Evaluation of the Independence at Home Demonstration

An Examination of Year 8, the Second Year of the COVID-19 Pandemic

February 2024

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Submitted to:

Centers for Medicare & Medicaid Services
Center for Medicare and Medicaid Innovation
7500 Security Blvd.
Baltimore, MD 21244
Project Officer: David Nyweide
Contract Number:
HHSM-500-2014-00034I/HHSM-500-T0018

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Executive summary

The Independence at Home (IAH) demonstration is a Congressionally mandated test of whether a payment incentive and service delivery model for providing home-based primary care reduces health care spending and improves health outcomes for chronically ill and functionally limited Medicare beneficiaries. Participating home-based primary care practices can earn incentive payments if (1) their beneficiaries' Medicare spending is less than a given spending target and (2) their performance on selected quality measures meets specified thresholds.

The demonstration, which began in June 2012, was originally intended to last three years, but Congress has extended it three times. This report describes the evaluation's findings through 2021, or Year 8 of the IAH demonstration. Year 8 was the first year of the third extension of IAH and second year of the COVID-19 pandemic.

More than half of the original 18 practices left the demonstration before Year 8, including three that withdrew just before the third extension began in Year 8.

The number of practices, clinicians, and beneficiaries in the demonstration has decreased in every year since Year 5. Each of the seven practices in Year 8 had considerably fewer clinicians and beneficiaries than the prior year. Combined with the length of the demonstration, the small number of practices hinders the ability to robustly evaluate the effects of the demonstration and means that the remaining practices are unlikely to resemble other home-based primary care practices. This provides little confidence that the evaluation results would apply to other practices.

In Year 8, IAH beneficiaries continued receiving more ambulatory visits and home health services than comparison beneficiaries. IAH practices demonstrated worsening performance on one quality measure in Year 8.

IAH beneficiaries received 16 percent more ambulatory visits—including home, office, telehealth, and telephone visits—from primary care clinicians and specialists than comparison beneficiaries. On average, IAH beneficiaries had a primary care visit every 5.5 weeks while comparison beneficiaries had a primary care visit every 9.3 weeks. As in Year 7, IAH beneficiaries had a higher share of primary care visits by telehealth or telephone in Year 8. IAH beneficiaries were also more likely to use home health services provided under the Medicare home health benefit. They had greater home health spending, more home health visits, and more days in care than comparison beneficiaries.

Among practices that participated in Year 8, performance on one quality measure decreased since Year 7: four practices met the performance threshold for the annual

documentation of patient preferences measure in Year 7, but only one practice met it in Year 8. Nearly all IAH practices failed to meet the performance threshold for half of the six quality measures tied to payment in Year 8, which reduced the incentive payment those sites received for Year 8. Because these three measures were reported by IAH sites (rather than measured using claims data), failure to meet the performance threshold for the site-reported quality measures may reflect low performance on the activity being measured or a failure to report the activity.

The estimated effect of IAH on total spending in Year 8 was not statistically significant and was a smaller decrease than in Year 7 when the demonstration had more participants.

IAH may have reduced total Medicare spending in Year 8 (-$320 PBPM, -7.5 percent, not statistically significant), but the estimated effect was smaller than in Year 7, the first year of the COVID-19 pandemic (-$459 PBPM, -10.7 percent, statistically significant). Among the seven sites that participated in both years, the Year 7 effect was very similar to the Year 8 effect, suggesting little change in the effect of IAH on total spending for these seven sites. COVID-19 diagnoses and COVID-19 hospitalizations did not play a direct, material role in the results in Year 7 or Year 8. IAH may have increased net spending in Year 8 after accounting for incentive payments CMS paid to IAH sites. We did not find evidence that IAH reduced hospital admissions or unplanned readmissions in Year 8.

While IAH's estimated spending reductions were generally greater during the pandemic, the limited favorable evidence is not generalizable beyond the COVID-19 pandemic.

The IAH demonstration aimed to reduce Medicare spending, hospital use, and to improve health outcomes. The non-significant estimated effect on spending in Year 8 was larger than in Year 6 and most other pre-pandemic years. The features of home-based primary care provided by IAH practices may have been especially valuable during the COVID-19 pandemic, affecting spending and other outcomes differently than before the pandemic. For example, developing a trusting relationship and effective communication through visits at home with IAH clinicians may have made IAH beneficiaries feel more comfortable receiving routine visits, COVID-19 vaccinations, and other services during the pandemic. Estimated effects of IAH in Year 8 on spending and other outcomes, which occurred during the second year of the COVID-19 pandemic, are not generalizable to other home-based primary care practices or periods of time.

The declining number of participating practices and clinicians, non-significant effects on spending and hospital use, and worsening performance on some quality measures suggest that the IAH payment incentive was not an effective policy to reduce spending and hospital use in the first year of the demonstration's third extension.

1. Introduction

Section 3024 of the Patient Protection and Affordable Care Act (Public Law 111-148) enacted the Independence at Home (IAH) demonstration in 2010. The purpose of the IAH demonstration is to test a payment incentive and service delivery model for providing home-based primary care to Medicare beneficiaries who are chronically ill and functionally limited. Home-based primary care is any services that primary care clinicians provide in the home (including assisted living facilities and other group residences) rather than in an office. In June 2012, the Centers for Medicare & Medicaid Services (CMS) launched the IAH demonstration. Under the demonstration, physicians and nurse practitioners (NPs) direct home-based primary care teams with the goal of reducing health care spending and improving health outcomes.

The legislation authorizing IAH demonstration requires an independent evaluation to determine the impact of the demonstration on beneficiaries' Medicare spending and other health-related outcomes. This report describes the evaluation's findings through the eighth year of the IAH demonstration. It is the latest addition to our previous evaluation reports covering the first seven years of the IAH demonstration.[1]

1.1. Background on the IAH demonstration and evaluation

The IAH demonstration provides incentives to home-based primary care practices that meet certain requirements to encourage lower cost and higher quality care. As part of the IAH demonstration, participating practices can earn incentive payments if the Medicare spending on their beneficiaries is below the practice's target spending level and if the practice meets standards on a set of quality measures. (See Appendix A for more information about calculation of the incentive payment and Chapter 2 for more information about the quality measures.) The IAH demonstration provides incentives to practices to deliver timely, coordinated care by treating beneficiaries' acute conditions promptly and preventing beneficiaries' chronic conditions from worsening. Improved management of care for beneficiaries may decrease the need for costly emergency department (ED) visits and hospital admissions. For the IAH demonstration to save Medicare money, it must reduce Medicare spending for beneficiaries of IAH practices compared with similar beneficiaries who did not receive home-based primary care. The reduction in Medicare spending must also be larger than the incentive payments CMS paid to IAH practices, which represent the cost to CMS of attracting and maintaining participants in the demonstration.

1.1.1. Eligibility requirements for practices and beneficiaries

The law that enacted the IAH demonstration describes the eligibility requirements for practices and beneficiaries. Demonstration practices must have experience delivering home-based primary care and have teams led by physicians or nurse practitioners;

[1] Previous IAH evaluation reports are available at https://www.cms.gov/priorities/innovation/innovation-models/independence-at-home.

the teams can include physician assistants, clinical staff, and other health and social services staff (Exhibit 1.1).

Exhibit 1.1. Requirements for practices to participate in the IAH demonstration

- Be led by physicians or nurse practitioners who provide home-based primary care as part of a team
- Be organized (at least partly) as a physician practice
- Have experience providing home-based primary care to beneficiaries with several chronic illnesses
- Make in-home primary care visits and be available at all hours
- Use electronic medical records, remote monitoring, and mobile diagnostic technology
- Provide services to at least 200 IAH-eligible beneficiaries each year
- Report data for quality measures to CMS
- Achieve savings at least once in three consecutive years

Beneficiaries who receive home-based primary care from the IAH practices are eligible for the demonstration if they meet several criteria related to their health and use of health care (Exhibit 1.2). Congress limited the demonstration to 10,000 beneficiaries in each of the first five years, 15,000 beneficiaries in Years 6 and 7, and 20,000 beneficiaries in Years 8 to 10.[2]

Exhibit 1.2. Requirements for beneficiaries to be eligible for the IAH demonstration

- Have at least two chronic conditions
- Require human assistance with at least two activities of daily living
- Have been hospitalized and received acute or subacute rehabilitation services in the prior 12 months
- Be enrolled in fee-for-service Medicare
- Not be in long-term care or hospice at the time of enrollment in the demonstration

1.1.2. Evaluation study design

We used a quasi-experimental difference-in-differences design to study the effects of IAH on key outcomes, such as spending and hospital use. We matched beneficiaries in a comparison group (who did not receive home-based primary care) with IAH beneficiaries based on their characteristics. Beneficiaries in the matched comparison group met the IAH eligibility criteria and lived in the same geographic areas as IAH beneficiaries. We constructed our sample of IAH and comparison beneficiaries for each of 10 years: two fixed pre-demonstration years and eight demonstration years based on the IAH practices participating in the eighth demonstration year.

We estimated effects as the change in outcomes for beneficiaries meeting IAH eligibility criteria and receiving home-based primary care from IAH practices before and after the start of the demonstration relative to the change during the same

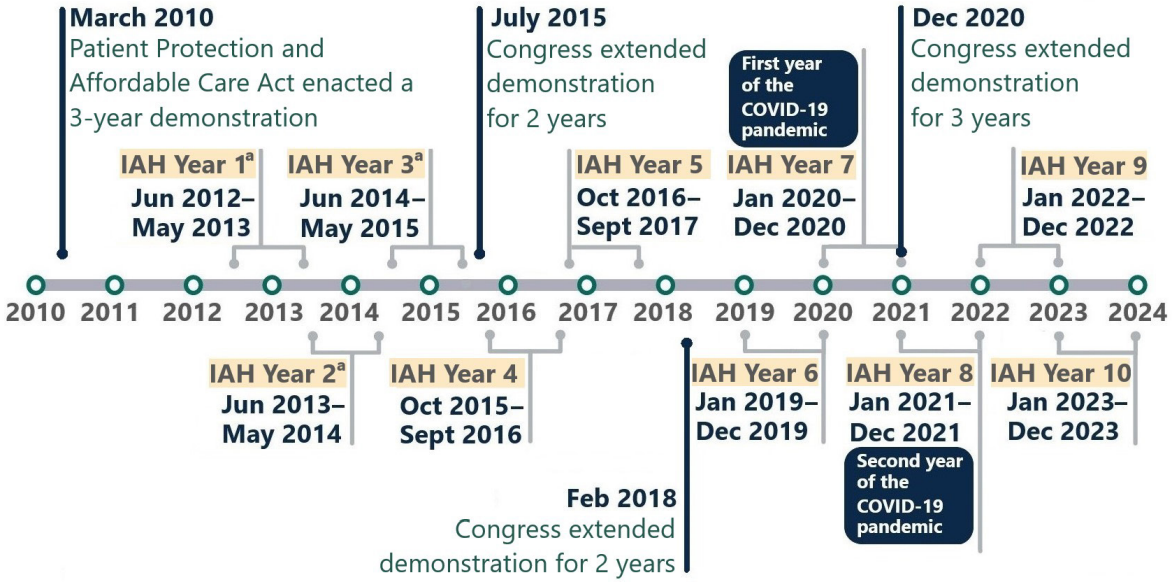
[2] The IAH group used for the evaluation is not constrained by the statutory limit on the number of enrollees.

period for the comparison group. The difference-in-differences methodology in the evaluation removes any consistent influence of unmeasured factors on outcomes from the estimated effects (see Appendix A for details on the methodology).

1.2. History of the IAH demonstration

The demonstration, which began in June 2012, was originally intended to last three years, but Congress has extended it three times (Exhibit 1.3). Year 8, the subject of this report, was the first year of the third extension of the demonstration.

Exhibit 1.3. Key dates related to the IAH demonstration



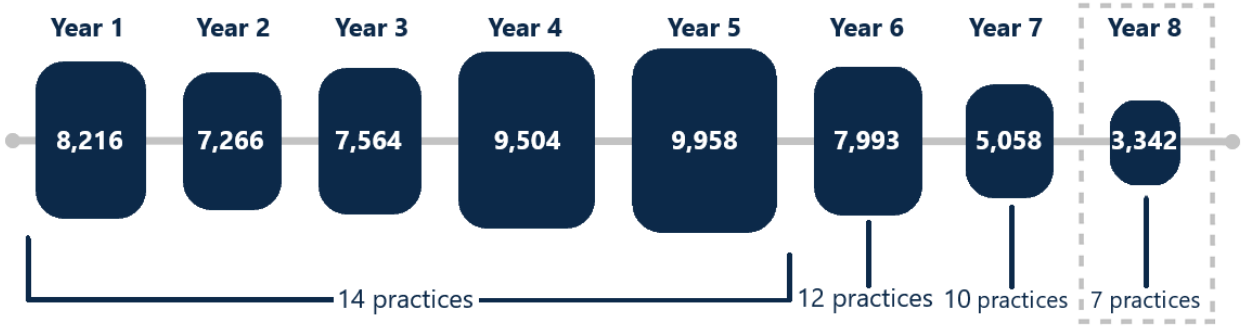
[a] For three participants, Years 1 to 3 began in September and ended in August rather than June to May.

The demonstration began with 15 participants, and three more participants joined in September 2012 for a total of 18. We refer to each of these participants as practices (or sites), though some of the 18 were consortia that consisted of multiple organizations with different ownership participating as one practice.

1.3. Continued decline of IAH participation in Year 8

Year 8 was the first year of the third extension of the IAH demonstration. Only seven of the original 18 participants remained in the demonstration (and the evaluation) by Year 8. Furthermore, fewer beneficiaries participated at these practices in Year 8 than in any previous year of the demonstration (Exhibit 1.4).

Exhibit 1.4. Number of IAH beneficiaries and participating practices in the evaluation by year

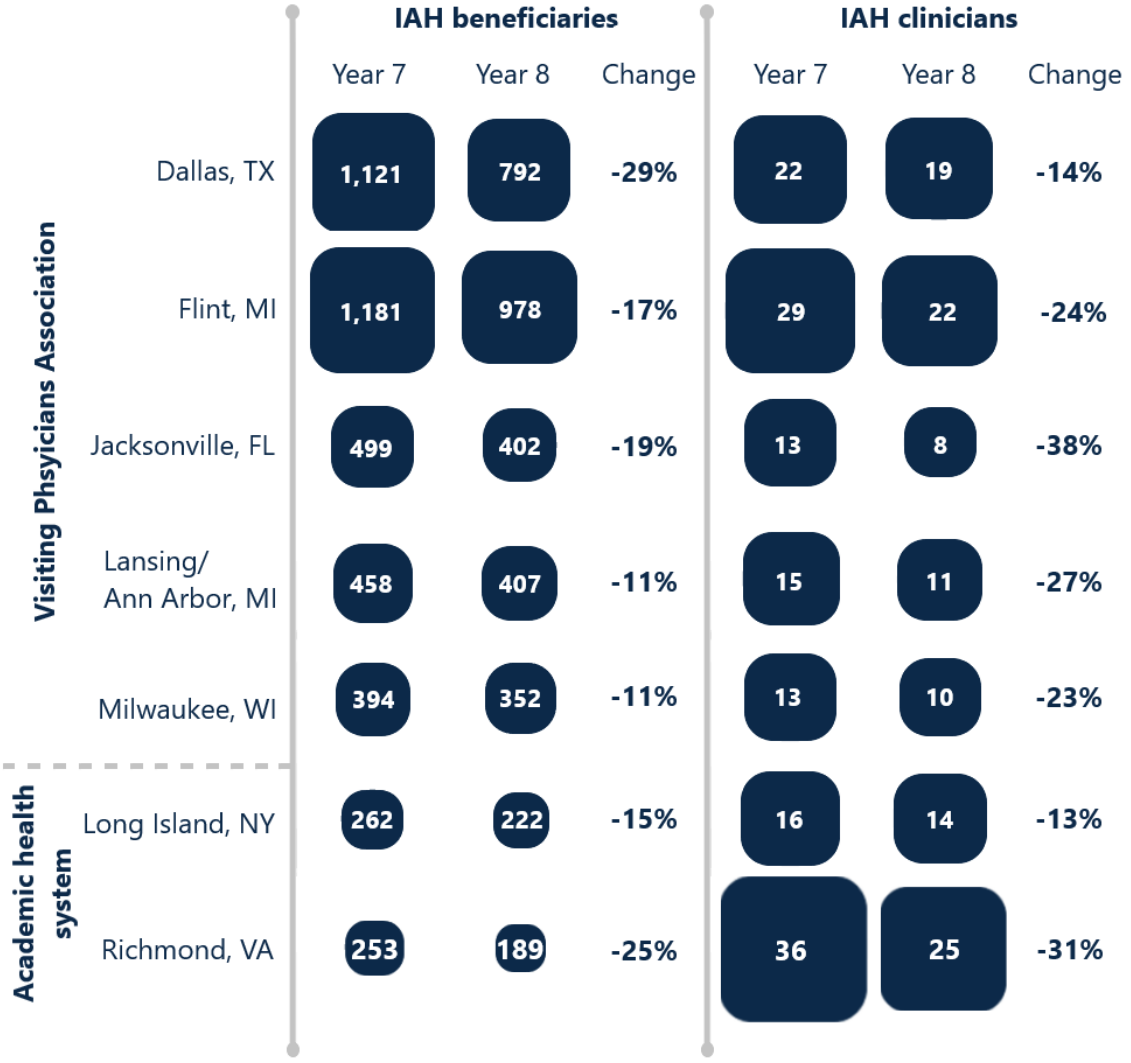


Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: The number of IAH beneficiaries and participating practices in the evaluation appear below the demonstration year. The demonstration originally included 18 practices, but the evaluation excludes four practices that left the demonstration before Year 4. For more information about differences between the evaluation and the list of beneficiaries enrolled in the demonstration, see Appendix A.

At each of these seven sites, the number of clinicians in Year 8 decreased notably relative to Year 7 (Exhibit 1.5). As a result, the number of IAH beneficiaries decreased, too. From Year 7 to Year 8, the average IAH site had a 24 percent reduction in clinicians participating in the demonstration and an 18 percent reduction in beneficiaries. Lower participation in Year 8 along with the length of the demonstration hampers the evaluation's ability to measure the effect of the demonstration on outcomes, as we discuss in Chapter 4.

Exhibit 1.5. Among all practices that participated in Year 8, the number of IAH beneficiaries in the evaluation sample and clinicians decreased from Year 7 to Year 8



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Note: The practice in Richmond is a consortium that consists of three organizations.

The declining participation from Year 7 to Year 8 continued a trend throughout the demonstration. The 11 practices that withdrew before Year 8 did so for a variety of reasons (Exhibit 1.6). Four of the 11 practices left the demonstration before Year 4 because they could not meet the demonstration requirements, and we did not include these four practices in any year of the evaluation sample. Of the remaining seven practices, two left the demonstration after completing Year 5 in September 2017, two more left after Year 6, and three additional practices left after Year 7.

Exhibit 1.6. Reasons why practices left the IAH demonstration

Practice	Timing of withdrawal	Reason for withdrawal
Atlanta, GA (2 practices)[a]	Before Year 3	Internal business issues and reporting difficulties
Chicago, IL (7 practices)[a]	Before Year 3	Internal business issues and reporting difficulties
Stuart, FL (2 practices)[a]	Before Year 3	Internal business issues and reporting difficulties
Louisville, KY	Before Year 4	Did not meet Medicare programmatic billing rules
Austin, TX	Before Year 6	Did not meet statutory requirement for achieving savings at least once in three consecutive years
Cleveland, OH	Before Year 6	Did not meet statutory requirement for achieving savings at least once in three consecutive years
Boston, MA	Before Year 7	Did not meet statutory requirement for minimum number of beneficiaries
Durham, NC	Before Year 7	Dissatisfaction with demonstration operations
Brooklyn, NY	Before Year 8	Began participating in a different CMS Innovation Center initiative
Portland, OR	Before Year 8	Began participating in a different CMS Innovation Center initiative
Wilmington, DE	Before Year 8	Began participating in a different CMS Innovation Center initiative

Source: Data from the IAH implementation contractor.

[a] Practices located in Atlanta, Chicago, and Stuart participated as consortia.

CMS = Centers for Medicare & Medicaid Services.

1.4. Summary of previous reports

In our evaluations reports covering Years 1 to 6, we found no compelling evidence that the IAH payment incentive affected the delivery of care in a way that measurably reduced hospital use or Medicare spending. The estimated reduction in spending in Year 5 was $330 per beneficiary per month (PBPM), or 7.5 percent; this estimated reduction was statistically significant but driven by a single influential site that stopped delivering home-based primary care after the end of the year.[3] Without that site, the estimated effects were much smaller and not statistically significant in Year 5 or across the first five years. In Year 6, the estimated effect of the IAH payment incentive on total spending was a reduction of $41 PBPM, which was not statistically significant.[4]

In our evaluation report covering Year 7, the first year of the COVID-19 pandemic, we found that IAH likely reduced total Medicare spending in Year 7, but the estimated reduction of $459 PBPM (10.7 percent) cannot be generalized outside of the first year of the pandemic or to other home-based primary care practices.[5] Changes in the

[3] For more information, refer to the evaluation report covering Years 1 to 5 of the IAH demonstration.

[4] For more information, refer to the evaluation report covering Years 1 to 6 of the IAH demonstration.

[5] For more information, refer to the evaluation report covering Years 1 to 7 of the IAH demonstration.

relative effectiveness of home-based primary care for IAH beneficiaries during the COVID-19 pandemic likely played a large role in the Year 7 results. We cannot compare these results with results from other studies of home-based primary care because of differences between how IAH practices are organized and operate relative to other home-based care providers.[6] No other studies have examined the effect of a payment incentive like the one used in IAH on outcomes for beneficiaries receiving home-based primary care.

1.5. Implications of the COVID-19 pandemic for evaluating Year 8

> *"[One] challenge we faced was the continual shifting of focus and work in order to address the surges and declines of COVID cases with each wave."*
>
> — IAH practice survey respondent

IAH Year 8 ran from January to December 2021. The U.S. Department of Health and Human Services (HHS) declared a public health emergency because of COVID-19 on January 31, 2020. The COVID-19 pandemic and the public health emergency declared by HHS continued through all of 2021 and greatly affected all aspects of health care during that time. Events such as the introduction of vaccines and the emergence of major COVID-19 variants made 2021 a distinct phase of the COVID-19 pandemic.[7] Thus, results from the evaluation of Year 8 cannot be generalized outside the second year of the COVID-19 pandemic.

The ways IAH could have affected spending and other outcomes in Year 8 (2021), the second year of the COVID-19 pandemic:

- Changes in care delivery by IAH practices because of the IAH payment incentive
- Changes in the relative effectiveness of home-based primary care for IAH beneficiaries during the COVID-19 pandemic, some of which may have also applied in Year 7 (2020)

As was the case for the first year of the COVID-19 pandemic (2020), interpretation of the estimated effect of the IAH demonstration should differ during the pandemic from years preceding the pandemic. If home-based primary care through IAH practices became relatively more (or less) effective at reducing spending during the pandemic relative to care received by the comparison group and continued through the second year of the pandemic, then the estimated effect in Year 8 would reflect this change. Or, it could differ from the estimated effect in Year 7 because of changes in the phases of the pandemic from 2020 to 2021.

[6] At the outset of the evaluation, we could not examine the effects of providing home-based primary care from IAH practices and the IAH payment incentive in a single analysis. For more information, see the evaluation report covering Years 1 to 4 of the IAH demonstration.

[7] For more information about the trajectory of the COVID-19 pandemic, refer to the Centers for Disease Control and Prevention's COVID-19 Timeline.

2. What was care like for IAH beneficiaries during the second year of the COVID-19 pandemic?

Key takeaways

- IAH practices' home-based primary care had several features that differed from typical office-based care, such as opportunities for clinicians to observe potential safety issues and medication management in the home. These features of home-based primary care may have offered enhanced benefits during the COVID-19 pandemic.
- IAH beneficiaries had 16 percent more ambulatory visits than comparison beneficiaries in Year 8, a smaller gap than in Year 7. Ambulatory visits include home, office, telehealth, and telephone visits with all primary and specialty care providers.
- Primary care played a larger role in IAH beneficiaries' health care than for comparison beneficiaries: IAH beneficiaries averaged one primary care visit every 5.5 weeks in Year 8, and comparison beneficiaries averaged one every 9.3 weeks. Primary care visits include home, office, telehealth, and telephone visits with all primary care providers.
- IAH beneficiaries experienced an increase in Year 8 for specialty care spending only, and comparison beneficiaries experienced increases for primary care and specialty care spending.
- IAH beneficiaries had a higher share of primary care visits by telehealth or telephone (30.5 percent) relative to comparison beneficiaries (20.2 percent), yet IAH beneficiaries also had 2.1 more in-person primary care visits on average.
- IAH beneficiaries were more likely to use home health services than comparison beneficiaries and had higher home health spending, more visits, and more days in care.
- Performance on one quality measure decreased since Year 7, and nearly all IAH practices failed to meet the performance threshold for half of the quality measures tied to payment in Year 8. Failing to meet these performance thresholds reduced the incentive payment those sites received for Year 8.

As described in Chapter 1, the COVID-19 pandemic caused continued disruptions to health care delivery in Year 8 of the demonstration, or 2021, the second year of the pandemic. We examined how IAH practices delivered care to chronically ill and functionally limited Medicare beneficiaries during the second year of the COVID-19 pandemic in the context of these disruptions and associated changes to health care delivery. This chapter describes changes that IAH practices made in care delivery during Year 8 compared with Year 7 (the first year of the COVID-19 pandemic) and how these changes compare to the comparison group.

We used multiple data sources to describe and measure service provision, including Medicare claims data, qualitative interview data collected from Years 1 to 6, survey data collected by the IAH implementation contractor in early 2022, and performance data on quality measures (see Appendix A for details). Together, these sources

provide insight into the evolving landscape of health care delivery for IAH and comparison beneficiaries during the COVID-19 pandemic and shed light on the experiences of IAH practices and the adaptations they made to help meet beneficiaries' needs.

2.1. Home-based primary care provided by IAH practices

2.1.1. Characteristics of care delivery in practices participating in Year 8

Year 8 participants included five practices that were part of the Visiting Physicians Association (VPA) and two that were part of nonprofit academic medical centers or health systems with academic missions. VPA, a for-profit corporation, has multiple home-based primary care practices operating in several states; five of those practices (in Dallas, Flint, Jacksonville, Lansing, and Milwaukee) participated in the demonstration. The VPA practices share similar structural and operational characteristics (Exhibits A.2, A.3, and A.4). Practices assigned IAH beneficiaries to a care team led by a physician. Other care team members included medical assistants, NPs, and physician assistants (PAs). Practices risk-stratified beneficiaries based on their history of hospital admission and ED visits to identify beneficiaries' care needs and determine the frequency of phone calls to beneficiaries and caregivers to help meet those needs. As of Year 6 (2019), each VPA practice employed a nurse navigator to provide care management and visits at home for beneficiaries with the highest hospital and ED use. During the demonstration, the VPA practices reported fostering relationships with skilled nursing facilities (SNFs) and other care partners to help coordinate care, such as by VPA clinicians contacting these partners to remind them to communicate with the practice when caring for their IAH beneficiaries. One notable difference across the VPA practices was that one of the five cared mostly for IAH beneficiaries in assisted living or other group living facilities, whereas the other four cared mostly for IAH beneficiaries in private residences.

The two other practices that participated in Year 8 were affiliated with academic medical centers or health systems with academic missions: Long Island and the Richmond-based consortium consisting of Philadelphia, Richmond, and Washington/Baltimore. Physicians or NPs led multidisciplinary care teams at these practices, which included other staff, such as social workers, nurses, and consulting pharmacists. These practices had access to institutional resources and robust information technology systems. The consortium practice relied on clinical judgment to assign risk categories to beneficiaries and conducted proactive beneficiary and caregiver calls. The other practice used a formal risk stratification process to proactively identify and then reach out to beneficiaries with high care needs and assign beneficiaries to appropriate care teams. Most visits provided by the two academic practices took place in private homes.

2.1.2. Features of IAH practices' home-based primary care

IAH practices' home-based primary care had several features that differed from typical office-based care, and those features may have continued to offer enhanced benefits during the second year of the COVID-19 pandemic. These features included beneficiaries' ability to receive health care services at home and clinicians' ability to gather valuable information about beneficiaries' care needs that they cannot obtain during office visits, such as how beneficiaries store and organize medication (Exhibit 2.1). As in the first year of the COVID-19 pandemic, trusted relationships with the IAH practice may have allowed beneficiaries to receive needed primary care services at home (including x-rays, ultrasound exams, and blood draws) and avoid urgent care centers and EDs to help minimize beneficiaries' risk of contracting COVID-19. In 2021, the slow and chaotic vaccine rollout and the emergence of multiple new variants of COVID-19 created an environment of uncertainty. At least some IAH practices helped address these challenges by administering COVID-19 vaccines to IAH beneficiaries in their home.

Exhibit 2.1. Common features of home-based primary care delivered by IAH practices

Feature	Description or example
Provides access to primary care for beneficiaries who have limited mobility or costly or unreliable transportation	For some beneficiaries, traveling to an office for a visit presents substantial physical demands and a financial burden. In addition to providing visits at home, IAH practices tend to arrange a variety of other services provided in the home, such as x-rays, ultrasound exams, and blood draws.
Allows the clinician to obtain information they could not obtain in an office visit that may improve health care, avoid accidents, or address health-related social needs	Examples include observing how beneficiaries and their caregivers communicate, learning how beneficiaries store and organize medication, understanding obstacles to symptom management, and identifying safety improvements that would reduce the risk of falls.
Encourages development of a trusting relationship and effective communication among the beneficiary, caregiver, and clinician	A trusting clinician relationship may help clinicians become aware of and respond to acute exacerbations of chronic conditions and new problems and understand a beneficiary's goals and preferences for care.
Tracks beneficiaries across settings, as required by the IAH demonstration to provide follow-up contacts within 48 hours of hospital and ED use	Early in the IAH demonstration, many IAH practices added staff, such as nurse case managers, to their care teams to track beneficiaries across settings. Some practices expanded their use of electronic medical records or electronic health information exchanges to improve timely notification and follow-up of hospital and ED visits.
Offers access to the primary care team at all hours, as required by the IAH demonstration	Access to care teams are especially valuable for beneficiaries and caregivers so they can obtain help in managing acute conditions and avoid visits to urgent care centers and EDs. Early in the IAH demonstration, IAH practices reported efforts to improve consistency of access at all hours and coordinate after-hours care through communication supported by an electronic medical record.

Exhibit 2.1 *(continued)*

Feature	Description or example
Coordinates care with home health agencies for beneficiaries receiving home health services	Home health services refer to services provided under the Medicare home health benefit, which requires a beneficiary to be homebound and needing at least one of the following: (1) intermittent skilled nursing care or (2) physical therapy, speech-language pathology, or occupational therapy services. IAH practices reported having close relationships with home health agencies, and communication and coordination with home health agencies was an important part of preventing or responding to acute problems.

Source: Mathematica's analysis of information reported by IAH practices in interviews from the first few years of the demonstration.

ED = emergency department.

AH beneficiaries and caregivers indicated a preference for home-based primary care when surveyed earlier in the demonstration.[8] More than 80 percent of IAH beneficiaries expressed their preference for receiving care at home rather than at a traditional office or clinic setting. Similarly, caregivers favored home-based primary care for beneficiaries.

2.1.3. Types of clinicians who provided care

One way practices could reduce Medicare spending for their beneficiaries and earn IAH incentive payments is to employ lower-cost types of clinicians as part of the home-based primary care team. In many states, NPs and PAs can treat beneficiaries without direct supervision of physicians, allowing them to visit beneficiaries independently. Fee-for-service (FFS) Medicare reimbursement is lower for a visit made by an NP or PA than for visits made by a physician.

From Year 7 to Year 8, IAH beneficiaries had a decrease in visits from lower cost IAH clinicians (NPs and PAs), whereas comparison beneficiaries received more visits from NPs and PAs. The biggest difference from Year 7 was a narrowing of the gap in NP visits between IAH and comparison beneficiaries. Compared with Year 7, the share of visits provided by primary care physicians from IAH practices increased by 13.1 percentage points (from 62.7 percent), and the share of visits from NPs dropped 10.7 percentage points (from 33.2 percent) (Exhibit 2.2). In both years, less than 5 percent of visits by IAH practices were from PAs. Notably, more than half of these changes for IAH beneficiaries in Year 8 can be attributed to the change in sites participating in the demonstration. Among the three sites that withdrew from the IAH demonstration after Year 7, these sites had a higher proportion of visits by NPs in Year 7 than the seven sites that continued in the demonstration. When we examined data for practices that participated in both years, the 13.1 percentage point increase in physician visits drops to a 5.0 percentage point increase, and the 10.7 percentage point decrease in NP visits drops to a 5.1 percentage point decrease (Exhibit B.1). For

[8] For more information, refer to the evaluation report covering Years 1 to 4 of the IAH demonstration.

comparison beneficiaries, primary care physicians conducted 68.4 percent of visits, NPs conducted 20.8 percent of visits, and PAs conducted 10.8 percent of visits.

Exhibit 2.2. From Year 7 to Year 8, IAH beneficiaries had a decrease in the share of visits from lower cost IAH clinicians (NPs and PAs), whereas comparison beneficiaries received more visits from NPs and PAs

	Primary care physicians		Nurse practitioners		Physician assistants	
Group	Year 7	Year 8	Year 7	Year 8	Year 7	Year 8
IAH beneficiaries	62.7	75.8	33.2	22.5	4.1	1.7
Comparison beneficiaries	74.2	68.4	16.9	20.8	8.9	10.8

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: These are unadjusted results weighted to reflect the number of months beneficiaries were eligible for IAH. IAH beneficiaries' visits reflect care from IAH practices only. Comparison beneficiaries' visits reflect care from all providers. Results reflect home and office visits as well as telehealth and telephone visits. See Appendix A for more detail. Results for Year 7 reflect the 10 practices that participated in Year 7, and they differed substantively from results in the same year for the seven practices that also participated in Year 8. See Appendix B for more detail.

2.2. Ambulatory visits for IAH and comparison beneficiaries

2.2.1. Ambulatory visit patterns

IAH beneficiaries had 16 percent more ambulatory visits than comparison beneficiaries in Year 8, a smaller gap than in Year 7. IAH beneficiaries averaged nearly two more ambulatory visits in Year 8 than comparison beneficiaries when accounting for primary and specialty care received in person, by telehealth, or by telephone (13.9 and 12.0 visits, respectively, Exhibit 2.3). In Year 7, IAH beneficiaries averaged three more visits (28 percent) than comparison beneficiaries. The driving force behind the decrease in the gap between IAH and comparison beneficiaries was more visits for comparison beneficiaries from Year 7 and Year 8, from 10.9 in Year 7 to 12.0 in Year 8. The average number of ambulatory visits for IAH beneficiaries was the same (13.9) in both years.

> *"Since the first wave of the pandemic, telehealth use has mostly been scaled up and down relative to local rates and has been great continuity of care. We also have some patients who have been refusing in-person visits, in which case telehealth is used in place of an in-person visit. Since vaccinations became available, the comfort level has been higher in general, so we [are] doing majority in-person care."*
>
> — IAH practice survey respondent

IAH beneficiaries received about two of every three in-person visits at home (6.4 of 10.2 in Year 8), and comparison beneficiaries had practically all in-person visits in the office. About 26 percent of total ambulatory visits for IAH beneficiaries (3.6 of 13.9) were conducted by telehealth or telephone compared with about 17 percent for comparison beneficiaries (2.0 of 12.0). The number of telehealth and telephone visits dropped in Year 8, the second year of the COVID-19 pandemic,

for IAH and comparison beneficiaries, a time when some IAH practices reported an increase in beneficiaries' comfort with returning to in-person visits.

Exhibit 2.3. IAH beneficiaries had 16 percent more ambulatory visits than comparison beneficiaries in Year 8, a smaller gap than in Year 7

	IAH beneficiaries	Comparison beneficiaries	IAH-comparison relative difference
In-person home visits			
Year 7	5.7	<0.1	Close to 100%
Year 8	6.4	<0.1	Close to 100%
In-person office visits			
Year 7	3.0	8.1	-63.0%
Year 8	3.8	9.9	-61.6%
Telehealth and telephone visits			
Year 7	5.1	2.8	82.1%
Year 8	3.6	2.0	80.0%
Total ambulatory visits			
Year 7	13.9	10.9	27.5%
Year 8	13.9	12.0	15.8%

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: These are unadjusted results weighted to reflect the number of months beneficiaries were eligible for IAH. Numbers may not sum to the totals because of rounding. Ambulatory visits include home, office, telehealth, and telephone visits with all primary and specialty care providers. Visits for IAH beneficiaries include visits from all clinicians, not just IAH practices. See Appendix A for more detail about the measures we used. Results for Year 7 reflect the 10 practices that participated in Year 7, and they did not differ substantively from results in the same year for the seven practices that also participated in Year 8.

2.2.2. Frequency of primary and specialty care visits

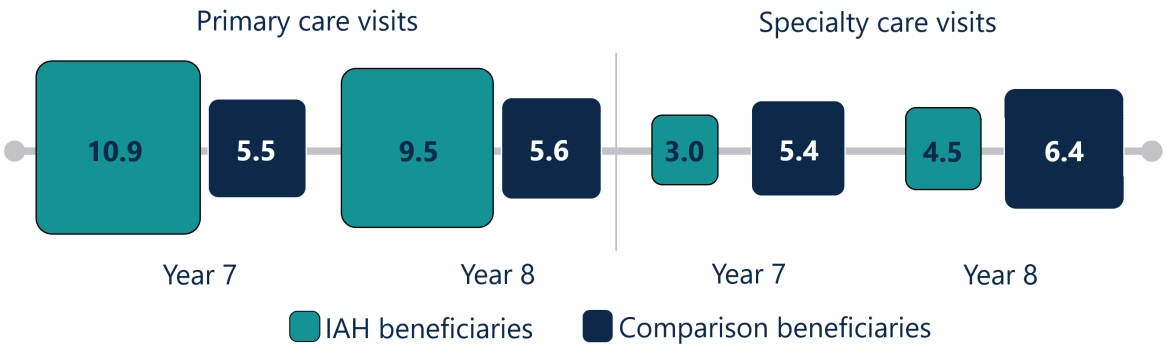
Primary care played a larger role in IAH beneficiaries' health care than it did for comparison beneficiaries, who relied more on specialty care. IAH beneficiaries received more primary care visits from primary care physicians and non-physician clinicians and somewhat fewer specialty care visits than comparison beneficiaries in Year 8. IAH beneficiaries had 9.5 primary care visits, and comparison beneficiaries had 5.6 visits on average in Year 8 (Exhibit 2.4), which is about one primary care visit every 5.5 weeks for IAH beneficiaries and every 9.3 weeks for comparison beneficiaries. We observed similar differences in the number of primary care visits between IAH and comparison beneficiaries early in the demonstration before the COVID-19 pandemic as well as in the two years before the IAH demonstration.[9] For IAH beneficiaries, the number of primary care visits was lower than earlier years in the demonstration. Among the seven practices that participated in Year 8, IAH beneficiaries averaged 11.0 to 11.6 primary care ambulatory visits per year in Years 1 to 4 and 10.9 in Year 7

[9] For more information, refer to the evaluation report covering Years 1 to 4 of the IAH demonstration.

(data not shown), decreasing to 9.5 primary care visits in Year 8. The decrease in primary care visits from Year 7 to Year 8 for IAH beneficiaries is attributable to a reduction in telehealth and telephone visits, which we discuss in the next section.

Specialty care use increased for IAH and comparison beneficiaries in the second year of the COVID-19 pandemic. Comparison beneficiaries had more specialty care visits than IAH beneficiaries in Year 7 and Year 8, but IAH beneficiaries had a larger increase between the two years. In fact, the decrease in primary care visits for IAH beneficiaries (1.4 visits) was offset by the increase in specialist visits (1.5 visits). This increased use of specialty care for both groups in Year 8 may reflect changes in care associated with the COVID-19 pandemic. For example, avoidance or delay in seeking specialty care during the first year of the pandemic could have lessened in the second year of the pandemic.

Exhibit 2.4. IAH beneficiaries received many more primary care visits and fewer specialty care visits than comparison beneficiaries in Years 7 and 8



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

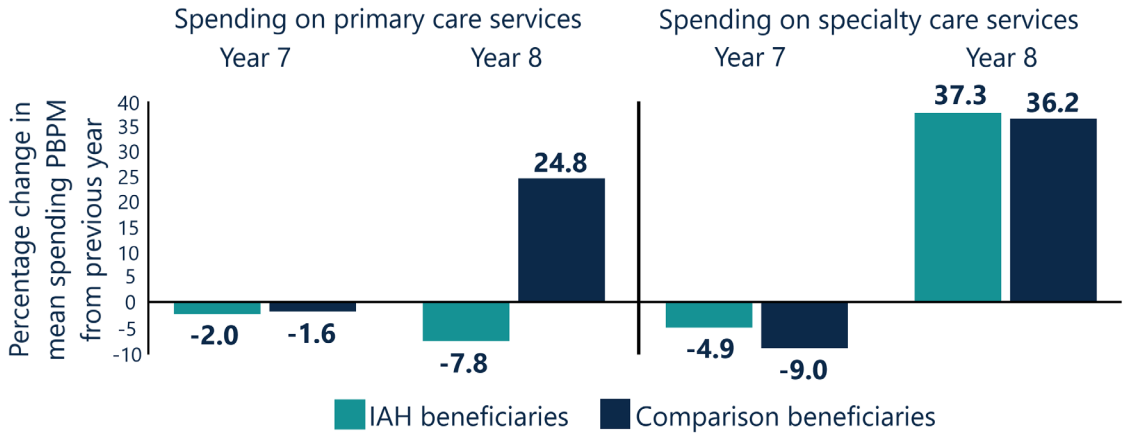
Notes: These are unadjusted average results weighted to reflect the number of beneficiaries eligible for IAH. Results reflect home and office visits as well as telehealth and telephone visits. Primary care visits for IAH beneficiaries include visits from all primary care clinicians (primary care physicians, nurse practitioners, and physician assistants), not just IAH practices. See Appendix A for more detail about the measures we used. Results for Year 7 reflect the 10 practices that participated in Year 7, and they did not differ substantively from results in the same year for the seven practices that also participated in Year 8.

2.2.3. Primary and specialty care spending

Spending for primary care services decreased for IAH beneficiaries in the second year of the COVID-19 pandemic but increased for comparison beneficiaries. Spending for primary care visits in outpatient, office, and home settings (including visits made by telehealth or telephone) decreased by 7.8 percent from Year 7 to Year 8 for IAH beneficiaries (Exhibit 2.5). The decrease in primary care spending for IAH beneficiaries was likely related to the reduction in the average number of primary care visits shown earlier in the chapter (from 10.9 to 9.5 visits). For comparison beneficiaries, spending for primary care services increased since Year 7 by 24.8 percent (from $45.20 to $56.40, an increase of $11.20 PBPM or about $134

per beneficiary per year) (Exhibit B.2). However, there was little change in the average number of primary care visits for comparison beneficiaries (from 5.5 to 5.6 visits). One explanation for the increase in spending for comparison beneficiaries could be an increase in the average duration of primary care visits, which would translate to higher spending even when the volume of visits remains stable. For example, in 2021, an office visit with an established patient lasting 10 to 19 minutes was reimbursed at $57 per visit while an office visit with an established patient lasting 40 to 54 minutes was reimbursed at $183. A single visit lasting 30 minutes longer would generate $126 higher reimbursement, which could help explain the average increase in primary care spending of $134 per beneficiary per year while there was little change in the number of visits. It is conceivable that delays in care during the first year of the pandemic may have led to poorer health, poorer management of chronic conditions, or delayed diagnoses for some comparison beneficiaries who then required longer, costlier visits in Year 8.[10] One-third of older adults reported delayed medical care in the first year of the pandemic (Zhong et al. 2022), but some results suggest that comparison beneficiaries may have experienced more delays in care than IAH beneficiaries. For example, comparison beneficiaries experienced a larger decrease in specialty care spending from Year 6 to Year 7, and comparison beneficiaries had a smaller share of visits via telehealth and telephone than IAH beneficiaries in Year 7.

Exhibit 2.5. IAH beneficiaries experienced an increase in Year 8 for specialty care spending only, and comparison beneficiaries experienced increases for primary care and specialty care spending



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Unadjusted results weighted to reflect the number of eligible beneficiaries for IAH. Visits for IAH beneficiaries include visits from all clinicians, not just IAH practices. Results reflect home and office visits as well as telehealth and telephone visits. See Appendix A for more detail about the measures. Results for Year 7 reflect the 10 practices that participated in Year 7, and they did not differ substantively from results in the same year for the seven practices that also participated in Year 8.

PBPM = per beneficiary per month

[10] For more information, see the evaluation report covering Years 1 to 7 of the IAH demonstration.

Despite the decrease among IAH beneficiaries and increase among comparison beneficiaries, primary care spending remained much higher for IAH beneficiaries in Year 8. Primary care spending was $102 PBPM for IAH beneficiaries, whereas it was $56 PBPM for comparison beneficiaries. This difference corresponds to the large gap in primary care visits for IAH and comparison beneficiaries. However, spending for primary care in Year 8 was lower than pre-pandemic spending (Year 6) for IAH beneficiaries but higher for comparison beneficiaries.

IAH and comparison beneficiaries experienced a considerable increase in spending on specialty care services from Year 7 to Year 8. Spending on specialty care, encompassing outpatient, office, and home care (including telehealth or telephone visits), increased about the same amount for the two groups—more than one-third. This increase corresponded with the increase in specialty care visits for the two groups. This change represents a notable shift from Year 7, where both groups observed a decrease in spending on specialty care, with the comparison group having a larger decrease (9.0 percent) than the IAH group (4.9 percent). Because of the sizeable increases from Year 7 to Year 8, both groups had higher specialty care spending in Year 8 than in the year before the COVID-19 pandemic (Year 6).

2.2.4. Mode of primary and specialty care visits

In Year 8, the second year of the COVID-19 pandemic, the CMS waiver allowing eligible providers to deliver certain services through telehealth and telephone remained in place. Under pre-pandemic restrictions, Medicare beneficiaries could not receive telehealth or telephone visits except in limited cases.[11] We examined how mode of visits (in-person, telehealth, and telephone) varied from Year 7 to Year 8 for primary and specialty care visits for IAH and comparison beneficiaries.

This report refers to telehealth visits as visits that include real-time audio and video communication between the clinician and the beneficiary. Telephone visits include only real-time audio.

In Year 8, IAH beneficiaries averaged 2.1 more in-person primary care visits than comparison beneficiaries, but the gap decreased compared with Year 7. IAH beneficiaries received an average of 6.6 primary care visits in person, similar to the average of 6.7 in Year 7 (Exhibit 2.6). The average number of primary care visits that comparison beneficiaries received in person increased from 4.0 in Year 7 to 4.5 in Year 8.

[11] Before the public health emergency in 2020, with the exception of certain waivers, Medicare only paid for telehealth when a beneficiary was in a designated rural area and received the telehealth visit outside his or her home at a clinic, hospital, or certain other types of medical facilities.

Exhibit 2.6. In Year 8, IAH beneficiaries averaged more in-person primary care visits than comparison beneficiaries, but the difference decreased compared with Year 7

Group	In person		Telehealth		Telephone	
	Year 7	Year 8	Year 7	Year 8	Year 7	Year 8
IAH beneficiaries	6.7	6.6	2.7	2.1	1.5	0.8
Comparison beneficiaries	4.0	4.5	1.0	0.8	0.5	0.3
Difference	2.7	2.1	1.7	1.3	1.0	0.5

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

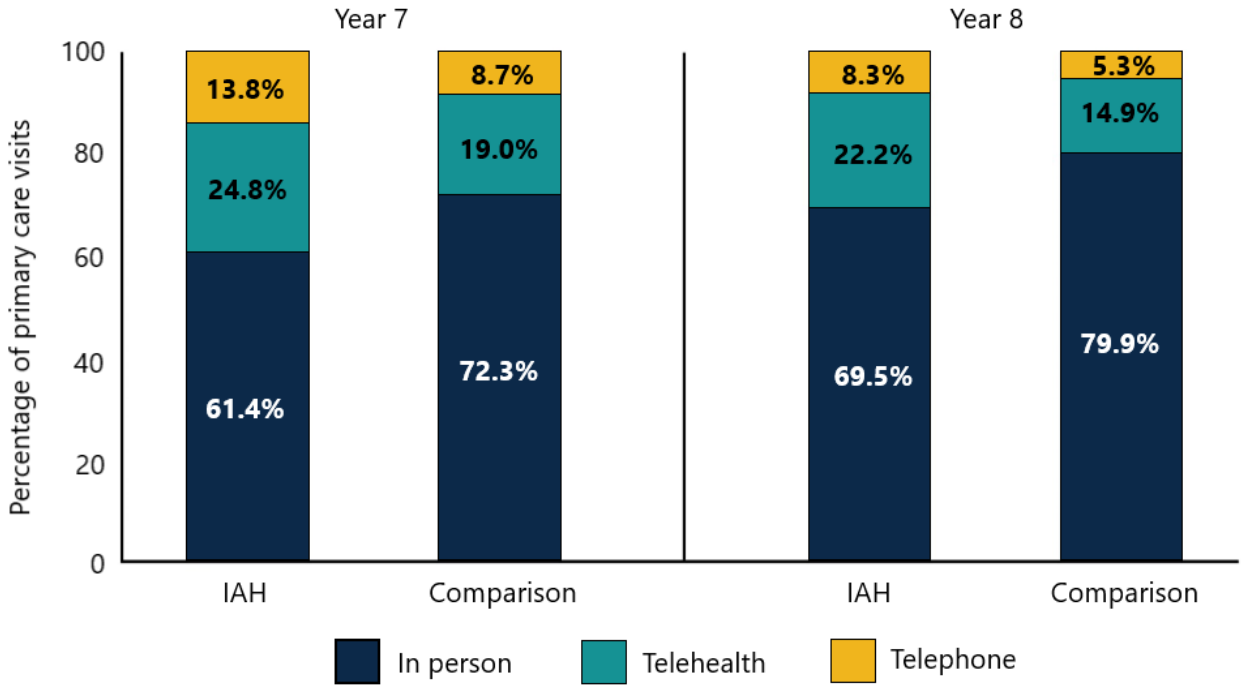
Notes: Unadjusted results weighted to reflect the number of months beneficiaries were eligible. Primary care visits for IAH beneficiaries include visits from all primary care clinicians (primary care physicians, nurse practitioners, and physician assistants), not just IAH practices. See Appendix A for more details. Results for Year 7 reflect the 10 practices that participated in Year 7, and they did not differ substantively from results in the same year for the seven practices that also participated in Year 8.

Both IAH and comparison beneficiaries received fewer primary care visits through telehealth and telephone in Year 8 than in Year 7. The average number of primary care visits via telehealth or telephone dropped from 4.2 to 2.9 visits for IAH beneficiaries and from 1.5 to 1.1 visits for comparison beneficiaries. The decrease in number of visits received via telehealth or telephone in Year 8 could reflect the challenges encountered with telehealth and telephone visits as well as preferences for more in-person care in the second year of the COVID-19 pandemic. In a survey conducted by the implementation contractor in early 2022 (Year 9), IAH practices that participated in Year 8 reported successes and challenges with telehealth visits during the COVID-19 pandemic. Although some providers reported preferring in-person visits, visiting via telehealth and telephone helped practices continue to follow up with beneficiaries amid staffing challenges and beneficiaries' and caregivers' concerns about exposure to COVID-19. Still, functional status limitations, cognitive impairment, and other issues made it difficult for many beneficiaries to use telehealth on their own.

> *"[Our preference] is to get in home for a face-to-face visit. Much more information able to be gathered with eyes/ears in home environment. … [Telehealth was an] excellent check-in tool for our most vulnerable population but typically required technology help from a caregiver or family member."*
>
> – IAH practice survey respondent

Relative to comparison beneficiaries, IAH beneficiaries had a higher share of primary care visits by telehealth or telephone in Year 8. IAH beneficiaries averaged 30.5 percent of their primary care visits by telehealth or telephone, whereas comparison beneficiaries had 20.2 percent of primary care visits using these mechanisms (Exhibit 2.7). The share of primary care visits received in-person increased for both groups in Year 8, but comparison beneficiaries had a greater share of primary care visits in person than IAH beneficiaries, 79.9 percent and 69.5 percent, respectively.

Exhibit 2.7. IAH beneficiaries had a higher share of primary care visits by telehealth or telephone relative to comparison beneficiaries



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Unadjusted results weighted to reflect the number of beneficiaries eligible for IAH. Primary care visits for IAH beneficiaries include visits from all primary care clinicians, not just IAH practices. Percentages may not sum to 100 due to rounding. See Appendix A for more detail about the measures. Results for Year 7 reflect the 10 practices that participated in Year 7, and they did not differ substantively from results in the same year for the seven practices that also participated in Year 8.

In both groups, most specialty care visits occurred in person in Years 7 and 8, with an increase for in-person visits for both groups from Year 7 to Year 8 (Exhibits B.3 and B.4).

2.2.5. Types of care delivery services

IAH practices delivered more chronic care management services (CCM) and advance care planning to their beneficiaries than comparison beneficiaries received from all other providers (Exhibit 2.8).

Exhibit 2.8. IAH beneficiaries were much more likely to receive certain types of care delivery services than comparison beneficiaries

Care delivery service description	IAH beneficiaries' services from IAH practices and comparison beneficiaries' services from other providers
CCM	
In 2014, Medicare began reimbursing CCM services provided to beneficiaries with multiple chronic illnesses that place them at a significant risk of death, exacerbation, or functional decline, with a duration expected to be at least 12 months or until death. CCM services involve a comprehensive approach, including helping beneficiaries achieve their health goals, providing round-the-clock access to care and health information, managing care transitions, and coordinating with clinicians and other health care providers. In 2020, new CCM codes were added to cover staff-provided principal care management services under physician supervision.	IAH beneficiaries were much more likely than comparison beneficiaries to receive CCM services in Year 8. In Year 8, 27.7 percent of IAH beneficiaries received CCM services from an IAH practice, compared with 5.3 percent of comparison beneficiaries who received CCM services from any provider. This finding was similar to Year 7 findings, when 29.1 percent of IAH beneficiaries received CCM from an IAH practice compared with only 6.1 percent of comparison beneficiaries.
Advance care planning	
Advance care planning services have been eligible for Medicare reimbursement since 2016. These services involve outlining a beneficiary's health care wishes before they become incapable of making medical decisions. A care team comprising the beneficiary, family members or caregivers, and a physician or another qualified health care professional typically participates in these services.	In Year 8, 20.4 percent of IAH beneficiaries received advance care planning services from an IAH practice, compared with 4.3 percent of comparison beneficiaries who received these services from any provider. This finding was a slight increase from Year 7 when 16.6 percent of IAH beneficiaries received these services; for comparison beneficiaries, the share of beneficiaries who received this service was the same in the two years.
Cognitive assessment and care plan services	
On January 1, 2017, Medicare began reimbursing clinicians for a comprehensive clinical visit for beneficiaries with cognitive impairment. Reimbursement requires cognition-focused evaluation; identification of caregivers and their needs; and development, revision, or review of an advance care plan.	In Year 8, virtually zero IAH or comparison beneficiaries received cognitive assessment and care plan services from IAH or non-IAH providers, even though close to 40 percent of both groups had dementia (Exhibit A.12).
Remote patient monitoring	
Remote patient monitoring involves collecting and analyzing beneficiaries' physiologic data (such as blood pressure and glucose monitoring) that are used to develop and manage a treatment plan related to a chronic or acute health illness or condition. In 2019, Medicare expanded the list of services reimbursable under remote patient monitoring and later confirmed that providers can furnish these services to beneficiaries with acute or chronic conditions.	In Year 8, virtually zero IAH or comparison beneficiaries received remote patient monitoring services from IAH or non-IAH providers. In a survey conducted in early 2022 (Year 9), one IAH practice reported initiating a new home telemonitoring program that was designed for beneficiaries with COVID-19 but useful for other beneficiaries as well.

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Exhibit 2.8 *(continued)*

Notes: These are unadjusted results. IAH beneficiaries' results reflect care from IAH practices only. Comparison beneficiaries' visits reflect care from all providers. Results for Year 7 reflect the 10 practices that participated in Year 7, and they did not differ substantively from results in the same year for the seven practices that also participated in Year 8.

CCM = chronic care management.

Infrequent provision of CCM and cognitive assessment and care plan services reflects a broader trend of infrequent billing for these and other coordination services (Agarwal et al. 2022). It is possible that some IAH beneficiaries received services that would have qualified for reimbursement, but the provider did not submit a claim for those services. For example, during interviews early in the demonstration, some IAH practices reported that care teams discussed advance care planning with beneficiaries, providing this support before the service became eligible for reimbursement in 2016. Further, a large share of IAH-eligible beneficiaries are likely eligible for CCM, and IAH practices' care delivery models include comprehensive care to beneficiaries with complex care needs and multiple chronic conditions. For example, CCM services include managing care transitions, overseeing medication self-management, and providing access to care and health information at all hours—services that IAH practices reported providing in interviews conducted during early years of the demonstration before CCM began to be reimbursed.

2.3. Use of home health services by IAH and comparison beneficiaries

Home health services refer to services provided under the Medicare home health benefit, which requires a beneficiary to be homebound and needing at least one of the following: (1) intermittent skilled nursing care or (2) physical therapy, speech-language pathology, or occupational therapy services. These services do not include home-based primary care (such as the visits IAH practices provide). Beneficiaries who receive home health services are eligible to receive social work and aide services through home health. In most cases, home health services are paid on a flat basis per 30-day episode regardless of the number of visits, with adjustments for factors such as case mix and geography and whether the home health episode began after discharge from an inpatient facility such as a hospital or skilled nursing facility. A prior hospital stay is not required to qualify for home health services. The beneficiary must have an in-person visit with a physician, NP, or PA who certifies that the beneficiary is eligible under the Medicare home health benefit and establishes a home health plan of care.

IAH beneficiaries used home health services more extensively than comparison beneficiaries. As in prior years, most IAH and comparison beneficiaries used home health services in Year 8, but more IAH beneficiaries (93.4 percent) used these services than did comparison beneficiaries (82.1 percent) (Exhibit 2.9). The relative difference in percentage of beneficiaries who used home health services for IAH and comparison beneficiaries remained steady in Year 8 (14.1 to 13.8 percent). IAH practices tended to have close relationships with home health agencies. Several IAH

clinicians reported in interviews we conducted earlier in the demonstration that communication and coordination with home health agencies was an important part of preventing or responding to acute problems. Respondents at IAH practices reported communicating regularly with home health agency staff about changes in beneficiaries' conditions and beneficiaries' recent hospital or ED use. Higher use of home health services among IAH beneficiaries may also be explained in part by IAH clinicians conducting home visits where they can observe beneficiary needs for home health care more readily than clinicians treating comparison beneficiaries might observe during an office visit. For example, an IAH clinician might observe that a beneficiary would benefit from receiving home health services to improve how they store and manage their medications or increase their mobility.

Exhibit 2.9. IAH beneficiaries used home health services more extensively than comparison beneficiaries

	IAH beneficiaries	Comparison beneficiaries	Relative percent difference
Percentage of beneficiaries who used home health services			
Year 6	90.1	76.4	17.9%
Year 7	90.8	79.6	14.1%
Year 8	93.4	82.1	13.8%
Average home health spending PBPM for beneficiaries who used home health services			
Year 6	$774	$682	13.5%
Year 7	$832	$697	19.4%
Year 8	$915	$768	19.1%

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Home health services refer to services provided under the Medicare home health benefit. Unadjusted results weighted to reflect the number of beneficiaries eligible for IAH. Results for Years 6 and 7 reflect the larger numbers of practices that participated in those years, and they did not differ substantively from results in the same year for the seven practices that also participated in Year 8.

PBPM = per beneficiary per month.

IAH beneficiary spending on home health services was 19.1 percent higher than spending for comparison beneficiaries in Year 8; the difference was similar in Year 7 (19.4 percent) but increased from Year 6 to Year 7 (13.5 percent). Differences in spending for IAH and comparison beneficiaries reflect differences in the number of visits and days in home health for home health users. For example, among those who used home health services in Year 8, IAH beneficiaries had more home health visits (51.1) and more days in home health (152.6) than comparison beneficiaries (44.2 visits and 129.9 days, respectively).

2.4. Performance on quality measures used to calculate IAH incentive payments in Year 8

To be eligible for an incentive payment in Year 8, IAH practices had to meet performance thresholds for six quality measures (Exhibit 2.10). To determine their performance on these measures, the IAH implementation contractor used Medicare claims and enrollment data along with site-reported information. If a practice successfully met the thresholds for all six quality measures, it would receive the full maximum payment available. Practices that met the performance threshold for three, four, or five quality measures were awarded 50 percent, 67 percent, or 83 percent of the maximum payment, respectively. The payment amount did not vary based on how much a practice exceeded the performance threshold for a specific measure.

Practices driven by the incentive payment would be expected to demonstrate improvements or maintain high performance on the quality measures as time progressed. In addition, we anticipated that meeting these quality measures might lead to reduced Medicare spending as the sites enhanced their performance in improving follow-up processes and reducing hospital admissions and ED visits.

Exhibit 2.10. Quality measures used to calculate IAH incentive payments

Site-reported measures	Claims-based measures
Follow-up contact within 48 hours of hospital admissions, hospital discharges, and ED visits for at least 50 percent of these events[a]	All-cause hospital readmissions within 30 days less than or equal to average utilization in a similar population
Medication reconciliation in the home within 48 hours of hospital discharges and ED visits for at least 50 percent of these events[a]	Hospital admissions for selected ambulatory care-sensitive conditions less than or equal to average utilization in a similar population[b]
Patient preferences documented annually for at least 80 percent of IAH enrollees	ED visits for selected ambulatory care-sensitive conditions less than or equal to average utilization in a similar population[b]

[a] Follow-up contact after hospital discharge or ED visit and medication reconciliation are required to take place in the patient's home or, during the COVID-19 public health emergency, via telehealth or telephone.

[b] Ambulatory care-sensitive conditions include diabetes, congestive heart failure, and chronic obstructive pulmonary disease. For more information about how the implementation contractor calculates the claims-based measures, see the methodology report on CMS's website (CMS 2021).

ED = emergency department.

Most IAH practices did not meet the performance threshold for the three site-reported quality measures tied to payment in Year 8, even though doing so would have increased the amount of their incentive payments. Only one practice met or submitted evidence of meeting the performance thresholds for all three site-reported quality measures tied to incentive payments (Exhibit 2.11). Median performance on the site-reported measures fell well below the performance threshold. In contrast, all seven sites consistently achieved the performance threshold

for the claims-based measures of hospital admissions, all-cause hospital readmissions measures, and ED visits throughout Years 1 to 8.

Exhibit 2.11. All practices met the performance threshold for claims-based measures in Year 8, but nearly all practices failed to meet the performance threshold for the three site-reported measures

	Lowest performance	Median performance	Highest performance	Threshold	Number of practices that met threshold
Site reported measures					
Percentage with follow-up contact within 48 hours	5.5	11.3	78.2	50	1
Percentage with medication reconciliation within 48 hours	0	0	71.6	50	1
Percentage with patient preferences documented annually	2.5	7.8	95.9	80	1
Claims-based measures					
All-cause hospital readmissions within 30 days: ratio of observed to expected	0.84	0.77	0.62	<1	7
Hospital admissions for selected ambulatory care-sensitive conditions: ratio of observed to expected	0.75	0.59	0.54	<1	7
ED visits for selected ambulatory care-sensitive conditions: ratio of observed to expected	0.97	0.69	0.11	<1	7

Source: Data from the IAH implementation contractor.

Note: Failure to meet the performance threshold for a quality measure may reflect failure to meet the threshold level for the quality measure activity or a failure to document and report the activity in the IAH Reporting System established by the IAH implementation contractor.

ED = emergency department.

The performance of sites in documenting beneficiary preferences, an area in which some IAH practices demonstrated improvement in Year 7, experienced a notable decline in Year 8. As part of its requirements, CMS required practices to discuss with beneficiaries their treatment preferences and accurately record these preferences in the medical record at least once a year. Beneficiaries eligible for IAH often experience major changes in health or functional status that may affect quality of life or life expectancy. Documenting beneficiary preferences annually can provide practices with information to inform patient-centered treatment decisions. During interviews early in the demonstration, practices reported that they used a variety of systems to collect beneficiaries' preferences and that they faced challenges in documenting these preferences, including issues with the functionality of their

electronic medical records, confusion about the requirements for this documentation, and other clinician priorities.[12]

Because performance on this measure varied throughout the demonstration (Exhibit B.5), we examined performance over time for the seven sites that participated in Year 8. Only one of the seven sites met the threshold in Year 8. This site consistently achieved the threshold for documenting beneficiary preferences in all years of the demonstration. Among the six sites that did not meet the threshold in Year 8, one site had successfully met the threshold from Years 1 to 7 but fell short in Year 8. The remaining five sites each documented beneficiaries' preferences less than 8 percent of the time in Year 8. This rate represented a large drop from Year 7, when all five of these practices documented beneficiaries' preferences for at least 70 percent of IAH beneficiaries, and four of these practices achieved the quality threshold of 80 percent. We do not know whether these practices continued to gather most beneficiaries' preference information but did not document it or whether they gathered this information for fewer beneficiaries over time. Either way, the payment incentive did not motivate most of the sites to meet the threshold for this quality measure in Year 8.

In Year 8, only one practice managed to meet the threshold for the 48-hour follow-up contact measure and the 48-hour medication reconciliation measure. Of the six practices that did not meet these thresholds in Year 8, one practice had consistently met the threshold for both measures in previous years. The remaining five practices failed to meet the threshold for these measures throughout the entire period from Year 1 to 7. Although these practices reported in interviews an increased focus on medication reconciliation as of Year 6, there was no notable change in performance.

In a previous evaluation report, we highlighted several factors that could have affected performance on these measures, including timely notification of beneficiary hospital admissions and ED visits and the availability of clinicians for after-hours and weekend visits.[13] Some practices noted that follow up within 48 hours was not medically necessary for every beneficiary. Those practices exercised clinical judgment in assessing when a patient needed a follow up visit within 48 hours or when a visit within 72 or 96 hours would meet the patient's needs. The practice that met the thresholds for the 48-hour follow-up contact and medication reconciliation measures was likely aided by receiving automated notification of hospital admissions or ED visits and electronic health records. It is possible that burdens imposed by the ongoing COVID-19 pandemic could have contributed to one practice's failure to meet the thresholds for these measures in Year 8 after having successfully met them in Year 7 and earlier years. Finally, practices reported challenges collecting data and submitting data to the IAH Reporting System. Some needed to hire new data analysis

[12] For more information, refer to the evaluation report covering Years 1 to 4 of the IAH demonstration.

[13] For more information, refer to the evaluation report covering Years 1 to 4 of the IAH demonstration.

staff while others expanded responsibilities of existing staff to try to meet these quality measure reporting requirements. Therefore, it is possible that some practices were conducting 48-hour follow up contacts, reconciling medications within 48 hours, and discussing patient preferences with at least some of their patients but not consistently documenting these activities and submitting evidence of meeting the threshold.

3. What were the effects of the IAH demonstration on Medicare spending, hospital use, and health outcomes through Year 8?

Key takeaways

- IAH may have reduced total Medicare spending in Year 8 (-$320 PBPM, -7.5 percent), but the loss of three additional sites from the demonstration led to statistically insignificant results that were smaller than effects in Year 7 (-$459 PBPM). These results cannot be generalized to other years or other home-based primary care practices.
- COVID-19 diagnoses and COVID-19 hospitalizations did not play a direct material role in the effects of IAH in Year 8, but the COVID-19 pandemic affected interpretation of the evaluation results.
- CMS paid practices about $2.5 million more in incentive payments in Year 8 than the estimated aggregate spending reduction.
- For beneficiaries that were dually eligible for Medicare and Medicaid, IAH probably reduced spending in Year 8 by a considerable amount. The estimated reduction for this group was -$841 PBPM (-18.3 percent), compared with an increase of $98 PBPM (2.4 percent) for non-dually eligible beneficiaries.
- IAH did not reduce hospital admissions or unplanned readmissions in Year 8.
- IAH did not reduce outpatient ED visits or potentially avoidable outpatient ED visits by a meaningful amount in Year 8.
- IAH reduced the probability of dying of any cause in Year 8 by 2.3 percentage points (-16.3 percent).

Examining beneficiaries who received home-based primary care from IAH practices before and after the start of the demonstration, we estimated the effects of the IAH demonstration in Year 8 on spending and other outcomes using a difference-in-differences methodology (see Appendix A for more details). In the first six years of the demonstration, we interpreted results as estimated effects of the IAH payment incentive.

Starting in Year 7, the COVID-19 pandemic altered our interpretation, which has implications for generalizability of the evaluation results. In Years 7 and 8, we interpret estimates as the effects of IAH *during the COVID-19 pandemic*. For IAH beneficiaries, the second year of the COVID-19 pandemic (Year 8) presented similar challenges to the first year. Chronically ill, functionally impaired beneficiaries (like those eligible for the IAH demonstration) were still stressed and isolated, even after vaccination, as new variants emerged. Like the first year of the COVID-19 pandemic (Year 7), these and other factors unique to the environment during the pandemic may have led to changes in the relative effectiveness of home-based primary care for IAH beneficiaries. Those changes could account for differences in the estimated effects of IAH during the pandemic relative to those for years before the pandemic.

In Year 8, IAH beneficiaries were slightly less likely than comparison beneficiaries to be diagnosed with COVID-19 (20.6 percent versus 22.2 percent) and to have COVID-19 while hospitalized (7.9 percent versus 8.0 percent). However, also like the first year of the COVID-19 pandemic (Year 7 of the evaluation), we did not find evidence that COVID-19 diagnoses and beneficiaries diagnosed with COVID-19 while hospitalized played a direct, material role in the effects of IAH in Year 8.

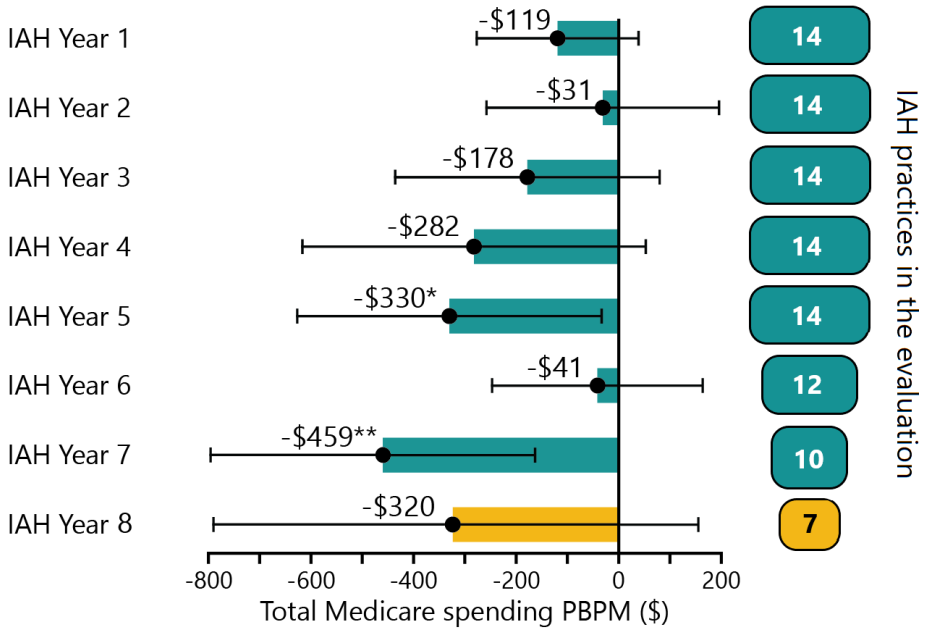
3.1. Effects of IAH on Medicare spending

3.1.1. Effects on total Medicare spending

IAH may have reduced total Medicare spending in Year 8 (-$320 PBPM, -7.5 percent), but the loss of three additional sites from the demonstration led to statistically insignificant results that were smaller than effects in Year 7 (-$459 PBPM). The uncertainty in the estimate was larger than in prior demonstration years, as seen in the 90% confidence interval ranging from -$765 PBPM to $156 PBPM (Exhibits 3.1 and C.2a). The wide confidence interval reflects the fewer sites participating in Year 8 and the increased variability in spending that may have been due in part to the continued effects of the COVID-19 pandemic. This estimate cannot be generalized outside of the second year of the pandemic or to other home-based primary care practices.

Among the seven sites that participated in both years, the Year 7 effect was very similar to the Year 8 effect (-$340 PBPM, Exhibit C.2a), suggesting little change in the effectiveness of IAH for these seven sites from Year 7 to Year 8. Total Medicare spending increased by about the same amount for IAH (1.8 percent) and comparison beneficiaries (1.2 percent) in Year 8 relative to Year 7. Thus, the differences we observe between the two years primarily reflected a reduction in demonstration participants. As in Year 7, the size of the estimated effect in Year 8 was substantively larger than it was in Year 6 and most other pre-pandemic years.

Exhibit 3.1. IAH may have reduced total Medicare spending Year 8



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Effects in each year were estimated using the sites that participated in that year (seven sites in Year 8, 10 sites in Year 7, 12 sites in Year 6, and 14 sites in Years 1 to 5). Differences between Years 5 to 8 represent the change in participating sites and any differences before and during the COVID-19 pandemic in the effects of the IAH payment incentive and home-based primary care. The horizontal lines represent 90% confidence intervals. Across all eight years, the average annual reduction in total spending was not statistically significant (-$207 PBPM; 90% confidence interval: -$431, $18). Estimated effects cannot be generalized to other home-based primary care practices or to periods not affected by the COVID-19 pandemic.

*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 levels.

PBPM = per beneficiary per month.

Across all eight years, the estimated average annual effect of IAH on total Medicare spending was not statistically significant (-$207 PBPM, 90% confidence interval: -$431, $18). We also estimated the average annual effect when removing one IAH site at a time to test the sensitivity of results to the effects from individual sites (Exhibit C.4). When we removed one site at a time, most results were consistent with the full sample, with a few exceptions. Removing two sites led to larger statistically significant average annual reductions in spending across all eight years (-$302 PBPM and -$274 PBPM). Both are large sites that participated in Years 1 to 8, which means that they had a large influence across all eight years due to their size and number of years they contribute to the estimated effect. Removing a different site, one that stopped providing home-based primary care after it left the demonstration, substantially reduced the average annual effect estimate to -$60 PBPM, which was not statistically significant. We interpret effects removing one site at a time with caution. With so few sites (half of which withdrew from the demonstration before Year 8), the potential for individual sites to heavily influence the estimated effect for the full sample across all years is high. That we observed such heavy influence of

individual sites is a main reason why results of the demonstration cannot be generalized to other home-based primary care practices.

3.1.2. Effects on spending categories

IAH may have reduced inpatient spending in Year 8, but the loss of three additional sites from the demonstration led to smaller, statistically insignificant effects (-$161 PBPM, 9.6 percent). About half of the non-significant estimated effect on total Medicare spending was from a reduction in inpatient spending. Similar to total spending, the estimated reduction in inpatient spending of $161 PBPM was smaller than the Year 7 reduction in inpatient spending of $245 PBPM (Exhibits C.10a and C.10b). Again, a change in the sample of participating sites accounted for much of the difference in results between years. The estimated effect on inpatient spending of -$161 PBPM was similar to the Year 7 effect in the seven sites that participated in Years 7 and 8 (-$181 PBPM), suggesting little change in the efficacy of IAH on inpatient spending from Year 7 to Year 8 among those seven sites.

Exhibit 3.2. Most effects on spending categories were small or not statistically significant in Year 8

Spending category	Effect on spending PBPM in Year 8 (90% confidence interval)
Inpatient	-$161 (-$492, $170)
Skilled nursing facility	-$51 (-$126, 23)
Home health (Parts A and B)	$37 (-$49, $122)
Hospice	$5 (-$24, $34)
Outpatient	-$76*** (-$85, -$45)
Clinician/supplier	-$46 (-$180, $89)
Durable medical equipment	-$28** (-$48, -$7)

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Effects in Year 8 were estimated using the seven sites that participated in Year 8. Estimated effects cannot be generalized to other home-based primary care practices or to periods not affected by the COVID-19 pandemic.

*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 levels.

PBPM = per beneficiary per month.

We estimated a statistically significant reduction in outpatient spending (-$76 PBPM, 30 percent), which was similar to the Year 7 effect on outpatient spending, though we interpret effects on outpatient spending with caution because we observed a large change in the difference between IAH and comparison beneficiaries before the demonstration. There was also a statistically significant reduction in durable medical equipment spending (-$28 PBPM, 19 percent). Both outpatient spending and durable medical equipment spending represented a relatively small portion of total Medicare spending for IAH beneficiaries in Year 8 (6.8 percent and 2.7 percent, respectively). We did not find statistically significant spending changes in other spending categories (SNF, clinician/supplier, home health, and hospice).

3.1.3. Aggregate spending effects

CMS paid practices about $2.5 million more in incentive payments in Year 8 than the estimated aggregate spending reduction. Incentive payments made to IAH practices are intended to motivate improvements in performance on quality metrics and lower Medicare spending. The incentive payment calculation is based on whether each IAH practice had lower Medicare spending than its estimated spending target, and whether each practice met specific quality thresholds. The spending target reflects projected spending for Medicare beneficiaries who were not eligible for IAH, and unlike the evaluation, the incentive payment calculation does not account for any spending trends predating the demonstration. In general, the methods and objectives for calculating the incentive payments are different from the methods and objectives for estimating the effect of IAH on total Medicare spending used in the evaluation, including estimates of gross aggregate effects. See Appendix A for more information about differences between the calculation of effects on spending for the evaluation and incentive payments to IAH practices.

We accounted for incentive payments in the evaluation by adding them to the gross aggregate effects (-$320 PBPM multiplied by total IAH person months) resulting in the estimated effect of IAH net of incentive payments. In Year 8, we estimated a gross aggregate spending reduction of $9.9 million with a wide confidence interval (-$24.7 million to $4.8 million), suggesting a large degree of uncertainty (Exhibit 3.3). Total incentive payments to IAH practices in Year 8 were $12.5 million, so the evaluation estimated a net increase in Medicare spending of $2.5 million in Year 8. CMS also paid out to IAH practices more than their estimated reduction in total spending in Years 1, 2, and 6.

Exhibit 3.3. IAH may have increased net spending in Year 8

Year	Total Medicare spending		Incentive payments to IAH practices	Net aggregate effect
	Gross aggregate effect	90% confidence interval		
Year 1	−$9,448,124	−$22,116,947, $3,220,699	$11,668,023	$2,219,899
Year 2	−$2,162,808	−$18,115,610, $13,789,994	$5,322,343	$3,159,535
Year 3	−$12,854,270	−$31,623,671, $5,915,131	$7,219,783	−$5,634,487
Year 4	−$25,442,886	−$55,868,337, $4,982,565	$8,095,010	−$17,347,876
Year 5	−$31,350,990*	−$59,793,938, −$2,908,042	$6,855,823	−$24,495,167
Year 6	−$3,190,507	−$19,231,594, $12,850,579	$11,050,083	$7,859,576
Year 7 (COVID-19)	−$22,648,708**	−$39,330,128, −$5,967,287	$18,490,834	−$4,157,874
Year 8 (COVID-19)	−$9,921,292	−$24,691,644, $4,849,059	$12,470,089	$2,548,797

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse. CMS provides incentive payment results at https://www.cms.gov/priorities/innovation/innovation-models/independence-at-home.

Exhibit 3.3 *(continued)*

Notes: Gross aggregate effect calculations are based on the beneficiary-level estimates shown in Exhibit 3.1 and the number of IAH beneficiary months in each year. Net aggregate effects are calculated as the gross aggregate effect plus total incentive payments, or the spending changes after accounting for the outlays of incentive payments as costs to CMS. Differences between Years 5 to 8 represent the change in participating sites as well as any differences in the effects of the IAH payment incentive and home-based primary care during the COVID-19 pandemic, so the results cannot be generalized to other years or home-based primary care providers.

*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 level.

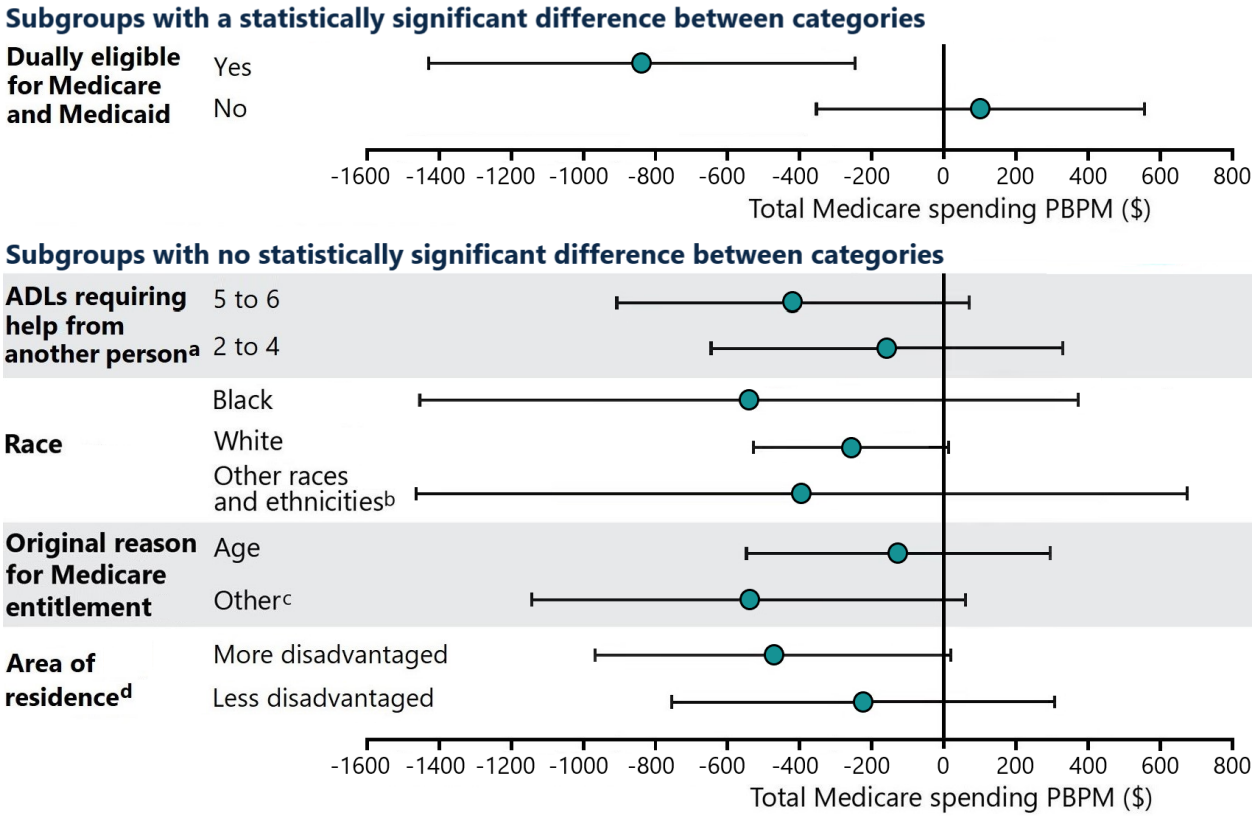
CMS = Centers for Medicare & Medicaid Services.

3.1.4. Subgroup analyses

To better understand the estimated effect of IAH in Year 8, we explored the effects on total spending for several subgroups of beneficiaries who may have been at particularly high risk for experiencing poor outcomes and incurring high spending because of social and health care disruptions that continued during the second year of the COVID-19 pandemic (Exhibit C.5a). These subgroups were defined by (1) the need for assistance from another person with activities of daily living (ADLs), (2) dual Medicare and Medicaid coverage, (3) race, (4) original reason for Medicare entitlement being a disability or end-stage renal disease, or (5) living in a more disadvantaged area (Exhibit 3.4). We considered the effects by subgroup to be different if the effects of IAH in Year 8 between categories of subgroups were statistically significantly different. For example, we calculated whether the estimated effect of IAH among beneficiaries dually eligible for Medicare and Medicaid was statistically different from the effect among non-dually eligible beneficiaries.

In Year 8, the estimated effects for most subgroups were not different from each other (Exhibit 3.4). Only the subgroup defined by dual eligibility had a statistically significant difference between groups (Exhibit C.5b). Subgroups defined by assistance with ADLs, race, original reason for Medicare entitlement, and living in a more disadvantaged area did not have statistically significant differences between categories in the estimated effects of IAH. Although differences for most subgroups were not statistically significant, the pattern of results across subgroups suggested that IAH may have had larger effects on subgroups that are medically complex or are part of underserved populations.

Exhibit 3.4. For beneficiaries that were dually eligible for Medicare and Medicaid, IAH probably reduced total spending in Year 8 by a considerable amount



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Circles show the estimated effects of IAH in Year 8 for beneficiaries in the labeled subgroup. The horizontal lines represent 90% confidence intervals. Subgroup sample sizes are available in Appendix C. Results cannot be generalized to other years or home-based primary care providers.

[a] All beneficiaries in our sample required assistance from another person with at least two of six ADLs.

[b] The estimate for the other races and ethnicities subgroup, which includes Hispanic beneficiaries, was based on only 229 IAH beneficiaries in Year 8. Because of the small sample size, we interpret this result with caution.

[c] The other category for the original reason for Medicare entitlement category includes entitlement because of disability, end-stage renal disease, or both.

[d] Residing in a more disadvantaged area is defined as the beneficiary living in a nine-digit ZIP code with an Area Deprivation Index score at or above the 75th percentile across the United States. Residing in a less disadvantaged area reflects a score of less than 75. See Appendix A for more details.

ADLs = activities of daily living; PBPM = per beneficiary per month

For beneficiaries who were dually eligible, IAH probably reduced spending in Year 8 by a considerable amount. We estimated a large reduction in spending of $841 PBPM (-18.3 percent) for dually eligible beneficiaries. This effect was statistically significant and larger than the reduction of $522 PBPM for the same group of seven sites in Year 7 (which was not statistically significant). The larger effect in Year 8 was the result of a reduction in total spending among IAH dually eligible beneficiaries ($181 lower than Year 7) and an increase in total spending among comparison group

dually eligible beneficiaries ($138 higher than Year 7). The reduction in spending was significantly different from non-dually eligible beneficiaries ($p < 0.01$), who had an estimated increase of $98 PBPM (2.4 percent). We interpret these estimated effects with some caution because we observed a large change in the difference in spending between IAH and comparison beneficiaries for dually eligible beneficiaries during the two years before the demonstration, which violates a key assumption we rely on to interpret results as estimated effects of IAH. Our concern is that the results could be driven by these changes before the demonstration that persisted, rather than by the effects of IAH. If we were to extrapolate the pre-demonstration change into the demonstration period, however, we would find large *increases* in IAH spending for dually eligible beneficiaries relative to comparison beneficiaries. Because the pre-demonstration change was in the opposite direction from the Year 8 results, we conclude that the estimated effect for dually eligible beneficiaries in Year 8 was not driven by differences in pre-demonstration trends alone.

As with the full sample, inpatient spending accounted for a large share of the estimated effect of IAH on total spending for dually eligible beneficiaries. The reduction in inpatient spending for dually eligible beneficiaries in Year 8 was large and statistically significant (-23.6 percent), whereas the effect for non-dually eligible beneficiaries was not statistically different from zero (6.1 percent; Exhibit C.5b). This may suggest that dually eligible IAH beneficiaries who were hospitalized were less ill than dually eligible comparison beneficiaries and therefore required less expensive care (for example, if comparison beneficiaries were more likely to have a major complicating condition than IAH beneficiaries). Statistically significant reductions in SNF spending also accounted for a large share of the estimated effect for dually eligible beneficiaries (-24.2 percent; Exhibit C.5b), and these effects appeared only after the COVID pandemic began (Years 7 and 8). This suggests that IAH practices' care delivery approaches may have reduced the frequency or length of SNF stays for dually eligible IAH beneficiaries relative to dually eligible comparison beneficiaries more during the pandemic than in earlier years.

Although results in both years were statistically significant, the effect among dually eligible beneficiaries in Year 8 (-18.3 percent) was somewhat larger than the effect among dually eligible beneficiaries in Year 7 (-13.8 percent). Unlike the effect of IAH on total spending in the full sample, the difference in results between Years 7 and 8 was *not* primarily driven by the change in demonstration participants. Among the set of sites participating in both Year 7 and Year 8, the Year 7 effect was smaller and not statistically significant (-11.4 percent) compared with the statistically significant effect in Year 8 (-18.3 percent). IAH may have had a growing effect on decreasing total spending by dually eligible beneficiaries from the first to the second year of the COVID-19 pandemic. The difference in effects between Year 7 and Year 8 among those sites participating in both years came from several categories of spending, including most prominently inpatient spending (from -$315 to -$469 PBPM, or $154

PBPM larger) and clinician/supplier spending (from -$58 to -$151 PBPM or $93 PBPM larger).

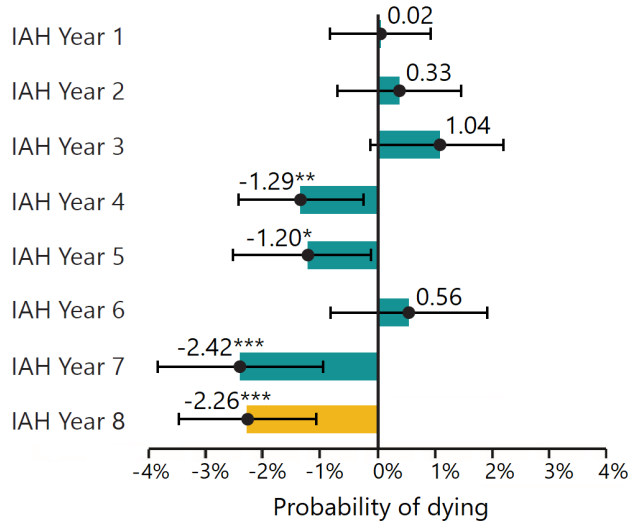
In Year 8, effects for beneficiaries who required assistance from another person with most or all ADLs were smaller than in Year 7 but still sizable. In Year 8, the effect for beneficiaries requiring assistance with five or six ADLs was -$420 (-8.3 percent), and the effect for those requiring assistance with two to four ADLs was -$157 (-4.6 percent). The difference between the groups was not statistically significant (Exhibit C.5c). In Year 7, we found much larger differences between the groups (a -14.0 percent effect for the five or six ADL group and a -0.4 percent effect for the two to four ADL group). This finding could suggest a less acute but still important need for home care for beneficiaries requiring assistance with most or all ADLs in the second year of the COVID-19 pandemic relative to the first.

3.2. Effects of IAH on mortality

We also examined the effect of IAH on mortality. Mortality is high in this population; more than 15 percent of IAH beneficiaries died in Year 8. Changes IAH practices made to care delivery in response to the payment incentive could affect health, including through changes in the mortality rate. In addition, a change in the relative effectiveness of home-based primary care during the COVID-19 pandemic could have affected mortality. Finally, mortality can be a strong driver of spending. End-of-life care is often costly, and if IAH reduced the mortality rate during the second year of the COVID-19 pandemic for IAH beneficiaries relative to comparison beneficiaries, less end-of-life care could have contributed to the sizeable but not statistically significant reductions in total spending in Year 8.

IAH reduced the probability of dying of any cause in Year 8 by 2.3 percentage points (16.3 percent)—a large effect that was similar to the effect we observed in Year 7. Similar results in the first two years of the COVID-19 pandemic lends credibility to the idea that IAH may have reduced the probability of dying during the pandemic. As with other outcomes, effects on the death rate during Year 8 were generally not directly driven by a COVID-19 diagnosis or hospitalization (Exhibits C.14a and C.14b). Still, we interpret effects on the probability of dying with some caution. Before the demonstration, we observed a change in the difference in the probability of dying between the IAH and comparison groups of 1.4 percentage points (from 8.2 percent lower for the IAH group two years before the demonstration to 6.8 percent lower one year before the demonstration), though this change in the difference was not statistically significant. This type of changing difference between IAH and comparison groups, if it persisted, could interfere with the estimated effect of IAH. If the observed baseline trends continued through Year 8, however, we would expect to estimate that the demonstration *increased* the probability of dying, which is not consistent with what we found during Year 8.

Exhibit 3.5. IAH reduced the probability of dying in Year 8



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Effects in each year were estimated using the sites that participated in that year (seven sites in Year 8, 10 sites in Year 7, 12 sites in Year 6, and 14 sites in Years 1 to 5). The differences between Years 5 to 8 represent the change in participating sites and any differences in the effects of the IAH payment incentive and home-based primary care over time. The horizontal lines represent 90% confidence intervals. Estimated effects cannot be generalized to other home-based primary care practices or to periods not affected by the COVID-19 pandemic.

*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 level.

Reducing the probability of dying likely contributed to the sizeable but not statistically significant reductions in total spending in Year 8. Because end-of-life care is typically costly, lowering the likelihood of dying could contribute directly to reduced spending. In Year 8, on average, IAH beneficiaries who died had nearly twice the level of spending of those who did not die ($8,844 versus $4,941 PBPM).

3.3. Effects of IAH on hospital use

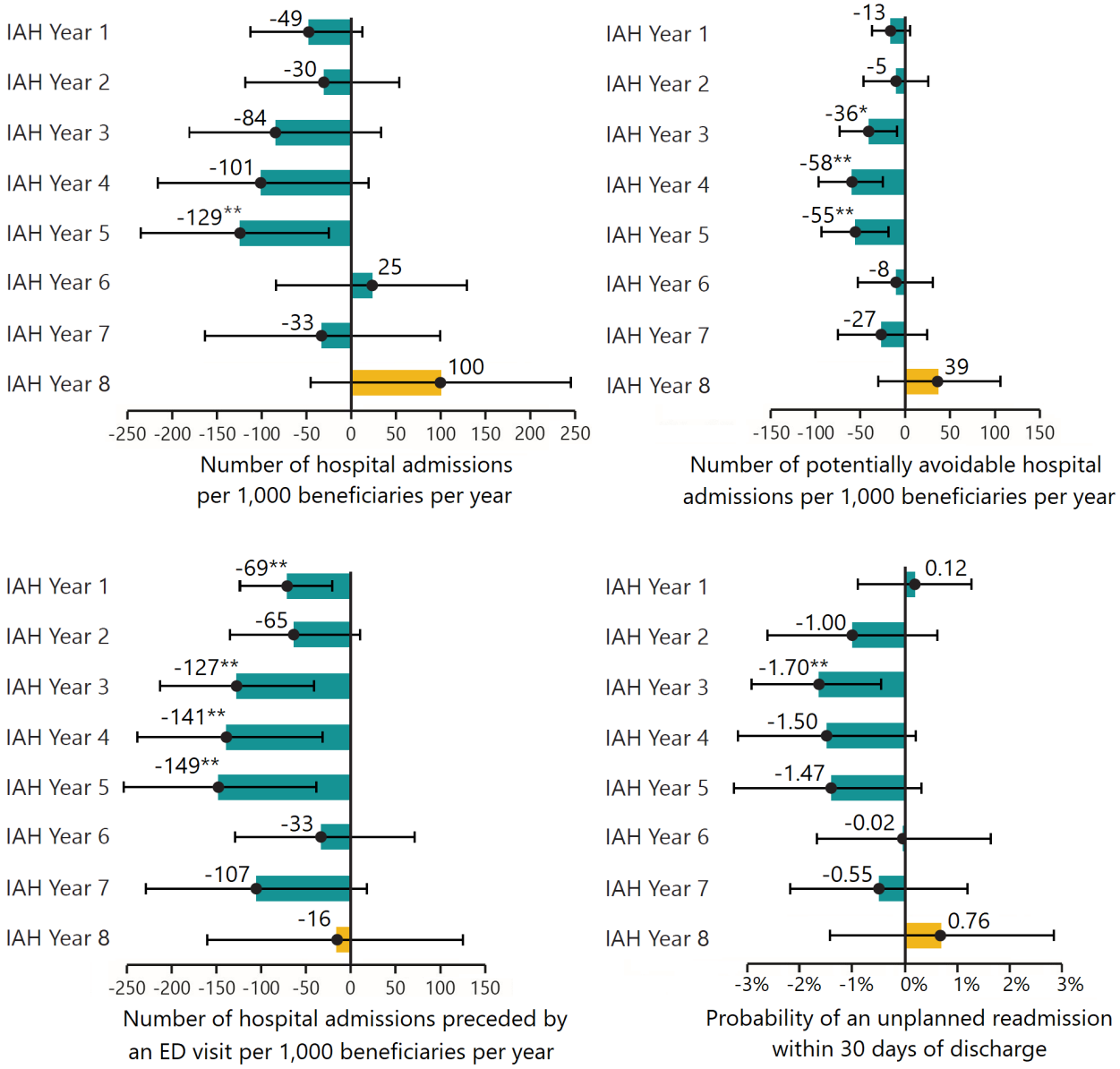
The IAH payment incentive may have motivated IAH sites to change how they provided care in ways that reduced hospital admissions and ED visits for two reasons. First, IAH practices could earn higher incentive payments by lowering total Medicare spending (as we explain further in Appendix A), and hospital admissions and ED visits are key contributors to total spending. Second, practices could earn higher incentive payments by meeting the performance threshold for quality measures that reflect hospital use such as hospital admissions for select chronic conditions (see Chapter 2 and Appendix B for details). To examine whether IAH affected hospital use, we estimated the effect of IAH in Year 8 on hospital admissions (total, potentially avoidable, and those preceded by an ED visit), outpatient ED visits (total and potentially avoidable), and the probability of unplanned all-cause 30-day hospital readmission.

Hospital admissions and unplanned readmissions increased but not by a significant amount in Year 8. The estimated effects were positive and not statistically significant in Year 8 for total admissions per 1,000 beneficiaries (5.6 percent) and the probability of readmission (0.76 percentage points, 5 percent; Exhibit 3.6). For both outcomes, this was less favorable than in Year 7 where the estimated effects were small decreases that were also not statistically significant. Though neither Year 7 nor Year 8 effects for total admissions and unplanned readmissions were statistically significant, differences in the size of effects between Year 7 and Year 8 were not driven by differences in the sites participating across years; the estimates in Year 7 were similar in the Year 8 and Year 7 samples of participating sites (Exhibits C.11a and C.11b). We interpret the effect on the probability of readmission in Year 8 with caution because we observed a large change in the difference in the probability of readmission between IAH and comparison beneficiaries in the two years before the demonstration.

Effects on hospital admissions preceded by an ED visit (-16 per 1,000 beneficiaries, -1.1 percent) and potentially avoidable admissions (39 per 1,000 beneficiaries, 8.7 percent) were less favorable in Year 8 than in Year 7. Similar to total admissions and readmissions, less favorable effects in these two types of admissions in Year 8 were likely not driven by changes in participating sites. We observed the same change in the estimated effect of IAH on each type of admissions between Years 7 and 8 among those sites that participated in both years (Exhibit C.11a and C.11b). Taken together, there is little evidence that IAH improved outcomes related to inpatient hospital use in the first two years of the COVID-19 pandemic.

Although neither estimated effect was statistically significant, we estimated that IAH modestly increased hospital admissions but reduced inpatient spending. One potential reason why the estimated effects were in different directions is in what services are included in our measure of spending. Inpatient spending includes spending for short-stay and critical access hospitals but also psychiatric hospitals, long-term care hospitals, and inpatient and outpatient rehabilitation facilities. Hospital admissions counts only admissions to critical access and acute care hospitals, along with observation stays in these facilities. However, when we examined use of long-term care hospitals and inpatient rehabilitation facilities, neither of these settings accounted for large reductions in inpatient spending; the reductions were mainly from short-stay and critical access hospitals. Another potential explanation for the difference in results for inpatient spending and hospital admissions could be that IAH beneficiaries experienced shorter, but not fewer hospital stays. We examined the average length of stay for all hospital admissions combined for IAH and comparison beneficiaries throughout the demonstration, but we did not find any meaningful changes in length of stay when comparing Year 8 to prior years.

Exhibit 3.6. IAH did not reduce hospital admissions or unplanned readmissions in Year 8



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Effects in each year were estimated using the sites that participated in that year (seven sites in Year 8, 10 sites in Year 7, 12 sites in Year 6, and 14 sites in Years 1 to 5). The differences between Years 5 to 8 represent the change in participating sites and any differences in the effects of the IAH payment incentive and home-based primary care over time. The horizontal lines represent 90% confidence intervals. Estimated effects cannot be generalized to other home-based primary care practices or to periods not affected by the COVID-19 pandemic.

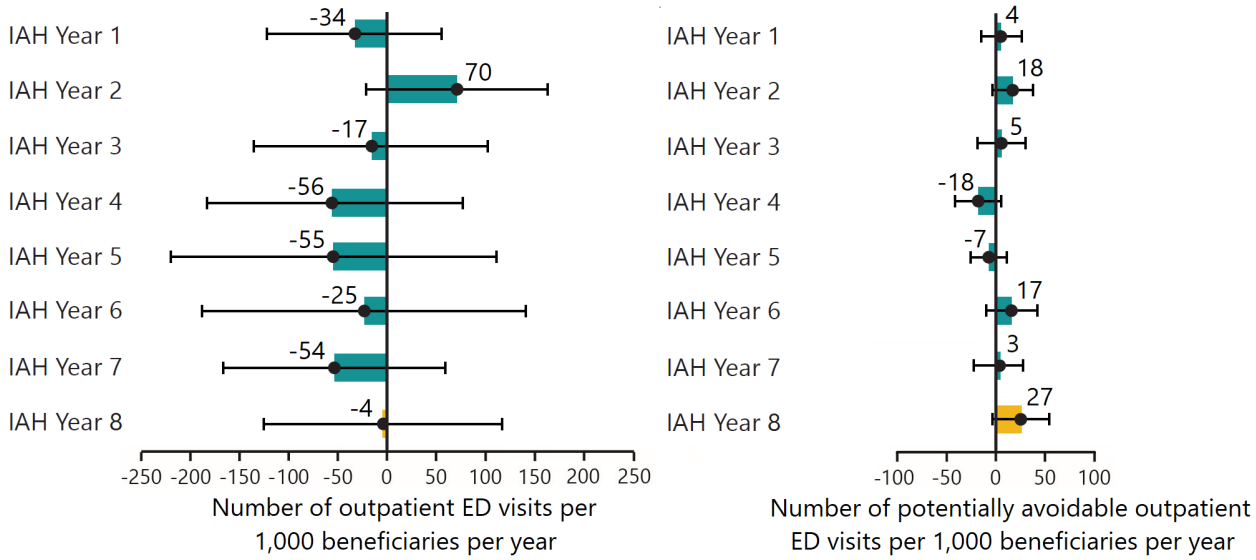
*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 levels.

ED = emergency department.

IAH did not reduce outpatient ED visits or potentially avoidable outpatient ED visits by a meaningful amount in Year 8. The effect on outpatient ED visits (-4 per 1,000 beneficiaries, -0.3 percent) and the effect on potentially avoidable outpatient ED visits (27 per 1,000 beneficiaries, 14.2 percent) in Year 8 were less favorable than in Year 7 (Exhibit 3.7). Neither change was driven by the change in participating sites from Year 7 to Year 8 (Exhibits C.12a and C.12b). Throughout the demonstration, estimated effects on outpatient ED visits have had wide confidence intervals, meaning that even though the estimated effect may be closer to zero in Year 8, our conclusion that IAH has not reduced outpatient ED visits is consistent with conclusions from prior years.

Potentially avoidable outpatient ED visits represent less than 15 percent of total ED visits and have shown inconsistent estimated effects, changing magnitude and sign (increase or decrease) year to year. In addition, there was a large change in the difference in potentially avoidable outpatient ED visits between IAH and comparison beneficiaries in the two years before the demonstration. For these reasons, we interpret the Year 8 effect on potentially avoidable outpatient ED visits with caution.

Exhibit 3.7. IAH did not reduce the number of outpatient ED visits or potentially avoidable ED visits in Year 8



Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Effects in each year were estimated using the sites that participated in that year (seven sites in Year 8, 10 sites in Year 7, 12 sites in Year 6, and 14 sites in Years 1 to 5). The differences between Years 5 to 8 represent the change in participating sites and any differences in the effects of the IAH payment incentive and home-based primary care over time. The horizontal lines represent 90% confidence intervals. Estimated effects cannot be generalized to other home-based primary care practices or to periods not affected by the COVID-19 pandemic.

*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 levels.

ED = emergency department.

3.4. Effects on institutional long-term care

Entering institutional long-term care is a health outcome that matters to beneficiaries and their families. The IAH payment incentive may provide an incentive to IAH practices to encourage high-cost beneficiaries to enter institutional long-term care, because residence in such a facility removes them from the calculation of incentive payments for the demonstration.

IAH did not reduce the probability of entering institutional long-term care in Year 8. Although we estimated that IAH increased the probability of entering institutional long-term care in Year 8 by 1.59 percentage points (22.8 percent; Exhibit 3.8), it is unlikely that IAH caused a meaningful increase in the likelihood of entering institutional long-term care. During the study period there was a national shift away from institutional care toward community-based care for Medicaid beneficiaries who require long-term supports and services during the IAH demonstration (Murray et al. 2021). We see this shift reflected in IAH beneficiaries (3.4 percentage point decline from Year 1 to Year 8) and comparison beneficiaries (3.0 percentage point decline from Year 1 to Year 8). In addition, large, statistically significant differences in the pre-demonstration trends for IAH and comparison beneficiaries cause us to question the estimated increase in entering institutional long-term care we calculated in Year 8. If the pre-demonstration difference actually continued into the demonstration period, we would expect to find that IAH increased entry into institutional long-term care—which is the result we found for Year 8 and several earlier years. It is plausible that the IAH and comparison groups might have been differentially affected by the national shift away from institutional care because IAH beneficiaries had a much lower rate of entering institutional long-term care than comparison beneficiaries in the year before the demonstration (9.3 and 17.1 percent, respectively). Taken together, we think it is unlikely that IAH meaningfully increased the likelihood of entering institutional long-term care.

Exhibit 3.8. IAH did not reduce the probability of entering institutional long-term care in Year 8

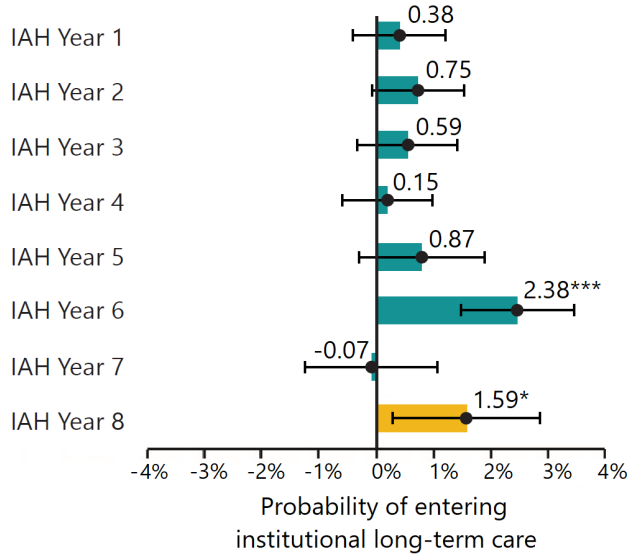


Exhibit 3.8 *(continued)*

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Effects in each year were estimated using the sites that participated in that year (seven sites in Year 8, 10 sites in Year 7, 12 sites in Year 6, and 14 sites in Years 1 to 5). The differences between Years 5 to 8 represent the change in participating sites and any differences in the effects of the IAH payment incentive and home-based primary care over time. The horizontal lines represent 90% confidence intervals. Estimated effects cannot be generalized to other home-based primary care practices or to periods not affected by the COVID-19 pandemic. We interpret results in all years with caution due to large, statistically significant differences in the pre-demonstration trends for IAH and comparison, which may have been related to a national shift away from institutional care toward community-based care.

*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 level.

3.5. Additional sensitivity analyses

We conducted several other sensitivity analyses to better understand the Year 8 results, all of which do not substantively change the main results.

- Controlling for COVID-19 diagnosis or hospital admission did not materially change the estimated effect of IAH on spending (Exhibits C.6a and C.6b). Because we select comparison beneficiaries from the same geographic regions as IAH beneficiaries, area-level experience with COVID-19 (for example, unmeasured COVID-19 infections or policy responses) were unlikely to influence results. That said, as was true in Year 7, the pandemic may have generally changed factors that affected health outcomes and spending in Year 8, such as the flow of new beneficiaries into IAH practices or beneficiaries' levels of activity, stress, and loneliness—changes that IAH and comparison groups may have experienced differently, as we describe in Chapter 4.
- Results in Year 8 were generally not driven by one site or by sites with the largest numbers of beneficiaries. To explore these potential explanations for the Year 8 results, we estimated the effect of IAH on total Medicare spending in Year 8 using an alternative weighting scheme that gave each practice equal weight in all demonstration years rather than a weight proportional to its size, which is the primary approach. Results from the equal weighting analysis were consistent with the primary approach (Exhibit C.7a). We also estimated effects on total Medicare spending excluding one practice at a time from the sample. Excluding one site at a time also generally produced effects that were consistent with the full sample, with two exceptions (Exhibit C.4). Excluding one large site (Site A, Exhibit C.4) led to a somewhat larger and statistically significant reduction in total spending. In this site, total spending increased for IAH beneficiaries during both years of the COVID-19 pandemic (relative to before the pandemic) but remained relatively constant for comparison beneficiaries. Excluding a moderately sized site (Site I) led to a somewhat smaller effect on spending that was not statistically significant. In this site, total spending for IAH beneficiaries decreased during both years of the COVID-19 pandemic in Site I but increased for comparison beneficiaries. Sites A and I have similarities in structural and operational characteristics because they

are operated by the same corporation. But we do not have qualitative data on changes these sites made during the COVID-19 pandemic that might explain why the effect of IAH was different in those sites during the pandemic. As noted previously in this chapter, we interpret results from analyses excluding one site at a time with caution because the likelihood of any single site having a large influence on results is high with so few sites.

- Results did not differ when we removed Merit-based Incentive Payment System adjustments (Exhibit C.8). These adjustments applied to claims for clinicians participating in CMS initiatives could have affected results if they had been applied unevenly to clinicians who treated IAH and comparison beneficiaries.
- Effects on total spending were somewhat smaller but not meaningfully different when accounting for an IAH practice's participation in an accountable care organization (ACO; Exhibit C.9a). If IAH practices were more (or less) likely to participate in an ACO than providers who cared for comparison beneficiaries, we might be concerned that the estimated effect of IAH was partly caused by ACO participation rather than the demonstration. In Year 8, 94 percent of IAH beneficiaries (six of the seven IAH practices) and nearly half of comparison beneficiaries participated in an ACO. Although we observed different levels of participation for IAH and comparison beneficiaries, the fact that nearly all IAH beneficiaries participated in an ACO in Year 8 makes it difficult to separate the effect of IAH from any potential effects of being in an ACO for the seven practices that participated in Year 8.

4. Discussion and limitations

The IAH demonstration aimed to reduce Medicare spending and improve health outcomes, and the legislation that established IAH identified hospital use as a mechanism by which IAH might reduce spending. When considering whether the IAH demonstration met its stated goals in Year 8, we considered not only statistical significance but also the size and consistency of the direction (increase or decrease) of the estimated effects of IAH. We also examined the extent to which results differed for the same group of seven practices during Year 7, the first year of the pandemic. Additionally, we explored whether IAH may have been more effective in Year 8 for certain subgroups of beneficiaries. Finally, we considered implications of the decline in participation and other limitations of the evaluation.

To what extent did the IAH demonstration meet its goals of reducing spending and hospital use and improving health outcomes in Year 8, the second year of the COVID-19 pandemic?

- IAH began its third extension in Year 8 with only seven sites, a reduction from ten in Year 7.
- IAH may have reduced total Medicare spending in Year 8, but the loss of three sites from the demonstration led to a smaller, non-significant effect than in Year 7.
- IAH may have increased net spending in Year 8 after accounting for incentive payments CMS paid to IAH sites.
- IAH did not reduce hospital admissions or unplanned readmissions.
- IAH reduced the probability of dying of any cause but did not reduce the probability of entering institutional long-term care.
- These results cannot be generalized beyond the COVID-19 pandemic or to other home-based primary care practices.

We did not find strong evidence that IAH achieved its goals in Year 8, and the limited favorable evidence we have is not generalizable beyond the unique circumstances of the pandemic. The estimated effect of IAH on total spending in Year 8 was not statistically significant and was a smaller decrease than in Year 7 when the demonstration had more participants. However, as in Year 7, the size of the estimated effect in Year 8 was substantively larger than it was in Year 6 and most other pre-pandemic years. This change from pre-pandemic years was most likely driven by the disruptions in health care and society as a whole during the COVID-19 pandemic. Therefore, we considered mechanisms by which IAH could have affected outcomes differently in Year 8 than in Years 1 to 6. In particular, we examined how the relative effectiveness of home-based primary care for IAH beneficiaries may have changed.

4.1. Discussion of the estimated effects for Year 8

There are two mechanisms by which IAH could have affected outcomes differently in Year 8 than in demonstration years preceding the COVID-19 pandemic:

1. Changes in care delivery by IAH practices *because of the IAH payment incentive,* which was the focus of the evaluation in Years 1 to 6, and which could have had

larger (or smaller) effects on outcomes during the COVID-19 pandemic than in previous years, and

2. Changes in the relative effectiveness of home-based primary care for IAH beneficiaries *because of the COVID-19 pandemic and public health emergency declared by HHS*, which continued through 2021 and affected all aspects of health care during that time.

4.1.1. How the IAH payment incentive could have affected outcomes during the second year of the COVID-19 pandemic

It is unlikely that changes in care delivery that IAH practices made before the pandemic because of the payment incentive was the most important factor influencing outcomes. During the early years of the demonstration, many practices tried to reduce hospital use by making care more comprehensive and responsive to beneficiaries' needs. Examples included increasing follow-up for beneficiaries with high rates of hospital use and improving communication and coordination of round-the-clock coverage for care. To provide follow-up contacts for beneficiaries within 48 hours of a hospital discharge or ED visit (as required by a quality measure tied to IAH incentive payments), many practices added staff dedicated to tracking hospital admissions and discharges, such as nurse case managers. Yet IAH practices reported that their basic model of home-based primary care, such as frequent primary care visits and extensive use of home health, was unchanged during the demonstration. Results from the first six years of IAH provide little evidence that the payment incentive affected the delivery of care in a way that measurably and consistently reduced total Medicare spending. In addition, during interviews conducted late in Year 6 just before the COVID-19 pandemic began, we learned of no major changes in care delivery by IAH practices in the two prior years that may have led to a larger effect of the payment incentive in later years of the demonstration.

It is possible that some changes made during the first half of the demonstration in response to the payment incentive had a larger effect on outcomes during the COVID-19 pandemic than in pre-pandemic years. The information reported by IAH practices about changes in care delivery during Years 1 to 6, however, along with little evidence that the payment incentive resulted in notable reductions in total Medicare spending in Years 1 to 6, suggests larger effects during the COVID-19 pandemic were more likely driven by changes in the relative effectiveness of home-based primary care for IAH beneficiaries during the pandemic.

4.1.2. How the relative effectiveness of home-based primary care for IAH beneficiaries could have changed during the first two years of the COVID-19 pandemic

Changes in the relative effectiveness of home-based primary care for IAH beneficiaries may have been a key contributor to the estimated effect of IAH on total spending in Year 8. The effectiveness of home-based primary care could have changed relative to pre-demonstration years as a result of the following:

1. Increased effectiveness of strategies that IAH practices had been using to deliver home-based primary care since before the IAH demonstration began,
2. New strategies IAH practices adopted in response to the pandemic, and
3. Changes in care experienced by the comparison group during the pandemic that did not affect the IAH group.

4.1.2.1. Increased effectiveness of strategies that IAH practices had been using to deliver home-based primary care since before the IAH demonstration

Home-based primary care provided by IAH practices has several features that differ from typical office-based care. Those features may have been especially valuable during the COVID-19 pandemic, affecting spending differently than they did before the pandemic.

IAH practices provided frequent primary care visits, and IAH beneficiaries had more total visits. As we described in Chapter 2, IAH beneficiaries had about four more primary care visits per beneficiary than comparison beneficiaries in Year 8. Additional visits may have increased access to care, developed trust, improved communication between beneficiaries and IAH practices, and reduced loneliness, all of which could have led to better outcomes during the COVID-19 pandemic. Although comparison beneficiaries had more specialty care visits, a gap remained in total ambulatory visits (primary care and specialty care), with IAH beneficiaries having about two visits more than comparison beneficiaries in Year 8.

What are some reasons that frequent primary care visits may have affected IAH beneficiaries' outcomes differently during the COVID-19 pandemic than in a typical year?

- Providing visits at home may have increased access to care during a time many beneficiaries were reluctant to leave their homes
- Developing a trusting relationship and effective communication with IAH practices may have made IAH beneficiaries feel more comfortable receiving routine visits, COVID-19 vaccinations, and other services
- Reducing loneliness and feelings of social disconnection may have improved health, since both are associated with an increased risk of sickness and death (Courtin and Knapp 2017; Perissinotto et al. 2012).

The gap between IAH and comparison beneficiaries in total ambulatory visits was even larger among dually eligible beneficiaries, who had more than three additional visits (14.6 versus 11.2 visits) compared with one additional visit among non-dually eligible beneficiaries (13.5 versus 12.6 visits) (Exhibit 4.1). This difference in visits could have contributed to the large, statistically significant reduction in spending in Year 8 we estimated for dually eligible beneficiaries. It was the only subgroup with a statistically significant difference in total spending between groups in Year 8 (-18.3 percent for dually eligible beneficiaries and 2.4 percent for non-dually eligible beneficiaries). The estimated effect for dually eligible beneficiaries was larger in Year 8 than in Year 7, but even in Year 7, it was sizeable (a statistically significant reduction of -13.8 percent).

Exhibit 4.1. Dually eligible IAH beneficiaries had considerably more total ambulatory visits than dually eligible comparison beneficiaries in Year 8, but the same was not true of beneficiaries who were not dually eligible

	Total ambulatory visits, IAH beneficiaries	Total ambulatory visits, comparison beneficiaries	Relative percentage difference
Dually eligible	14.6	11.2	30.3%
Not dually eligible	13.5	12.6	7.3%

Source: Mathematica's analysis of data from the IAH implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: Unadjusted results are weighted to reflect the number of months eligible. Ambulatory visits include home, office, telehealth, and telephone visits with all primary and specialty care providers. Visits for IAH beneficiaries include visits from all clinicians, not just IAH practices. See Appendix A for more details.

About 44 percent of IAH (and comparison) beneficiaries were dually eligible in Year 8. Because the dually eligible subgroup overlaps considerably with other subgroups who typically have poorer health and more limited functional status or have less access to care and other health care services, the large statistically significant effect of IAH for dually eligible beneficiaries may reflect a combination of factors. For example, relative to non-dually eligible IAH beneficiaries in Year 8, dually eligible IAH beneficiaries were about twice as likely to be Black and to have qualified for Medicare based on a disability. Care delivery approaches that IAH practices have used since before the demonstration began may have been more effective for these subgroups during the COVID-19 pandemic.

What do results for subgroups tell us about the effect of IAH in Year 8?

During the second year of the COVID-19 pandemic, IAH reduced total spending among beneficiaries who were dually eligible for Medicare and Medicaid but not among those who were not dually eligible. Reductions in inpatient and SNF spending were contributing factors and could have been related to having more ambulatory visits.

One explanation for IAH reducing total spending among dually eligible beneficiaries in Year 8 could be less SNF use. IAH practices' approaches to care delivery following hospital and SNF discharge may have prevented or shortened SNF stays during the COVID-19 pandemic. The estimated effect of IAH on SNF spending for dually eligible beneficiaries was considerably larger and statistically significant in the first two years of the COVID-19 pandemic (Years 7 and 8) compared with pre-pandemic years. This effect occurred because SNF spending among dually eligible IAH beneficiaries decreased from Year 6 to Year 8, whereas SNF spending among dually eligible comparison beneficiaries increased (Exhibit C.5b). Dually eligible beneficiaries may have desired to return home from a hospital or SNF as soon as possible as a way to reduce the beneficiary's risk of contracting COVID-19—particularly because dually eligible beneficiaries may have been at higher risk of experiencing severe illness from COVID-19 than other beneficiaries. It is plausible that IAH practices' approaches to providing care for beneficiaries after discharge from a hospital or SNF may have allowed some

IAH beneficiaries and their caregivers to feel confident avoiding or shortening a SNF stay. For example, perhaps dually eligible IAH beneficiaries and their caregivers felt more confident than those in the comparison group that the beneficiary would receive timely primary care and sufficient support from a home health care agency that works closely with their primary care practice.

IAH practices' use of home and community-based services available through Medicaid (such as personal care services, home modifications, transportation, and day services) also may have contributed to the effect of IAH on total Medicare spending among dually eligible beneficiaries. Perhaps IAH practices used home and community-based services available through Medicaid more effectively during the second year of the pandemic for their beneficiaries relative to the comparison group.

IAH beneficiaries used home health services more extensively than comparison beneficiaries, and IAH practices had strong working relationships with home health agencies. Because of the disruptions in health care and society as a whole during the COVID-19 pandemic, IAH and comparison beneficiaries had a greater chance to experience a decline in health and functional status during Year 8 than in pre-pandemic years. Yet IAH beneficiaries were more likely to use home health services than comparison beneficiaries in Year 8 and had higher home health spending, more visits, and more days in care. The gap in home health spending between IAH and comparison beneficiaries was considerably larger than before the COVID-19 pandemic. There are several reasons to believe that, compared with pre-pandemic years, use of home health services by IAH beneficiaries in Year 8 may have played a larger role in preventing or slowing declines in health and functional status, which may have limited the need for other more intensive use of health care services (hospital-based services or other services). These reasons include the following:

- Many home health staff provide timely updates to IAH practices on changes in beneficiaries' health and functional status. These updates may have been more valuable during the COVID-19 pandemic because beneficiaries were at increased risk of deteriorating health and functional status than in previous years. Also, because decreased caregiver availability during the first year of the pandemic may have extended into the second year (Federman et al. 2021; Leggett et al. 2022; Reckrey et al. 2022), some changes in health and functional status could have gone unreported to the IAH practice if not for home health staff.
- Frequent visits from a home health agency may have combined with the higher number of primary care visits for IAH beneficiaries to reduce loneliness and feelings of social disconnection, which are associated with an increased risk of sickness and death.
- Some home health agencies reported spending more time with beneficiaries than usual in the first year of the pandemic, such as ensuring medications were accessible and taken properly, encouraging beneficiaries to be physically active, and providing education regarding the pandemic (Bell et al. 2022). This increase

in time may have included providing education about COVID-19 vaccines and support to make a vaccine appointment in the second year of the pandemic.

If home health played a larger role in preventing or slowing declines in health and functional status during the COVID-19 pandemic than in previous years, it could have contributed to the sizeable, though not statistically significant, reductions in total spending in Year 8.

Home health use and spending between IAH and comparison beneficiaries were similar for dually eligible and non-dually eligible beneficiaries. Still, the reasons to think that home health services may have been more effective than usual during the pandemic, in conjunction with more ambulatory visits, may be especially applicable to beneficiaries who were dually eligible since these beneficiaries tend to have worse health and less access to high-quality primary care and other health care services. For example, older adults with chronic illness whose income was below the poverty level—which applies to most dually eligible beneficiaries—were at highest risk of being persistently lonely in the second year of the pandemic (Kotwal et al. 2022).

4.1.2.2. New strategies IAH practices adopted in response to the COVID-19 pandemic

> *"We did vaccinate all of our home-based primary care patients … when vaccines became available—an organized campaign."*
>
> — IAH practice survey respondent

IAH beneficiaries continued to receive a larger share of their care via telehealth and telephone in Year 8 than comparison beneficiaries. Also, at least some IAH practices made concerted efforts to increase the COVID-19 vaccination rate among IAH beneficiaries. As in Year 7, IAH beneficiaries had a higher share of primary care visits by telehealth or telephone in Year 8 relative to comparison beneficiaries. The COVID-19 vaccine became widely available in early 2021 but was distributed in chaotic ways that varied across health care providers, pharmacies, and geographic areas (AJMC 2021). In many cases, people had to register for vaccines online, which posed a considerable barrier for IAH and comparison beneficiaries because of their limited functional status and high prevalence of dementia and other chronic conditions. At least some IAH practices administered COVID-19 vaccines to IAH beneficiaries in their homes or helped them book appointments for vaccines. If IAH beneficiaries had a higher rate of vaccination than the comparison group, it might have had several positive consequences, such as reducing the risk of experiencing severe illness from COVID-19 and allowing IAH beneficiaries to feel safer around other people and lessen social isolation. Yet we cannot state definitively that IAH practices made more concerted efforts to increase the vaccination rate because we do not have data on vaccine administration and coordination from all IAH practices, nor do we have data from providers who cared for the comparison group.

4.1.2.3. Changes in care experienced by the comparison group during the COVID-19 pandemic that did not affect the IAH group

Some of the increase in the effect of IAH on total spending among dually eligible beneficiaries from Year 7 to Year 8 may be explained by comparison beneficiaries receiving less specialty care. Comparison beneficiaries had a larger decrease in specialty care spending from before the COVID-19 pandemic (Year 6) to the first year of the pandemic (Year 7) than IAH beneficiaries. Specialty care spending for comparison beneficiaries rebounded in the second year of the COVID-19 pandemic. However, receiving less specialty care than usual in the first year may have affected comparison beneficiaries' health and spending in the second year (Year 8), because specialty care plays a bigger role in comparison beneficiaries' health care than for IAH beneficiaries.

The decrease in specialty care spending in Year 7 was more than twice as large for dually eligible comparison beneficiaries as for non-dually eligible comparison beneficiaries. This decrease in spending could indicate delays in care during the first year of the COVID-19 pandemic. Possible consequences of any such delays in care could include more hospital admissions or more costly hospital admissions in the second year of the COVID-19 pandemic. We found evidence of the latter: more costly hospital admissions. An increase in the effect of IAH on inpatient spending from Year 7 to Year 8 was a major reason why the effect of IAH on total spending increased for dually eligible beneficiaries relative to Year 7. When examining the seven practices that participated in both years, the estimated reduction in inpatient spending for dually eligible IAH beneficiaries increased from a non-significant -$315 PBPM (-15.8 percent) in Year 7 to a statistically significant -$469 PBPM (-23.6 percent) in Year 8 (Exhibit C.5b). This was caused by a reduction in inpatient spending for IAH beneficiaries from Year 7 to Year 8 together with inpatient spending in the comparison group that was largely unchanged between the two years. This finding may suggest that dually eligible IAH beneficiaries who were hospitalized in Year 8 were less ill than dually eligible comparison beneficiaries and therefore required less expensive care.

4.2. Limitations

Small numbers of participants can lead to imprecise results (large confidence intervals) and random fluctuations in estimated results. The small number of practices and beneficiaries hampers the evaluation's ability to robustly measure the effects of the demonstration. The small number of practices arose because Congress limited the size of the demonstration and practices have withdrawn from the demonstration. The number of practices has decreased from 18 at the outset to 10 in Year 7 and seven in Year 8. With such small numbers of sites and beneficiaries, evaluation results could be subject to random fluctuations, which could lead to (1) larger deviations between the true and estimated effects of IAH and (2) wider

confidence intervals, lessening the chance of an estimated effect being statistically significant.

Results are not generalizable to beneficiaries who do not meet IAH eligibility criteria, beneficiaries of other providers, or years not affected by the COVID-19 pandemic. The IAH demonstration shows how IAH affected outcomes for chronically ill and functionally limited Medicare fee-for-service beneficiaries treated by IAH practices participating in a given year. Attrition from the demonstration, combined with the fact that five of the seven practices that remained in Year 8 are operated by the same corporation, means that the results for Year 8 of the demonstration are unlikely to inform what might happen if the IAH payment incentive was extended to other providers. Furthermore, results for Year 8 cannot be generalized outside of the second year of the COVID-19 pandemic, because the COVID-19 pandemic and public health emergency continued through 2021 and greatly affected all aspects of health care during that time.

The longer the demonstration, the higher the risk of confounding in the estimated effects. The difference-in-differences methodology used for the evaluation removes any consistent influence of unmeasured factors on outcomes from the estimated effects (see Appendix A for details on the methodology). This approach works by using the year before the demonstration as a baseline to account for pre-demonstration differences between the IAH and comparison groups. For example, it is plausible that in the year before the demonstration, a larger share of IAH beneficiaries were permanently homebound than comparison beneficiaries, but we cannot measure this characteristic using administrative data. Under a difference-in-differences methodology, our inability to measure homebound status does not pose a risk of bias in the estimated effects as long as (1) the association between being permanently homebound and outcomes such as spending and death did not change since before the demonstration and (2) the share of beneficiaries who were permanently homebound did not change differently for the IAH and comparison groups from before the demonstration to a given demonstration year. But because the pre-demonstration baseline year (2011–2012) ended nearly nine years before Year 8, factors other than the payment incentive may have affected outcomes differently for IAH and comparison beneficiaries.

Beginning in Year 7, the COVID-19 pandemic may have driven changes in unobserved factors that confounded the estimated effects. The COVID-19 pandemic systemically disrupted beneficiaries' patterns of seeking care and clinicians' delivery of care. As one example, the share of beneficiaries new to an IAH practice changed between the year preceding the COVID-19 pandemic and the years during the pandemic. Among the seven practices that participated in Year 8, the share of IAH beneficiaries who were new to an IAH practice in Year 8 decreased by 13 percent relative to before the COVID-19 pandemic from 33.9 percent in Year 6 to 29.4 percent in Year 8. Among dually eligible beneficiaries—the subgroup among which IAH had a large, statistically significant reduction in total spending in Year 8—the

share of IAH beneficiaries who were new to the IAH practice decreased by even more (a reduction of 18 percent from Year 6 to Year 8). The decrease in the share of new IAH beneficiaries during the COVID-19 pandemic may have been related to a temporary reduction in the number of new patients accepted by some IAH practices or from fewer hospital admissions, which can be a precipitating factor to starting home-based primary care. Being new to an IAH practice was associated with higher total spending relative to existing beneficiaries ($6,165 versus $5,185 PBPM in Year 8, unadjusted), perhaps because a recent health event prompted some beneficiaries to start home-based primary care. Yet, since we do not know which beneficiaries in the comparison group were new patients of their respective providers, we cannot account for any changes in the share of new beneficiaries between the IAH and comparison groups that could confound the estimated effects of IAH on outcomes such as spending.

The difference-in-differences study design would account for any difference in the share of new beneficiaries in the IAH and comparison groups if we had reason to believe that that any such difference in the share was constant before and during the demonstration. But, similar to Year 7, we observed a change in the share of IAH beneficiaries who were new patients in Year 8 without knowing the impact on the comparison beneficiaries during the COVID-19 pandemic, which cannot be accounted for by the study design. Thus, the study results in Year 8 may be partly attributable to changes in the share of beneficiaries new to an IAH practice, as driven by the disruptive effects of the COVID-19 pandemic.

4.3. Conclusion

This evaluation provides the most comprehensive and robust estimates of the effects of IAH on spending and other outcomes by seven IAH practices during the second year of the COVID-19 pandemic. The demonstration, which began in June 2012, was originally intended to last three years, but Congress has extended it three times. Participation trends suggest a lack of ability or desire for many IAH practices to participate in the third extension of the demonstration, which began in Year 8. Eleven of the original 18 practices withdrew from the demonstration by Year 8, including three that withdrew just before Year 8. The number of clinicians and their beneficiaries in the seven practices that remained in the demonstration also declined to their lowest levels. Between Year 7 and Year 8, the average number of clinicians per IAH practice decreased by 24 percent and the average number of IAH beneficiaries per practice decreased by 18 percent. In Year 8, the practices also demonstrated worsening performance on some quality measures, and nearly all practices failed to meet the performance threshold for half of the six quality measures tied to payment in Year 8.

IAH may have reduced total Medicare spending in Year 8, but the loss of three additional sites from the demonstration contributed to a smaller, non-significant effect on IAH on total spending than in Year 7, the first year of the pandemic. Also, IAH may have *increased* net spending in Year 8 after accounting for incentive payments CMS paid to IAH practices. However, the estimated effects in Years 7 and 8 were substantively larger than in Year 6 and most other pre-pandemic years. COVID-19 diagnoses and COVID-19 hospitalizations did not explain this change. Instead, systemic changes to health care delivery and society more broadly during the COVID-19 pandemic likely caused changes in the relative effectiveness of home-based primary care. Yet overall, we did not find strong evidence that IAH achieved its goals in Year 8. The limited favorable evidence is not generalizable beyond the unique circumstances of the pandemic nor to other home-based primary care providers. More generally, results from the first eight years of the demonstration provide no compelling evidence that the IAH payment incentive affected the delivery of care in a way that measurably and consistently reduced total Medicare spending or hospital use and improved health outcomes.

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