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Home Health Agency Performance in the United States: 2011–15

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Abstract

OBJECTIVES—To evaluate home health agency quality performance.

DESIGN—Observational study.

SETTING—Home health agencies

PARTICIPANTS—All Medicare-certified agencies with at least 6 months of data from 2011 to 2015.

MEASUREMENTS—Twenty-two quality indicators, five patient survey indicators, and their composite scores.

RESULTS—The study included 11,462 Medicare-certified home health agencies that served 92.4% of all ZIP codes nationwide, accounting for 315.2 million people. The mean composite scores were 409.1 ± 22.7 out of 500 with the patient survey indicators and 492.3 ± 21.7 out of 600 without the patient survey indicators. Home health agency performance on 27 quality indicators varied, with the coefficients of dispersion ranging from 4.9 to 62.8. Categorization of agencies into performance quartiles revealed that 3,179 (27.7%) were in the low-performing group (below 25th percentile) at least one time during the period from 2011–12 to 2014–15 and that 493 were in the low-performing group throughout the study period. Geographic variation in agency performance was observed. Agencies with longer Medicare-certified years were more likely to have high-

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performing scores; agencies providing partial services, with proprietary ownership, and those with long travel distances to reach patients had lower performance. Agencies serving low-income counties and counties with lower proportions of women and senior residences and greater proportions of Hispanic residents were more likely to attain lower performance scores.

CONCLUSION—Home health agency performance on several quality indicators varied, and many agencies were persistently in the lowest quartile of performance. Still, there is a need to improve the quality of care of all agencies. Many parts of the United States, particularly lower-income areas and areas with more Hispanic residents, are more likely to receive lower quality home health care.

Keywords

home health care; home health agency; quality measurement; geographic variation; health services

Medicare-certified home health agencies, which provide a comprehensive array of in-home services, including home health aide assistance, social work, nursing, occupational therapy, physical therapy, and speech therapy, serve a critical role in caring for individuals receiving ongoing outpatient care or who have been discharged from a nursing home or hospital.^{1,2} High-quality home health care can benefit individuals and health systems by improving individuals' health status and quality of life, shortening hospital stays, lowering hospital costs, and preventing unplanned readmissions.^{3–14} As the population in the United States ages and the number of elderly individuals grows (from 45 million in 2015 to a projected 84 million in 2050),¹⁵ the provision of high-quality home health care is an increasingly important component of the U.S. healthcare system. Given that home health agencies provide the majority of home health care in this country, there are increasing national efforts to monitor and improve the quality of agency performance. Since 1999, Medicare-certified agencies have been required to report data on quality processes and outcomes to the Centers for Medicare and Medicaid Services (CMS), and in 2003, CMS began publicly reporting agency performance.^{2,16,17} In addition, in 2005, the National Quality Forum endorsed standardized performance measures that aim to facilitate comparison of the quality of home health care.¹⁸

Despite increased attention to the quality of home health care, data about the quality of performance of agencies and variation in performance are limited.^{13,19–21} Prior studies have largely focused on home health care use and services.^{22–28} Although these studies have shown that rural areas used home health care services less frequently and that a single agency was more likely to serve areas in the Midwest and West,^{22–25} it is largely unknown how much geographic variation there is in quality of agency performance. There could be regional contextual influences that lead to regional variation in addition to variation between individual agencies. Such influences might include the local workforce, the social and medical context of the individuals served, and other forces that result in a lack of homogeneity according to location. Nevertheless few studies have examined regional context. The assessment of agency performance might increase awareness of the variation in quality of home health care in the United States and stimulate greater investments to achieve a reliable national standard of quality across all agencies. Accordingly, national home health care data from 2011 to 2015 was used to assess trends in agency performance, including

variation in performance and identification of consistently low-performing agencies, as well as agency- and county-level characteristics associated with agency performance.

METHODS

Study Sample

The home health care data, publicly available at Home Health Compare (<http://www.medicare.gov/download/downloadddb.asp>), at the agency level, includes quality performance, patient survey results, and agency characteristics. The patient survey data measure patient satisfaction and experience of care. CMS obtains this information from the Outcome and Assessment Information Set that has assessments for individuals who received home health care. Data in the Home Health Compare are updated quarterly and reported on a rolling basis as a 12-month period that spans two calendar years. The first year and last year of the 12-month period were used to define a time period, and data were constructed from four time periods: June 1, 2011 to May 31, 2012; June 1, 2012 to May 31, 2013; June 1, 2013 to May 31, 2014; and June 1, 2014 to May 31, 2015. Performance and patient survey data were available for each period. Not all agencies were repeated in each substudy period.

Home Health Agency Performance

For each agency, CMS reports a performance score, ranging from 0 to 100, corresponding to lowest to highest performance, for each of the 27 indicators that can be categorized into five quality measures and one survey measure: managing daily activities, managing pain and treating symptoms, treating wounds and preventing pressure, preventing harm, preventing unplanned hospital care, and patient experience of care (Table S1). Each quality indicator score was adjusted for patient characteristics and medical conditions.^{16,17} All agencies were required to have at least 6 months of data and to have data for at least one indicator in each of the six measures. Because approximately 22% of agencies had no data or less than 6 months of data for the patient survey measure, the main analysis was restricted to the five quality measures, which comprise 22 indicators, although a sensitivity analysis was conducted excluding the 22% of agencies that had no data for the survey measure (Appendix 1, Table S1).

For each time period and each agency, a measure-specific score was calculated for each quality measure based on an average of the indicator scores within each measure, which ranged from 0 to 100, corresponding to the lowest to highest performance. If an agency had missing data for a particular indicator in a given measure, the measure-specific score was calculated by excluding that indicator. For indicators in which a low score indicated better performance, that score was subtracted from 100 so that a high score indicated better performance. For the main analysis, the five quality performance scores were combined into one composite score by adding them together (range 0–500). For the sensitivity analysis, the one patient survey measure was also added (range 0–600).

Outcome

The primary outcome was the agency-specific composite score. An agency was classified as low performing if its performance score was lower than the 25th percentile of all agencies'

scores. An agency was assigned to a county if that agency provided services to individuals residing in any ZIP code in that county. For each county, agency performance scores were aggregated weighted according to the population aged 18 and older in the ZIP codes that the agency served in that county.

Agency and County Characteristics

Agency-specific characteristics were included in the agency-level analysis: years of Medicare certification; partial service (providing fewer than six types of services vs all six services), ownership (proprietary vs other), the average distance (miles) between an agency's office and a patient's home, and number of ZIP codes within a county that an agency served. For the county-level analysis, the above agency-specific characteristics and county-specific characteristics (median income, population distribution according to high school graduation, insurance coverage, race and ethnicity (white, black, Hispanic, other), age, sex) available from the 2013 U.S. Census estimates (www.census.gov) were included.

Statistical Analysis

Agency performance was compared at the agency and county levels. To assess the variation in performance at the agency level, the dispersion in performance of each quality indicator across agencies was quantified by calculating the population-weighted coefficient of variation. An indicator with a high value in the coefficient of variation implies more heterogeneity in agency performance. To assess variation in performance at the county level, the performance scores were mapped by coloring counties according to their scores in the 2011–12 and 2014–15 periods with a gradient from green to red (representing highest to lowest scores).

To assess agency characteristics associated with performance, a mixed model with agency-specific random intercepts was fitted to model the performance score as a function of the agency-specific characteristics, accounting for time periods represented by an ordinal variable (time = 0 for 2011–12, time = 1 for 2012–13, time = 2 for 2013–14, time = 3 for 2014–15). To assess county characteristics associated with performance, a mixed model with county-specific random intercepts was fitted to model the overall county-specific performance score as a function of agency- and county-specific characteristics, accounting for time periods. A spherical covariate structure was included in the model to account for spatial autocorrelation across counties. Analyses were conducted using SAS version 9.4 64-bit (SAS Institute, Inc., Cary, NC).

RESULTS

Study Sample

The study included 11,462 Medicare-certified home health agencies that served 92.4% of all ZIP codes nationwide, accounting for 315.2 million people. Overall, these agencies had been Medicare certified for a median of 10.0 years (interquartile range (IQR) 4.0–23.0 years); 20.7% were partial service, and 76.7% were proprietary. The median distance between an agency and a patient's home was 16.6 miles (IQR 12.1–23.6 miles), and the median number of ZIP codes served per agency were 40.0 (IQR 24.0–64.0) (Table 1).

Agency Performance

The overall composite score was 492.3 ± 21.7 out of 600 with the patient survey measure and 409 ± 22.7 out of 500 without, or 82% of the total scores (Table 1). No agency achieved the highest score. Mean scores for the 27 quality indicators ranged from 48 to 98 out of 100 (Figure 1A). Overall, 18 indicators (four of which included the patient survey measure) had a mean score of 80 or above, and three indicators had a mean score below 60 (Table S1). Between 2011–12 and 2014–15, 11 indicators increased by at least 1 point, and two decreased by at least 1 point (Table S1). In 2014–15, three indicators had a score of 98 or above out of 100 (Table S1). Of the five quality measures, “managing daily activities” was the only measure whose score improved from 2011–12 (57 ± 11.6) to 2014–15 (61 ± 12.6) these numbers do not require a decimal point. (out of 100). No other scores changed substantially (Table 1).

Between 2011–12 and 2014–15, the average composite score without the patient survey measure increased from 404 ± 21.2 to 411 ± 22.5 out of 500 ($P < .001$, Figure 2A; Figure S1). There were 115 agencies (1.2% of total) with a performance score lower than 350 out of 500, or below 70% of the total score in 2011–12 and 104 (1.1% of total) in 2014–15, of which 16 agencies were in both periods. Between 2011–12 and 2014–15, the threshold for the low-performing group increased from 392 to 398 out of 500. There were 3,179 agencies classified at least one time in the low-performing group, of which 493, covering approximately 5.5% of all ZIP codes served by all agencies, were consistently in the low-performing group during the study period (Figure 2B). Mean composite scores (out of 500) were 419 ± 13.7 for never, 392 ± 19.6 for at least one time, and 375 ± 15.4 for always being in the low-performing group ($P < .001$, Table 1, Figure 2C). There were eight indicators with a mean score of less than 60 in the low-performing group (Table S2).

Variation in Agency Performance

At the agency level, the coefficients of dispersion of the individual quality indicators ranged from 62.8 to 4.9 (Figure 1B). At the county level, although there was improvement (Figure 3A,B), geographic variation persisted in 2014–15 from 2011–12 (Figure 3C). The Pearson correlation coefficient of county-specific agency performance scores between 2011–12 and 2014–15 was 0.45 ($P < .001$), indicating that regional variation in agency performance persisted in 2014–15. Washington, Oregon, Wyoming, Louisiana, Minnesota, and some areas of Texas, Montana, Colorado, and Kansas had lower scores than other states in 2014–15. Figure 3D shows the location of the 493 agencies that were always in the low-performing group.

Characteristics Associated with Agency Performance

Agencies with longer Medicare-certified years were more likely to have higher performance scores; agencies providing partial services, with proprietary ownership, and with long travel distances to reach patients tended to have low-performing scores (Figure S2). Counties with people with high incomes and greater insurance coverage were more likely to be served by high-performing agencies; counties with more Hispanic residences were more likely to be served by low-performing agencies (Tables S3 and S4).

Sensitivity Analysis

The results from the sensitivity analysis restricted to agencies with patient survey data were not substantially different (Appendix 2).

DISCUSSION

This large, comprehensive investigation of home health agency performance on several quality measures provides a contemporary picture of national trends in quality. Efforts to improve care immediately after a hospitalization or nursing home stay require systemic changes beyond the reach of hospitals, healthcare practitioners, and individuals. Given that over time, patients are more likely to be discharged with home health care²⁹, the current study may help policy-makers understand what has been achieved and inform how best to encourage quality.

Better performance may lead to better care. The association between nursing home and home health performance in quality of care and outcomes has been studied.^{9,13,30–32} For example, one study found that individuals receiving care in higher-quality skilled nursing facilities had lower readmission rates (18%) than those in lower-quality skilled nursing facilities (22%).⁹ Another study found that improving nursing home and home health performance was associated with lower community-level risk-standardized readmission rates.¹³ The existing standard is that all agencies should achieve the highest score for quality care. The current study found that approximately 500 agencies were consistently classified as low performers throughout the study period. Given that agencies in the low-performing group have the greatest opportunity to improve, reaching the national average or an achievable benchmark of care³³ could be a first step for these agencies. Once the low-performing agencies improve their performance, the national average or the achievable benchmark can be updated, and a new threshold for low performance can be estimated, leading to a new cycle of quality improvement.

Although approximately two-thirds of indicators had a score of 80 out of 100, no agency achieved 80 or higher for all indicators scored. Thus, policies could be designed to encourage all agencies to reach the national average of 80 or higher on each indicator. Moreover, three indicators had a mean score of less than 60 across all agencies: how often individuals improved at getting in and out of bed; how often individuals improved at walking or moving around; and how often individuals improved at taking their drugs correctly by mouth. These indicators are a cornerstone of home health care and should merit focused attention.

It was also found that three indicators had consistently high scores: how often the home health team checked for pain (98), how often the home health team treated individuals' pain (98), and how often the home health team checked individuals' risk of falling (99). These indicators may be modified to evaluate a higher standard of quality. At the time of submission of this study, CMS announced that it would drop six quality indicators from Home Health Compare in 2017, including the above two pain-related indicators.³⁴ Replacing outdated indicators with more-contemporary standards for person-centered care has been an important strategy for advancing high-quality care in hospitals and should be

applied in home health care as well. Given the importance of home health care, market demand is likely to increase, and its function could expand; if so, new quality of care indicators would be indicated. For example, home health care may play an important role in the provision of in-home palliative care, which has been associated with less symptom burden and greater patient and caregiver satisfaction.^{8,35–40}

The relationship between the quality and the availability or use of home health care is unclear. Regions that have good availability of home health services may not necessarily receive high-quality care. It has been reported that the central regions, particularly the South Central region, have greater home health care availability than other regions.^{25,26} The current study findings indicate that the South Central region had lower performance than other regions.

This study suggests that specific agency-level characteristics are associated with performance, including Medicare certification and offering full as opposed to partial services. The finding that proprietary ownership of agencies is associated with a low-performing score extends prior studies^{30–32} and provides a more-contemporary assessment at the national level. For example, the 2003–07 home health care data were used to assess changes in agency performance after the initiation of Home Health Compare, and it was found that nonprofit agencies showed greater improvement on some quality measures than their counterparts.³¹ Another study used national cost and case mix–adjusted quality outcomes data and found that for-profit agencies had higher costs but poorer performance than nonprofit agencies.³² The negative association between an agency's performance and its distance from patient homes may reflect the need for staff to travel long distances, which may restrict their ability to provide high-quality care and increase staff turnover rates.^{41–44} Moreover, in rural areas, travel times for staff may inhibit quality of performance. The social, economic, and clinical context in rural areas may affect performance. In some cases, this situation may not be improved than by moving the agency and its clients to less rural and more affluent or desirable locations. Thus, improvements in quality will need to consider not only internal organizational factors, but also external factors—requiring a more-collaborative approach to quality improvement. The findings that low-income and Hispanic populations were more likely to be served by low-performing agencies may indicate potential disparities in home health care, and future studies are warranted to elucidate this. Other factors, such as better documentation of hospital and nursing home stays and discharge instructions and timely outpatient follow-up visits, were not included in the analysis, but they could be important to support agencies in providing appropriate, responsive care.^{45–47}

This study has limitations. Two 30-day hospital read-mission–related indicators that were recently available were not included.⁴⁸ The study was conducted based on agency-level data, not individual-level data. It was not possible to account for factors regarding the social and medical context of the people served, such as cleanliness and safety of their homes, the presence of social support networks, their insurance status, and access to medications. These factors may affect agency performance but were not accounted for in the CMS adjusted score for indicators. These data are important for understanding agency performance and should be a focus of future research.

In conclusion, home health agency performance on several quality indicators varied, and many agencies were persistently in the lowest quartile of performance. Still, there is a need to improve the quality of care of all agencies. Many parts of the United States, particularly areas with lower income and areas with more Hispanic residents, are more likely to receive lower quality home health care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

(A) Distribution of home health agency performance and (B) coefficient of dispersion according to the 27 individual indicators: 1 = how often patients improved at getting in and out of bed; 2 = how often patients improved at walking or moving around; 3 = how often patients improved at bathing; 4 = how often patients' breathing improved; 5 = how often patients had less pain when moving around; 6 = how often the home health team treated symptoms of people with heart failure (weakening of the heart); 7 = how often the home health team treated their patients' pain; 8 = how often the home health team checked patients for pain; 9 = how often patients improved at taking their drugs correctly by mouth; 10 = how often the home health team determined whether their patients received a pneumococcal vaccine (pneumonia shot); 11 = how often the home health team determined whether patients received an influenza shot for the current influenza season; 12 = how often the home

health team began their patients' care in a timely manner; 13 = how often the home health team taught patients (or their family care-givers) about their drugs; 14 = for patients with diabetes, how often the home health team obtained doctor's orders, gave foot care, and taught patients about foot care; 15 = how often the home health team checked patients for depression; 16 = how often the home health team checked patients' risk of falling; 17 = how often home health patients had to be admitted to the hospital; 18 = how often patients receiving home health care needed any urgent, unplanned care in the hospital emergency department without being admitted to the hospital; 19 = how often patients' wounds improved or healed after an operation; 20 = how often the home health team took doctor-ordered action to prevent pressure sores (bed sores); 21 = how often the home health team included treatments to prevent pressure sores (bed sores) in the plan of care; 22 = how often the home health team checked patients for risk of developing pressure sores (bed sores); 23 = patients who reported that they would definitely recommend the home health agency to friends and family; 24 = patients who reported that their home health team discussed medicines, pain, and home safety with them; 25 = patients who gave their home health agency a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest); 26 = patients who reported that their home health team communicated well with them; 27 = patients who reported that their home health team gave care in a professional way.

Figure 2.

Distributions of home health agency composite performance score at the agency level. (A) Overall difference in scores between 2011–12 and 2014–15; (B) percentage of agencies classified in the low-performance group; (C) difference in scores between agencies in never being in; one, two, or three times being in, and all times being in the low-performance group.

Figure 3.

Geographic variation in (A) home health care performance according to U.S. county in 2011–12, (B) 2014–15 performance based on the 2011–12 performance scale, (C) 2014–15 performance based on its own scale, and (D) locations of agencies in the low-performance group throughout the study period. Performance was mapped by shading counties with a gradient from red to green (lowest rate in red to highest rate in green).

Table 1
Agency-Specific Characteristics and Quality Measures at Home Health Agency Level According to Time Period

Characteristic	Overall	2011–12	2012–13	2013–14	2014–15
Years of Medicare certification, median (IQR)	10.0 (4.0–23.0)	9.0 (4.0–22.0)	9.0 (4.0–23.0)	10.0 (5.0–23.0)	11.0 (5.0–23.0)
Partial service (providing fewer than six types of services versus all six services), %	20.7	21.2	20.6	20.5	20.3
Ownership as proprietary, %	76.7	76.0	76.6	77.0	77.3
Distance to patient's home, miles, median (IQR)	16.6 (12.1–23.6)	16.4 (12.0–23.2)	16.6 (12.0–23.6)	16.5 (12.0–23.4)	17.0 (12.3–24.0)
Number of ZIP codes served, median (IQR)	40.0 (24.0–64.0)	39.0 (23.0–63.0)	41.0 (24.0–65.0)	40.0 (24.0–63.0)	42.0 (25.0–66.0)
Measure score, mean $\pm$ standard deviation					
Managing daily activities	59.1 $\pm$ 12.2	57.4 $\pm$ 11.6	58.6 $\pm$ 12.0	59.4 $\pm$ 12.3	61.0 $\pm$ 12.6
Managing pain	82.1 $\pm$ 8.0	81.7 $\pm$ 7.7	82.1 $\pm$ 7.7	82.1 $\pm$ 8.2	82.7 $\pm$ 8.2
Bed sores	95.5 $\pm$ 6.0	94.8 $\pm$ 6.5	95.5 $\pm$ 5.9	95.7 $\pm$ 5.9	96.0 $\pm$ 5.6
Preventing harm	82.1 $\pm$ 6.9	81.0 $\pm$ 7.1	82.1 $\pm$ 7.0	82.7 $\pm$ 6.8	82.5 $\pm$ 6.8
Preventing unplanned admission	86.3 $\pm$ 2.9	86.2 $\pm$ 2.8	86.3 $\pm$ 2.9	86.5 $\pm$ 2.9	86.2 $\pm$ 2.9
Patients survey	84.0 $\pm$ 6.1	84.0 $\pm$ 5.9	84.0 $\pm$ 6.1	84.0 $\pm$ 6.2	83.9 $\pm$ 6.3
Composite score without patient satisfaction measure					
Aggregated (n = 11,462)	407.5 $\pm$ 21.8	403.6 $\pm$ 21.2	406.6 $\pm$ 20.9	408.6 $\pm$ 21.9	410.6 $\pm$ 22.5
Never being in the low performance group (n = 7,790)	418.7 $\pm$ 13.7	414.2 $\pm$ 13.3	417.7 $\pm$ 12.9	420.4 $\pm$ 13.5	422.2 $\pm$ 13.8
At least one time being in the low performance group (n = 3,179)	392.1 $\pm$ 19.6	388.7 $\pm$ 19.4	391.4 $\pm$ 17.4	392.9 $\pm$ 19.5	394.8 $\pm$ 21.3
Always being in the low performance group (n = 493)	375.1 $\pm$ 15.4	372.0 $\pm$ 15.0	373.1 $\pm$ 15.2	376.6 $\pm$ 15.0	378.5 $\pm$ 15.5
Composite score with patient satisfaction measure					
Aggregated (n = 8,961)	492.3 $\pm$ 21.7	488.2 $\pm$ 21.2	491.3 $\pm$ 21.1	493.7 $\pm$ 21.4	495.7 $\pm$ 22.3
Never being in the low performance group (n = 5,809)	502.9 $\pm$ 14.4	498.3 $\pm$ 14.0	501.8 $\pm$ 13.6	504.6 $\pm$ 14.0	506.4 $\pm$ 14.6
At least one time being in the low performance group (n = 2,705)	477.2 $\pm$ 19.4	473.0 $\pm$ 19.5	475.9 $\pm$ 17.9	478.7 $\pm$ 18.3	480.7 $\pm$ 20.9
Always being in the low performance group (n = 447)	459.5 $\pm$ 15.4	456.6 $\pm$ 14.8	457.6 $\pm$ 15.4	460.6 $\pm$ 15.4	462.7 $\pm$ 15.3

IQR = interquartile range.