

By Jennifer M. Reckrey, Mia Yang, Bruce Kinoshian, Evan Bollens-Lund, Bruce Leff, Christine Ritchie, and Katherine Ornstein

DOI: 10.1377/hlthaff.2019.01537
HEALTH AFFAIRS 39,
NO. 8 (2020): 1289-1296
©2020 Project HOPE—
The People-to-People Health
Foundation, Inc.

Receipt Of Home-Based Medical Care Among Older Beneficiaries Enrolled In Fee-For-Service Medicare

ABSTRACT Millions of older Americans are homebound and may benefit from home-based medical care. We characterized the receipt of this care among community-dwelling, fee-for-service Medicare beneficiaries ages sixty-five and older surveyed in the National Health and Aging Trends Study between 2011 and 2017. Five percent of those surveyed received any home-based medical care between 2011 and 2017 (mean follow-up time per person was 3.4 years), and 75 percent of home-based medical care recipients were homebound. Only 11 percent of the total homebound population (approximately 4.4 million fee-for-service Medicare beneficiaries in 2017) received any home-based medical care between 2011 and 2017. Receipt of home-based medical care was more common among homebound beneficiaries living in metropolitan areas and assisted living facilities, which suggests that geographic factors create operational efficiencies for home-based medical care practices that may improve their financial sustainability within the fee-for-service reimbursement setting. The significant unmet needs of this high-need, high-cost population and the known health and cost benefits of home-based medical care should spur stakeholders to expand the availability of this care.

There are an estimated two million older adults in the United States who never or rarely leave home and an additional five million older adults who leave home only with assistance or with significant difficulty.¹ These people are considered homebound by the Medicare definition.² The homebound population is understudied and often is invisible to health care delivery systems, payers, and quality-reporting programs.³ As the population of older adults grows and the shift from institution- to community-based long-term care continues, the number of homebound people will also grow.^{1,4}

Being homebound has tremendous clinical implications. Compared with their nonhomebound counterparts, homebound people use more med-

ications,⁵ experience higher symptom burden,⁶ have more functional impairment,^{1,7} and are hospitalized more frequently.^{1,7} Homebound people also have higher mortality rates,⁸ with two-year mortality rates as high as 40 percent among those who report rarely or never leaving home.⁹ In addition, homebound people report difficulty obtaining routine medical care¹ and an inability to engage in valued activities,¹⁰ which may contribute to these poor outcomes.

Home-based medical care provides longitudinal, interdisciplinary care in the home and includes both home-based primary care and other longitudinal medical services (for example, palliative care). In contrast to home health services (for example, short-term skilled nursing care, physical therapy, home health aide services),

Jennifer M. Reckrey (jennifer.reckrey@mountsinai.org) is an associate professor of geriatrics and palliative medicine at the Icahn School of Medicine at Mount Sinai, in New York, New York.

Mia Yang is an assistant professor of internal medicine and geriatrics and gerontology at the Wake Forest University School of Medicine, in Winston-Salem, North Carolina.

Bruce Kinoshian is an associate professor of geriatrics at the University of Pennsylvania, in Philadelphia, Pennsylvania.

Evan Bollens-Lund is a data analyst in the Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai.

Bruce Leff is a professor of medicine in the Division of Geriatric Medicine at Johns Hopkins University School of Medicine, in Baltimore, Maryland.

Christine Ritchie is a professor of palliative care and geriatric medicine at Massachusetts General Hospital, in Boston, Massachusetts.

Katherine Ornstein is an associate professor of geriatrics and palliative medicine at the Icahn School of Medicine at Mount Sinai.

home-based medical care provides ongoing medical care to treat the patient's acute and chronic health conditions in the home. Although recipients of home-based medical care are not necessarily homebound, many home-based medical care programs and providers target this vulnerable population.

There are few randomized controlled trials of home-based medical care,¹¹ but in primarily observational studies, home-based primary care (the predominant model of this care) has been shown to be associated with reduced hospitalizations and emergency department visits and with high patient and caregiver satisfaction compared with traditional office-based care.^{12,13} In addition, lower costs among those receiving home-based primary care have been reported within both Department of Veterans Affairs and non-Veterans Affairs practices.^{12,14,15} The strongest evidence of cost savings among Medicare beneficiaries receiving home-based medical care comes from the Center for Medicare and Medicaid Innovation's Independence at Home Demonstration, a Shared Savings Program in which fourteen practices throughout the US provided home-based primary care services to high-risk, chronically ill patients. In its first two years Independence at Home saved an average of \$2,700 per beneficiary per year over expected patient costs, and projections suggest that expansion of home-based primary care to the 2.4 million beneficiaries who qualify for it would result in ten-year systemwide savings of between \$2.6 billion and \$27.8 billion.¹⁶

Despite this evidence, home-based medical care is not widely disseminated, and the number of people receiving such care paid for by Medicare nationally is unknown. Our prior work demonstrated that only 12 percent of the 2.1 million people living in the community who rarely or never leave home reported receiving any medical care at home in 2011.¹ Only about five thousand primary care providers made approximately 1.7 million home visits in 2013, while in the same year nearly seven times as many providers visited patients in nursing facilities.¹⁷ Although enrollees of individual home-based primary care programs have been described, data on the characteristics (including homebound status) of the older Medicare population that actually receives home-based medical care services are limited.

This study used data from a nationally representative study linked to Medicare claims to evaluate the receipt of home-based medical care among a population of older adults with defined homebound status and to determine patients' sociodemographic, geographic, and clinical characteristics that are associated with receipt of this care.

Study Data And Methods

DATA SOURCES Data are from seven rounds of the National Health and Aging Trends Study (NHATS), an annual longitudinal population-based survey of late-life disability trends and trajectories. NHATS uses two-hour interviews conducted in person (via proxy as necessary) to collect detailed self-reports of physical function, activities of daily living, chronic health conditions, and economic status, as well as to conduct physical and cognitive tests. In 2011 NHATS enrolled and conducted surveys with a random sample of Medicare beneficiaries ages sixty-five and older living in the contiguous US, drawn from the Medicare enrollment file in 2010. Participants were then interviewed annually, and the sample was replenished in 2015. To ensure that all respondents had complete Medicare claims available for analysis, we included only participants with six or more consecutive months of fee-for-service claims data before their most recent NHATS interview ($n = 7,552$). We then linked NHATS results to Medicare claims for all data years from 2011 to 2017.

MEASURES Our primary outcome was the receipt of home-based medical care as determined via Medicare claims. Because a single home visit may occur in the absence of longitudinal home-based medical care (for example, a posthospitalization transitional care visit or a one-time home assessment visit), we defined receipt of home-based medical care as receipt of at least two home visits within the 180 days surrounding the completed NHATS interview (ninety days before and ninety days after). For those who died or were placed in a nursing home within ninety days after their interview, we defined receipt of home-based medical care as a single home visit within this period. We used Healthcare Common Procedure Coding System codes to identify medical visits to private residences (99341–99345, 99347–99350) and assisted living facilities (99324–99328, 99334–99337).

On the basis of previous work,¹ homebound status was determined using the NHATS mobility questionnaire. We considered individuals to be homebound if they reported that they never or rarely (once a week or less) left home in the past month, never left home by themselves, or left home but needed help or had difficulty. Demographic, clinical, and functional measures were assessed by NHATS via in-person interviews of respondents, their proxy, or both, in addition to in-person home-based assessments of functional and cognitive status. Probable dementia was determined on the basis of self or proxy reports of diagnosis, cognitive testing, or both.¹⁸ We report characteristics (including homebound status) of respondents at the most recently completed

NHATS interview; among those receiving home-based medical care, we report characteristics at the most recently completed NHATS interview where they were determined to receive home-based medical care as defined above.

ANALYSIS We examined the receipt of home-based medical care in each of the seven study years to determine the overall receipt of this care in the full sample and among homebound participants. We used NHATS survey weights to create annual population estimates of home-based medical care use per year, with 95% confidence intervals. We used regression models to explore differences in home-based medical care use across individual calendar years and to determine whether there was a linear trend in the use of this care during the study period. Next, we compared characteristics of beneficiaries by use of home-based medical care and homebound status, using *t*-tests and chi-square analyses. Finally, we created a multivariable logistic regression model to assess factors independently associated with receipt of home-based medical care among homebound people, adjusting for calendar year fixed effects.

The Johns Hopkins University Institutional Review Board approved the NHATS protocol, and all NHATS participants provided informed consent before their interview.

LIMITATIONS This study had several potential limitations. Homebound status and other variables were determined annually via survey and do not reflect possible fluctuations in these characteristics over time (for example, someone may temporarily report being homebound with difficulty getting around at home after an acute illness). In addition, claims data were available only for fee-for-service Medicare beneficiaries.

Although our results do not include home-based medical care that occurs under Medicare Advantage, a 2019 analysis of home-based medical care in the Medicare Advantage population produced estimates of use that were similar to those we produced.¹⁹

Study Results

We identified 7,552 community-dwelling, fee-for-service Medicare beneficiaries surveyed from 2011 to 2017. Nearly 5 percent of these beneficiaries received home-based medical care at any point during follow-up (exhibit 1) (mean follow-up time per individual was 3.4 years; data not shown), and the average number of home-based medical care visits per calendar year for those who received them was 7.74 (exhibit 1). Of those receiving home-based medical care, 75 percent were homebound, and among homebound recipients, 11.26 percent received home-based medical care. Less than 2 percent of the nonhomebound sample received home-based medical care at any point during follow-up.

The percentage of community-dwelling, fee-for-service Medicare beneficiaries receiving home-based medical care in any given year between 2011 and 2017 ranged from 2.04 percent (an estimated 505,000 people) in 2015 to 2.76 percent (an estimated 639,000 people) in 2016 (exhibit 2). A larger proportion of homebound beneficiaries used home-based medical care annually compared with nonhomebound beneficiaries. No significant linear trends in the use of home-based medical care over time were noted for either the full population of community-dwelling, fee-for-service Medicare beneficiaries or the homebound subgroup (data not

EXHIBIT 1

Receipt of home-based medical care (HBMC) among older fee-for-service Medicare beneficiaries by homebound status (unweighted), 2011–17

	N	Received HBMC	No. of HBMC visits in calendar year (among those receiving HBMC)	
			Mean	SD
All respondents	7,552	4.97%	7.74	6.30
Homebound	2,486	11.26	7.64	5.71
Never or rarely (once a week or less) left home	842	17.34	8.47	6.64
Left home, but never by self	511	14.09	6.32	3.96
Left home, but needed help/had difficulty	1,133	5.47	7.24	4.73
Not homebound	5,066	1.88	7.22	5.69

SOURCE Authors' analysis of data from participants in the 2011–17 waves of the National Health and Aging Trends Study who have six or more consecutive months of fee-for-service Medicare claims before their most recent National Health and Aging Trends Study interview. **NOTES** Receipt of HBMC was defined as at least two home visits within ninety days before or after the National Health and Aging Trends Study interview date. SD is standard deviation.

EXHIBIT 2

Weighted estimates of annual home-based medical care use among fee-for-service Medicare beneficiaries, by calendar year, 2011-17

Year	Total population			Homebound population		
	Weighted percent	Population estimate (thousands)	95% CI (thousands)	Weighted percent	Population estimate (thousands)	95% CI (thousands)
2011	2.29	547	(386, 709)	7.61	386	(275, 497)
2012	2.41	527	(387, 669)	8.12	366	(257, 475)
2013	2.21	443	(309, 579)	7.06	289	(197, 381)
2014	2.64	478	(345, 611)	9.15	355	(248, 463)
2015	2.04	505	(396, 614)	7.12	337	(252, 423)
2016	2.76	639	(454, 823)	10.59	515	(346, 683)
2017	2.56	546	(405, 688)	7.37	327	(224, 431)

SOURCE Authors' analysis of the data from participants in the 2011-17 waves of the National Health and Aging Trends Study who have six or more consecutive months of fee-for-service Medicare claims before their most recent National Health and Aging Trends Study interview. **NOTES** Receipt of home-based medical care was defined as at least two home visits within ninety days before or after the National Health and Aging Trends Study interview date. Homebound was defined as never or rarely (once a week or less) leaving home in the past month; leaving home, but never by self; or leaving home, but needing help or having difficulty. CI is confidence interval.

shown). Relative to 2016, the year in which the highest percentage of the population received home-based medical care, there was significantly lower use of home-based medical care in 2015 among all fee-for-service Medicare beneficiaries, and in 2013, 2015, and 2017 there was lower use among the homebound subgroup. See online appendix exhibit 1 for analysis of home-based medical care time trends from 2011 to 2017.²⁰

Among homebound beneficiaries, those who received home-based medical care were more likely to live in a metropolitan area or in an assisted living facility compared with those who did not receive home-based medical care (exhibit 3). Those who received home-based medical care were also more likely to have dementia, have been hospitalized in previous twelve months, die within twelve months of the interview, and receive Medicare home health care.

In a multivariable analysis, receipt of home-based medical care among homebound beneficiaries was most strongly associated with living in an assisted living facility (odds ratio: 6.09) and living in a metropolitan area (odds ratio: 6.15). Home-based medical care use continued to be associated with greater age, impairment in two or more activities of daily living, dementia, receipt of Medicare home health care, and region of residence. See appendix exhibit 2 for results from a multivariable logistic regression model predicting receipt of home-based medical care among homebound beneficiaries.²⁰

The nonhomebound beneficiaries who received home-based medical care had more chronic conditions, more functional impairment, and higher health care use compared with nonhomebound beneficiaries who did not receive home-based medical care. Similar to the homebound

population, they were more likely to live in an assisted living facility than those who did not receive home-based medical care. Importantly, the nonhomebound beneficiaries who received home-based medical care were more socially disadvantaged compared with those who did not. They were less likely to be white non-Hispanic, to be married, and to have at least a high school education, and they were more likely to have Medicaid and be in the lowest income quartile (exhibit 3).

Discussion

Our study is the first to use data from a national sample of Medicare beneficiaries to link the use of home-based medical care, as determined by claims data, to individual homebound status. Fewer than 5 percent of Medicare beneficiaries in our sample received home-based medical care at any point between 2011 and 2017, and only 11.26 percent of those who were homebound received this care. Although the homebound beneficiaries who received home-based medical care were older, sicker, and more functionally impaired than the homebound beneficiaries who did not receive this care, the latter were still a highly vulnerable group: Approximately one-third were hospitalized in the previous year, and nearly as many died in the twelve months after their interview.

These findings suggest that the number of people who may benefit from home-based medical care greatly exceeds the number who receive it. Although data suggest that homebound beneficiaries with multiple chronic conditions and functional limitations benefit from home-based medical care,¹²⁻¹⁴ information about optimal

EXHIBIT 3
Characteristics of community-dwelling fee-for-service Medicare beneficiaries, by homebound status and receipt of home-based medical care (HBMC), 2011-17

	Homebound		Not homebound	
	HBMC	No HBMC	HBMC	No HBMC
DEMOGRAPHIC CHARACTERISTICS				
Number of beneficiaries	280	2,206	95	4,971
Age, years	87.28 ^{***}	83.40	84.74 ^{***}	77.95
Female	71.07%	67.50%	61.05%	52.5%
White non-Hispanic	63.57	65.10	61.05 ^{***}	73.53
Married	22.58 ^{***}	31.73	28.42 ^{***}	51.42
At least high school education	71.22	65.28	66.32 ^{***}	81.76
Medicaid	28.35	28.41	33.33 ^{***}	11.32
Income in lowest quartile	39.64	41.70	47.37 ^{***}	20.46
GEOGRAPHY AND LIVING ARRANGEMENTS				
Lives in metropolitan area	94.29% ^{***}	76.43%	— ^a ^{***}	77.89%
Region of residence	***		**	
Northeast	21.43	16.32	20.00%	15.29
Midwest	28.57	21.71	33.6	23.56
South	35.36	44.83	— ^a	43.21
West	14.64	17.14	— ^a	17.94
Lives alone	54.29 ^{***}	35.13	61.05 ^{***}	33.41
Assisted living	46.79 ^{***}	11.11	47.37 ^{***}	4.53
FUNCTIONAL AND CLINICAL CHARACTERISTICS				
Impairment in two or more activities of daily living	69.64% ^{***}	45.83%	17.89% ^{***}	2.35%
Difficulty moving around inside	72.14 ^{***}	60.02	12.63	7.38
Two or more chronic conditions	95.00	93.20	86.32 ^{**}	74.93
Dementia	64.52 ^{***}	38.88	30.85 ^{***}	8.01
Died within 12 months of interview	40.00 ^{***}	31.14	14.74	9.01
Hospitalized in 12 months before interview	51.07 ^{***}	37.44	36.84 ^{***}	14.46
Received Medicare home health care in 180 days surrounding interview	51.79 ^{**}	26.16	49.47 ^{**}	5.29

SOURCE Authors' analysis of data from participants in the 2011-17 waves of the National Health and Aging Trends Study who have six or more consecutive months of fee-for-service Medicare claims before their most recent National Health and Aging Trends Study interview. **NOTES** Receipt of HBMC was defined as at least two home visits within ninety days before or after the National Health and Aging Trends Study interview date. Homebound was defined as never or rarely (once a week or less) leaving home in the past month; leaving home, but never by self; or leaving home, but needing help or having difficulty. ^aResults are not reportable because of cell size restrictions. ***p* < 0.05 ****p* < 0.01

rates of use of this care are lacking. It is apparent that the current system of community-based primary care does not adequately meet the needs of medically and socially complex homebound people. For example, in a post hoc analysis of homebound community-dwelling Medicare beneficiaries in our study who did not receive home-based medical care, we found that a significant portion (more than 20 percent) had no primary care provider visits in any ambulatory, nonhospital setting (that is, claims submitted for nonhospital provider services by internal medicine physicians, family medicine physicians, or nurse practitioners)²¹ in the 180 days surrounding their interview (ninety days before and ninety days after) (data not shown). Given the importance of coordinated primary care for high-cost, high-need patients such as those who are homebound, home-based medical care is a promising model whose expansion can help meet the needs of this vulnerable population.

In addition to finding underuse of home-based medical care among homebound people, our evaluation of nonhomebound people who are receiving home-based medical care suggests that this may be an important source of care for nonhomebound people as well. Twenty-five percent of home-based medical care recipients in our study were nonhomebound (exhibit 1), and these beneficiaries were more clinically complex and functionally impaired compared with the nonhomebound beneficiaries who did not receive home-based medical care. Importantly, they also had lower income, higher use of Medicaid, and less education and were more likely to be nonwhite (exhibit 3). This suggests that home-based medical care may be an important care delivery approach that can address social determinants of health in patients with complex care needs. This may in part reflect the ability of interdisciplinary home-based medical care teams to meet both the medical needs and the

complex social needs of vulnerable people in the community.²²⁻²⁴ Further evaluation of outcomes associated with the receipt of home-based medical care over time relative to both trajectories of homebound status and other social determinants of health is needed.

An important driver of the underuse of home-based medical care is the challenge of creating a financially sustainable model of such care within a fee-for-service model in which reimbursement for care of patients with complex chronic illness and functional impairments is limited. Our finding of higher rates of home-based medical care among those living in assisted living facilities and in metropolitan areas likely reflects the fact that favorable factors related to geography and the built environment create operational efficiencies and opportunities to improve the financial sustainability of home-based medical care practices. This is consistent with literature reporting a dearth of such practices in rural areas.^{17,25} Although cost savings generated by home-based medical care can contribute rather substantially to shared savings for accountable care organizations in the current fee-for-service Medicare system,^{26,27} our finding of no sustained growth in the proportion of Medicare beneficiaries receiving home-based medical care from 2011 to 2017 suggests that these shared savings opportunities have not resulted in significant growth of home-based medical care to date.

Given the financial challenges of supporting a home-based medical care practice within a Medicare fee-for-service payment structure, a growing number of home-based medical care practices are seeking value-based contracts to support the care they provide.²⁸ Such contracts provide practices with additional per patient revenue beyond the visit-based Medicare payment to manage high-need, high-cost patients. This additional financial support may offset existing, unbillable costs incurred by home-based medical care practices (for example, travel) and support for nonmedical team members (for example, social workers). In addition, value-based contracts may improve the ability of home-based medical care to address important social determinants of health,²² such as home modifications and repairs to improve safety and function for homebound people.²⁹

An important barrier to home-based medical care participation in value-based care has been the lack of quality metrics that are appropriate to the home setting or the needs of homebound older adults.³ Quality metrics relevant to home-based medical care are necessary to ensure that its providers can participate in the growing number of value-based reimbursement options within both Medicare Advantage and traditional

The number of people who may benefit from home-based medical care greatly exceeds the number who receive it.

Medicare. A Centers for Medicare and Medicaid Services Qualified Clinical Data Registry for home-based medical care has been implemented so that home-based medical care providers can access performance payments under the Merit Incentive Payment System program.³⁰ However, additional work is required to ensure the appropriate measurement of the value that home-based medical care provides.

Payment reforms are necessary to make home-based medical care more broadly sustainable, but such reforms must recognize that most home-based medical care practices are small and require costly mobile interdisciplinary care teams. For example, Medicare's High Needs Direct Contracting option in the Center for Medicare and Medicaid Innovation's Direct Contracting model is intended to target practices such as home-based medical care by providing per member per month payments above and beyond fee-for-service reimbursement for those with high needs,³¹ yet the minimum size limits of the program (750 high-need patients by year 3) would preclude adoption by most home-based medical care practices.

A more promising approach would be to treat groups of home-based medical care providers as distinct practices caring for high-risk patients within the Center for Medicare and Medicaid Innovation's Primary Care First model,³² which provides performance-based payments meant to strengthen primary care and incentivize provision of high-quality care for people with serious illnesses. Most home-based medical care providers currently combine office- and home-based care within their practices and therefore would not qualify for these higher payments.³³ However, if home-based medical care services were considered separately and embedded in a Primary Care First payment structure, this could incentivize providers and systems to use home-based medical care as a financially sustainable model to care for high-risk patients.³⁴

Conclusion

Home-based medical care is serving both clinically and socially complex homebound and non-homebound people, but the number of people who may benefit from this care is much greater than the number who receive it. Policies that

support the expansion of home-based medical care through quality metric development and payment reform will help ensure that vulnerable people can benefit from this high-value, patient-centered model of care. ■

The study investigators were supported by the National Institute on Aging (Grant Nos. R03AG060092 to Jennifer Reckrey and R01AG060967 to Katherine Ornstein). The National Health and Aging Trends Study is supported by the

National Institute on Aging (Grant No. NIA U01AG032947) and was conducted by Johns Hopkins University. The content is solely the responsibility of the authors and does not necessarily represent the official views of the

National Institutes of Health. Bruce Leff is a board member of the American Academy of Home Care Medicine and a consultant to Landmark Health. The authors acknowledge Omari-Khalid Rahman for providing analytic support.

NOTES

- Ornstein KA, Leff B, Covinsky KE, Ritchie CS, Federman AD, Roberts L, et al. Epidemiology of the homebound population in the United States. *JAMA Intern Med.* 2015; 175(7):1180–6.
- Medicare Interactive. The homebound requirement [Internet]. Washington (DC): Medicare Rights Center; [cited 2020 May 20]. Available from: <https://www.medicareinteractive.org/get-answers/medicare-covered-services/home-health-services/the-homebound-requirement>
- Leff B, Carlson CM, Saliba D, Ritchie C. The invisible homebound: setting quality-of-care standards for home-based primary and palliative care. *Health Aff (Millwood).* 2015;34(1): 21–9.
- Kaye HS, Harrington C. Long-term services and supports in the community: toward a research agenda. *Disabil Health J.* 2015;8(1):3–8.
- Kronish IM, Federman AD, Morrison RS, Boal J. Medication utilization in an urban homebound population. *J Gerontol A Biol Sci Med Sci.* 2006;61(4):411–5.
- Wajnberg A, Ornstein K, Zhang M, Smith KL, Soriano T. Symptom burden in chronically ill homebound individuals. *J Am Geriatr Soc.* 2013;61(1):126–31.
- Negrón-Blanco L, de Pedro-Cuesta J, Almazán J, Rodríguez-Blázquez C, Franco E, Damián J, DISCAP-ARAGON Research Group. Prevalence of and factors associated with homebound status among adults in urban and rural Spanish populations. *BMC Public Health.* 2016;16:574.
- Jacobs JM, Hammerman-Rozenberg A, Stessman J. Frequency of leaving the house and mortality from age 70 to 95. *J Am Geriatr Soc.* 2018;66(1): 106–12.
- Soones T, Federman A, Leff B, Siu AL, Ornstein K. Two-year mortality in homebound older adults: an analysis of the National Health and Aging Trends Study. *J Am Geriatr Soc.* 2017;65(1):123–9.
- Szanton SL, Roberts L, Leff B, Walker JL, Seplaki CL, Soones T, et al. Home but still engaged: participation in social activities among the homebound. *Qual Life Res.* 2016;25(8): 1913–20.
- Reckrey JM, Brody AA, McCormick ET, DeCherrie LV, Zhu CW, Ritchie CS, et al. Rationale and design of a randomized controlled trial of home-based primary care versus usual care for high-risk homebound older adults. *Contemp Clin Trials.* 2018;68:90–4.
- Totten AM, White-Chu EF, Wasson N, Morgan E, Kansagara D, Davis-O'Reilly C, et al. Home-based primary care interventions [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2016 Feb [cited 2020 May 20]. (Report No. 15(16)-EHC036-EF). Available from: <https://www.ncbi.nlm.nih.gov/books/NBK356253/>
- Stall N, Nowaczynski M, Sinha SK. Systematic review of outcomes from home-based primary care programs for homebound older adults. *J Am Geriatr Soc.* 2014;62(12):2243–51.
- Edes T, Kinoshian B, Vuckovic NH, Nichols LO, Becker MM, Hossain M. Better access, quality, and cost for clinically complex veterans with home-based primary care. *J Am Geriatr Soc.* 2014;62(10):1954–61.
- De Jonge KE, Jamshed N, Gilden D, Kubisiak J, Bruce SR, Taler G. Effects of home-based primary care on Medicare costs in high-risk elders. *J Am Geriatr Soc.* 2014;62(10): 1825–31.
- Rotenberg J, Kinoshian B, Boling P, Taler G, Independence at Home Learning Collaborative Writing Group. Home-based primary care: beyond extension of the Independence at Home Demonstration. *J Am Geriatr Soc.* 2018;66(4):812–7.
- Yao N, Ritchie C, Camacho F, Leff B. Geographic concentration of home-based medical care providers. *Health Aff (Millwood).* 2016;35(8):1404–9.
- Kasper JD, Freedman VA, Spillman BC. Classification of persons by dementia status in the National Health and Aging Trends Study [Internet]. Baltimore (MD): Johns Hopkins Bloomberg School of Public Health; 2013 Jul 26 [cited 2020 Jun 22]. (Technical Paper No. 5). Available from: https://www.nhats.org/scripts/documents/NHATS_Dementia_Technical_Paper_5_Jul2013.pdf
- Harrison KL, Leff B, Altan A, Dunning S, Patterson CR, Ritchie CS. What's happening at home: a claims-based approach to better understand home clinical care received by older adults. *Med Care.* 2020;58(4): 360–7.
- To access the appendix, click on the Details tab of the article online.
- Bynum JPW, Chang C-H, Austin A, Carmichael D, Meara E. Outcomes in older adults with multimorbidity associated with predominant provider of care specialty. *J Am Geriatr Soc.* 2017;65(9):1916–23.
- Valluru G, Yudin J, Patterson CL, Kubisiak J, Boling P, Taler G, et al. Integrated home- and community-based services improve community survival among Independence at Home Medicare beneficiaries without increasing Medicaid costs. *J Am Geriatr Soc.* 2019;67(7):1495–501.
- Leff B, Lasher A, Ritchie CS. Can home-based primary care drive integration of medical and social care for complex older adults? *J Am Geriatr Soc.* 2019;67(7):1333–5.
- Norman GJ, Wade AJ, Morris AM, Slaboda JC. Home and community-based services coordination for homebound older adults in home-based primary care. *BMC Geriatr.* 2018;18(1):241.
- Yao NA, Ritchie C, Cornwell T, Leff B. Use of home-based medical care and disparities. *J Am Geriatr Soc.* 2018;66(9):1716–20.
- Saunders R, Bleser W, Japinga M. Serious illness approaches by ACOs: U.S. Medical Management [Internet]. Washington (DC): Duke-Margolis Center for Health Policy; 2019 Apr 25 [cited 2020 May 20]. Available from: <https://healthpolicy.duke.edu/sites/default/files/u31/>

- case_study_1_-_usmm.pdf
- 27** U.S. Medical Management. Public reporting [Internet]. Troy (MI): USMM; [cited 2020 May 20]. Available from: <https://aco.usmmlc.com/public-reporting.html>
- 28** Landers S, Madigan E, Leff B, Rosati RJ, McCann BA, Hornbake R, et al. The future of home health care: a strategic framework for optimizing value. *Home Health Care Manag Pract*. 2016;28(4):262–78.
- 29** Szanton SL, Thorpe RJ, Boyd C, Tanner EK, Leff B, Agree E, et al. Community aging in place, advancing better living for elders: a bio-behavioral-environmental intervention to improve function and health-related quality of life in disabled older adults. *J Am Geriatr Soc*. 2011;59(12):2314–20.
- 30** John A. Hartford Foundation. Moving and scaling home-based primary care phase II: quality, training, and advocacy [Internet]. New York (NY): John A. Hartford Foundation; 2020 Feb [cited 2020 May 20]. Available from: <https://www.johnahartford.org/grants-strategy/moving-and-scaling-home-based-primary-care-phase-ii-quality-training-and-advocacy>
- 31** Centers for Medicare and Medicaid Services. Direct Contracting model options [Internet]. Baltimore (MD): CMS; [cited 2020 May 20]. Available from: <https://innovation.cms.gov/initiatives/direct-contracting-model-options/>
- 32** Centers for Medicare and Medicaid Services. Primary Care First model options [Internet]. Baltimore (MD): CMS; [cited 2020 May 20]. Available from: <https://innovation.cms.gov/initiatives/primary-care-first-model-options/>
- 33** Kinosian B, Taler G, Boling P, Gilden D, Independence at Home Learning Collaborative Writing Group. Projected savings and workforce transformation from converting Independence at Home to a Medicare benefit. *J Am Geriatr Soc*. 2016; 64(8):1531–6.
- 34** Leff B, Boling P, Taler G, Kinosian B. To strengthen the Primary Care First model for the most frail, look to the Independence at Home demonstration. *Health Affairs Blog* [blog on the Internet]. 2020 Feb 18 [cited 2020 May 20]. Available from: <https://www.healthaffairs.org/doi/10.1377/hblog20200218.661865/full/>