

The Current State of Home Health Care in Puerto Rico

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Objective: Assess home health care (HHC) agency coverage in Puerto Rico (PR), a U.S. territory, and compare PR agencies with those in the U.S. (excluding PR) and in a subset of counties outside of PR with high Puerto Rican populations (CHPRPs).

Methods: PR HHC coverage was mapped using data from 2020 U.S. Census ZIP Code Tabulation Area (ZCTA) and publicly available Centers for Medicare and Medicaid Services (CMS) files. Descriptive statistics on HHC agencies, patients and Medicare beneficiaries were calculated from publicly available CMS data. Pearson's χ^2 , Fisher's exact, or t tests were used to compare PR agencies with U.S. (excluding PR) and CHPRP agencies.

Results: Nearly all PR ZCTAs were served by ≥ 7 HHC agencies. Compared with U.S. and CHPRP agencies, those in PR have higher nonprofit ownership, higher Medicare Advantage (MA) enrollment, and better fall prevention and quality of patient care, but lower performance in timely HHC initiation, patient influenza vaccination, and patient experience.

Conclusion: PR HHC agencies excel in patient improvement metrics, with opportunities to strengthen patient experience and preventive care. Future research should examine factors underlying observed differences, and MA enrollee access to and use of HHC.

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Key words: Home health care, Medicare, Care quality, Disparities

The population of Puerto Rico (PR), a U.S. territory, is rapidly aging, with the number of adults aged 65 years and older nearly doubling from 2010 to 2019, straining social resources and reducing caregiver availability (1). Medicare-certified home health care (HHC) agencies play a vital role in the recovery and treatment of older patients by delivering skilled care in patients' homes (2). From a policy perspective, understanding the supply and quality of HHC services is vital to meet the aging PR population's needs. To date, only one study from 1999–2000 has examined PR's HHC services (3). Since then, there have been significant changes that merit attention in the PR HHC landscape. Therefore, our study aimed to assess HHC agency coverage across PR and compare PR HHC agencies to those in the U.S. and a subset of counties outside of PR with high Puerto Rican populations (CHPRPs).

Methods

Home Health Care agency coverage in Puerto Rico

We determined agency coverage by mapping the catchment areas (geographic areas in which agencies provide services) of all the active Medicare-certified HHC agencies ($n = 35$) across 131 ZIP Code Tabulation Areas (ZCTAs) in PR. The map was generated in R version 4.4.2 using publicly available data from the 2022 Home Health Compare–Zip Code file and the 2020 U.S. Census Bureau ZCTA file (4,5). The Home Health Compare–ZIP Code file, based on Outcome and Assessment Information Set data, identifies each ZIP code in which an agency served at least one patient during the data collection period.

Identification of counties with high Puerto Rican Populations

Using a visualization from the 2020 U.S. Census Bureau's Interactive Gallery (6), we created a ranked list at the county level, with the racial/ethnic group defined as Hispanic or Latino specifying Puerto Rican. From that list, we identified the top 10 CHPRPs (excluding those in PR): Bronx (the Bronx, NY), Kings (Brooklyn, NY), Orange (Orlando, FL), Cook (Chicago, IL), Philadelphia (Philadelphia, PA), Hillsborough (Tampa, FL), Osceola (Kissimmee, FL), Hartford (Hartford, CT), Hampden (Springfield, MA), and New Haven (New Haven, CT). Using 2022 Home Health Compare–Zip Code data, ZIP codes in these counties were identified and linked to HHC agencies ($n = 826$) serving the areas corresponding to those ZIP codes (4). Some ZIP code boundaries cross over into other counties, so surrounding areas are included; for example, most of the ZIP codes in Orlando, FL are in Orange County, but they can also be found in Osceola, Lake, and Seminole counties.

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Medicare beneficiary characteristics

We used 2022 national-, state-, and county-level data from the Centers for Medicare & Medicaid Service (CMS) Fee-for-Service (FFS) Geographic Variation Public Use File, which includes only beneficiaries fully enrolled in an FFS or a Medicare Advantage (MA) plan with Medicare Parts A and B coverage (7). Variables of interest were enrollment in Medicare Parts A and B, and enrollment in an FFS or MA plan, as well as HHC utilization among FFS enrollees. The descriptive statistics presented in Table 1 were calculated in Excel using the sums and percentages already cited in the dataset (national level = total U.S. beneficiaries; state level = beneficiaries in the 50 U.S. states [excluding PR] and beneficiaries in PR; county level = beneficiaries residing in CHPRPs). For these data, state and county totals do not equal national totals due to rounding, as noted in the data methodology (7). Pearson's χ^2 was used for comparisons of PR versus CHPRPs and the U.S. (excluding PR).

Agency and patient characteristics

Agency and patient characteristics were derived from publicly available 2022 Medicare Post-Acute Care and Hospice Provider Utilization and Payment Public Use Files, Home Health Compare data, and Provider of Services data (8–10). Our sample included HHC agencies that were active providers and eligible to participate in Medicare alone or in both Medicare and Medicaid. We excluded agencies located in other U.S. territories (besides PR). The patient data—which included age, sex, and race/ethnicity—were captured only from sampled agencies. Agency characteristics included: urbanicity; ownership; CMS program participation; size (categorized as small, medium, or large, based on tertiles); staffing ratios; Quality of Patient Care (QoPC) Star Rating and scores for its 7 components; Home Health Consumer Assessment of Healthcare Providers and Systems' (HHCAHPS) Patient Experience Star Rating and scores for its 5 components (based on survey results from ≥ 40 patients over 4 quarters); and scores for 3 additional quality indicators (11).

Descriptive analyses of agency and patient characteristics were calculated in Stata 15.1. Fisher's exact or t-tests were used, as appropriate, to compare PR HHC agencies to those in CHPRPs and the U.S. (excluding PR).

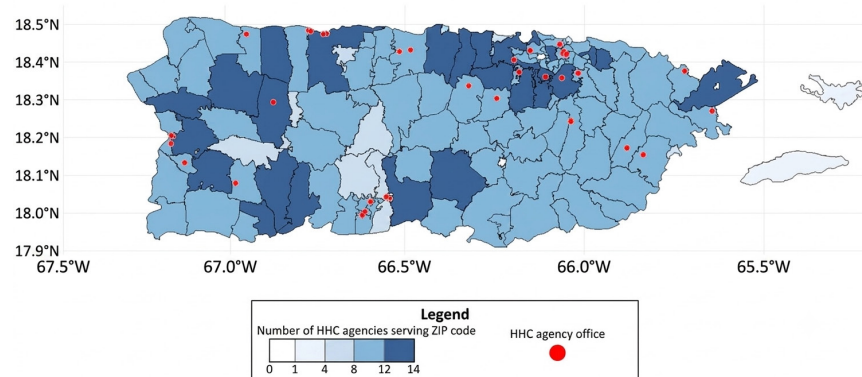
The lead institution's Institutional Review Board provided approval.

Results

Home Health Care agency coverage in Puerto Rico

In 2022, 95.4% of ZCTAs in PR were serviced by at least 7 HHC agencies operating on the main island, indicating a high level of coverage (Figure 1). Notable exceptions were the Puerto Rican islands of Vieques and Culebra, which together were served by only 2 agencies; neither island had an agency office.

Figure 1. Number of home health care agencies serving each ZIP Code Tabulation Area (ZCTA) in Puerto Rico is displayed on a scale from zero agencies (white) to 14 agencies (dark blue). Active home health agency offices are represented by red dots.



Medicare beneficiary characteristics

Our analytic sample included 788,106 beneficiaries in PR, and 66,826,294 in the U.S. (excluding PR), including 2,753,217 in CHPRPs. Table 1 shows comparisons of PR agencies versus U.S. agencies (excluding PR) and those in CHPRPs. The following results are significant at $\alpha = 0.05$ ($P = .0001$). While Medicare (Parts A and B) enrollment rates are similar, MA enrollment is highest in PR (95.1% vs. 49.6% in the U.S. and 55.8% in CHPRPs), resulting in much lower FFS enrollment (4.9% vs. 50.4% and 44.2%, respectively) and the lowest HHC utilization among FFS enrollees (4.9% vs. 8.7% and 11.1%, respectively).

Agency and patient characteristics

Our final analytic sample included 35 HHC agencies in PR, and 8,131 in the U.S. (excluding PR), including 826 in CHPRPs. The patient samples from those agencies included 4,024 from PR, and 3,070,774 from the U.S. (excluding PR), including 453,518 from CHPRPs. Table 1 shows comparisons of HHC agency and patient characteristics for PR agencies versus U.S. agencies (excluding PR) and those in CHPRPs. The following results are significant at $\alpha = 0.05$ ($P = .0001$), unless otherwise specified. Puerto Rico HHC agencies differed significantly from those in the U.S. and in CHPRPs, except in terms of location and size. Nearly all the HHC agency offices in PR (100%, $P = .0040$) and CHPRPs (98.8%, n.s.) were in urban areas, compared with 83.7% of those in the U.S. For-profit ownership was significantly lower in PR (51.4%) compared to the U.S. (80.9%) and CHPRPs (83.5%). While small agencies in PR served similar numbers of beneficiaries (mean=42.5) to those in the US and CHPRPs (45.32 and 41.38, respectively), medium and large PR HHC agencies served fewer beneficiaries (mean = 83.6 and 216.2 beneficiaries, respectively) than their U.S. (169.0 and 902.3, respectively) and CHPRPs (164.1 and 1,416.6, respectively) counterparts.

Puerto Rican HHC agencies had the highest proportion of RN staffing (88.5%) compared with U.S. (62.1%) and CHPRP agencies (72.4%) but had the lowest home health aide staffing (5.3% vs. 16.3% for U.S., and 14.9% for CHPRPs).

Table 1. Characteristics of Medicare beneficiaries, Home Health Care agencies, and patients in the U.S., Puerto Rico, and counties with high Puerto Rican populations

	Total U.S. beneficiaries**	U.S. beneficiaries (excluding PR)**	Beneficiaries in counties with high Puerto Rican populations**	Puerto Rican beneficiaries**		
	n = 68,192,489	(U.S.) n = 66,826,294	(CHPRP) n = 2,753,217	(PR) n = 788,106		
Medicare beneficiary characteristics†	% (n)	% (n)	% (n)	% (n)	P value (U.S. vs. PR)	P value (CHPRPs vs. PR)
Part A & B enrollment	86.99 (59,319,668)	87.63 (58,561,338)	84.98 (2,339,583)	85.46 (673,484)	.0001*	.0001*
Medicare advantage enrollment	50.03 (29,679,713)	49.57 (29,028,317)	55.76 (1,304,438)	95.12 (640,589)	.0001*	.0001*
Fee-for-Service enrollment	49.97 (29,639,955)	50.43 (29,533,021)	44.24 (1,035,145)	4.88 (32,895)	.0001*	.0001*
Home health utilization‡	8.71 (2,582,573)	8.73 (2,579,490)	11.10 (114,873)	4.91 (1,615)	.0001*	.0001*
	Total U.S. agencies	U.S. agencies (excluding PR)	U.S. agencies in counties with high Puerto Rican populations	Puerto Rican agencies		
	n = 8,166	(U.S.) n = 8,131	(CHPRP) n = 826	(PR) n = 35		
Home Health Care agency characteristics	% (n)	% (n)	% (n)	% (n)	P value (U.S. vs. PR)	P value (CHPRPs vs. PR)
Urban location‡	83.75 (6,836)	83.68 (6,801)	98.79 (816)	100.00 (35)	.0040*	1.0000
For-Profit ownership‡	80.74 (6,593)	80.86 (6,575)	83.54 (690)	51.43 (18)	.0001*	.0001*
Medicare and Medicaid program participation‡	75.18 (6,139)	75.42 (6,132)	53.75 (444)	20.00 (7)	.0001*	.0001*
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	P value (U.S. vs. PR)	P value (CHPRPs vs. PR)
Count of beneficiaries§						
Small agency	45.41 (0.45)	45.32 (0.45)	41.38 (1.24)	42.50 (3.88)	.4845	.7881
Medium agency	168.56 (1.06)	169.02 (1.06)	164.12 (3.69)	83.64 (3.47)	.0001*	.0001*
Large agency	900.01 (18.67)	902.33 (18.73)	1416.63 (119.10)	216.17 (36.44)	.0001*	.0001*
Staffing§						
% RN	62.18 (20.85)	62.07 (20.82)	72.37 (19.30)	88.53 (10.67)	.0001*	.0001*
% LPN/LVN	21.58 (0.19)	21.65 (18.65)	12.68 (14.12)	6.18 (7.40)	.0001*	.0001*
% Aide	16.23 (16.05)	16.28 (16.07)	14.93 (16.12)	5.29 (5.32)	.0001*	.0001*
	Total U.S. HHC patients	U.S. HHC patients (excluding PR)	U.S. HHC patients in counties with high Puerto Rican populations	Puerto Rican HHC patients		
	n = 3,074,798	(U.S.) n = 3,070,774	(CHPRPs) n = 453,518	(PR) n = 4,024		
Home Health Care patient characteristics§	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	P value (U.S. vs. PR)	P value (CHPRPs vs. PR)
Average Age	77.62 (3.60)	77.62 (3.60)	78.65 (3.74)	77.37 (2.03)	.4690	.0011*
% Female	60.27 (6.31)	60.28 (6.31)	61.68 (6.73)	58.12 (6.33)	.0638	.0039*
Race/Ethnicity#						
% Asian or Pacific Islander	5.32 (14.33)	5.37 (14.38)	4.53 (12.78)	0.00 (0.00)	.0001*	.0001*
% Non-Hispanic Black or African American	15.41 (20.84)	15.52 (20.87)	27.46 (28.77)	0.00 (0.00)	.0001*	.0001*
% Hispanic/Latino	16.71 (24.50)	16.05 (23.47)	11.31 (16.16)	98.80 (1.41)	.0001*	.0001*
% Non-Hispanic White	74.21 (22.77)	74.36 (22.55)	70.20 (25.44)	0.00 (0.00)	.0001*	.0001*
% American Indian or Alaska Native, Other, or Unknown	0.95 (3.98)	0.96 (4.01)	0.49 (1.79)	0.00 (0.00)	.0001*	.0005*
% Missing***	11.49 (19.03)	11.54 (19.05)	12.41 (19.78)	1.20 (1.41)	.0001*	.0001*

P values are significant at $\alpha < 0.05$, noted with an asterisk (*).

†Pearson's χ^2 test; §Fisher's exact test; §t-test; ‡among FFS enrollees only; #Column totals may exceed 100%, as values are averages of agency-level percentages. Within each agency, percentages sum to 100%

For these data, state and county totals do not equal national totals due to rounding in the original data; *Data not reported for some race/ethnicity categories at some agencies. U.S. = U.S. agencies, excluding Puerto Rico; CHPRP = U.S. agencies (outside of Puerto Rico) in counties with high Puerto Rican populations; HHC = home health care; PR = Agencies in Puerto Rico; RN = registered nurse; LPN/LVN = Licensed Practical Nurse/Licensed Vocational Nurse; Aides = Home Health Aide; SD = standard deviation.

Puerto Rico HHC agencies served patients who were slightly younger (77.4 vs. 78.7 years, $P = .0011$) and had a lower percentage of female patients (58.1% vs. 61.7%, $P = .0039$) compared with agencies in CHPRPs. When comparing PR agencies to U.S. agencies (excluding PR), no significant differences in patient age or sex were observed. Race/ethnicity differed significantly, with 98.8% of PR patients identifying as Hispanic/Latino, compared to 16.1% in the U.S. and 11.3% in CHPRPs.

In Table 2, our analysis of QoPC Star ratings revealed that PR HHC agencies had the highest overall rating (3.7) compared with the U.S. (3.3, $P = .0033$) and CHPRP (3.2, $P = .0015$) agencies, excelling in several outcome quality measures, such as falls, ambulation, bed transferring, bathing, and dyspnea.

However, PR HHC patients experienced more pressure ulcer/skin injuries. Regarding process measures, timely care initiation and patient influenza vaccination rates were lower in PR (88.6% and 31.3%, respectively) compared with the U.S. (94.7%, $P = .0210$ and 73.3%) and CHPRP (94.5%, $P = .0274$ and 70.8%). Patient Experience Star ratings were also lower in PR (2.7) than in the U.S. (3.5), particularly for the communication component.

Discussion

Based on a cross-sectional analysis of 2022 data, this overview of HHC agencies in PR offers critical insights into coverage, Medicare

Table 2. Quality of patient care and patient experience performance for Home Health Care agencies in the U.S., Puerto Rico and counties with high Puerto Rican populations

	Total U.S. agencies n = 8,166	U.S. agencies (excluding PR) n = 8,131	U.S. agencies in counties with high Puerto Rican populations n = 826	Puerto Rican agencies n = 35		
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	P value (U.S. vs. PR)	P value (CHPRPs vs. PR)
Quality of patient care star rating						
Timely initiation of care† ∅	94.70 (8.25)	94.72 (8.20)	94.46 (8.38)	88.58 (15.02)	.0210*	.0274*
Improvement in management of oral medication‡ ∅	75.09 (16.01)	75.08 (16.03)	75.97 (15.40)	77.66 (10.39)	.1526	.3645
Improvement in ambulation‡ ∅	78.26 (14.44)	78.22 (14.47)	77.23 (14.63)	85.30 (5.28)	.0001*	.0001*
Improvement in bed transferring‡ ∅	79.47 (14.46)	79.44 (14.48)	79.23 (13.96)	85.42 (6.67)	.0001*	.0001*
Improvement in bathing‡ ∅	81.09 (14.26)	81.06 (14.29)	80.33 (14.27)	88.20 (5.64)	.0001*	.0001*
Improvement in dyspnea‡ ∅	78.79 (17.41)	78.74 (17.42)	79.49 (16.71)	91.01 (9.38)	.0001*	.0001*
Acute care hospitalization during the first 60 days of home health (claims-based) ‡ ∅	14.00 (3.96)	14.00 (3.95)	14.51 (3.81)	15.29 (5.76)	.3261	.5541
Other quality of patient care indicators						
How often the home health team made sure that their patients have received a flu shot for the current flu season† ∅	73.10 (17.42)	73.29 (17.19)	70.76 (17.48)	31.34 (17.77)	.0001*	.0001*
Changes in skin integrity post-acute care: pressure ulcer/injury‡ ∅	0.38 (0.69)	0.38 (0.69)	0.36 (0.67)	0.63 (0.63)	.0273*	.0188*
Percent of residents experiencing 1 or more falls with major injury‡ ∅	1.05 (1.16)	1.06 (1.16)	0.88 (1.05)	0.36 (0.38)	.0001*	.0001*
Patient experience star rating						
How patients rated overall care from agency□	3.48 (1.01)	3.48 (1.01)	3.03 (1.03)	2.70 (0.87)	.0001*	.0688
Health team gave care in a professional way□	3.15 (1.10)	3.15 (1.10)	2.76 (1.09)	2.85 (0.82)	.0713	.5719
Health team communicated well with them□	3.86 (1.07)	3.86 (1.07)	3.36 (1.16)	3.48 (1.15)	.1007	.5929
Health team discussed medicines, pain, and home safety□	3.30 (1.00)	3.31 (1.00)	2.78 (1.07)	2.63 (0.97)	.0012*	.4273
Patients who reported yes, they would definitely recommend the home health agency□	3.15 (1.24)	3.16 (1.24)	2.70 (1.16)	1.48 (0.64)	.0001*	.0001*
	77.87 (11.77)	77.87 (11.79)	73.72 (13.13)	78.62 (6.89)	.5438	.0006*

P values are significant at $\alpha < 0.05$, noted with an asterisk (*).

7 tests were used to calculate differences. Values represented as percentages are denoted with a diamond (∅); all other values are ratings from 1 to 5.

The Quality of Patient Care Star Rating (out of 5 stars) is composed of 7 components, listed below the "Quality of Patient Care Star Rating" row; process measures are represented with a dagger (†) and outcome measures with a double dagger (‡).

The Patient Experience Star Rating (out of 5 stars) is composed of 4 components, listed below the "Patient Experience Star Rating" row and are denoted by a square (□). U.S. = U.S. agencies, excluding Puerto Rico. CHPRP = U.S. agencies in counties with high Puerto Rico population. PR = Agencies in Puerto Rico.

beneficiary characteristics, agency and patient characteristics, and quality measures compared with agencies in the rest of the U.S., including those located in CHPRPs.

While HHC coverage appeared robust across most PR ZCTAs, all agency offices were concentrated in metropolitan areas. While most Puerto Ricans live in urban settings, approximately 8% live in rural areas. As a result, local variation in HHC access may be masked by the broader geographic distribution of ZCTAs across the island. Coverage remained limited on the islands of Vieques and Culebra, where over 20% of the population was 65 years old or older (12). Although Part A and B enrollment rates were similar to those in the U.S., including CHPRPs, HHC utilization among most PR beneficiaries is unknown due to high MA enrollment and lack of associated data. While some HHC access barriers remain unclear, geographic and transportation challenges may limit service availability, underscoring the need for policy solutions, such as mobile care units or telehealth expansion (13,14).

Puerto Rican HHC agencies employed considerably higher proportions of RNs than their U.S. and CHPRP counterparts, indicating that U.S. agencies may be substituting RNs with less expensive LPN/LVNs. This difference—potentially influenced by there being a larger share of nonprofit agencies in PR that prioritize RN-led care—reflects distinct health care delivery models and potential variations in regulatory and training environments (15).

Puerto Rican HHC agencies also demonstrated strong performance in the overall QoPC rating and other quality metrics (e.g., fall prevention), likely due to their higher RN ratios—which previous research has linked to improved outcomes and fewer hospital readmissions (16). However, PR HHC agencies had significantly lower rates of patient influenza immunizations and higher rates of pressure ulcers and skin injuries during HHC episodes, suggesting that agency staff may not be effectively communicating about flu vaccinations and that reduced use of home health aides could be delaying the diagnosis and treatment of pressure ulcers (17,18).

As further evidence of patient/caregiver communication challenges, PR HHC agencies had lower Patient Experience Star ratings compared with U.S. agencies, particularly on the issue of communicating about medicines, pain, and home safety. This discrepancy may reflect differences in patient expectations or systemic barriers in patient–provider interactions (19). Given the role of quality communication in health outcomes (20), these findings underscore the need for enhanced HHC clinician training to ensure optimal patient interactions.

While this study provides valuable insights, its descriptive nature and reliance on public data limit its scope. The absence of publicly available MA enrollee data, such as the Medicare Advantage Geographic Variation Public Use File, which includes encounter data for other care settings but excludes HHC utilization, further constrains understanding of reported HHC access issues for MA enrollees. Future studies could incorporate qualitative research and/or provider surveys to better understand care delivery challenges, workforce dynamics, and the lived experiences of agency staff and patients.

Conclusion

Puerto Rican HHC agencies follow a unique delivery model that excels in outcome quality metrics, though opportunities exist to increase performance in patient experience, pressure ulcer prevention, and flu immunization. Lack of data on MA enrollees calls for further research on utilization and access factors, along with a deeper examination of underlying drivers such as health care policies, cultural practices, and resource allocation.

Resumen

Objetivo: Evaluar la cobertura de agencias de salud en el hogar (HHC, siglas en inglés) en Puerto Rico (PR), territorio de EE. UU., y comparar agencias de PR con aquellas en EE. UU. (excluyendo PR) y un subconjunto de condados fuera de PR con alta población puertorriqueña (CHPRPs, siglas en inglés). **Métodos:** La cobertura de HHC en PR se cartografió con datos del Censo de EE. UU. de 2020 por Áreas de Tabulación de Códigos Postales (ZCTA, siglas en inglés) y archivos de acceso público de los Centros de Servicios de Medicare y Medicaid (CMS, siglas en inglés). Se calcularon estadísticas descriptivas de agencias de HHC, pacientes y beneficiarios de Medicare con datos de acceso público de CMS. Se usaron pruebas χ^2 de Pearson, exacta de Fisher o *t* para comparar agencias de PR con agencias de EE. UU. (excluyendo PR) y CHPRPs. **Resultados:** Casi todas las ZCTA de PR fueron atendidas por ≥ 7 agencias de HHC. En comparación con agencias de EE. UU. y CHPRPs, aquellas en PR tienen mayor proporción sin fines de lucro, mayor afiliación a Medicare Advantage (MA, siglas en inglés) y mejor prevención de caídas y calidad de atención, pero menor desempeño en inicio oportuno de HHC, vacunación contra influenza, y experiencia del paciente. **Conclusión:** Las agencias de HHC en PR sobresalen en métricas de mejoría del paciente, con oportunidades de fortalecer experiencia y atención preventiva. Futuros estudios deben examinar factores subyacentes a diferencias observadas y acceso y uso de HHC entre afiliados a MA.

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