

# Assessment of the Medicare Quality Improvement Organization Program

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**Background:** Studies have shown improvement in quality of health care in the United States. However, the factors responsible for this improvement are largely unknown.

**Objective:** To evaluate the effect of the Medicare Quality Improvement Organization (QIO) Program in 4 clinical settings by using performance data for 41 quality measures during the 7th Scope of Work.

**Design:** Observational study in which differences in quality measures were compared between baseline and remeasurement periods for providers that received different levels of QIO interventions.

**Setting:** Nursing homes, home health agencies, hospitals, and physician offices in the 50 U.S. states, the District of Columbia, and 2 U.S. territories.

**Participants:** Providers receiving focused QIO assistance related to quality measures and providers receiving general informational assistance from QIOs.

**Measurements:** 5 nursing home quality measures, 11 home health measures, 21 hospital measures, and 4 physician office measures.

**Results:** For nursing home, home health, and physician office measures, providers recruited specifically by QIOs for receipt of assistance showed greater improvement in performance on 18 of 20 measures than did providers who were not recruited; similar improvement was seen on the other 2 measures. Nursing homes and home health agencies improved more in all measures on which they chose to work with the QIO than in other measures. Nineteen of 21 hospital measures showed improvement; in this setting, QIOs were contracted for improvement initiatives solely at the statewide level. Overall, improvement was seen in 34 of 41 measures from baseline to remeasurement in the 7th Scope of Work.

**Limitations:** As in any observational study, selection bias, regression to the mean, and secular trends may have influenced the results.

**Conclusions:** These findings are consistent with an impact of the QIO Program and QIO technical assistance on the observed improvement. Future evaluations of the QIO Program will attempt to better address the limitations of the design of this study.

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Recent reports have highlighted deficiencies in quality of health care in the United States (1, 2). Several reports of nationwide improvements have also been published by such organizations as the Agency for Healthcare Research and Quality, the National Committee for Quality Assurance, the Joint Commission on Accreditation of Healthcare Organizations, and the Medicare Quality Improvement Organization (QIO) Program. The extent to which these improvements are attributable to the efforts of health plans, accreditors, or QIOs is unclear, given the absence of comparison groups (3–11).

The Centers for Medicare & Medicaid Services (CMS), the federal agency responsible for administering Medicare, Medicaid, and several other health care–related programs, seeks to improve the quality of health care for Medicare beneficiaries through contracts with QIOs (12)—state-based organizations staffed with clinicians, analysts, and others with expertise in case review and quality improvement. The 53 QIO contracts cover the 50 U.S. states, the District of Columbia, Puerto Rico, and the Virgin Islands. A single organization can hold more than 1 QIO contract. **Appendix Figure 1** (available at [www.annals.org](http://www.annals.org)) shows the locations of QIO lead offices.

The most recently concluded QIO contract period, the 7th Scope of Work, began in 2002. At various points during this period, the CMS began public reporting of provider performance on quality measures for nursing homes, home health agencies, and hospitals (13–15). We

evaluated the effect of the QIO Program in 4 clinical settings by using performance data for 41 quality measures and explored the implications of these findings for future Program evaluations.

## METHODS

### Participants

For the 7th Scope of Work, the CMS expanded the QIO contract, which was previously limited to hospitals and physician offices, to include nursing homes and home health agencies. For each of the 4 settings, the CMS required QIOs to offer assistance to all interested providers in their state or jurisdiction. In the nursing home, home health agency, and physician office settings, QIOs were also required to recruit subsets of providers, known as *iden-*

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tified participant groups (IPGs), that would receive focused assistance related to clinical quality measures. There was no IPG requirement for the hospital setting.

The 53 QIOs recruited voluntary IPGs among nursing homes, home health agencies, and physician offices during the initial months of the 7th Scope of Work. The CMS used outcome measures and clinical process measures to evaluate the performance of each QIO as part of a performance-based service contract. The QIOs were evaluated on improving statewide and IPG clinical process measures and provider satisfaction with their QIO.

Each QIO was required to recruit an IPG of at least 10% but no more than 15% of the nursing homes in its state or jurisdiction and at least 5% but no more than 7.5% of primary care practitioners (physicians, nurse practitioners, and physicians' assistants). For the home health setting, the minimum number of providers in the IPG was 30% of the agencies in the state; there was no maximum number.

The CMS provided general guidance to the QIOs on the selection of IPG providers but did not control the selection process. The QIOs shared information among themselves about appropriate factors, such as willingness to commit resources to quality improvement and baseline performance, for which there were opportunities for improvement.

In this study, we classified providers not participating in an IPG as *non-IPG providers*. Nursing homes and home health agencies that were participants in an IPG were required to select 1 or more quality measures to target for improvement. For these 2 settings, we subdivided providers in IPGs by measure into 2 subgroups: IPG-select and IPG-other (Appendix Figure 2, available at [www.annals.org](http://www.annals.org)). For a given measure, the *IPG-select* subgroup consists of IPG providers that elected to focus on that measure, and the *IPG-other* subgroup consists of IPG providers that selected other measures.

### QIO Interventions

We collected information on the intensity of QIO assistance for nursing homes but not the other provider settings so that we could classify the non-IPG and IPG providers according to 4 levels of QIO intervention (high, medium, low, and none). The highest level of activity involved on-site visits or planned multicontact educational interventions in a group setting to the provider by QIO staff; low-level activity was often limited to sending written or electronic material to the nursing home. Overall, there was a strong relationship between participant status and level of QIO intervention. Only 32.5% of the non-IPG facilities received a high level of QIO intervention, whereas 97.3% of the IPG facilities received this level of intervention. We did not collect information on non-QIO quality improvement programs in which non-IPG providers may have participated during the 7th Scope of Work.

At the statewide level, QIOs promoted quality im-

provement in the 4 settings through such activities as partnerships with provider organizations, work with business and consumer groups, regional educational meetings, and direct QIO communication with providers (10, 16, 17). Development and dissemination of information on best practices and improvement tools gave providers resources that were useful in improvement work (6, 7, 18–26). With the IPG providers, QIOs conducted more focused activities.

### Quality Measures

Quality measures selected by the IPGs were driven by different factors in each setting, including contractual direction and limitations, baseline performance, and method of improvement. Data are reported on 5 nursing home measures, 11 home health agency measures, 21 hospital measures, and 4 outpatient measures. One measure (infection) was not reported because it was measured in more than 1 way, and another measure (delirium) was not reported because very few providers specifically worked to improve performance in this area. The Appendix (available at [www.annals.org](http://www.annals.org)) provides details on the selection and reporting of measures by setting.

### Data Sources

We used data from nursing homes and home health agencies that were reported to CMS through the systems required for Medicare payment: the Minimum Data Set (27) and the Outcomes Assessment and Information Set (28). Medicare- and Medicaid-certified nursing homes are required to conduct Minimum Data Set assessments of all residents on admission and at mandated intervals. The Outcomes Assessment and Information Set provides a comprehensive assessment of adult home care patients; like the Minimum Data Set assessment, its use is required on admission and at mandated intervals.

The hospital data were abstracted by clinical data abstraction contractors, who provide data support to the CMS. As in the 6th Scope of Work evaluation (8), we used random samples of 125 inpatient records per state per quarter for Medicare patients with a diagnosis of acute myocardial infarction, heart failure, or pneumonia or who had undergone surgery. Sample cases were weighted according to their probability of selection in the national quarterly sample. We analyzed CMS National Claims History data to determine assignment, based on majority of care, of Medicare beneficiary to practitioner for the physician office setting. Information on assignment of beneficiary to practitioner and performance on physician office quality measures was compiled quarterly.

For nursing homes, home health agencies, hospitals, and physician offices, we report only baseline and remeasurement data, because of space limitations and because the CMS evaluated QIO performance on the basis of improvement from baseline to remeasurement. The baseline and remeasurement periods were separated by about 2 years for

**Table 1. Characteristics of Nursing Homes, Home Health Agencies, and Physician Offices\***

Characteristic	Non-Identified Participant Group Providers	Identified Participant Group Providers
<b>Nursing homes</b>		
Number studied	11 076	2236
Beds		
Mean, <i>n</i>	117.6	127.6
Median, <i>n</i>	106.0	116.0
<50, %	4.2	2.5
50–99, %	38.1	33.6
100–149, %	36.7	38.3
150–199, %	13.0	14.8
≥200, %	8.0	10.7
Urban location, %	65.2	68.6
Located in hospital, %	3.6	6.1
Medicaid residents, %	68.1	63.5
<b>Home health agencies</b>		
Number studied	2445	4251
Size, %†		
Very small (10–30)	28.2	5.7
Small (31–150)	32.1	24.5
Medium (151–500)	26.2	36.4
Large (≥501)	13.5	33.4
<b>Physician offices</b>		
Number physicians	325 634	15 263
Mean age of physicians, <i>y</i>	46	47
Physician specialty code, %		
General practice	5	5
Family practice	26	41
Internal medicine	29	39
All other	40	15

\* Identified participant group providers volunteered to receive focused attention from the Quality Improvement Organizations.

† The proxy for size is the number of utilization outcome episodes for the acute hospitalization quality measure during the fourth quarter of 2002.

nursing homes, home health agencies, and hospitals and by 3 years for physician offices.

For nursing homes, we used the second quarter of 2002 as the baseline period and the second quarter of 2004 as the remeasurement period. For home health, 1 May 2001 to 30 April 2002 was the baseline period and 1 February 2004 to 31 January 2005 was the remeasurement period. For the hospital setting, the first quarter of 2002 was the baseline period and the fourth quarter of 2004 was the remeasurement period. For the physician office setting, the baseline and remeasurement periods varied depending on the QIO contract cycle. The selection of baseline and remeasurement periods varied by setting because of contractual reasons and data set limitations.

### Statistical Analysis

For the nursing home setting, QIO contracts and publicly reported data required a minimum denominator of 30 for the chronic care measures and 20 for the acute care measures to create stable rates (qualifying providers). Approximately 13 000 of 16 000 nursing facilities, or about 80%, were included for each long-stay measure. The 1 short-stay measure, pain, had approximately 3100 qualify-

ing providers. For nursing homes, the percentage of providers with excluded data because they did not meet the denominator requirements (exclusion rate) varied by measure from 17.8% to 44.9% for non-IPG providers and from 5.4% to 34.9% for IPG providers. For contractual and reporting reasons, in the home health setting, agencies had to have at least 30 episodes of care in their denominator for a particular measure to be included in the calculations. For the 11 home health agency measures in our study, approximately 6000 home health agencies (about 80%) were included in the rate calculations. The exclusion rate varied by measure from 10.4% to 17.2% for non-IPG providers and from 0.5% to 1.8% for IPG providers.

In the hospital setting, the only missing information was from an occasional chart that was not sent to the clinical data abstraction contractors. The physician office setting measurement was based on claims data, and we have no measure of claims that were not submitted.

For nursing homes and home health agencies, the national mean baseline and remeasurement rates were calculated, by quality measure, for participant groups (non-IPG, IPG-other, and IPG-select). National means were calculated as means of individual facility rates. The sample for both nursing homes and home health agencies consisted of qualifying providers that reported quality measure rates at both baseline and remeasurement. For the hospital setting, we report data on the number of patients sampled nationwide with primary diagnoses of acute myocardial infarction, heart failure, and pneumonia, as well as those eligible for surgical infection prevention measures. Descriptive statistics for the physician office setting are the number of eligible patients at baseline and baseline and remeasurement rates for Medicare beneficiaries who received most care from practitioners in IPG and non-IPG physician offices.

We also analyzed time-trend data for nursing homes and home health agencies. These data included all providers who reported at any of the time intervals and met the denominator requirement for at least 1 period. These data included all reporting nursing homes and home health agencies regardless of the number of periods in which they reported data; therefore, the denominator counts are not the same as those in the previous analyses.

## RESULTS

Table 1 shows provider characteristics across non-IPG and IPG nursing homes, home health agencies, and physician offices. Compared with non-IPG nursing homes, IPG nursing homes tended to have a lower proportion of Medicaid residents and were larger, more often found in urban locations, and more likely to be located in a hospital. The IPG home health agencies tended to be larger than non-IPG home health agencies. In the physician office setting, the predominant specialty codes were similar for the 2 groups: general practice, family practice, internal medicine,

**Table 2. Nursing Home Performance on Selected Quality Measures at Baseline and Remeasurement\***

Quality Measure	Nursing Homes, n†	Mean Rate, %		Change in Performance, percentage points
		Baseline‡	Remeasurement§	
<b>Decline in activities of daily living since the last Minimum Data Set administration</b>				
Non-IPG	10 438	15.2	15.4	0.2
IPG	2251	16.5	16.0	-0.5
IPG-other	1817	15.6	15.5	-0.1
IPG-select	434	20.4	17.8	-2.6
<b>Moderate pain daily or severe pain any time in the past 7 days</b>				
Non-IPG	10 892	10.5	6.8	-3.7
IPG	2305	11.7	6.0	-5.7
IPG-other	496	6.7	5.2	-1.5
IPG-select	1089	13.0	6.2	-6.8
<b>Physically restrained daily in the past 7 days</b>				
Non-IPG	11 076	9.8	7.7	-2.1
IPG	2326	9.6	6.4	-3.2
IPG-other	1717	7.3	5.7	-1.6
IPG-select	609	16.5	8.4	-8.1
<b>Pressure ulcers in the past 7 days</b>				
Non-IPG	11 075	8.4	8.6	0.2
IPG	2326	9.0	8.8	-0.2
IPG-other	946	7.4	8.2	0.8
IPG-select	1380	10.1	9.3	-0.8
<b>Short-stay residents with moderate pain daily or severe pain any time in the past 7 days</b>				
Non-IPG	7425	24.9	22.5	-2.4
IPG	1600	26.3	21.5	-4.8
IPG-other	932	24.0	20.4	-3.6
IPG-select	668	29.7	23.0	-6.7

\* IPG = identified participant group. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

† Number of nursing homes that reported at both baseline and remeasurement for the specific measure.

‡ Mean of rates from individual facilities across all U.S. states or jurisdictions at baseline in the second quarter of 2002. Rates from individual facilities are the number of patients as a percentage of eligible patients.

§ Mean of rates from individual facilities across all U.S. states or jurisdictions at remeasurement in the second quarter of 2004. Lower values at remeasurement indicate improved performance.

and obstetrics/gynecology. However, IPG physician offices had a higher proportion of family practice and internal medicine specialists compared with non-IPG physician offices.

**Appendix Table 1** (available at [www.annals.org](http://www.annals.org)) shows the total number of nursing homes and the number of IPG nursing homes for the second quarters of 2002 and 2004, by state or jurisdiction. **Appendix Table 2** (available at [www.annals.org](http://www.annals.org)) shows similar data for home health agencies. **Appendix Table 3** (available at [www.annals.org](http://www.annals.org)) shows the number of primary care physicians at baseline, IPG practitioners, and IPG practitioners as a percentage of total primary care physicians, by state or jurisdiction.

### Nursing Homes

**Table 2** shows quality measures for IPG and non-IPG nursing homes. For all 5 quality measures, IPG nursing homes experienced greater improvement from baseline to remeasurement than did non-IPG nursing homes. Non-IPG nursing homes improved in 3 measures, whereas IPG

nursing homes improved in all 5 measures. The IPG-select nursing homes showed greater improvement than did IPG-other nursing homes in all 5 measures. The most substantial improvements for the IPG-select nursing homes were in the chronic care pain measure (from 13.0% of residents at baseline to 6.2% at remeasurement), the short-stay (post-acute care) pain measure (from 29.7% to 23.0%), and the restraints use measure (16.5% to 8.4%). **Figures 1 to 3** show time-trend results for the nursing home measures.

### Home Health Agencies

**Table 3** shows mean data on quality measures at baseline and remeasurement for IPG and non-IPG home health agencies. Both groups showed improvement from baseline to remeasurement in mean facility rates for 10 of 11 measures. In addition, for 10 of 11 measures, improvement was greater for IPG agencies than non-IPG agencies. For the 1 measure with an overall decline in performance (acute care hospitalizations), IPG and non-IPG agencies

had the same rate of hospitalization at baseline and remeasurement. Comparisons within IPG agencies show that the IPG-select agencies improved more than IPG-other agencies on all 11 quality measures. Appendix Figures 3 to 8 (available at [www.annals.org](http://www.annals.org)) show time trends for the home health agency quality measures.

**Hospitals**

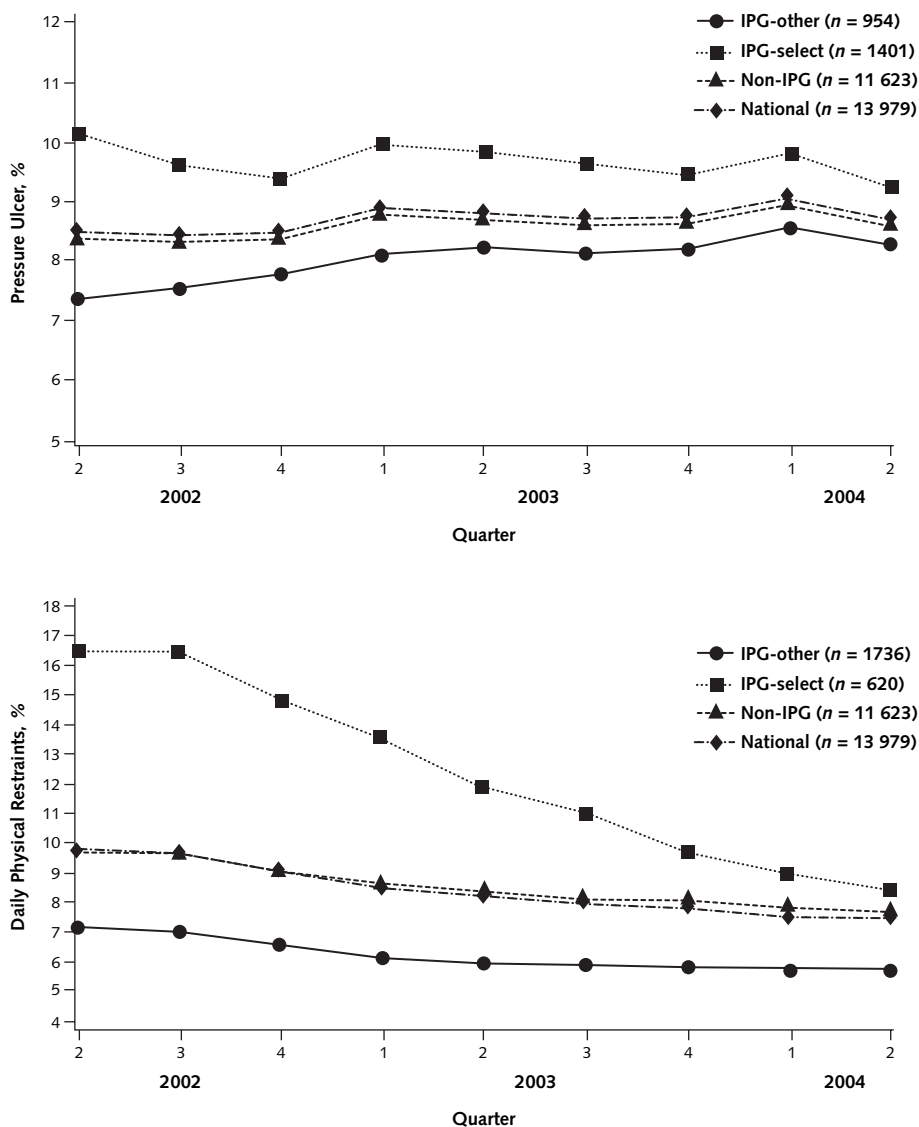
There were no comparison groups for the hospital setting; therefore, overall trends in hospital performance were examined. Table 4 shows the nationally weighted mean performance rates for the 21 hospital quality measures from the first quarter of 2002 and the fourth quarter of 2004. Nineteen of the 21 measures improved during this

period. The 2 measures for which no improvement was seen were use of angiotensin-converting enzyme inhibitors for left ventricular systolic dysfunction in heart failure and selection of prophylactic antibiotics for surgical patients.

**Physician Offices**

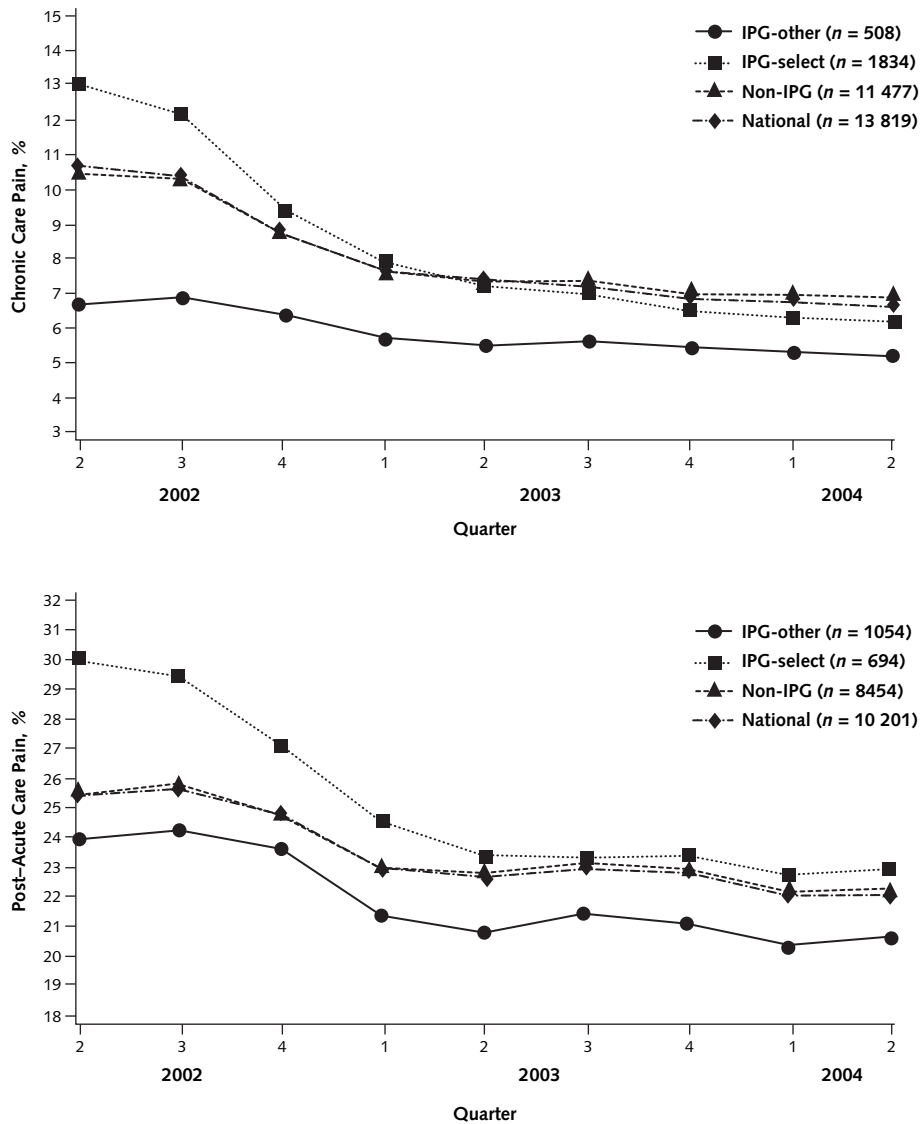
Table 5 shows baseline and remeasurement performance for IPG and non-IPG physician offices. The IPG offices showed improvement in all 4 measures, whereas the non-IPG offices showed improvement in 2 of the 4 measures but slight worsening in the screening mammography and diabetic retinal eye examination measures. Baseline performance was generally better for IPG offices than non-IPG offices. The greatest improvements for IPG offices

Figure 1. Time-trend data for nursing home facilities: pressure ulcer (top) and daily physical restraints (bottom).



Quarterly means were calculated from facilities with a reportable score in that quarter. Lower scores indicate better performance. Numbers in parentheses are the average numbers of facilities across quarters. IPG= identified participant group. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

Figure 2. Time-trend data for nursing home facilities: chronic care pain (top) and post-acute care pain (bottom).



Quarterly means were calculated from facilities with a reportable score in that quarter. Lower scores indicate better performance. Numbers in parentheses are the average numbers of facilities across quarters. IPG = identified participant group. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

occurred in the diabetic hemoglobin A<sub>1c</sub> testing measure (improvement of 8.7 percentage points) and the diabetic lipid profile determination measure (improvement of 11.2 percentage points). Procedures performed outside of primary care practices (diabetic retinal eye examination and screening mammography) had more modest improvements.

## DISCUSSION

We assessed whether national clinical quality measures had improved in the QIO 7th Scope of Work and whether QIOs contributed to this improvement. We found that

clinical quality improved for Medicare beneficiaries on 34 of 41 measures. These findings are consistent with published findings for a previous contract period for the inpatient hospital and outpatient (physician office) settings (8). However, for the first time, they now include the clinical performance results for nursing homes and home health agencies.

Assessment of the contribution of the QIO Program to quality improvement is challenging. Two types of contributions are possible. One type derives from the work that the Program does in partnership with stakeholder organizations and in support of CMS quality initiatives. This

work includes the convening of partnerships and other activities that focus provider attention on the need to improve in a given area, the development of quality measures and support for the infrastructure by which provider performance data are publicly reported, and the development of improvement methods and tools. The other contribution is direct provision of technical assistance to providers.

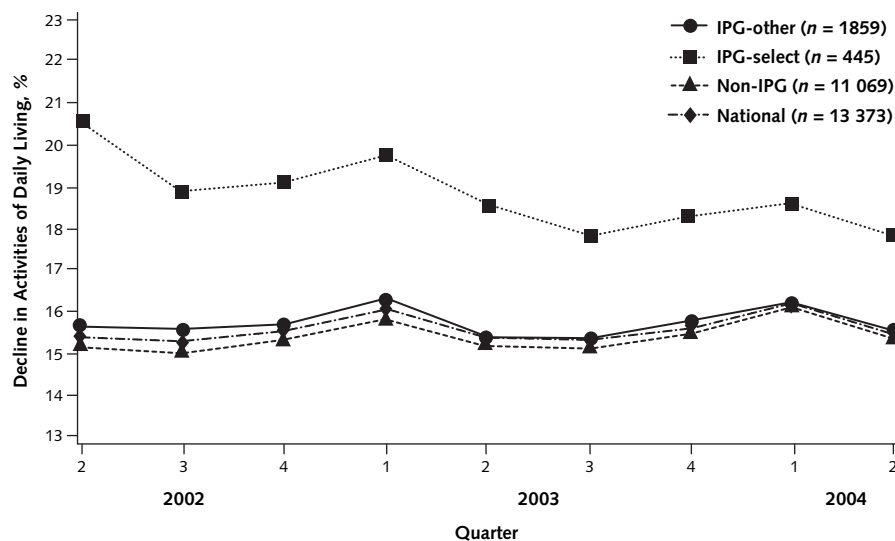
As an example of the first type of contribution, in preparation for and during the 7th Scope of Work, the Program played a leading national role in creating the measurement, reporting, and improvement infrastructure for efforts to prevent surgical infection in hospitals. In 2000, there were no nationally available measures of surgical infection prevention, nor were there reliable estimates of the extent to which preventable infections occur. Through a QIO developmental project, in partnership with the Centers for Disease Control and Prevention, national performance measures were formulated that were broadly endorsed by major surgical and medical specialty societies (29). In another QIO project, a retrospective medical record review demonstrated a substantial opportunity to improve the quality of care for delivery of prophylactic antibiotics (30). A QIO-sponsored national collaborative that included 56 hospitals and 43 QIOs representing 50 states tested change ideas to prevent surgical site infections and to facilitate the spread of improvement methods between hospitals and QIOs across the United States (31, 32). These activities created the foundation for the inclusion of surgical infection prevention measures in the QIO 7th Scope of Work. The substantial improvement that occurred during the contract period preceded the adoption of

surgical infection measures by the Joint Commission on Accreditation of Healthcare Organizations and public reporting of hospital performance on these measures.

Although it is difficult to distinguish the unique contribution of the QIO Program through such activities, the Program has played a leading role with other stakeholders in national quality improvement initiatives. Increasingly, however, reviewers have focused on the second type of contribution that the Program may make: technical assistance by QIOs to providers.

Snyder and Anderson (9) attempted to assess the contribution of QIOs to the improvement in hospital measures in the QIO 6th Scope of Work by comparing the amount of improvement achieved by hospitals receiving different levels of QIO assistance. They did not find evidence of such a contribution. Their study, however, was criticized for its small and unrepresentative sample of 5 U.S. states, the short interval assessed (half of the contract period), and use of retrospective assignment by QIOs of the intensity of assistance that hospitals received in which the reliability of the assignment was not tested (33). Furthermore, in the context of a contract that required state-wide improvement in which QIOs may have directed their resources away from hospitals that had internal capacity for improvement, a comparison among hospitals receiving different levels of assistance would not be a true test of the effects of QIOs (34). In another study of the effect of QIOs on hospitals in the 6th Scope of Work, some hospital quality improvement directors reported QIO assistance as being helpful, and others said that they did not need it (10).

Figure 3. Time-trend data for nursing home facilities: decline in activities of daily living.



Quarterly means were calculated from facilities with a reportable score in that quarter. Lower scores indicate better performance. Numbers in parentheses are the average numbers of facilities across quarters. IPG = identified participant group. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

**Table 3. Home Health Agency Performance on Selected Quality Measures at Baseline and Remeasurement\***

Quality Measure	Home Health Agencies, n	Mean Rate, %		Change in Performance, percentage points
		Baseline†	Remeasurement‡	
<b>Improved ambulation or locomotion</b>				
Non-IPG	1788	29.5	32.3	2.8
IPG	4187	31.5	35.6	4.1
IPG-other	3855	31.6	35.4	3.8
IPG-select	332	29.9	37.6	7.7
<b>Improved transferring</b>				
Non-IPG	1751	42.7	44.4	1.7
IPG	4177	46.0	49.8	3.8
IPG-other	3738	46.8	49.8	3
IPG-select	439	39.3	49.4	10.1
<b>Improved toileting</b>				
Non-IPG	1686	51.7	56.3	4.6
IPG	4127	56.7	61.3	4.6
IPG-other	4074	56.8	61.3	4.5
IPG-select	53	50.9	62.7	11.8
<b>Improved pain interfering with activity</b>				
Non-IPG	1779	50.6	54.7	4.1
IPG	4181	53.0	58.6	5.6
IPG-other	3510	54.1	58.5	4.4
IPG-select	671	47.0	59.0	12
<b>Improved bathing</b>				
Non-IPG	1789	48.1	52.8	4.7
IPG	4186	53.1	58.2	5.1
IPG-other	3913	53.4	58.3	4.9
IPG-select	273	49.0	56.5	7.5
<b>Improved oral medication management</b>				
Non-IPG	1758	29.7	32.5	2.8
IPG	4178	31.9	36.1	4.2
IPG-other	3675	32.2	36.0	3.8
IPG-select	503	29.3	36.7	7.4
<b>Improved upper-body dressing</b>				
Non-IPG	1619	55.4	60.0	4.6
IPG	4114	58.6	64.1	5.5
IPG-other	4029	58.7	64.2	5.4
IPG-select	85	52.9	60.1	7.2
<b>Improved frequency of confusion</b>				
Non-IPG	1720	33.2	36.5	3.3
IPG	4160	36.1	40.8	4.7
IPG-other	4067	36.3	40.8	4.5
IPG-select	93	28.4	40.4	12
<b>Stabilization in bathing</b>				
Non-IPG	1805	91.1	92.5	1.4
IPG	4184	91.6	93.0	1.4
IPG-other	4113	91.7	93.1	1.4
IPG-select	71	87.1	91.2	4.1
<b>Any emergent care provided</b>				
Non-IPG	1856	27.0	26.5	-0.5
IPG	4202	25.4	23.8	-1.6
IPG-other	3637	24.3	23.1	-1.2
IPG-select	565	32.5	28.6	-3.9
<b>Received acute care hospitalization</b>				
Non-IPG	1859	33.4	34.8	1.4
IPG	4202	31.7	31.7	0
IPG-other	3746	30.8	30.9	0.1
IPG-select	456	39.3	38.4	-0.9

\* IPG = identified participant group. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

† Mean of rates at individual agencies across all U.S. states or jurisdictions at baseline, 1 May 2001–30 April 2002. Rates at individual agencies are the number of patients as a percentage of eligible patients.

‡ Mean of rates at individual agencies across all U.S. states or jurisdictions at remeasurement, 1 February 2004–31 January 2005. Higher values at remeasurement indicate improved performance, except for emergent care and acute hospitalization, for which lower values indicate improvement.

**Table 4. Hospital Performance on Selected Quality Measures at Baseline and Remeasurement**

Quality Measure	Mean Rate, %		Change in Performance, percentage points
	Baseline*	Remeasurement†	
<b>Acute myocardial infarction</b>			
Aspirin given at arrival	83.6	86.8	3.2
Aspirin prescribed at discharge	86.3	91.4	5.1
Angiotensin-converting enzyme inhibitor given for left ventricular systolic dysfunction‡	69.5	72.0	2.5
Adult smoking cessation advice or counseling provided	43.2	71.6	28.4
β-Blocker prescribed at discharge	80.2	90.1	9.9
β-Blocker given at arrival	73.2	82.0	8.8
<b>Heart failure</b>			
Discharge instructions provided	5.5	20.8	15.3
Left ventricular failure assessment	78.3	85.5	7.2
Angiotensin-converting enzyme inhibitor given for left ventricular systolic dysfunction‡	64.0	63.8	-0.2
Adult smoking cessation advice or counseling provided	25.6	61.6	36
<b>Pneumonia</b>			
Initial antibiotic given within 4 hours of arrival	61.8	69.0	7.2
Initial antibiotic given consistent with guidelines	68.5	74.9	6.4
Blood culture done within 24 hours	62.1	73.6	11.5
Blood culture done before first antibiotic received	81.1	81.9	0.8
Influenza immunization or screening	24.8	43.2	18.4
Pneumococcal immunization or screening	22.9	50.2	27.3
Adult smoking cessation advice or counseling provided	32.1	57.4	25.3
Oxygenation assessment	98.0	99.0	1.0
<b>Surgical infection prevention</b>			
Antibiotic given within 1 hour before incision	46.2	68.5	22.3
Prophylactic antibiotic consistent with guidelines	91.4	91.2	-0.2
Prophylactic antibiotics withdrawn within 24 hours	37.1	51.6	14.5

\* Mean of rates from individual hospitals across all U.S. states or jurisdictions at baseline, first quarter of 2002. The rates from individual hospitals are the number of patients as a percentage of eligible patients.

† Mean of rates from individual hospitals across all U.S. states or jurisdictions at remeasurement, fourth quarter of 2004. Higher values at remeasurement indicate improved performance.

‡ The definitions for this quality measure changed between the first quarter of 2001 and the fourth quarter of 2004.

The 2005 National Healthcare Quality Report recently released by the Agency for Healthcare Research and Quality reported 4-fold greater improvement on measures on which QIOs worked than on other measures included in the report (35). The Institute of Medicine, however, in a statutorily mandated review of the QIO Program whose results were released in February 2006, concluded that “the quality of health care received by Medicare beneficiaries has improved over time” but “the existing evidence is inadequate to determine the extent to which the QIO program has contributed directly to those improvements” (36).

We assessed the effect of technical assistance by comparing results among providers that received greater or lesser amounts of assistance from QIOs. Such a comparison was not possible in the hospital setting because QIOs were responsible for working with all hospitals in the state and we did not have reliable data about the relative intensity of assistance in this setting. In other settings, however, we found that providers that were recruited specifically by the QIO for receipt of assistance (those in an IPG) improved more on 18 of 20 measures than did providers who

were not recruited, and improvement on the other 2 measures was similar. Nursing homes and home health agencies improved more on all measures on which they chose to work with the QIO (IPG-select) than on other measures (IPG-other).

Although there are potential limitations to the data used to assess trends in clinical measure results, evidence suggests that our findings are generally valid and reliable. Data for nursing homes and home health agencies are self-reported and therefore are subject to reporting bias that may be heightened by public reporting. However, these data are linked to payment, and providers may be penalized if they report incorrect information. According to Sangl and colleagues (37), the reliability of the Outcomes Assessment and Information Set (home health agencies) and the Minimum Data Set (nursing homes) data are acceptable, although evidence for the validity of the quality measures themselves is mixed. Kinatukara and associates (38) demonstrated low interrater reliability among experts using the Outcomes Assessment and Information Set in test situations. The clinical hospital data are abstracted through independent review of medical records by the clin-

ical data abstraction contractors, who use standardized data collection procedures with rigorous internal quality control procedures (8). The trends in hospital measures are consistent with those recently reported by the Joint Commission on Accreditation of Healthcare Organizations in which self-reported data by hospitals seeking accreditation during this period were used (5). Physician office claims data sometimes understate utilization (39).

Another potential limitation is the dearth of quantitative information on the intensity of assistance received by the participant groups. By contract, QIOs were required to improve statewide rates for the 7th Scope of Work quality measures and, more specifically, to improve them within an identified subset of providers, the IPG. Contract monitoring showed that IPG providers received greater assistance than did non-IPG providers, and we further confirmed this finding retrospectively for nursing homes (but not for other settings). Because non-IPG providers also received some QIO assistance, the observed difference between the 2 groups may be less than it would be if non-IPGs had received no assistance.

Our findings are consistent with an effect of QIO technical assistance on performance. For many programs, identifying recipients of assistance, helping them, and finding improvement might be a sufficient demonstration of program impact. However, there are alternative explanations for our findings. Chance is an unlikely explanation, given that we are working with population data sets and all of the trends are in the same direction. Secular trends, particularly public reporting, may explain some of the observed improvement, but not all of the measures improved, and the greater improvement for the IPG-select providers argues against this as the sole explanation.

Our findings could be influenced by selection bias and regression to the mean. The IPG was presumably selected in part by the QIOs because they viewed these providers as likely to improve on the basis of their baseline performance and the QIO's assessment of their internal capacity and motivation for improvement. The baseline performance for the IPG was generally similar to that of the non-IPG; the finding of greater improvement by this group for virtually all measures is therefore inconsistent with regression to the mean as a sufficient explanation for our findings. Selection bias could account for some of the difference between the IPG and non-IPG providers, but within the group of providers that the QIO recruited—the IPG—the greater improvement among IPG-select providers than IPG-other providers is not explainable simply by a selection effect.

The IPG-select providers, however, had worse baseline performance than the IPG-other providers, and there may be interactive effects with other factors, such as provider size and differences among QIOs at the state level. We attempted to explore these relationships through more detailed analysis. We stratified the various comparison groups into quartiles by baseline performance and further stratified by provider size. We also used inferential statistics to control for differences among these groups in baseline performance, size, and other factors. Ultimately, we decided not to report such analyses, given the lack of an a priori experimental design that would have allowed unbiased estimates of QIO effect.

In summary, improvements on most measures in the 7th Scope of Work were greater for the providers with which the QIO worked closely and were greater for the measures for which providers requested and received QIO technical assistance. These findings are consistent with an

**Table 5. Physician Office Performance on Quality Measures at Baseline and Remeasurement\***

Quality Measure	Patients at Risk at Baseline, <i>n</i> <sup>†</sup>	Mean Rate, %		Change in Performance, percentage points
		Baseline	Remeasurement	
<b>Chronic disease: diabetes</b>				
Biennial retinal eye examination by an eye care professional				
Non-IPG	2 062 173	69.1	69.0	-0.1
IPG	192 233	69.6	71.3	1.7
Annual hemoglobin A <sub>1c</sub> testing				
Non-IPG	2 062 173	76.6	82.8	6.2
IPG	192 233	76.7	85.4	8.7
Biennial lipid profile determination				
Non-IPG	2 062 173	75.1	84.8	9.7
IPG	192 233	76.1	87.3	11.2
<b>Preventive services: breast cancer</b>				
Biennial screening mammography				
Non-IPG	2 697 029	59.2	58.6	-0.6
IPG	210 573	64.9	65.5	0.6

\* IPG = identified participant group. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

† Three different sets of patients, 1 per quality improvement organization “wave” of baseline and remeasurement, were included.

effect of the QIO Program and an effect of QIO technical assistance. The Program's effect is conjoined with that of other CMS initiatives and those of other stakeholders. Secular trend, regression to the mean, and selection bias may also have contributed to our findings related to QIO technical assistance.

Our study demonstrates the difficulty in evaluating a program that aims to offer assistance to those who request it and to achieve the maximum possible improvement nationally and within each U.S. state. To mitigate this difficulty, program interventions and related data collection techniques must be prospectively designed. Evidence of effect is likely to be most difficult to distinguish from other factors when historical controls are used, more distinguishable when comparison groups are used that are well matched to the intervention group, and best when selection bias is eliminated through randomized selection of the intervention group.

To improve our ability to assess program impact in the QIO 8th Scope of Work, which was launched in August 2005, we have made 3 changes. First, we have reduced the contract requirements for statewide improvement and will prospectively collect information on the level of assistance received by IPG and non-IPG providers. Second, we will seek to match IPG providers with controls in the non-IPG group. Finally, we will use an independently administered survey that will ask providers to assess the extent to which they would have achieved improvement without QIO assistance.

For the QIO 9th Scope of Work, which will begin in August 2008, we are in the process of convening an evaluation workgroup that will make recommendations on program design for that contract period, on the basis of the work of a contractor currently in place and on advice from a group of independent technical experts. Through that process, we will consider the potential for more fundamental redesign, such as randomized selection of the IPG, delayed implementation of assistance for a subset of providers, or both.

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**Disclaimer:** The opinions herein are those of the authors and are not necessarily those of the Centers for Medicare & Medicaid Services.

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## APPENDIX: CLARIFICATION ADDENDUM FOR SELECTION AND REPORTING OF MEASURES

Performance data for nursing home and home health agency measures were publicly reported for the first time in 2002 and 2003, respectively. Criteria for selection of a particular measure for quality improvement were discussed among QIOs in “community of practice” national telephone conferences, e-mail listservs, and national meetings. For nursing homes, the CMS had no specific requirements for measure selection; the principal advice was to choose a measure for which there was significant “room for improvement.” In practice, this meant avoiding measures for which a facility’s current performance was well above the national or state average or for which the provider had achieved the best possible performance. The guidance for home health agencies was found in the formal Outcome-Based Quality Improvement training system. Every home health agency in the IPG was encouraged to use the Outcome-Based Quality Improvement system, which includes a data-driven procedure for identifying measures for which an agency had significant room for improvement. In the outpatient setting, QIOs were evaluated on the relative improvement of all IPG practices on all 4 measures.

### Nursing Homes

We report data on 5 nursing home measures. Four of these measures applied to long-term residents: the percentage of residents whose need for help with daily activities had increased from the previous assessment, the percentage with moderate pain daily or severe pain in the past 7 days, the percentage with pressure ulcers in the past 7 days, and the percentage who were physically restrained daily in the past 7 days. The fifth measure was the percentage of short-stay (post-acute care) residents with moderate or severe pain. We do not report data for 3 nursing home quality measures: percentage of short-stay residents with delirium (because few nursing homes selected this measure), percentage of chronic care residents with an infection (because of varying definitions of this measure across states), and percentage of residents

whose ability to move about in and around their room got worse (because of concerns about the reliability of the measure). Four hundred thirty-four nursing homes targeted decline in activities of daily living for improvement during the 7th Scope of Work, 1809 targeted pain in chronic care residents, 609 targeted use of physical restraints, 1380 targeted development of pressure ulcers, and 668 targeted post-acute care pain.

### Home Health Agencies

We report data for 11 of 41 publicly reported measures. These 11 measures account for more than 75% of all home health agencies that selected measures for improvement. Four measures are related to mobility: improved ambulation, improved transferring, improved toileting, and improvement in pain interfering with activity. Another 4 measures are related to daily needs: improved upper-body dressing, improved bathing, improved management of oral medications, and stabilization in bathing. Two measures are related to medical emergencies: acute hospital admission and emergent care. One measure, improvement in confusion, is related to mental status. Improved toileting, upper-body dressing, confusion frequency, stabilization in bathing, and emergent care were each targeted by 50 to 100 home health agencies. Improved ambulation, transferring, pain, bathing, and medication management and acute care hospitalization were each targeted by 250 to 700 home health agencies.

### Hospitals

We report national rates for 21 of 23 publicly reported measures: 6 acute myocardial infarction measures, 4 heart failure measures, 8 pneumonia measures, and 3 surgical infection prevention measures. Two measures were excluded owing to very low numbers of eligible cases: timely thrombolysis and timely percutaneous coronary intervention.

### Physician Offices

We report national rates for all 4 physician office measures, based on analysis of Medicare claims for beneficiaries enrolled in traditional fee-for-service Medicare. Three of these measures pertain to patients with diabetes: biennial retinal eye examination by an eye care professional, annual testing of hemoglobin A<sub>1c</sub>, and biennial lipid profile. The fourth measure was biennial mammography for women 52 to 69 years of age at the end of the 2-year period. The QIOs were also assessed on the statewide performance of these 4 measures on the basis of analysis of Medicare claims. In addition, QIOs were required to improve their state’s rates of influenza and pneumococcal vaccination of Medicare beneficiaries 65 years of age or older as assessed by the Consumer Health Plans Survey. The QIOs were not required to improve vaccination rates for their IPG practitioners because we did not have a reliable measure of vaccination rates for each IPG practitioner.

**Appendix Table 1. Number of Nursing Homes at Baseline and Remeasurement, Number of Nursing Homes in an Identified Participant Group at Baseline and Remeasurement, and Proportion of Identified Participant Group Nursing Homes, by U.S. State or Jurisdiction**

U.S. State or Jurisdiction	All Nursing Homes, <i>n</i>		Identified Participant Group Nursing Homes, <i>n</i>		Identified Participant Group Nursing Homes at Baseline, %*
	Second Quarter, 2002	Second Quarter, 2004	Second Quarter, 2002	Second Quarter, 2004	
Alabama	230	228	35	35	15
Alaska	15	14	15	14	100
Arizona	137	134	21	21	15
Arkansas	251	237	25	25	10
California	1349	1311	191	188	14
Colorado	223	215	33	32	15
Connecticut	254	246	31	31	12
Delaware	42	42	13	13	31
District of Columbia	21	20	14	13	67
Florida	713	692	74	74	10
Georgia	362	362	56	56	15
Hawaii	46	46	15	15	33
Idaho	83	80	13	13	16
Illinois	854	820	90	90	11
Indiana	548	516	86	84	16
Iowa	464	458	70	70	15
Kansas	377	367	57	57	15
Kentucky	301	294	45	45	15
Louisiana	321	309	48	48	15
Maine	121	118	18	18	15
Maryland	246	240	33	33	13
Massachusetts	502	475	75	74	15
Michigan	435	431	64	64	15
Minnesota	426	415	68	67	16
Mississippi	204	205	38	37	19
Missouri	542	523	81	81	15
Montana	103	101	15	15	15
Nebraska	229	228	35	35	15
Nevada	43	43	15	15	35
New Hampshire	83	81	15	15	18
New Jersey	359	355	54	54	15
New Mexico	82	81	15	15	18
New York	671	667	100	100	15
North Carolina	414	420	63	63	15
North Dakota	85	83	15	15	18
Ohio	996	985	149	149	15
Oklahoma	373	361	56	56	15
Oregon	144	138	20	20	14
Pennsylvania	759	725	113	112	15
Puerto Rico	7	6	6	5	86
Rhode Island	97	95	16	16	16
South Carolina	177	177	23	23	13
South Dakota	112	112	17	17	15
Tennessee	343	335	52	51	15
Texas	1144	1136	172	168	15
Utah	91	90	15	15	16
Vermont	44	41	15	14	34
Virgin Islands	1	1	1	1	100
Virginia	282	280	35	35	12
Washington	268	249	46	43	17
West Virginia	141	133	20	20	14
Wisconsin	406	401	73	73	18
Wyoming	39	39	15	15	38
All states or jurisdictions	16 560	16 161	2480	2458	15

\* Proportion of nursing homes in a U.S. state or jurisdiction that were included in the nursing home identified participant group for that state or jurisdiction.

**Appendix Table 2. Number of Home Health Agencies at Baseline and Remeasurement, Number of Home Health Agencies in the Identified Participant Group at Baseline and Remeasurement, and Proportion of Identified Participant Group Home Health Agencies at Baseline, by U.S. State or Jurisdiction**

U.S. State or Jurisdiction	All Home Health Agencies, n*		Identified Participant Group Home Health Agencies, n*		Identified Participant Group Home Health Agencies as of 1 August 2002, %†
	1 August 2002	31 July 2005	1 August 2002	31 July 2005	
Alabama	140	141	110	109	79
Alaska	16	16	6	6	38
Arizona	62	75	41	41	66
Arkansas	175	173	88	88	50
California	541	653	283	266	52
Colorado	119	130	86	80	72
Connecticut	81	83	46	46	57
Delaware	14	16	13	12	93
District of Columbia	12	21	6	6	50
Florida	354	583	279	268	79
Georgia	87	96	77	77	89
Hawaii	17	19	16	16	94
Idaho	48	49	17	17	35
Illinois	274	339	124	121	45
Indiana	172	185	101	97	59
Iowa	172	171	149	146	87
Kansas	129	132	81	76	63
Kentucky	108	102	74	72	69
Louisiana	229	224	161	159	70
Maine	33	30	31	29	94
Maryland	44	47	38	38	86
Massachusetts	110	113	89	84	81
Michigan	190	275	124	120	65
Minnesota	223	209	94	88	42
Mississippi	60	57	54	51	90
Missouri	160	154	113	111	71
Montana	47	38	22	22	47
Nebraska	64	68	52	50	81
Nevada	35	57	25	25	71
New Hampshire	35	36	35	34	100
New Jersey	51	50	42	41	82
New Mexico	61	68	26	24	43
New York	198	188	178	168	90
North Carolina	162	165	147	145	91
North Dakota	30	26	28	25	93
Ohio	316	394	152	145	48
Oklahoma	169	200	156	148	92
Oregon	61	60	47	42	77
Pennsylvania	271	283	157	148	58
Puerto Rico	46	47	42	42	91
Rhode Island	23	22	20	19	87
South Carolina	72	69	46	45	64
South Dakota	46	42	40	39	87
Tennessee	139	138	107	105	77
Texas	818	1339	417	412	51
Utah	38	54	25	25	66
Vermont	12	12	12	12	100
Virgin Islands	2	2	1	1	50
Virginia	146	161	122	118	84
Washington	59	59	35	35	59
West Virginia	63	60	45	41	71
Wisconsin	119	118	94	91	79
Wyoming	29	24	22	19	76
All states or jurisdictions	6682	7873	4396	4245	66

\* Pediatric home health agencies were excluded.

† Proportion of home health agencies in a U.S. state or jurisdiction that were included in the home health agency identified participant group for that state or jurisdiction.

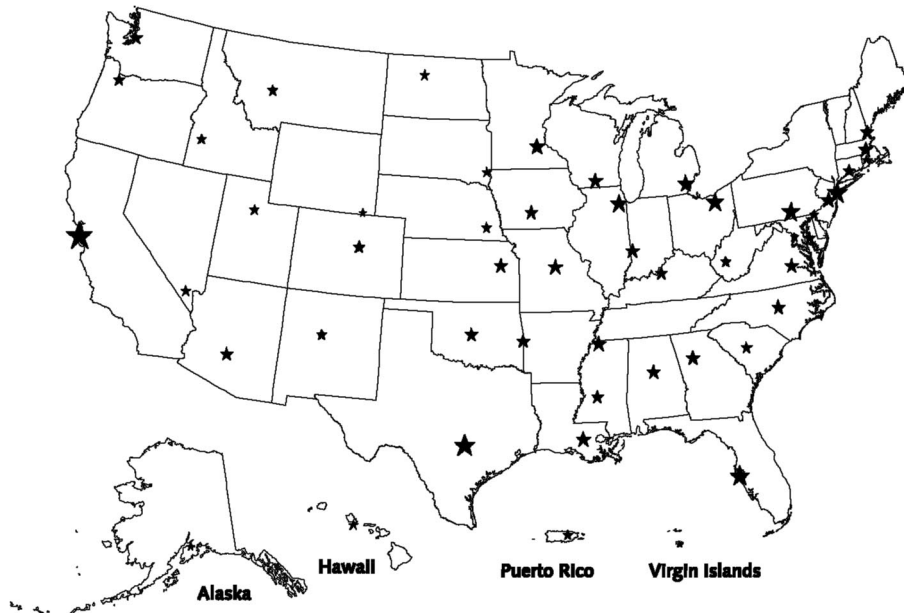
**Appendix Table 3. Number of Primary Care Practitioners at Baseline, Number of Physicians in an Identified Participant Group at Baseline, and Proportion of Identified Participant Group Primary Care Practitioners, by U.S. State or Jurisdiction**

U.S. State or Jurisdiction	All Primary Care Practitioners, n*	Identified Participant Group Primary Care Practitioners, n	Identified Participant Group Primary Care Practitioners at Baseline, %†
Alabama	2828	214	8
Alaska	393	29	7
Arizona	2886	213	7
Arkansas	1705	109	6
California	24 705	3074	12
Colorado	3044	223	7
Connecticut	3306	163	5
Delaware	485	52	11
District of Columbia	906	64	7
Florida	10 636	798	8
Georgia	5016	245	5
Hawaii	1023	89	9
Idaho	723	57	8
Illinois	10 304	752	7
Indiana	3914	233	6
Iowa	1686	126	7
Kansas	1915	159	8
Kentucky	2666	146	5
Louisiana	3150	236	7
Maine	969	72	7
Maryland	4837	348	7
Massachusetts	6350	472	7
Michigan	6936	521	8
Minnesota	4190	216	5
Mississippi	1479	110	7
Missouri	3641	205	6
Montana	585	44	8
Nebraska	1347	98	7
Nevada	1050	62	6
New Hampshire	900	51	6
New Jersey	7128	486	7
New Mexico	1201	65	5
New York	19 662	1004	5
North Carolina	5534	308	6
North Dakota	529	36	7
Ohio	8395	447	5
Oklahoma	1859	117	6
Oregon	2496	208	8
Pennsylvania	10 276	783	8
Puerto Rico	728	43	6
Rhode Island	972	70	7
South Carolina	2733	185	7
South Dakota	562	43	8
Tennessee	4116	201	5
Texas	12 237	918	8
Utah	1251	78	6
Vermont	598	37	6
Virgin Islands	116	19	16
Virginia	5183	302	6
Washington	4507	338	7
West Virginia	1369	70	5
Wisconsin	3987	300	8
Wyoming	335	24	7
All states or jurisdictions	209 349	15 263	7

\* Defined as physicians or midlevel providers (MP, PA) who had a specialty code of general practice, family practice, obstetrics/gynecology, or internal medicine and subspecialties that predominantly performed primary care.

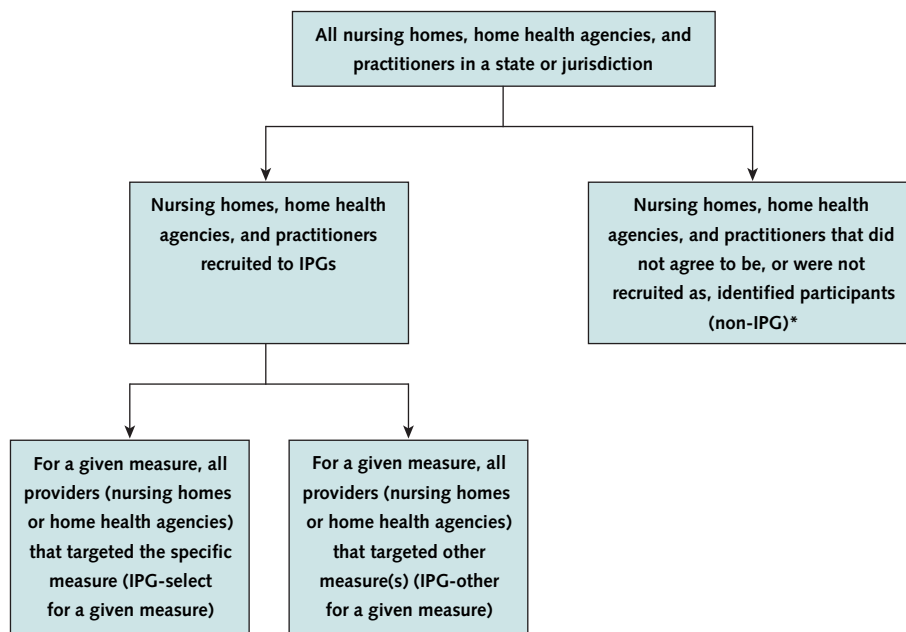
† Percentage of primary care practitioners in a U.S. state or jurisdiction who were included in the physician office identified participant group for that state or jurisdiction.

Appendix Figure 1. Locations of quality improvement organizations (QIOs).



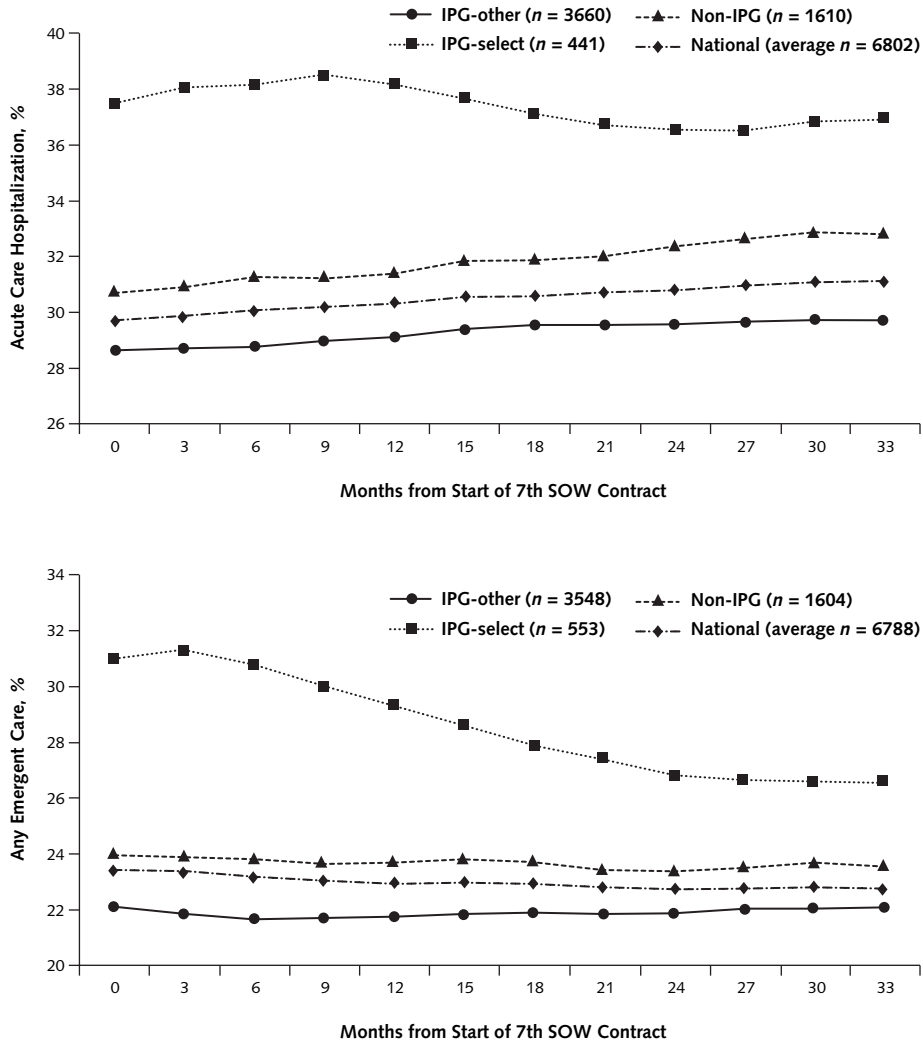
The size of each QIO is represented by the size of each star. Maine and Vermont QIO coverage is directed from the New Hampshire QIO office (Maine, New Hampshire, and Vermont are similar in QIO size).

Appendix Figure 2. Stratification of providers.



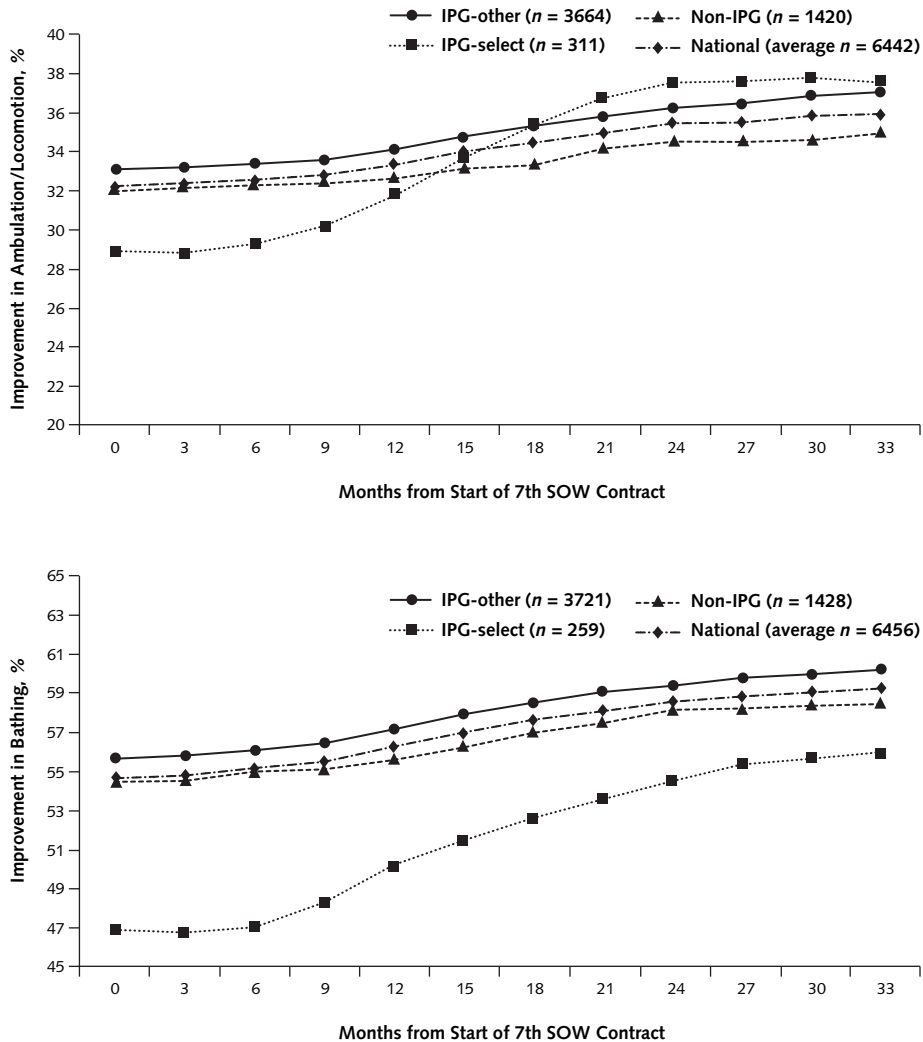
Quality improvement organizations (QIOs) were required to recruit a limited number of nursing homes, home health agencies, and physician offices into identified participant groups (IPGs) for focused quality improvement interventions. Facilities not participating in the IPG for a given setting are labeled “non-IPG” for that setting. For a given quality measure, IPG nursing homes and home health agencies are subdivided into those focusing on a specified quality measure (IPG-select) and those not focusing on the specified measure (IPG-other). \*Low-volume nursing homes and home health agencies and non-primary care physicians were not eligible for the IPG for contractual reasons.

Appendix Figure 3. Time-trend data for home health agencies: acute care hospitalization (top) and any emergent care (bottom).



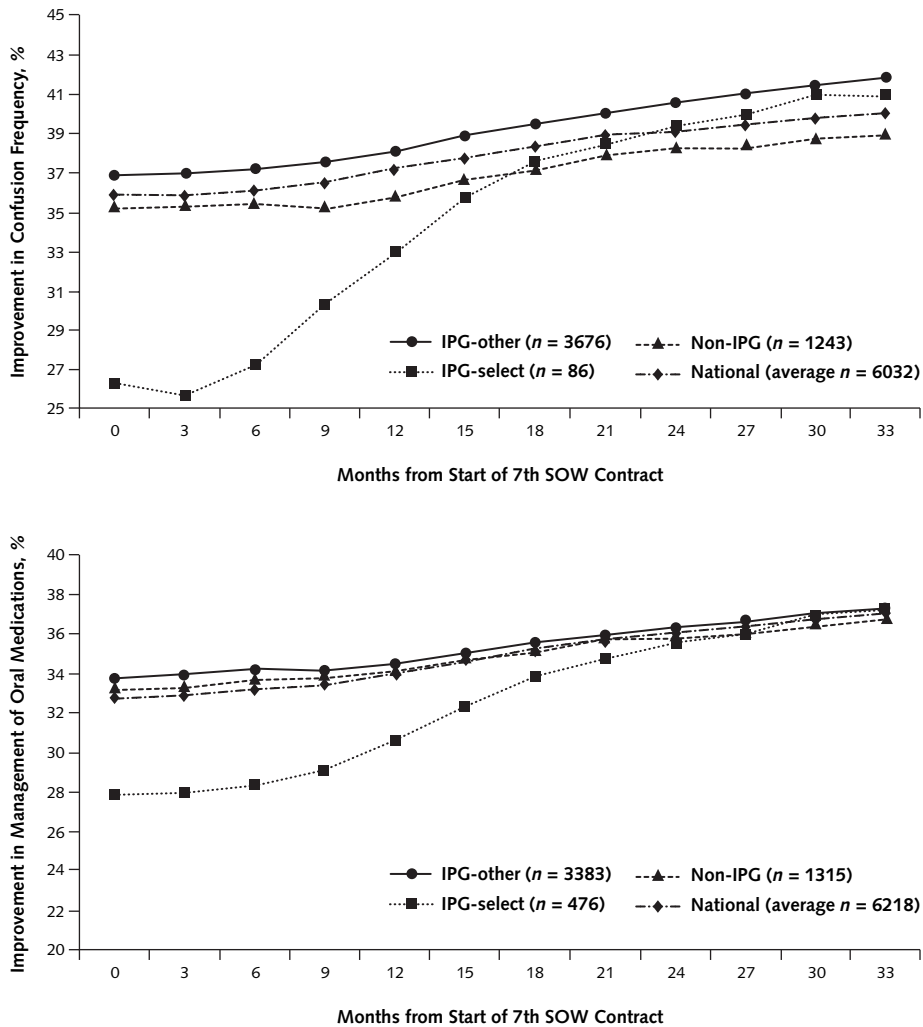
All rates are calculated as 12-month averages, ending with the last day of the month shown. “0” represents the 12-month period ending the month before the start of the contract. For the national group, the average number of facilities across all periods is given. All other groups include only home health agencies with valid data in the first and last time points shown. For these quality measures, lower scores indicate better performance. IPG = identified participant group; SOW = Scope of Work. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

Appendix Figure 4. Time-trend data for home health agencies: improvement in ambulation or locomotion (top) and improvement in bathing (bottom).



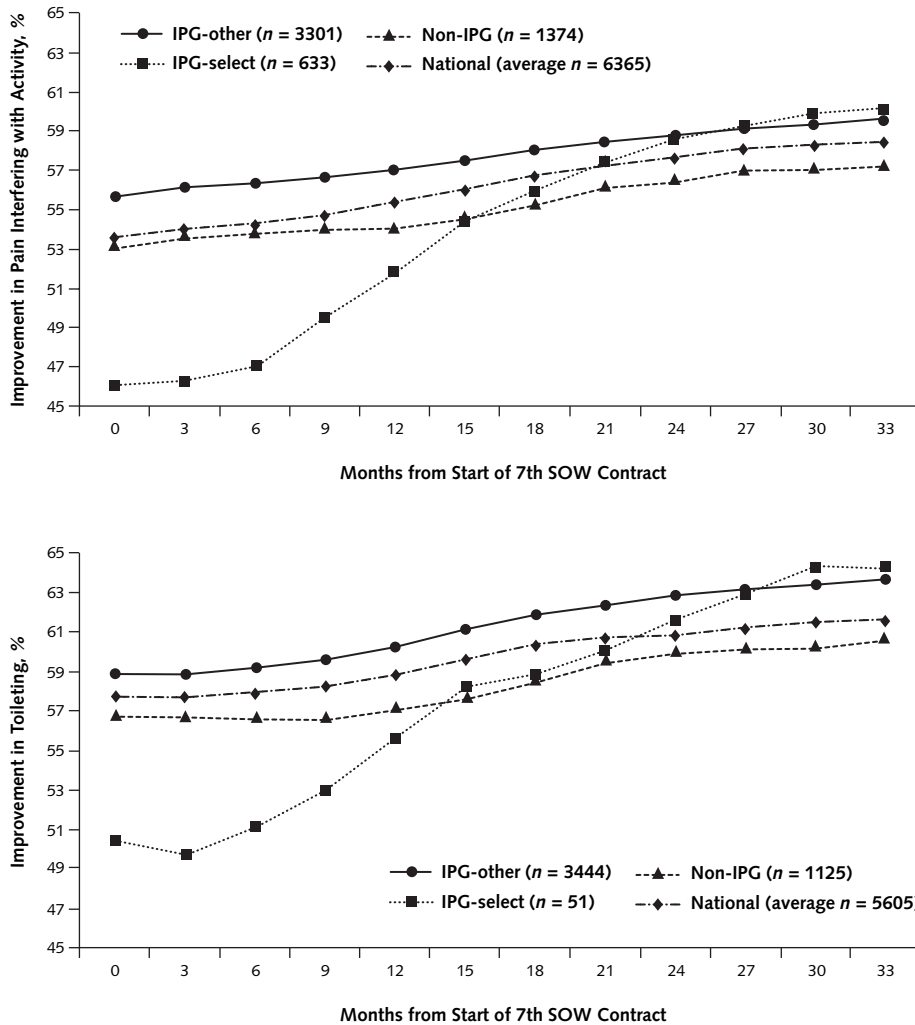
All rates are calculated as 12-month averages, ending with the last day of the month shown. "0" represents the 12-month period ending the month before the start of the contract. For the national group, the average number of facilities across all periods is given. All other groups include only home health agencies with valid data in the first and last time points shown. For these quality measures, higher scores indicate better performance. IPG = identified participant group; SOW = Scope of Work. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

Appendix Figure 5. Time-trend data for home health agencies: improvement in confusion frequency (top) and improvement in management of oral medications (bottom).



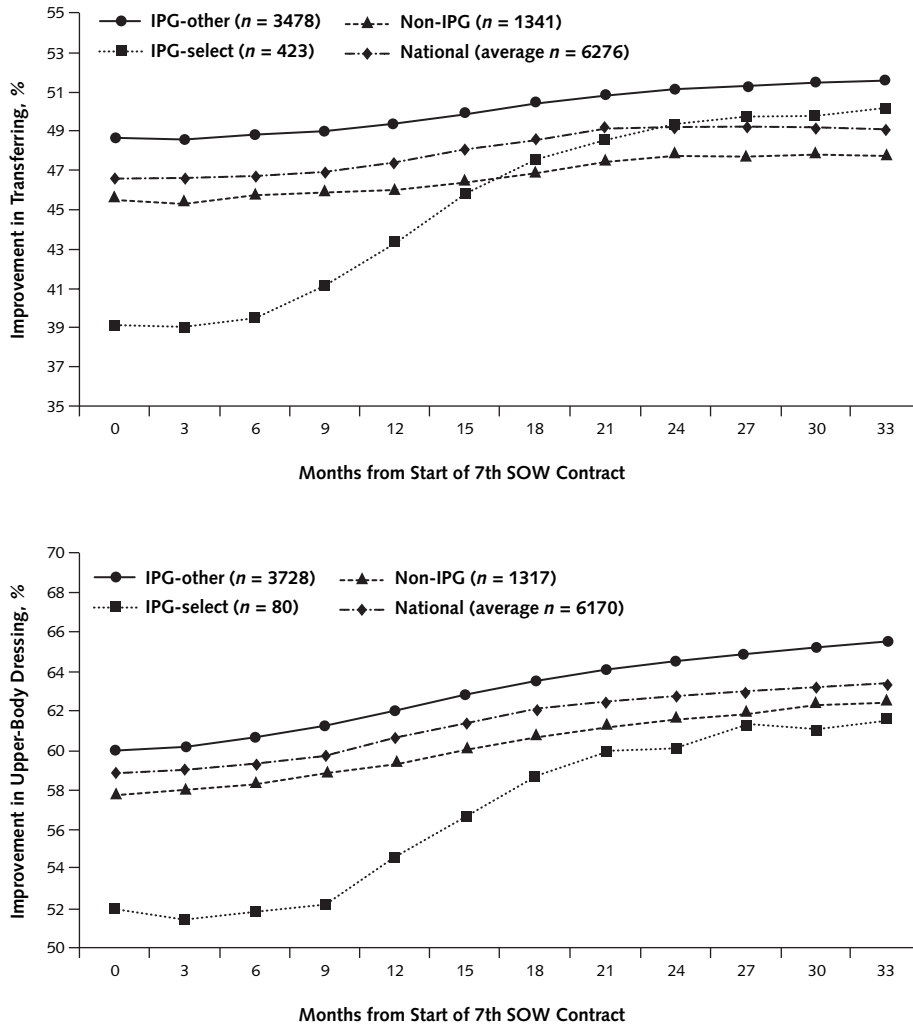
All rates are calculated as 12-month averages, ending with the last day of the month shown. "0" represents the 12-month period ending the month before the start of the contract. For the national group, the average number of facilities across all periods is given. All other groups include only home health agencies with valid data in the first and last time points shown. For these quality measures, higher scores indicate better performance. IPG = identified participant group; SOW = Scope of Work. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

Appendix Figure 6. Time-trend data for home health agencies: improvement in pain interfering with activity (top) and improvement in toileting (bottom).



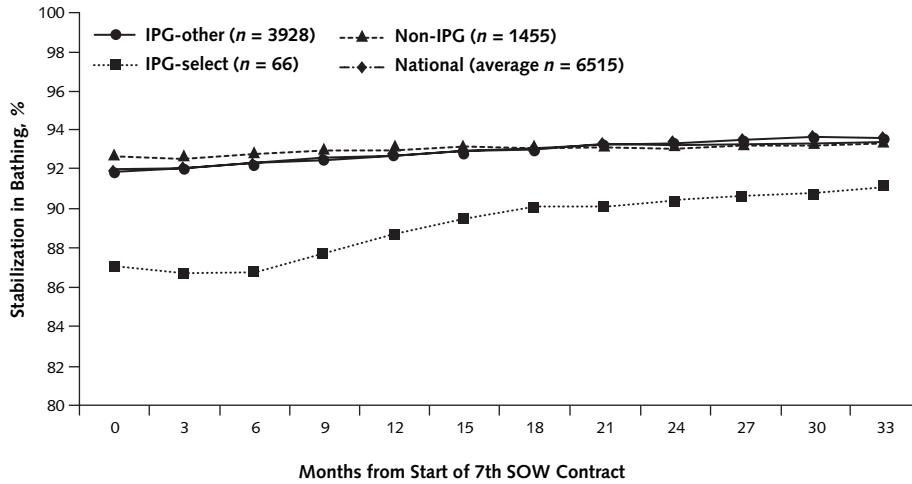
All rates are calculated as 12-month averages, ending with the last day of the month shown. "0" represents the 12-month period ending the month before the start of the contract. For the national group, the average number of facilities across all periods is given. All other groups include only home health agencies with valid data in the first and last time points shown. For these quality measures, higher scores indicate better performance. IPG = identified participant group; SOW = Scope of Work. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

Appendix Figure 7. Time-trend data for home health agencies: improvement in transferring (top) and improvement in upper-body dressing (bottom).



All rates are calculated as 12-month averages, ending with the last day of the month shown. "0" represents the 12-month period ending the month before the start of the contract. For the national group, the average number of facilities across all periods is given. All other groups include only home health agencies with valid data in the first and last time points shown. For these quality measures, higher scores indicate better performance. IPG = identified participant group; SOW = Scope of Work. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.

Appendix Figure 8. Time-trend data for home health agencies: stabilization in bathing.



All rates are calculated as 12-month averages, ending with the last day of the month shown. “0” represents the 12-month period ending the month before the start of the contract. For the national group, the average number of facilities across all periods is given. All other groups include only home health agencies with valid data in the first and last time points shown. For this quality measure, higher scores indicate better performance. IPG = identified participant group; SOW = Scope of Work. For a given measure, the IPG-select subgroup consists of IPG providers that elected to focus on that measure, and the IPG-other subgroup consists of IPG providers that selected other measures.