent movement, and (d) UTIs along with decreases in influenza vaccinations. An eight-hour increase in RN care was associated with decreased UTIs and increased influenza vaccines.

Perhaps the most striking result in Table 18is the fact that "Q315 Completion of 'Nursing Home Infection Preventionist Training Course' by NFA and DON" was significantly associated with five of the six outcomes, with four of the five effects being beneficial (reduced pressure ulcers antipsychotic medications, UTIs, and reduction in worsening of independent movement).

Table 18. Regression Results for Each MDS Measure as a Function of Meeting QIPP Criteria NSGOs

Regression Results for Each MDS Measure as a Function of Meeting QIPP Criteria NSGOs						
	Dependent Variable					
Explanatory Variables	MSR 453 pressure ulcers	MSR 419 anti-psychotic meds	MSR 451 indept. movement worsened	MSR 407 urinary tract infection	MSR 415 pneumococcal vaccine	MSR 454 seasonal influenza vaccine
Intercept	9.346*** (1.369)	14.293*** (1.584)	18.284*** (2.135)	4.468*** (0.405)	93.290*** (1.289)	95.719*** (0.924)

Regression Results for Each MDS Measure as a Function of Meeting QIPP Criteria NSGOs						
Q311 Submission of a PIP on a Long-stay MDS Measure	0.969 (0.872)	-0.435 (1.262)	-1.569 (1.505)	-0.672** (0.315)	2.061** (1.002)	1.111 (0.719)
Q312 Submission of a Workforce development focused PIP	-0.716 (0.721)	-0.432 (1.013	-0.464 (1.247)	-0.188** (0.259)	-0.465 (0.814)	-0.536 (0.584)
Q313 Submission of evidence of antibiotic stewardship / Q314 infection control policies	-1.615 (1.351)	-1.982 (1.575)	0.490 (2.159)	-0.983** (0.404)	3.229** (1.285)	1.690* (0.921)
Q315 Completion of 'Nursing Home Infection Preventionist Training Course' by NFA and DON	-1.130* (0.602)	-1.698** (0.840)	-2.503** (1.018)	-0.929*** (0.214)	0.246 (0.681)	-0.968** (0.485)
3.1.6 (8RN) Self-reported direct-care RN staffing hours	-0.116 (0.572)	-0.597 (0.797)	-1.233 (0.980)	-0.971*** (0.204)	-0.142 (0.650)	0.853* (0.466)
Number of observations	558	584	558	591	592	593
Mean of outcome	6.91	9.55	13.54	1.05	98.03	97.8
SD	4.15	6.08	7.11	1.69	4.99	3.57

Robust standard errors in parentheses. Significance level legend: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 19 presents the analogous regression results for PO facilities. For POs, an eight-hour increase in RN staffing [Q316(8RN) Self-reported direct care RN staffing hours] was associated with improvements in four of the six outcomes measures (reduced (a) pressure ulcers, (b) worsening of independent movement, (c) UTIs, and increased (d) influenza vaccinations).

Table 19. Regression Results for Each MDS Measure as a Function of Meeting QIPP Criteria POs

Regression Results for Each MDS Measure as a Function of Meeting QIPP Criteria POs						
Explanatory Variables	Dependent Variable					
	MSR 453	MSR 419	MSR 451	MSR 407	MSR 415	MSR 454
Intercept	8.778*** (0.843)	15.702*** (1.438)	17.969*** (1.293)	2.304*** (0.296)	93.168*** (2.506)	95.226*** (0.948)
Q312 Submission of a Workforce development focused PIP	0.376 (0.941)	-1.079 (1.688)	-0.332 (1.482)	-0.448 (0.347)	-3.422 (2.941)	-1.104 (1.132)
3.1.6 (8RN) Self-reported direct-care RN staffing hours	-2.223*** (0.761)	-2.220 (1.448)	-4.110*** (1.265)	-0.966*** (0.298)	3.701 (2.523)	2.305** (0.978)
Number of observations	275	292	284	295	295	297
Mean of outcome	7.28	12.98	14.34	1.14	93.18	96.12
SD	4.37	8.58	7.5	1.81	14.89	5.82

Robust standard errors in parentheses. Significance level legend: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 20 presents the number and percent of NSGOs and POs that were compliant with measures Q311 (Submission of a PIP on a Long-stay MDS Measure), Q312 (Submission of a Workforce development focused

PIP), Q 313/314 (Submission of evidence of antibiotic stewardship / infection control policies_, Q315 (Completion of 'Nursing Home Infection Preventionist Training Course' by NFA and DON), and Q316(8RN) (Self-reported direct-care RN staffing hours). The results for Table 9 show that almost 72 percent of NSGOs were compliant with all five measures, with almost 90 percent of NSGOs compliant with four or more measures. By contrast, less than one percent of POs were compliant with all five measures, and only approximately 10 percent of POs were compliant with three or more measures. More than two-thirds of POs (75 percent) were compliant with two questions.

Table 20. Number of nursing facilities that were compliant with EQ3 metrics (for questions 311, 312, 313/314, 315, and 316 8RN)

Number of NSGO that were compliant (for questions 311, 312, 313/314, 315, and 316 8RN)		
	N	Percent
Compliant to 0 questions	8	1.3%
Compliant to 1 question	4	0.7%
Compliant to 2 questions	17	2.8%
Compliant to 3 questions	26	4.3%
Compliant to 4 questions	114	18.9%
Compliant to 5 questions	433	71.9%
Number of PO that were compliant		
	N	Percent
Compliant to 0 questions	33	10.9%
Compliant to 1 question	43	14.2%
Compliant to 2 questions	227	74.9%