

Supporting Aging in Place Through IWISH:



Evaluation of the Supportive Services Demonstration: Phase 2 Research Design



Phase 2 Research Design

Evaluation of the Supportive Services Demonstration

Final

Ian Breunig
Melissa Vandawalker
Abt Associates

May 5, 2023

About This Document

This is the Phase 2 Research Design for the evaluation of the Supportive Services Demonstration for Elderly Households in HUD-Assisted Multifamily Housing. The U.S. Department of Housing and Urban Development (HUD) sponsored the Supportive Services Demonstration to test the impact of housing-based wellness supports on the tenure and healthcare utilization of low-income adults aged 62 and older living in HUD-assisted multifamily properties.



Abt Associates | 6130 Executive Boulevard | Rockville, MD 20852

Table of Contents

Document Summary	1
1. Supportive Services Demonstration and Evaluation Overview	2
1.1 The Supportive Services Demonstration.....	2
1.2 Randomization of Demonstration Properties	4
1.3 Organization of this Document	8
2. Overview of Phase 2 Evaluation.....	10
2.1 Phase 2 Research Questions.....	10
2.2 Data Sources and Uses.....	19
2.3 Phase 2 Evaluation Approaches	22
3. Implementation Study Data Collection and Analysis	24
3.1 Primary Data Collection by the Study Team	24
3.2 Secondary Data Sources.....	31
3.3 Implementation Analysis Approach.....	32
4. Impact Study Data Collection and Analysis	34
4.1 Research Questions, Outcomes, and Measures	34
4.2 Data Sources and Collection	37
4.3 Impact Analysis Approach.....	42
5. Comprehensive Report	59
5.1 Report of Findings after Six Years of IWISH.....	59
5.2 Data Delivery and Replication Protocol.....	61
6. References	62

List of Exhibits

Exhibit 1-1: IWISH Model Theory of Action.....	4
Exhibit 1-2: Map of Demonstration Properties.....	6
Exhibit 1-3: Supportive Services Demonstration and Evaluation Timeline	6
Exhibit 2-1. Implementation Analysis Research Questions and Data Sources, IWISH Properties	10
Exhibit 2-2: Phase 1 Evaluation IWISH Fidelity Ratings, by Category	12
Exhibit 2-3: Phase 2 Evaluation Primary Data Collection.....	20
Exhibit 2-4: Phase 2 Evaluation Secondary Data Collection.....	21
Exhibit 3-1: Phase 2 Property Owner and Manager Interview Domains.....	24
Exhibit 3-2: Phase 2 IWISH Staff Interview Domains and Subdomains.....	26
Exhibit 3-3: Phase 2 Resident Interview Domains	29
Exhibit 3-4: Phase 2 Standards for Success Data for Implementation Analysis.....	31
Exhibit 3-5: Phase 2 IWISH Quality Assurance Report Data for Implementation Analysis.....	32
Exhibit 4-1: Phase 2 Research Questions, Outcomes, and Data	36
Exhibit 4-2: Phase 2 HUD Administrative Data Measures.....	38
Exhibit 4-3: Transportation, Health, and Neighborhood Components of AARP Livability Index.....	42
Exhibit 4-4. Phase 2 Minimum Detectable Differences in Key Outcome Measures	48
Exhibit 4-5. Contextual Factors That May Influence the Implementation or Effectiveness of IWISH.....	53
Exhibit 5-1: Comprehensive Report Content and Organizational Structure.....	59
Exhibit 5-2: Overview of Replication Protocol	61

Document Summary

This document summarizes the evaluation approach planned for the extension of the Supportive Services Demonstration. The U.S. Department of Housing and Urban Development (HUD) is sponsoring the Supportive Services Demonstration for Elderly Households in HUD-Assisted Multifamily Housing to learn whether structured health and wellness support can help older adults living in privately owned HUD-assisted housing developments remain in that housing longer, or “age in place.” The model tested through the demonstration is called *Integrated Wellness in Supportive Housing* (IWISH).

The demonstration is designed to produce evidence about the IWISH model’s impact on older adults living in HUD-assisted properties. The goal of IWISH is to promote aging in place for residents of HUD-assisted properties, especially by delaying transfers to a long-term care institution. The demonstration has a randomized controlled trial design and tests whether IWISH affects length of stay in housing (housing tenure); transitions to long-term care facilities; unplanned hospitalizations and the use of other types of acute care with high healthcare costs; and the use of primary and non-acute care.

The Supportive Services Demonstration was initially funded for three years, from October 2017 through September 2020. In 2021, Congress extended the demonstration for two years, from October 2021 through September 2023. HUD contracted with Abt Associates and its partner L&M Policy Research (the “study team”) to evaluate the implementation and effectiveness of the IWISH model.

The evaluation has two phases. In Phase 1, the study team evaluated the implementation of the IWISH model for the initial three-year demonstration period. The Phase 1 study also linked HUD administrative data to Medicare and state Medicaid data to assess the IWISH model’s impact on housing tenure and healthcare utilization. The Phase 1 evaluation produced a research design and reports on the implementation and impacts of the IWISH model during the initial demonstration period.

The Phase 2 evaluation builds on the evaluation of the initial three-year IWISH period. The study team will evaluate the IWISH extension period largely by replicating the research design and statistical analysis plans of the Phase 1 impact study. The Phase 2 evaluation will measure impacts of the IWISH model for the two-year extension period and for the full six-year demonstration period between 2017 and 2023.

The Phase 2 evaluation also will include exploratory analyses based on program data and interviews with residents of IWISH properties, Resident Wellness Directors, Wellness Nurses, and property owners and managers of demonstration properties. The study team will assess changes in IWISH implementation from the end of the initial demonstration period in September 2020 and will document the perceptions of the benefits and usefulness of the IWISH model from different perspectives. The study also will collect and analyze Service Coordinator and IWISH program data through HUD’s data systems and reports to describe resident characteristics and service coordination at the demonstration properties. The results of the Phase 2 evaluation will be the subject of a final report expected in 2026.

1. Supportive Services Demonstration and Evaluation Overview

This introductory chapter provides an overview of the Supportive Services Demonstration for Elderly Households in HUD-Assisted Multifamily Housing and the *Integrated Wellness in Supportive Housing* (IWISH) model (Section 1.1), the two phases of the evaluation of the model’s implementation and impacts (Section 1.2), and the content and organization of this Research Design document (Section 1.3).

1.1 The Supportive Services Demonstration

The IWISH model builds on HUD’s existing Multifamily Service Coordinator program. The Supportive Services Demonstration provides grants to fund two onsite wellness positions—a Resident Wellness Director and a Wellness Nurse—in HUD-assisted multifamily properties to help address the health, housing, and social service needs of older adult residents. Core components of the IWISH design include proactive engagement with residents, and structured assessment of residents’ health and wellness needs. The demonstration also provides supplemental funding to make health and wellness programming available to residents and provide other wellness supports to residents.

Demonstration Staffing

The Supportive Services Demonstration funds two health and wellness staff positions in HUD-assisted multifamily properties:

- A Resident Wellness Director proactively engages with residents to conduct needs assessments and individual goal setting, coordinates health and wellness programming for the property, and builds partnerships with healthcare and social services partners in the community.
- A Wellness Nurse provides health education and coaching to residents; offers basic health and vital signs monitoring; helps residents work effectively with their healthcare providers; and provides assistance when residents return from hospitals, nursing homes, or rehabilitation centers.

These two demonstration-funded wellness staff have primary responsibility for implementing the IWISH model at their properties. The staff are expected to work together to implement the core components of the IWISH model and provide individual assistance as needed and requested by residents. For the initial three-year demonstration period, an implementation team (under contract to HUD) provided staff training, technical assistance, and monitoring. For the IWISH extension period, properties are responsible for providing training and staff support either directly or through contracted providers.

Integrated Wellness in Supportive Housing (IWISH) Model Core Components

The IWISH model as implemented in the demonstration has six core components. Detailed information about the IWISH model and expectations for IWISH staff can be found in the Phase 1 evaluation’s *First Interim Report* (Turnham et al., 2019).

Core Component 1: Proactive Engagement with Residents to Maximize Participation

Resident Wellness Directors and Wellness Nurses conduct outreach to and build relationships with residents to make sure they understand what the program has to offer and are motivated to participate. Resident Wellness Directors and Wellness Nurses continue to engage residents throughout the duration of the program. Meeting with IWISH staff and participation in IWISH activities are voluntary for residents.

Core Component 2: Standardized Assessment

All participating residents are offered an opportunity to participate in a standardized health and wellness assessment at least annually until the end of the program. Assessments include *person-centered interviews* with residents, so Resident Wellness Directors and Wellness Nurses understand their needs

and priorities more comprehensively. The person-centered interview is a conversation between the Resident Wellness Director and the resident, guided by a series of predetermined questions. The person-centered interview has four domains of questions:

1. Background and life history.
2. The typical day for the resident.
3. Relationships and social support.
4. Impact of health on functions for daily life.

The **health and wellness assessment** are a questionnaire that collects and documents information about the residents' physical health, mental health, and functional and social supports. Wellness Nurses generally will conduct the functional assessments and ask the assessment questions about residents' health and healthcare providers.

Core Component 3: Individual and Community Healthy Aging Plans

Each participating resident is offered the opportunity to work with the IWISH staff to develop an **Individual Healthy Aging Plan (IHAP)** that reflects their needs and priorities. The IHAP identifies actionable goals, barriers to their aging in place, and the service coordination the resident will receive from the wellness staff. The IWISH staff are also expected to create a **Community Healthy Aging Plan (CHAP)** for the property to help them develop wellness programming based on the most common needs of residents.

Core Component 4: Web-Based Data Platform

All IWISH properties are required to use a web-based data system to track information about participating residents, including assessment data, wellness goals, and their use of programming and service coordination. The data system allows Resident Wellness Directors and Wellness Nurses to track the needs, priorities, and progress of each enrolled resident. For the initial three years of the demonstration, IWISH properties were required to use a centralized data system that was tailored to the IWISH demonstration.

Core Component 5: Partnerships with Social Service and Healthcare Providers

Resident Wellness Directors and Wellness Nurses are expected to form partnerships with healthcare and social service organizations to enhance opportunities and resources for their properties' residents. These organizations include healthcare facilities, primary care providers, local agencies serving seniors, and other community agencies. The goal is for these IWISH partnerships related to health and wellness to add to the resource and referral partnerships typical of traditional service coordination.

Core Component 6: Evidence-Based Health and Wellness Programming

As part of the Supportive Services Demonstration grant, IWISH properties received supplemental funding of \$15 per unit per month to support evidence-based health and wellness programming and other related activities. With technical assistance from HUD's implementation team, the Resident Wellness Director and Wellness Nurse were expected to identify one or more evidence-based interventions that address the needs identified in resident assessments and to use the supplemental funding as needed to deliver that programming to residents. "Evidence-based" means rigorous evaluation has found a program to be effective in improving health. J

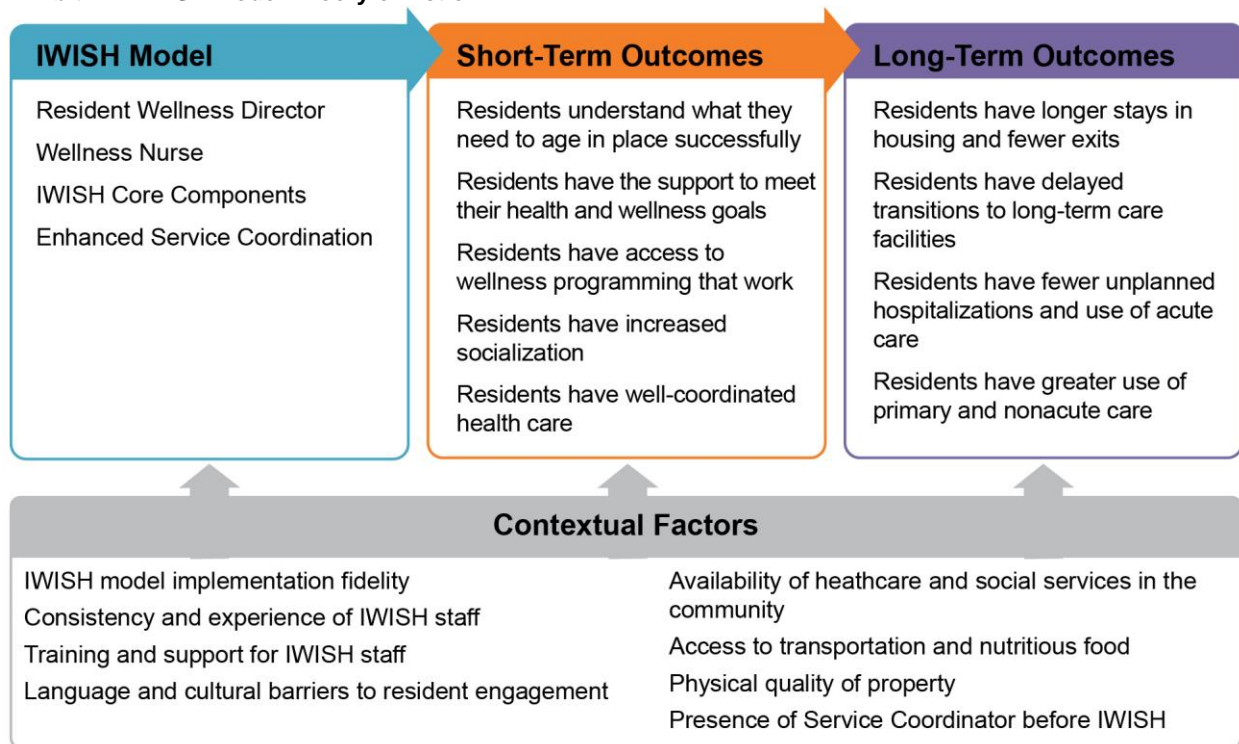
The IWISH Model's Theory of Action

Exhibit 1-1 outlines the theory of action for the IWISH model and shows the model's expected short-term and long-term outcomes and contextual factors. The IWISH model offers onsite wellness staffing in the positions of the Resident Wellness Director and Wellness, the six core components of the IWISH model, and enhanced service coordination that focus on residents' health and well-being. Over the short-term,

these inputs are hypothesized to raise resident awareness of their needs and facilitate behavior change and access to better coordinated health care. Over the longer term, we anticipate that those short-term outcomes will reduce unplanned hospitalizations, increase use of primary and nonacute care, and ultimately increase housing tenure and delay transitions to long-term care settings.

The IWISH model’s theory of action recognizes the many contextual factors that could affect IWISH implementation and influence the model’s expected short and long-term outcomes. These contextual factors include the consistency and experience of IWISH staff, and the training and support provided to them, the extent to which the treatment properties implement IWISH with fidelity to the model; factors that may influence resident engagement such as language and culture; and characteristics of the properties and communities where residents live such as the physical quality of the property and access to healthcare and social services in the community.

Exhibit 1-1: IWISH Model Theory of Action



1.2 Randomization of Demonstration Properties

The Supportive Services Demonstration is being evaluated with a cluster randomized controlled trial design. In 2016, HUD randomly assigned 124 HUD-assisted properties that predominantly or exclusively serve people aged 62 and older to one of the following three groups:

- 40 **treatment group** properties received grant funding to implement the IWISH model for the initial demonstration period.
- 40 **active control group** properties did not implement the IWISH model; they form one part of the overall control group for the evaluation’s impact analysis. In Phase 1, property owners and managers and Service Coordinators at these “active” control group properties participated in the study’s interviews to identify the service coordination and wellness programming available at their properties.
- 44 **passive control group** properties also did not implement the IWISH model; they form the other part of the overall control group for the evaluation’s impact analysis. The evaluation uses

administrative data from these “passive” control group properties for the impact analysis, but the properties are not involved in the evaluation’s primary data collection.

HUD stratified the properties by core-based statistical area (CBSA)^{1,2} prior to randomization within CBSAs to ensure that the IWISH and control groups are balanced on observed and unobserved characteristics that could influence residents’ housing tenure and healthcare utilization. To select properties for each group, HUD assigned weights to each property based on the rate of Medicare fee-for-service (FFS) participation in its county and the property’s budget request in response to the demonstration’s Notice of Funding Availability. HUD placed greater weight on properties with higher FFS participation rates and smaller budget requests to rank the properties in terms of their desirability for the demonstration then used simple random sampling to allocate the selected properties in each CBSA into treatment, active, and passive control groups.

In 2017, HUD awarded the 40 treatment group properties grant funding to support Resident Wellness Directors and Wellness Nurse positions and health and wellness programming for the initial three-year demonstration period. The specifics of the funding arrangement varied by property and whether the property had a grant through HUD’s Multifamily Services Coordinator program at the time of applying for the Supportive Services Demonstration. The 40 IWISH properties each signed a Cooperative Agreement with HUD to implement the model fully for the initial demonstration period.

The control group properties serve as the “counterfactual,” or what would have happened absent IWISH. The difference in average outcomes between residents in the treatment group properties and residents living in the control group properties is the “impact” of IWISH. Because the groups are randomly assigned, the only known systematic difference between the two groups is IWISH. Therefore, any difference in outcomes between IWISH and control group residents can be attributed to IWISH.

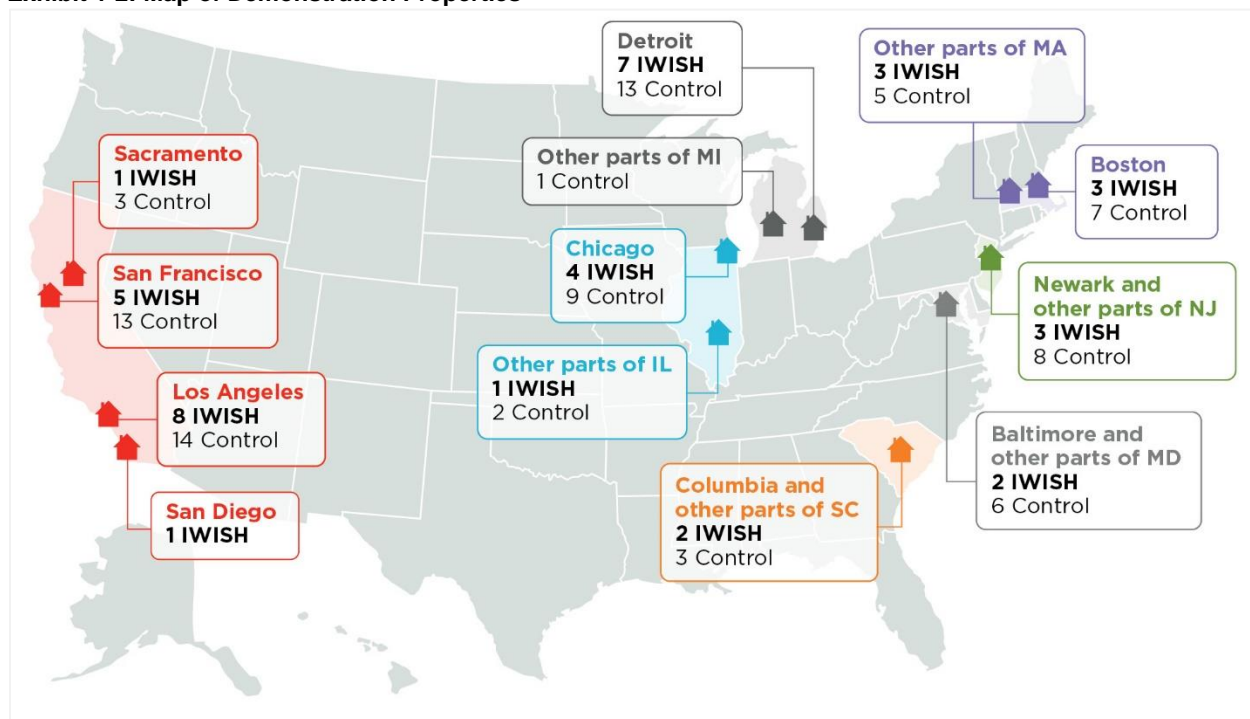
The evaluation’s research design uses “clustered” random assignment, meaning that random assignment is by property, not individual resident. That said, we are interested in the impacts that accrue to *individual residents* in those properties, and so we estimate impacts at the resident level by comparing average differences in outcomes between residents in the IWISH and control group properties.

Exhibit 1-2 shows the 124 properties by state and their approximate locations. By design, most treatment group properties and control group properties in a state are located within the same metropolitan area, and many are in the same neighborhood.

¹ A geographic area defined by the Office of Management and Budget that consists of an urban center of at least 10,000 people and adjacent counties with strong ties to the urban center according to commuting patterns. CBSAs vary in numerous ways, including access to and cost of healthcare and social services.

² CBSAs with too few properties to treat as independent strata were combined within States to form one larger stratum.

Exhibit 1-2: Map of Demonstration Properties



Evaluation of the Supportive Services Demonstration

The Supportive Services Demonstration is being evaluated through two phases as shown in Exhibit 1-3. The Phase 1 evaluation assessed IWISH implementation and outcomes for the initial three years of the demonstration. The Phase 2 evaluation assesses IWISH both for the two-year demonstration extension period and for the full demonstration period that includes the initial and extension periods, as well as a gap year (October 1, 2021–September 30, 2022) between the two demonstration periods.

Exhibit 1-3: Supportive Services Demonstration and Evaluation Timeline

Demonstration Period	Dates	Evaluation Phase
Initial IWISH Demonstration Period	October 1, 2017–September 30, 2020	Phase 1
IWISH Two-Year Extension	October 1, 2021–September 30, 2023	Phase 2
Full Demonstration Period (including gap year)	October 1, 2017–September 30, 2023	Phase 2

The evaluation of the demonstration consists of two main analyses: (1) an implementation analysis of the extent to which the treatment group properties implemented the IWISH model and the strengths and weaknesses of the model, and (2) an impact analysis to measure the impact of IWISH on resident tenure and healthcare utilization.

Publications from the Initial Demonstration Period

The first phase of the evaluation produced several publications.

The *Impact Study Research Design* for the initial demonstration period described the research design and analysis plan for the Phase 1 evaluation, including the research questions, outcome measures, data sources, analysis approach, and limitations.

Detailed results from the Phase 1 implementation analysis were reported in two interim reports:

The *First Interim Report* (Turnham et al., 2019) describes the baseline characteristics of residents living at IWISH (treatment group) properties, drawing on HUD administrative data, Medicare claims data, and public use data sources. It describes the first 18 months of IWISH implementation (October 2017–March 2019). The report focuses on the process of hiring and retaining IWISH staff and implementing key startup IWISH activities such as enrolling residents in the program and initially assessing their health and wellness needs.

The *Second Interim Report* (Giardino et al., 2021) describes the experiences of IWISH staff and residents with implementing IWISH during the initial three years of the demonstration (October 2017–September 2020). The report assesses to what extent the 40 treatment group properties implemented the core components of the IWISH model. It also describes the differences in experiences and contexts across these IWISH properties and the extent to which service coordination and wellness programming differed between them and control group properties.

The **final report of Phase 1** of the evaluation (publication expected in 2023) will provide IWISH impacts on residents' tenure and healthcare utilization for those initial three years of the demonstration.

Summary of Findings from the Phase 1 Implementation Study

For the initial three years of the demonstration, we found that most IWISH properties implemented IWISH with fidelity to the model. However, some properties were unable to implement all components of the model or to implement them completely. Technical assistance and support were available to the IWISH staff and turnover in staffing were among the factors that contributed to variation in IWISH implementation.

About 20 percent of IWISH properties had periods without full IWISH staffing, and no properties were able to develop the type of healthcare partnerships envisioned by the model. IWISH staff also reported their interactions with residents and their health and wellness programming changed as a result of the COVID-19 pandemic.

Phase 2 Evaluation of the IWISH Extension Period

In 2021, HUD requested that the study team further evaluate the Supportive Services Demonstration, which was extended by Congress for an additional two years in the Continuing Appropriations Act, 2021 and Other Extensions Act. The Phase 2 evaluation is a mixed-methods study that continues to evaluate the implementation and effectiveness of the IWISH model through a combination of qualitative and quantitative methods.

Four of the initial 40 treatment group properties opted to not continue in the demonstration for the extension period—two in South Carolina, one in California, and one in Michigan. The impact analysis for the Phase 2 evaluation will compare outcomes for the 40 treatment group properties versus 84 control group properties. The statistical approach used by the impact study for the Phase 1 evaluation censored individuals (i.e., stopped following outcomes over time) who exited the properties during the demonstration. The Phase 2 impact study will also censor individuals who still reside at the four treatment group properties that opted not to continue in the demonstration after the initial demonstration period ended. To ensure balance in censoring along geographic lines, the Phase 2 evaluation will also censor any residents who still reside at the three control group properties in South Carolina when the initial demonstration period ended. None of the residents at control group properties in California or Michigan will be censored at the end of the initial demonstration period because there are several properties in those states who opted to continue their active involvement in IWISH. (See *Section 4.3 Impact Analysis Approach* for additional details.)

The Phase 2 evaluation will not only document the model's implementation during the extension period but also consider the differences between the model implementation between the initial and extension periods, as described in the text box on the next page.

Expected Differences in IWISH Implementation in the Extension Period¹

Expected differences in IWISH implementation in the extension period include the following:

Enrollment

Properties are no longer required to have a formal enrollment process in which residents sign a consent form to participate in IWISH activities or to meet with the Wellness Nurse. Properties may determine their own enrollment or consent procedures; some might choose to have none. Properties are still required to proactively reach out to residents to educate them about IWISH and its benefits. Properties are also required to inform residents that IWISH was founded in 2021 for only an additional two years and that the future funding will depend on Congressional appropriation.

Use of Case Management Software to Collect Resident Data and Track Interactions with Residents

The treatment group properties are no longer required to use the same case management system and resident assessment questionnaires as they did for the initial demonstration period. However, IWISH properties still are required to conduct assessments and collect assessment data, and both IWISH properties and control group properties with Service Coordinator programs are required to report aggregate, property-level assessment, and service coordination data to HUD's Standards for Success (SfS) reporting system. The requirement for both the treatment group and active and passive control group properties to submit SfS data provides a new opportunity to compare assessment data between the groups. For the initial demonstration period, assessment data was available only for IWISH properties, although it was at the individual level. Although we will receive only aggregate data and only for properties with HUD-funded Service Coordinator programs, the SfS data could allow us to make some comparisons about resident needs and services between IWISH and control group properties.

Technical Assistance and Training

During the initial demonstration period, comprehensive, one-on-one technical assistance and training was provided to IWISH Resident Wellness Directors and Wellness Nurses by a HUD-contracted technical assistance provider. This training and support will not be provided to IWISH properties during the extension period.

Though IWISH staff will have access to training materials developed during the initial demonstration period, it is not expected that the training provided to IWISH staff in the extension period will be at the same level and intensity as that provided during the initial three years. According to their Cooperative Agreements with HUD, the grantee (property owner) is required to provide the necessary training and support to Resident Wellness Directors and Wellness Nurses to effectively implement the IWISH model. Interviews with IWISH staff and property owners and managers will help us understand the role the owner and management organizations play in supporting wellness staff in the implementation of IWISH. From the Phase 1 implementation analysis, we learned this support varied substantially across properties during the initial demonstration period.

1.3 Organization of this Document

The study team's technical approach for the Phase 2 evaluation includes collecting and analyzing qualitative data through interviews with property owners and managers, IWISH staff, and residents; collecting and analyzing Service Coordinator and IWISH program data through HUD's data systems and reports; and collecting, analyzing, and matching HUD, Medicare, and Medicaid administrative data and publicly available data on community characteristics.

The findings of the Phase 2 evaluation will be the subject of a report expected in 2026.

This Research Design is organized into five chapters (including this introduction):

- Chapter 1: Supportive Services Demonstration and Evaluation Overview.
- Chapter 2: Phase 2 Evaluation Overview.
- Chapter 3: Phase 2 Implementation Data Collection and Analysis.
- Chapter 4: Phase 2 Impact Data Collection and Analysis.
- Chapter 5: Phase 2 Evaluation Reporting.

2. Overview of Phase 2 Evaluation

The Phase 2 evaluation of the Social Services Demonstration will build on the Phase 1 evaluation of the initial three-year demonstration period and will use a combination of qualitative and quantitative data sources.

This chapter describes how the study team plans to address the Phase 2 research questions (Section 2.1). Section 2.2 describes the primary data and secondary data sources we will use. Section 2.3 is an overview of the technical approaches we will use to evaluate the demonstration’s implementation and impacts for the IWISH extension period.

2.1 Phase 2 Research Questions

The Phase 2 research questions are organized into three areas: IWISH program implementation, measuring impacts of IWISH, and comparison of IWISH to control group properties.

IWISH Program Implementation

The research questions on IWISH program implementation will be addressed through analysis of interviews with property owners and managers, IWISH staff, and residents of IWISH properties, and through analysis of HUD administrative and program data. Exhibit 2-1 shows the research questions for the Phase 2 implementation analysis and the corresponding data sources.

Exhibit 2-1. Implementation Analysis Research Questions and Data Sources, IWISH Properties

Research Question	Interviews with IWISH Staff	Interviews with Property Owners and Managers	Interviews with Residents	HUD Program Data	HUD Administrative Data
RQ1: How was IWISH implemented in the extension period?	✓	✓	✓	✓	
1a. How fully did treatment properties implement the IWISH model during the extension period?	✓	✓		✓	
1b. What data did properties collect through resident assessments, and how were the data used?	✓	✓	✓	✓	
1c. What changes did properties make to the IWISH model in response to COVID-19?	✓	✓	✓		
RQ2: What contextual factors influence resident engagement in IWISH?	✓	✓	✓	✓	✓
RQ3: How do support and staffing for IWISH in the extension period differ from the initial implementation period and vary across properties?	✓	✓		✓	
3a. What were the types and quality of training, technical assistance, and other supports provided to Resident Wellness Directors and Wellness Nurses and how did the assistance and training support IWISH implementation?	✓	✓		✓	
3b. How did properties use supportive services funding available from HUD and other sources to support IWISH implementation?	✓	✓		✓	
RQ4: How did property and community factors influence how properties implemented IWISH?	✓	✓	✓		✓

Research Question	Interviews with IWISH Staff	Interviews with Property Owners and Managers	Interviews with Residents	HUD Program Data	HUD Administrative Data
RQ5. What are the perceived benefits and most and least useful components of the IWISH model according to residents, IWISH staff, and property owners and managers?	✓	✓	✓		

RQ1: How was IWISH implemented in the extension period?

The evaluation of the extension period will document changes that treatment properties made in implementing IWISH after the end of the initial three-year demonstration period on September 30, 2020. The implementation analysis in the extension period is a three-year period that includes the one-year gap between the end of the initial period and the official start of the two-year extension on October 1, 2021.

The study team will evaluate how the program components implemented by the Resident Wellness Directors and Wellness Nurses differed from the initial period, including any changes to how assessments of resident health and wellness needs were conducted and used. The evaluation will document any changes in the on-site programming supported by IWISH. The evaluation will explore the factors that affected properties’ ability to maintain the staffing and programming under the IWISH model through the extension period and, for some properties, their ability to ramp up their program again for the extension period.

The study team will also document any changes to how IWISH staff conduct enhanced service coordination activities such as providing transitional care to residents coming home from a hospital or nursing home stay, assisting residents in self-managing their medications, providing support to residents during and after emergency medical situations, and interacting with residents’ family and caregivers.

We expect that each IWISH property will have its own implementation schedule during the extension period. This will add to the complexity of analyzing changes in IWISH implementation. To have accurate fidelity measures, we will need to identify dates for key milestones such as the start and end dates of IWISH staff or dates when working hours or caseloads changed.

A particular challenge will be accurately depicting IWISH implementation after the end of the initial demonstration period, especially at properties that experienced staff turnover, which could limit our ability to identify specific dates for IWISH milestones. We might have to rely on estimates or ranges of dates for certain IWISH milestones.

RQ1 has three sub-questions on IWISH implementation fidelity, resident assessments and collection of case management data, and changes related to the COVID-19 public health emergency.

1a. How fully did treatment properties implement the IWISH model during the extension period?

For the evaluation of the initial IWISH period, the study team developed a fidelity rating system to measure the extent to which IWISH properties implemented all core components of the IWISH model and how some program and property factors explained or contributed to observed variation in fidelity.

Exhibit 2-2 presents an overview of the rating system for the first phase of the evaluation. See the *Second Interim Report* (Giardino et al., 2021) for rating measures and how the study team rated the 40 treatment group properties for key aspects of the IWISH model. The study team rated the properties as “High”, “Medium”, or “Low” for each category based on the category’s rating measure.

Exhibit 2-2: Phase 1 Evaluation IWISH Fidelity Ratings, by Category

Category	Definition
Onsite Wellness Staffing and Support	
Resident Wellness Director staffing	<ul style="list-style-type: none"> • Presence of onsite Resident Wellness Director during demonstration period
Wellness Nurse staffing	<ul style="list-style-type: none"> • Presence of onsite Wellness Nurse during demonstration period
Property management support for IWISH	<ul style="list-style-type: none"> • Level of support for IWISH staff and time spent on IWISH by property management during demonstration period
IWISH Core Components	
Resident engagement	<ul style="list-style-type: none"> • Percentage of residents who enrolled in IWISH during the demonstration period
One-on-one health and wellness assessments	<ul style="list-style-type: none"> • Percentage of IWISH participants with completed health and wellness assessments
Individual and Community Healthy Aging Plans	<ul style="list-style-type: none"> • Percentage of IWISH participants who developed Individual Healthy Aging Plans • Completion of the Community Healthy Aging Plan based on identified needs of residents
Web-based data system	<ul style="list-style-type: none"> • Extent of use of web-based data system to record IWISH participant and service use data
Evidence-based programming based on resident needs	<ul style="list-style-type: none"> • Availability of evidence-based group programming recommended by the IWISH model and included in the IWISH Evidence-Based Catalog
Social services and healthcare partnerships	<ul style="list-style-type: none"> • Extent to which site staff developed property-wide partnerships with healthcare providers or interacted with providers on behalf of individual residents
Enhanced Service Coordination	
Standardized transitional care coordination	<ul style="list-style-type: none"> • Extent to which IWISH staff provided and coordinated care for residents returning home from a hospital or nursing home stay, as reported by staff
Medication self-management assistance	<ul style="list-style-type: none"> • Extent to which IWISH staff engaged in medication self-management assistance described in the IWISH Operations Manual
Family and caregiver interaction	<ul style="list-style-type: none"> • Extent to which IWISH staff interacted with residents' families and caregivers to help residents obtain needed services and support

For the Phase 2 evaluation, we will reassess IWISH fidelity for the extension period and for the full six-year demonstration period. For continuity, we will use the same fidelity measures for the extension period to the extent that the data will allow. However, there are some measures that we will revise because the data used for the initial IWISH period will no longer be available to the study team or because we are planning to collect more refined data for those measures. Measures that were based on individual-level data previously reported to the demonstration's centralized data system now will be based on information obtained directly from IWISH staff. We also will revise the measure for evidence-based programming and healthcare partnerships and add new measures for emergency care and for training and support for Resident Wellness Directors and Wellness Nurses.

The study team also will conduct nonexperimental analysis of how outcomes of the model are related to how the properties implemented the IWISH model's core components and provided enhanced service coordination to residents. As in the Phase 1 evaluation, we will use the fidelity ratings developed for the implementation analysis to assess whether the outcomes for IWISH residents correlate with how certain aspects of the IWISH model were implemented at their properties during the initial three years of the demonstration.

1b. What data did properties collect through resident assessments, and how were the data used?

A core component of the IWISH model is health and wellness assessments. Resident Wellness Directors and Wellness Nurses are expected to conduct assessments of residents and use the individual-level and property-level assessment data to identify resident needs and identify programming and individual supports to meet their needs.

For the initial demonstration period, IWISH staff were required to use a specific web-based client management system, Population Health Logistics (PHL), to maintain data on all residents who enrolled in IWISH and to record staff interactions with residents. PHL was customized for IWISH to support the resident assessment process by guiding IWISH staff through the assessment questions and tools and documenting the responses and results. Many IWISH staff reported challenges with using PHL including the time needed to complete data entry and the lack of reporting capabilities.

At the end of the initial demonstration period, PHL was no longer supported by HUD and IWISH properties changed to a case management software of their choosing. The assessment tools and questions were made available to the IWISH sites at the end of the initial demonstration period in document form. Properties could continue to use the IWISH assessment or could use a different assessment tool of their own choosing. HUD is interested in the types of assessment data collected by IWISH properties in absence of requirement to use PHL and whether the data collected is used to support service referrals and programming available to residents.

For the extension period, we will obtain aggregate, property-level health and wellness assessment data through HUD's SfS data system. IWISH properties, as well as the active control group properties with Service Coordinator programs funded through HUD grants or operating budgets, are required to report annually to HUD's SfS system. Data we will obtain through SfS includes aggregated data on residents' health and wellness needs and referrals for services. We will obtain additional information about health and wellness assessments through interviews with IWISH staff. Information we expect to collect through interviews includes how assessments are conducted between the two IWISH staff, which assessment tools are used, how often and under which circumstances assessments are conducted with residents, and how assessment data is used to help residents with their health and wellness goals.

1c What changes did properties make to the IWISH model in response to COVID-19?

The study team will continue to document changes to the program and workflows associated with the COVID-19 pandemic. During interviews conducted with IWISH staff in Summer 2020, we learned that IWISH staff had to pivot from implementing the IWISH model as designed to helping residents meet their basic needs during the pandemic. Staff at three-fourths of IWISH properties said they increased assistance for residents during this time. IWISH staff at almost all properties reported that group programming and access to indoor community spaces were not available to residents for at least some time, and IWISH staff communicated with residents primarily by phone, as many staff worked from home initially during Spring 2020. Staff reported that many residents felt affected by COVID-related restrictions and felt isolated in their homes.

For the extension period, we will ask IWISH staff and property owners and managers how much of the restrictions implemented during COVID is being maintained, and to what extent IWISH properties have resumed face-to-face meetings between IWISH staff and residents and group IWISH programming.

RQ2. What contextual factors influence resident engagement in IWISH?

The study team will build on information learned during the Phase 1 evaluation to explore further the factors that influence resident engagement in IWISH. Approximately 70 percent of residents living in treatment group properties enrolled in IWISH during the initial demonstration period. Residents enrolled in IWISH were largely similar in age, race/ethnicity to the overall resident population at their property.

We did, however, find small but statistically significant differences in the reported frequency of meetings with IWISH staff based on age, race/ethnicity, marital status, and primary language, suggesting a potential disparity in program engagement among some demographic groups.

Other, less-studied resident characteristics—extent of health needs, having the same cultural or linguistic background as IWISH staff, and trust that residents’ privacy would be maintained—could have influenced program enrollment and participation, but more information is needed to understand whether these relationships exist and their nature. While not asked about directly during the Phase 1 evaluation, these more nuanced factors arose as themes during its analysis of interviews with IWISH staff and focus groups with residents.

IWISH staff at some properties reported that it seemed to help enrollment if IWISH staff were of the same racial, ethnic, or cultural background as the residents and that it helped when they spoke the same language as residents. In focus groups, residents also noted that differences in background and language between staff and residents were exacerbated if staff did not take the time to build a relationship before soliciting residents’ enrollment.

Through interviews with residents, IWISH staff, and property owners and managers, we will explore these more nuanced factors and resident characteristics that could affect resident engagement in IWISH.

RQ3: How do support and staffing for IWISH in the extension period differ from the initial implementation period and vary across properties?

This research question addresses the training, technical assistance, and other supports made available to support the implementation of IWISH, including supplemental funding provided through the demonstration and other funding made available to support IWISH. This research question has two sub-questions.

3a. What were the types and quality of training, technical assistance, and other provided to Resident Wellness Directors and Wellness Nurses? How did the assistance and training support IWISH implementation?

For the initial demonstration period, the implementation team provided formal training and ongoing support, including an in-person and virtual training delivered to staff on IWISH procedures and policies before the start of resident enrollment. Then the implementation team provided day-to-day support through dedicated site liaisons assigned to each property and convened in-person and virtual trainings on special topics throughout the demonstration period. The implementation team also identified evidence-based health and wellness programs to meet specific resident health needs.

For the extension period, owner organizations are expected to provide training and ongoing support to Resident Wellness Directors and Wellness Nurses to implement the IWISH model at their properties, and staff training is an eligible demonstration expense. From the Phase 1 evaluation, we learned the role of property owners and managers at most properties is limited, and most property managers said they spend less than five hours a week on IWISH activities. Nonetheless, IWISH staff reported that owner and management involvement in IWISH is important and that frequent communication between IWISH staff and managers was necessary for referring residents to IWISH staff for service coordination and consulting about potential lease violations, collaborating with IWISH staff during emergency situations, and supporting the coordination and funding of health and wellness programming. In the absence of training and technical assistance from the implementation team, we anticipate that involvement of property owners and managers could increase to meet the needs of IWISH staff.

Based on interviews with owners and staff and information reported on demonstration Quality Assurance reports to HUD, we will document the types and methods of training and technical assistance provided to

IWISH staff after September 2020. We expect that providers of training and technical assistance will include staff from property owner and management organizations and contracted training organizations.

During interviews with IWISH staff, we will ask what support has been most and least useful to them in their work and what areas of support are still needed. We also will seek to understand property policies that can influence outcomes related to resident tenure or healthcare utilization, such as policies regarding staff involvement in resident emergency events.

3b. How did properties use supportive services funding available from HUD and other sources to support IWISH implementation?

The demonstration provides funding—through the grant or operating budget—for health and wellness programming and other resident supports on a \$15 per-unit per-month basis. This is in addition to the funding for the Resident Wellness Director and the Wellness Nurse and associated operating expenses. For the initial demonstration period, staff reported that funding for programming enabled them to offer programs such as fitness training, art therapy, gardening, and nutrition workshops. IWISH staff also reported using the funding to support program fees and materials and health and wellness equipment (e.g., exercise machines, blood pressure monitors, pedometers) and to meet individual health and wellness needs not otherwise covered.

In the Phase 1 evaluation, we learned from IWISH staff that supportive services funding allocated through the demonstration could be challenging to use. Some IWISH and property managers described a lack of clarity on program rules, coupled with restrictions on how the funding could be used, as a barrier to accessing all their awarded funding. At many properties, IWISH staff were unfamiliar with how the funds were allocated at their property because funding decisions were made by the owner or property management organization.

We will obtain information on supportive services funding largely through interviews with property owners and IWISH staff. Through these interviews, we will identify the funding sources for health and wellness programming and resident supports, including those funded through IWISH and through other sources. We will explore whether IWISH properties continued to have challenges in using demonstration supportive services funds in the extension period. The study team will also analyze available grant budgets and reports that document the use of supportive services funding. The study will not include a detailed cost analysis, but we do plan to understand the sources of the funding available to properties for onsite staff, programming, equipment, and any other health and wellness costs.

RQ4. How did property and community factors influence how properties implemented IWISH?

For the Phase 2 evaluation, we plan to continue to collect the perspectives of residents, IWISH staff, and property owners and managers on property and community characteristics that can influence the success of the IWISH model. These factors include safety and accessibility of the buildings, properties, and neighborhoods; whether residents have good access to common areas and amenities; and whether residents can easily access healthcare facilities, grocery stores, and pharmacies.

The study team will collect property and community data for every treatment group and control group property to help us understand how differences in impacts might vary by selected property and neighborhood characteristics. For the Phase 1 evaluation, we analyzed outcomes by whether the property had an onsite Service Coordinator before the IWISH demonstration and by the physical quality of the property based on HUD inspection ratings. For Phase 2, we also will analyze outcomes by the number of units the property has, whether the property owner is a nonprofit or for-profit organization, and the total number of affordable housing properties and units the owner organization owns or manages.

The community factors include the sociodemographic characteristics of neighborhood residents, number and accessibility of health and service providers, access to public transportation, access to nutritious food,

and location in an urban area (See Exhibit 4.5). We are planning to continue to assess these same community characteristics in Phase 2 with some modifications based on data available when the impact analysis is conducted. As the impact analysis is not expected to occur until 2025, we will update the measures for community characteristics to include any newly available public datasets that could help inform the analysis of impacts.

RQ5. What are the perceived benefits and most and least useful components of the IWISH model according to residents, IWISH staff, and property owners and managers?

Residents who participated in IWISH during the initial demonstration period attributed improvements in their health and well-being to IWISH staff and programming. Participating residents said they appreciated the counseling of the Resident Wellness Director and having the Wellness Nurse as a medical professional and designated point of contact for health and wellness at the property.

In the Phase 1 evaluation, residents identified six aspects of the Wellness Nurse role as having the most impact on their health: monitoring of vital signs, assessment of healthcare needs, support in emergency situations, wellness coaching, healthcare coordination, and assistance with medication self-management. Residents also described how programming provided an opportunity for social interaction as well as education. The aspects of the model that staff, property managers, and residents said were least useful were the formal setting of health goals in helping residents improve their health, the recordkeeping requirements, and the focus on developing partnerships with healthcare entities.

For the Phase 2 evaluation, we will ask many of the same questions we asked IWISH staff, owners, and residents during the initial demonstration period about the benefits of IWISH to enrolled residents, non-enrolled residents, property management, and tenure of residents and about which aspects of the IWISH model were most and least useful in helping residents make changes to their behaviors that may ultimately affect how long they stay in their home or their use of primary or emergency healthcare. We also will ask staff and owners to provide, without violating resident privacy, specific examples of how IWISH helps enrolled residents to successfully age in place and avoid unnecessary 911 calls, emergency department visits, and hospital and nursing home stays.

We will analyze perceived benefits and usefulness of the IWISH model for each of the six core IWISH components, for categories of enhanced service coordination, and for each of the potential short-term and long-term outcomes of the model.

Comparison to Non-IWISH Properties

RQs 6 and 7 compare characteristics of IWISH properties and residents to control group properties not implementing the IWISH model.

RQ6. What are the demographic and healthcare characteristics of residents residing in treatment group and control group properties?

The Phase 2 evaluation will continue to compare descriptive characteristics of residents in IWISH properties to residents in the control group properties to ensure any significant differences between the groups are accounted for in the impact analysis. The comparison also will help us better understand how demographic characteristics and health needs of residents changed over time. We will base our descriptive analysis on administrative data from HUD's Tenant Rental Assistance Certification System (TRACS) and SfS data systems and on Medicare and Medicaid data from the Centers for Medicare & Medicaid Services (CMS) obtained through the Chronic Conditions Data Warehouse (CCW).

Using TRACS data, we will compare demographics of residents at three points in time:

- Start of the initial IWISH demonstration (October 1, 2017).

- Start of the extension period (October 1, 2021).
- End of the IWISH extension period (September 30, 2023).

We will include in this analysis resident characteristics data from CMS such as prevalence of select chronic diseases once we have obtained this data from the CCW in 2025.

We will supplement the administrative data with qualitative data on resident characteristics from the resident, IWISH staff, and property owner and manager interviews. The study team is limited in our ability to use qualitative data to describe residents, however. Resident interviews will be a source of self-reported resident characteristics, but the interviews will be conducted with only a small number of residents ($n=120$) and therefore will not be representative of all IWISH property residents. Resident characteristic information from IWISH staff and owner interviews also will be subjective, based on the respondents' perception of residents' characteristics and affected by their own experiences and biases.

RQ7. How do service coordination and health and wellness programming at IWISH properties compare to service coordination and health and wellness programming in the control group properties?

RQ7 compares the IWISH model, as implemented in the treatment group properties, to supports and programming available in the active and passive control properties. HUD and the study team are interested in understanding how the IWISH model compares to service coordination and health and wellness programming in HUD-assisted properties for adults aged 62 and older overall, but our analysis is limited to the properties participating in the demonstration. RQ7 mostly compares IWISH to the traditional Service Coordinator programs being implemented in the majority of control group properties. We will obtain information on the control group properties from property owner and manager interviews and Sfs data.

In the Phase 1 evaluation, the study team found many similarities between IWISH and service coordination in the active control group properties. All but two active control group properties had a full-time Service Coordinator who performed a role like that of the Resident Wellness Director in IWISH. The study team found that though Service Coordinators conducted assessments and worked with residents to set personal goals similar to goalsetting in IWISH, resident assessments and goal setting was less formal and less structured at the active control properties.

The main difference in service coordination between IWISH properties and the control group properties was the Wellness Nurse position. There was also a greater focus in the IWISH properties on providing health-focused supports such as wellness checks and transitional care during emergency events and additional funding available for health-focused programming.

As residents are not required to enroll formally in IWISH for the extension period, we could find even fewer differences between IWISH and the active control group properties during the extension period. The study team will document any changes in service coordination and health and wellness programming at the active control group properties in the extension period through interviews with property owners and managers and through analysis of Sfs data. If HUD decides to expand the impact analysis by adding a comparison group of properties without Service Coordinators, the implementation analysis could also be expanded to document the service coordination and wellness programming available at the comparison properties.

As Service Coordinator positions have high turnover, we expect that property owner and manager interviews will provide us with a fuller picture of the service coordination and staffing that were in place in the period between the last contact we had with the properties in Summer 2020 and when we conduct Phase 2 interviews in 2023. Property owner and management interviews also should be able to provide us with information on costs and funding sources of health and wellness programming and resident supports.

SfS data will be available annually for the active and passive control group properties with Service Coordinator programs. Although most control group properties had Service Coordinators at the end of the initial demonstration period in 2020, the properties might not have continued their service coordination programs or might not have been required to report program data to HUD. Therefore, we could be limited in what we will be able to learn about service coordination and wellness programming for the active control group properties and expect missing data for some properties.

Impacts of the IWISH Model

The Phase 2 evaluation will replicate the impact study conducted for the Phase 1 evaluation. Key outcomes will be measured using HUD administrative data on housing and residents, linked to Medicare and Medicaid data on healthcare utilization and spending accessed through the CCW).

As in Phase 1, we will pool residents of the active and passive control group properties into one comparison group and will estimate the impact of IWISH as the difference between the average outcomes among residents of IWISH properties versus the average outcomes among residents of control group properties. We will use multivariable regressions, when necessary, to control for differences in resident and property characteristics that might have remained after the properties were randomized.

RQ8. What is the impact of IWISH on housing exits and transitions to long-term institutional care?

Over the longer term, the IWISH model is hypothesized to increase residents' housing tenure and delay transitions to long-term care settings. In Phase 1, the survival analysis found that residents of IWISH properties and control group properties were equally likely to end their residency during the initial three-year demonstration period, regardless of the reason. On average, 27 percent of residents in both groups exited their property before the end of the period, including the 10 percent of residents of both IWISH and control group properties who died and the 2 percent of residents who exited to long-term care.

In Phase 2 of the evaluation, we again will use survival analysis to measure how often residents of IWISH properties exited their properties versus residents of control group properties. We will also explore how housing exits and transitions to long-term care vary between age groups (e.g., ages 62-64, 65-74, 75-84, and 85 or older) since the risk of housing exits and potential need for long-term care vary systematically as residents age. The study team hypothesized that a three-year demonstration was not enough time for the anticipated effects of the model on housing exits and exits to long-term care to be seen, but the additional three years of the extension period may be enough time to detect impacts. Phase 2 of the evaluation will continue following the study sample of residents who were residing at the treatment group and control group properties on October 1, 2017, or moved in before October 1, 2018, to determine whether there is a significant difference in six-year housing exit or transitions to long-term care between residents of the IWISH and control group properties.

RQ9. What is the impact of IWISH on utilization of Medicare- and Medicaid-covered primary care and other non-acute healthcare services?

The analysis in Phase 1 of the evaluation found that during the initial three-year demonstration period, IWISH had no statistically significant impact on the number of primary care visits or new use of specialty physician services. On average, residents of both IWISH and control group properties had about six primary care visits per year. IWISH residents also had rates similar to the control group members of new visits with cardiologists, rheumatologists, endocrinologists, or ophthalmologists.

Though we did not find evidence in the Medicaid and Medicare data that IWISH residents increased use of primary care on average, interviews with staff at IWISH properties and focus groups with residents suggested that some IWISH residents' use of primary care did increase during the initial demonstration period. IWISH residents were encouraged to make follow-up appointments with their primary care physicians for regular preventive care. IWISH staff also would help "triage" residents, sometimes

referring them away from emergency care to more appropriate, non-acute sources of care. It could be that the efforts of the wellness staff increased the propensity of some IWISH residents to visit their primary care physician (but not enough to detect a statistically significant impact) whereas other residents substituted supports provided by the Wellness Nurses for visits with a primary care physician.

RQ10. What is the impact of IWISH on utilization of Medicare- and Medicaid-covered unplanned hospitalizations and other acute care?

Unplanned hospital admissions and use of emergency departments can adversely affect the health and well-being of older adults because of increased stress and the risk of infection, medical errors, or other trauma or complications that might occur. In addition, hospitalizations and emergency department visits are a key driver (38 percent in 2020) of healthcare costs in the U.S. (Kaiser Family Foundation, 2022).

In Phase 1 of the evaluation, the study team found that IWISH had no statistically significant impact on unplanned hospitalizations during the initial three-year demonstration period. On average, control group residents spent about two days per year in a hospital, as did IWISH residents. Our analysis also found IWISH had no statistically significant impact during the initial demonstration period on any of the secondary outcomes for this research question, including the number of unplanned hospital admissions or 30-day hospital readmissions, emergency department visits not resulting in hospitalization, and use of emergency or non-emergency medical transportation.

From interviews with residents, Resident Wellness Directors, Wellness Nurses, and property managers, we learned that preventative actions by the wellness staff during the initial three-year demonstration period might have affected whether some residents had an ambulance event or emergency department visit. IWISH staff at 38 of the 40 IWISH properties (95 percent) reported assisting residents during healthcare emergencies, including providing support during or after emergency events that occurred at the property and educating residents on how to prevent future emergency events or promote earlier identification of disease that might lead to such events if untreated. Staff from one-third of IWISH properties gave examples of when they believed preventative measures by the Wellness Nurse specifically helped avert the unnecessary use of emergency services.

2.2 Data Sources and Uses

The Phase 2 evaluation uses a mixed-methods approach that integrates qualitative data and quantitative data collection and analysis to respond to the study’s research questions. The Phase 2 evaluation uses several primary and secondary data sources to assess the implementation and impacts of IWISH during the extension period. This section provides an overview of the data sources and purposes. Detailed information about each data source is presented in Chapters 3 and 4.

Primary Data Sources

For the implementation analysis, the study team will collect and analyze primary data about IWISH implementation during the extension period from interviews with residents of IWISH properties, IWISH staff, and property owners and managers of IWISH and active control properties.

We will use the interview data to help answer several of the Phase 2 research questions: to assess changes in IWISH implementation and properties’ fidelity to the IWISH model in the extension period (RQ1), to identify what factors affect resident engagement in IWISH (RQ2), describe how property and community factors could affect IWISH implementation and outcomes (RQ3), to identify how support and staffing affect IWISH implementation (RQ4), and to describe perceived benefits and usefulness of IWISH (RQ5). We will use interviews with owners and managers of active control group properties to understand how service coordination and onsite health and wellness programming in IWISH compared to those in the control group properties (RQ7).

We also expect the interviews to provide information about contextual characteristics that could affect IWISH impacts (RQs 8-10), such as the quality of the property or neighborhood, the involvement of property owners and managers in IWISH implementation, and resident characteristics that might influence engagement in IWISH.

Exhibit 2-3 provides an overview of the primary data collection planned. Data collection plans are described in more detail in Chapters 3 and 4.

Exhibit 2-3: Phase 2 Evaluation Primary Data Collection

Activity and Mode	Timing	Respondent Detail	Purpose
In-person and telephone interviews with residents of IWISH properties	Summer 2023	120 residents of properties in the IWISH extension period, residents who have been living at the property since extension began	<ul style="list-style-type: none"> To hear resident experiences with and perceptions of IWISH benefits and usefulness To explore barriers to engagement in IWISH To understand resident, property, and community contextual characteristics that might influence IWISH implementation or outcomes
In-person and telephone interviews with Resident Wellness Directors and Wellness Nurses	Summer 2023	All Resident Wellness Directors and Wellness Nurses at the IWISH properties participating in the extension period	<ul style="list-style-type: none"> To collect detailed information on the implementation of IWISH during the extension period To hear about staff experiences with and perceptions of IWISH benefits and usefulness To learn about training and support for their positions To understand resident, property, and community contextual characteristics that might influence IWISH implementation or outcomes
Telephone interviews with IWISH property owners and managers	Summer 2023	Representatives from property owners of the 40 initial IWISH properties	<ul style="list-style-type: none"> To discuss IWISH implementation during the extension period To learn about training, support, and funding for IWISH To identify property management policies related to tenancy, transitional care, and medical emergencies To hear manager and owner perceptions of the benefits of IWISH
Telephone interviews with active control group property owners and managers	Summer 2023	Representatives from property owners of the 40 active control group properties	<ul style="list-style-type: none"> To discuss service coordination and health and wellness programming during the extension period To learn about training, support, and funding for service coordination and health and wellness programming To identify property management policies related to tenancy, transitional care, and medical emergencies To hear manager and owner perceptions of the benefits of service coordination and health and wellness programming

Secondary Data Sources

The study team will use a number of secondary data sources for both the implementation and impact analyses. Most of the data sources will respond to the impact research questions (RQs 8-10). We also will use administrative data from HUD and CMS to describe and compare the demographic and healthcare characteristics of residents at the IWISH and control group properties.

Exhibit 2-4 categorizes the secondary data sources planned for the Phase 2 evaluation. Data measures and data collection plans are described in more detail in Chapters 3 and 4.

Exhibit 2-4: Phase 2 Evaluation Secondary Data Collection

Data Source	Timing	Type of Data	Purpose
HUD ADMINISTRATIVE AND PROGRAM DATA			
Tenant Rental Assistance Certification System (TRACS)	Quarterly data extracts between October 2020 and September 2024	Demographic data on residents of IWISH properties and control group properties; dates of residency at property	<ul style="list-style-type: none"> To link individuals to Medicare, Medicaid, and public use data To assess impact of IWISH on housing exits To describe demographic characteristics of residents in IWISH and control group properties
Real Estate Assessment Center (REAC) physical inspection reports	One download during September 2023	Physical property inspections of multifamily assisted housing properties	<ul style="list-style-type: none"> To explore how outcomes could be related to variation in the physical condition of the properties where treatment group and control group members live
Integrated Real Estate Management System (iREMS)	As needed	Property data (size, funding type) of IWISH properties and control group properties	<ul style="list-style-type: none"> To explore how outcomes could be related to variation in property type or size
Standards for Success (SfS)	Annual extracts 2022–2024	Individual and property-level resident assessment and Service Coordinator program data	<ul style="list-style-type: none"> To describe property-level resident characteristics and participation in IWISH and service coordination activities
IWISH Quality Assurance reports	Annual extracts 2022–2024	Property-level resident data and IWISH program data	<ul style="list-style-type: none"> To describe summary characteristics of residents of IWISH properties To document IWISH staffing and turnover To learn about challenges and successes of IWISH implementation
MEDICARE DATA			
Medicare Beneficiary Summary File	Calendar years 2015–2023 accessed through the CCW June 2024–June 2026	Medicare beneficiary enrollment, chronic and potentially disabling conditions, and annual cost and use information	<ul style="list-style-type: none"> To build the impact study sample To construct outcome measures related to mortality and intermediate measures related to Medicare enrollment and chronic conditions
Medicare fee-for-service claims (Parts A, B, D)	Calendar years 2015–2023 accessed through the CCW June 2024–June 2026	Fee-for-service beneficiary identifiers, providers of service identifiers, dates of service, diagnosis codes, procedure codes, and reimbursement amount	<ul style="list-style-type: none"> To construct outcome measures related to healthcare service use and spending
Medicare Advantage (i.e., managed care) encounter records (Part C)	Calendar years 2015–2023 accessed through the CCW June 2024–June 2026	Managed care beneficiary identifiers, providers of service identifiers, dates of service, diagnosis codes, procedure codes	<ul style="list-style-type: none"> To construct outcome measures related to healthcare service use and spending
Medicare prescription drug events	Calendar years 2015–2023 accessed through the CCW June 2024–June 2026	Part D drug identifiers, quantities dispensed, dispense dates, and reimbursement amounts for all	<ul style="list-style-type: none"> To construct outcome measures related to healthcare service use and costs and intermediate

Data Source	Timing	Type of Data	Purpose
		drugs dispensed outside of an inpatient or outpatient setting and covered by a beneficiary's prescription drug plan	measures related to chronic conditions
Minimum Data Set 3.0	Calendar years 2015–2023 accessed through the CCW June 2024–June 2026	Nursing home resident assessments	<ul style="list-style-type: none"> To identify residents who exit properties and transition to institutional long-term care
MEDICAID DATA			
Transformed Medicaid Statistical Information System (T-MSIS)	Calendar years 2015–2023 accessed through the CCW June 2024–June 2026	Medicaid beneficiary identifiers, providers of service identifiers, dates of service, diagnosis codes, procedure codes, drug identifiers, quantities dispensed, dispense dates, and reimbursement amounts	<ul style="list-style-type: none"> To build the impact study sample To construct outcome and intermediate measures related to enrollment, chronic conditions, healthcare service use, spending, and transitions to institutional long-term care
COMMUNITY CHARACTERISTICS DATA			
CMS Geographic Variation Public Use File	Annual data for 2017 (Baseline) and the most recent data available as of June 2025	Demographics, socioeconomic status, spending, and service utilization for beneficiaries by state, county, and Hospital Referral Region	<ul style="list-style-type: none"> To explore how outcomes could be related to variation in the demand for Medicare-covered healthcare services in the community.
Area Health Resource Files	Annual data for 2017 (Baseline) and the most recent data available as of June 2025	County-, state-, and national-level data that characterize the population and the availability of healthcare professions facilities across regions	<ul style="list-style-type: none"> To explore how outcomes may be related to variation in local population characteristics, supplies of healthcare professionals and facilities, and hospital utilization rates and expenditures
American Community Survey (ACS)	Annual data for 2017 (Baseline) and the most recent data available as of June 2025	Community socioeconomic characteristics (e.g., race, ethnicity, poverty rate, homeownership rate) for the census tract and sometimes other geographic levels	<ul style="list-style-type: none"> To explore how outcomes could be related to variation in local socioeconomic conditions
AARP Livability Index	Annual data for 2017 (Baseline) and the most recent data available as of June 2025	Composite measures of community livability based on housing, neighborhood, health, transportation, environment, engagement, and opportunity.	<ul style="list-style-type: none"> To explore how outcomes could be related to variation in community livability rankings
Distressed Communities Index	Annual data for 2017 (Baseline) and the most recent data available as of June 2025	An index that characterizes the relative economic well-being of a community	<ul style="list-style-type: none"> To explore how outcomes could be related to whether the local area is prosperous, comfortable, mid-tier, at risk, or distressed

2.3 Phase 2 Evaluation Approaches

The Phase 2 evaluation will use the following approaches:

- Qualitative Data Collection.** The study team will collect data through interviews with IWISH Resident Wellness Directors and Wellness Nurses, interviews with residents of IWISH properties, and interviews with property managers and owners of both IWISH and control group properties. The qualitative data collection is planned for the second half of 2023.

- **Implementation Analysis.** The study team will use NVivo software to identify and report themes among the interview responses across properties. The study team will also code and use information obtained in progress reports (QA reports) submitted by IWISH grantees to HUD. The implementation analysis also will include a system rating to what extent the treatment group properties implemented core components of the IWISH model with fidelity during the extension period. The rating system is based on a combination of analysis of interview responses and analysis of IWISH program data in HUD's data systems and reports. We will develop fidelity ratings for each IWISH property for the extension period and for the full six-year demonstration period.
- **Administrative Data Analysis of Demographic and Healthcare Characteristics.** The study team will prepare descriptive characteristics of residents of IWISH properties using HUD and CMS administrative data, supplementing this data with information learned about residents through interviews. The study team also will analyze data on resident characteristics to understand any differences between residents of IWISH properties and residents of the control group properties.
- **Impact Analysis.** The study will use HUD administrative data and Medicare and Medicaid claims data to measure the outcomes related to housing exits, transitions to long-term care, and utilization of healthcare services and costs. With these data, we will estimate impacts as the difference between the average treatment group and average control group outcomes. We will compare the average outcomes for each of three time periods: the initial three-year demonstration period, the two-year extension period, and the full six-year demonstration period.

The results of these analyses will be the subject of the Comprehensive Report, expected in 2026.

The remainder of this Research Design document describes in detail the study team's plans for qualitative data collection and implementation analysis (Chapter 3), impact study data collection and analysis (Chapter 4), and reporting (Chapter 5).

3. Implementation Study Data Collection and Analysis

The implementation analysis of the Phase 2 evaluation will use a combination of primary and secondary data sources to examine how the treatment group properties implemented the IWISH model during the transition and extension period. The implementation analysis also will compare IWISH to service coordination and wellness programming at properties without IWISH. To analyze the implementation of IWISH, the study team will use qualitative data from interviews, property-level ratings of fidelity to the IWISH model, and HUD administrative data and IWISH program data.

This chapter details the primary and secondary data sources and analytical approaches we will use in the Phase 2 implementation analysis.

3.1 Primary Data Collection by the Study Team

The study team will collect and analyze primary data about IWISH implementation from interviews with IWISH property residents, IWISH wellness staff, and property owners and managers of IWISH and active control group properties. Interviews are planned for 2023 near the end of the extension period.

Interviews with IWISH Property Owners and Managers

Interviews with property owners and managers will provide information to help us respond to several of the Phase 2 research questions. We expect the owner and manager interviews will provide information about changes in IWISH staffing and program implementation that occurred after the end of the initial three-year demonstration period, training and technical assistance provided to the Resident Wellness Directors and Wellness Nurses, and availability and use of demonstration supportive services funding.

The study team plans to conduct telephone interviews with property owners of all 80 treatment group and active control group properties, including properties that did not continue their participation in the demonstration for the IWISH extension. Our purpose in these interviews is to understand owners’ motivation for not continuing their participation in the demonstration and to document the properties’ service coordination staffing and health and wellness programming between October 2020 and September 2023.

Property owner and management representatives could be staff members of either the property owner or property manager organization. The study team will determine the appropriate respondents in consultation with the grantee contact for each property, depending on the organizational structure of the property ownership and management. For the treatment group properties, we will ask to interview the people with the most knowledge of how IWISH is being implemented at their property.

Interviews with owners and managers are expected to take no more than 90 minutes. The proposed interview domains and topics are presented in Exhibit 3-1.

Exhibit 3-1: Phase 2 Property Owner and Manager Interview Domains

Domain	Subdomain	Description
IWISH Staff	Resident Wellness Director (RWD) Role	Perception of usefulness of RWD role
	Wellness Nurse (WN) Role	Perception of usefulness of WN role
	Property Owner and Management Role in IWISH	Role of property owner and management in IWISH implementation; types and frequency of support provided by property management; average amount of time property management staff spends on IWISH implementation weekly; how property management staff interact with RWDs and WNs

Domain	Subdomain	Description
IWISH Activities	Resident Enrollment	Role of property owner and management in enrollment in IWISH; challenges with and facilitators of resident enrollment
	Client Management Software	Role of property owner or management in selection or use of client management software; the extent to which software connects with other software used by property owner or management; challenges and benefits of client management software
IWISH Programming and Partnerships	Health and Wellness Programming	Role of property owner management in health and wellness programming
	Supportive Services Funding	How properties used supportive services funding allocated through demonstration grant; what resident needs were addressed by funding; challenges using funding; how funding allocation decisions were made
	Healthcare Partnerships	Identification of partnerships between properties and healthcare providers and nature of partnership, including formality and description of any data sharing between partners; challenges in developing partnerships; changes made to partnership development process
Enhanced Service Coordination	Healthcare Provider Interaction	Role of property owner and manager in interactions with healthcare providers on behalf of residents
	Transitional Care	Role of property owner and manager in supporting residents around a hospital or other healthcare facility stay; description of formal plans to provide transitional care for residents
	Emergency Situations	Role of property owner and manager in emergency health situations such as when 911 is called or when an ambulance is needed; description of formal plans to provide support for residents in emergency situations
IWISH Staff Training and Support	IWISH Training and Support	Training, technical assistance, and other support provided to RWDs and WNs by the property owner or manager to implement the IWISH model
	Non-IWISH Training and Support	Training, technical assistance, and other support provided to RWDs and WNs by the property owner or manager that is not specific to IWISH
	Unmet Training and Technical Assistance Needs	Perception of owners of training and areas of support needed by staff to implement the IWISH model
IWISH Implementation Changes	Extension Period Changes	Change in how IWISH staff and property owners/managers interact; changes in IWISH programming; change in day-to-day tasks of RWDs and WNs; change in type and duration of needs of residents during extension period
	COVID-19 Changes	Change in how IWISH staff and property owners/managers interact; change in IWISH programming; change in day-to-day tasks of RWDs and WNs; effect of COVID on staff workload and turnover; change in type and duration of needs of residents
Perception of Benefits of IWISH	Benefits to Residents	Perception of benefits to residents of property; specific examples of how IWISH helps enrolled residents to successfully age in place and avoid unnecessary 911 calls, emergency department visits, and hospital and nursing home stays
	Benefits to Property Management	Reported benefits to property management such as less turnover and less unit damage
	Usefulness of IWISH Components	Components of IWISH reported to have had the most and least impact on residents' health and wellness; helpfulness of specific IWISH components in addressing residents' health and wellness

Domain	Subdomain	Description
	IWISH Model Limitations	Reported limitations on the potential impact of the IWISH model on residents' health and wellness and housing tenure
	IWISH Model Recommendations	Recommendations for improvements to the IWISH model
Contextual Characteristics	Staff Characteristics	Perception of how personal characteristics of IWISH staff such as language ability, race, ethnicity, and personal history could affect IWISH implementation
	Resident Characteristics	Perception of how various resident demographic and personal characteristics could affect IWISH implementation; perception of whether all residents had equal access to IWISH programs and activities
	Program Characteristics	Perspectives on whether IWISH programming and activities were convenient and accessible for residents and whether RWDs and WNs made themselves available to residents; staff turnover among RWDs and WNs
	Property Characteristics	Perspectives on the safety and accessibility of their building and property; whether residents had sufficient access to common areas and amenities to help them age in place
	Community Characteristics	Perspectives on neighborhood safety and accessibility; residents' ability to easily access services such as medical appointments, grocery stores, and pharmacies

Interviews with IWISH Wellness Staff

The study team will interview IWISH wellness staff working at all properties participating in the IWISH extension. Our purpose will be to learn about Resident Wellness Directors' and Wellness Nurses' experiences implementing the IWISH program, how the IWISH program has changed through the extension period, and which aspects of the program IWISH staff perceive as the most and least useful. We will conduct some interviews in person during site visits; some we will conduct by telephone.

The study team will analyze responses from interviews with Resident Wellness Directors and Wellness Nurses to respond to research questions about IWISH implementation and changes made during the and extension period, technical assistance, and property owner support for IWISH, perspectives on contextual factors influencing resident engagement and implementation of IWISH, and perception of benefits and usefulness of IWISH.

Interviews with IWISH staff are expected to take no more than 120 minutes each. Exhibit 3-2 presents the proposed interview domains and topics.

Exhibit 3-2: Phase 2 IWISH Staff Interview Domains and Subdomains

Domain	Subdomain	Description
IWISH Staff	Resident Wellness Director (RWD) Role	How RWD spends the day among different activities, circumstances, and frequencies of interactions with residents; perception of usefulness of RWD role; satisfaction of RWD in their position
	Wellness Nurse (WN) Role	How WN spends the day among different activities, circumstances, and frequencies of interactions with residents; perception of usefulness of WN role; satisfaction of WN in their position
Support for IWISH	Property Management Role in IWISH	Role of property management in IWISH implementation; types and frequency of support provided by property management; average amount of time property management staff spends on IWISH implementation weekly

Domain	Subdomain	Description
IWISH Core Components	Resident Outreach and Engagement	Staff experience with conducting outreach to residents to educate them about IWISH; whether properties formally enroll residents into IWISH; methods staff used to conduct outreach to and, if applicable, enroll residents in IWISH; challenges with and successful strategies to engage residents
	Resident Assessment	Staff experience conducting health and wellness assessments with enrolled residents; changes in assessment process or types of assessments or screenings conducted with residents
	Individual Services Plans and Wellness Goals	Staff experience developing IWISH-specific Individual Healthy Aging Plans or individual services plans more generally; experience helping residents set and meet health and wellness goals; changes to plan procedures or components
	Community-Wide Services Plans	Staff experience developing IWISH-specific Community-Wide Healthy Aging Plans or community-wide services plans; changes to plan procedures or components; how staff use summary data of resident characteristics and needs
	Client Management Software	Data collection software used to document results of resident assessments and coordination of services to residents; assessment, communication, and reporting capabilities of client management software used; non-software assessment tools used
IWISH Programming and Partnerships	Health and Wellness Programming	Types and frequencies of health and wellness programming; topics covered; health needs addressed by programs; identification of evidence-based programming; average resident attendance of programs
	Supportive Services funding	How properties used supportive services funding allocated through demonstration grant; what resident needs were addressed by funding; challenges using funding; how funding allocation decisions were made
	Healthcare and Social Services Partnerships	Identification of partnerships between properties and healthcare and social services providers and nature of partnership, including formality and description of any data sharing between partners; challenges in developing partnerships; changes made to partnership development process
Enhanced Service Coordination	Tenancy Support	How RWDs and WNs provide support to residents to help them maintain their tenancy; interactions with property management about residents' tenancy and issues related to residents' ability to age in place
	Healthcare Provider Interaction	How RWDs and WNs interact with healthcare providers on behalf of individual residents; circumstances and frequencies of interactions; types of providers RWDs and WNs interact with the most; methods of interactions
	Transitional Care	How staff support residents around a hospital or other healthcare facility stay; description of formal plans to provide transitional care for residents; frequency and types of transitional care provided by staff
	Emergency Situations	How staff support residents in emergency health situations such as when 911 is called or an ambulance is needed; description of formal plans to provide support for residents in emergency situations

Domain	Subdomain	Description
	Family and Caregiver Interaction	How staff interact with family and caregivers on behalf of individual residents; circumstances and frequencies of interactions; types of providers interacting with most interactions
Training and Technical Assistance	IWISH Training and Support	Training, technical assistance, and other support provided to RWDs and WNs to implement the IWISH model; methods, types, and providers of support; daily supervision of IWISH staff
	Non-IWISH Training and Support	Training, technical assistance, and other support provided to RWDs and WNs that is not specific to IWISH; methods, types, and providers of training and support; continuing education requirements
	Unmet Training and Support Needs	Training and areas of support reported needed by IWISH staff
IWISH Implementation	Extension Period Changes	Change in how IWISH staff interact; change in health and wellness programming; change in day-to-day tasks of RWDs and WNs; change in type and duration of needs of residents since September 2020
	COVID-19 Changes	Change in how IWISH staff interact; change in IWISH programming; change in day-to-day tasks of RWDs and WNs; effect of COVID on staff workload and turnover; change in type and duration of needs of residents
Perception of Benefits of IWISH	Benefits to Enrolled Residents	Perception of benefits for residents from participating in IWISH; specific examples of how IWISH helps enrolled residents to successfully age in place and avoid unnecessary 911 calls, emergency department visits, and hospital and nursing home stays
	Benefits to Property Management	Reported benefits to property management such as less turnover and less unit damage
	Usefulness of IWISH Components	Components of IWISH reported to have the most and least impact on residents' health and wellness; helpfulness of specific IWISH components in addressing residents' health and wellness
	IWISH Model Limitations	Reported limitations on the potential impact of the IWISH model on residents' health and wellness and housing tenure
	IWISH Model Recommendations	Recommendations for improvements to the IWISH model
Contextual Characteristics	Staff Characteristics	Professional background of IWISH staff such as education and previous related work experience; tenure at property and as a RWD, WN, or Service Coordinator; language ability; perception of how their personal characteristics could affect their role or IWISH implementation
	Resident Characteristics	Resident age, preferred language, race/ethnicity, and tenure at the property; extent to which residents have a formal/informal support system and whether they feel part of the community and neighborhood
	Program Characteristics	Staff perspectives on whether IWISH programming and activities were convenient and accessible for residents and whether RWDs and WNs made themselves available to residents; resident perception of staff turnover among RWDs and WNs
	Property Characteristics	Staff perspectives on the safety and accessibility of their building and property and whether residents have sufficient

Domain	Subdomain	Description
		access to common areas and amenities to help them age in place
	Community Characteristics	Staff perspectives on neighborhood safety and accessibility; residents' ability to easily access services such as medical appointments, grocery stores, and pharmacies

Interviews with Residents of IWISH Properties

Residents of IWISH properties are an important data source for the evaluation. The study team will interview residents at 10 IWISH properties to understand residents’ perspectives on having IWISH implemented at their property and their personal engagement in IWISH activities and with IWISH staff, their perception of the benefits of the model, and their perception of changes in their health and well-being from access to IWISH group programming and staff. We will conduct interviews with both residents who participated in IWISH activities and those who did not.

Resident interviews will capture resident perspectives on their experience with specific elements of the IWISH model, including their experience with health and wellness assessments, and which elements of the model were most useful to them. Resident interviews also will be a valuable opportunity to learn from those who did not engage with IWISH staff or participate in IWISH group programming and understand their reasons for not participating.

Additionally, we will use information learned from resident interviews to help us understand the impact of the IWISH model on short-term outcomes (e.g., residents have the support they need to meet their goals) and long-term outcomes (e.g., residents have greater use of primary and non-acute care) and contextual effects such as the building and community characteristics that could influence the effectiveness of the program onsite.

We plan to interview a minimum of 120 residents across 10 treatment group properties, in person during site visits, when possible, otherwise by telephone. If residents are unavailable during the site visit or we do not have staff available to conduct an interview in the residents’ preferred language during the site visit, we will conduct interviews after the site visit via telephone. In-person interviews will be conducted in a private space on the property. All appropriate social distancing and COVID-19 precautions will be taken to ensure the safety of residents and the study team during data collection, should risk of transmission persist through 2023.

The interview guide will be semi-structured to allow interviewers both to capture information about pre-determined research priorities and learn about residents’ experiences in their own words and to allow residents to raise new topics.

Interviews will be conducted in teams of two, with one person leading the interview and the other taking notes. Interviews will be audio recorded with the consent of the resident. Interviews are expected to take 45 to 60 minutes. All residents who participate in interviews will receive a \$40 gift card as a thank you for their time. Exhibit 3-3 presents the proposed interview domains and topics.

Exhibit 3-3: Phase 2 Resident Interview Domains

Domain	Subdomain	Description
IWISH Staff	Resident Experience with Resident Wellness Director (RWD)	Resident experience with RWD, including the kinds of things the RWD helps residents with; whether they feel the RWD understands their goals, concerns, and needs; whether the RWD is readily available to them and able to communicate with them in their preferred language
	Resident Experience with Wellness Nurse (WN)	Resident experience with WN including what kinds of things the WN helps residents with; whether residents feel the WN understands their

Domain	Subdomain	Description
		goals, concerns, and needs; whether the WN is readily available to them and able to communicate with them in their preferred language
IWISH Activities	Resident Outreach and Engagement	How residents learned about IWISH and what they understand about it; reasons why residents did not enroll in IWISH
	Resident Assessment	Participation in the health assessment with the RWDs or WNs; resident experience of the assessment; perception of whether interview and health assessments were done in a person-centered manner aligned with the resident's needs and priorities
	Individual Healthy Aging Plans (IHAPs)	Resident experience and participation in setting health and wellness goals through IHAPs or more generally and working with IWISH staff to meet these goals
Programming and Partnerships	Resident Participation in IWISH Programming	Participation in IWISH group programming including the amount and frequency of participation; variation in participation by programming type and topics; helpfulness and perceived effectiveness of group programming; reasons for not participating in group programming
Enhanced Service Coordination	Resident Experience with Enhanced Service Coordination	How RWDs and WNs have helped residents deal with more serious medical issues, transitional care between an inpatient stay and home, and care coordination among residents' medical providers; extent to which RWDs and WNs coordinate with residents' family members and other caregivers when needed
Perceived Benefits of IWISH	Resident Goals for IWISH Participation	Residents' reasons for participating in IWISH model and what they hoped to get out of participation
	Useful Aspects of IWISH	Resident perspectives on the overall effectiveness of the IWISH model and whether it should be extended or modified, which aspects of the model were most and least effective and why
	Perceived Effect of IWISH Model on Short-Term Outcomes	Resident perspectives on the impact of IWISH model on their ability to age in place successfully and whether they feel they have access to the programming and other supports they need to do so; resident perspectives on behaviors related to health and tenancy they changed because of IWISH
	Effect of IWISH program on Long-Term Outcomes	Resident perspectives on the extent to which IWISH group programming and help they get from the RWDs and WNs have helped them stay at home and avoid unnecessary hospitalizations or nursing home stays recently or in the future; resident perspectives on how IWISH or the property could best support their health
Contextual Characteristics	Resident Characteristics	Resident age, preferred language, race/ethnicity, and tenure at the property; extent to which residents have a formal/informal support system and whether they feel they are part of the community and neighborhood
	Program Characteristics	Whether IWISH programming and activities were convenient and accessible for residents and RWDs and WNs made themselves available to residents; resident perception of staff turnover among RWDs and WNs
	Property Characteristics	Resident perspectives on the safety and accessibility of their building and property and whether they have sufficient access to common areas and amenities to help them age in place
	Community Characteristics	Resident perspectives on neighborhood safety and accessibility; residents' ability to easily access services such as medical appointments, grocery stores, and pharmacies

Conducting Resident Interviews in Multiple Languages

The study team seeks to provide all residents living at the properties selected for resident interviews an opportunity to participate. The study team will conduct interviews in multiple languages. Across all IWISH properties, residents speak approximately 40 different languages. When possible, native speakers on the study team will conduct interviews in languages other than English, including Spanish, Russian, Mandarin, and Tagalog. Other languages may be accommodated through real-time telephone interpretation services provided by a third-party vendor. The study team will also provide residents with disabilities with appropriate and reasonable accommodations to ensure they are able to participate in interviews if interested.

3.2 Secondary Data Sources

The implementation analysis uses secondary data from two HUD data sources: the Standards for Success data system that captures data on all HUD-funded service coordinator programs and annual Quality Assurance (QA) reports submitted by treatment properties to HUD.

HUD Standards for Success Data

The study team will obtain health and wellness data for residents at IWISH and active control group properties through HUD’s SfS data system. We will use much of the data collected through SfS to assess fidelity and changes to the IWISH model during the extension period. The SfS data also could provide insight into how IWISH affects residents’ health and well-being if there are notable changes in resident health and wellness assessment results over time.

We will request from HUD all SfS data submitted by IWISH properties as well as by active and passive control group properties that report data on the extension period (October 2021 through September 2023). We expect there will be at least two extracts of data. The study team will work with HUD’s Office of Multifamily Housing to obtain SfS data for all IWISH and control group properties that submitted data. Exhibit 3-4 shows SfS data fields that we plan to request for each IWISH, active control group, and passive control group property that submitted SfS data to HUD for the Phase 2 evaluation.

Exhibit 3-4: Phase 2 Standards for Success Data for Implementation Analysis

Domain	Subdomains	Data
Resident Characteristics	Demographic Characteristics	<ul style="list-style-type: none"> • Age • Ethnicity • Race
	Services Participation	<ul style="list-style-type: none"> • Services start date • Services end date (if applicable) • Participant status (Participant/Non-participant) • Received services coordination assistance (Yes/No) • Referred for and received medical or healthcare services (Yes/No/NA) • Referred for and received mental health services (Yes/No/NA)
	Services Needs	<ul style="list-style-type: none"> • Activities of daily living (ADLs) • Instrumental activities of daily living (IADLs) • Primary healthcare provider (Yes/No) • Needs Assessment Service • Emergency Room/Hospital Visit code

Quality Assurance Reports Submitted to HUD

The study team will review and analyze data from IWISH Quality Assurance Reports for all IWISH properties implementing IWISH during the extension period. As part of their grant agreement for the IWISH extension period, IWISH properties are required to complete regular QA Reports to HUD that provide updates on IWISH program implementation at their properties. We understand there is not a standard format for the QA, but that the QA Reports are expected to include information on IWISH staffing, partnerships with healthcare entities, health and wellness programming, and use of supportive services funding. The reports are expected to provide supplemental information for the research questions on implementation and fidelity to the IWISH model.

Exhibit 3-5 presents the data elements that the study team will collect, if available, from the QA Reports for use in the Phase 2 implementation analysis.

Exhibit 3-5: Phase 2 IWISH Quality Assurance Report Data for Implementation Analysis

Domain	Data
IWISH Staffing	<ul style="list-style-type: none"> • Whether Resident Wellness Director and Wellness Nurse staffing is through a contractor or direct hire • Qualifications of the Wellness Nurse • Documentation of any gaps in Resident Wellness Director or Wellness Nurse staffing
Technical Assistance	<ul style="list-style-type: none"> • Training and technical assistance provided to Resident Wellness Director and Wellness Nurse • Training and technical assistance providers • Frequency and extent of support • Formal training topic areas offered
Programming and Partnerships	<ul style="list-style-type: none"> • Social and healthcare partnerships developed in the community • Evidence-based programming offered to residents
Use of Demonstration Services Funding	<ul style="list-style-type: none"> • How demonstration supportive services funds were used

3.3 Implementation Analysis Approach

The analysis of interview responses will be largely qualitative, identifying and describing themes from the interviews about owner, staff, and resident experiences. The analysis also will use data from SfS and IWISH QA Reports to systematically document IWISH activities across treatment properties and to compare service coordination between the IWISH and control group properties. We will use both interview and program data to measure IWISH properties’ fidelity to the IWISH model during the extension period.

Analysis of Interview Responses

The study team will analyze notes and transcriptions of interviews conducted with residents, IWISH staff, and property owners and managers. Resident interviews conducted in languages other than English will be first transcribed in the language of the interview then translated into English for coding and analysis.

We will use the qualitative software NVivo to analyze the interview data collected. For continuity, the study team will continue to use the qualitative codebook from the Phase 1 evaluation, with some additions to accommodate the new, Phase 2 research questions. The coding structure is based on IWISH program model components, study research questions, and other themes identified during data collection from the Phase 1 evaluation.

The study team will analyze results within each theme and query the interview data to identify program implementation best practices/successes and challenges encountered and perceived program benefits. We will add new codes to capture themes unique to the extension period, changes to the IWISH program or service coordination, and IWISH programming costs and funding. Throughout coding, the study team will hold regular check-in meetings to discuss emergent themes and data quality.

In addition, immediately following each telephone or site visit interview, the interviewers will create summaries of each interview that identify key information such as the respondents interviewed, the date of the interview(s), and identification of notable IWISH program challenges or specific examples of how IWISH benefitted residents. We will use the summary information to identify early themes and to provide updates to HUD on implementation progress prior to the final Comprehensive Report in 2026.

Analysis of HUD IWISH Program Data

The study team will obtain and clean resident assessment data from SfS and from IWISH program data from IWISH QA Reports. We will record relevant data into a study database with other IWISH site information such as summary property and resident characteristics and fidelity ratings from the Phase 2 evaluation.

Revisiting Fidelity Ratings to Assess Changes in IWISH Implementation

For the Phase 1 Evaluation of the initial demonstration period, the study team developed a fidelity rating to measure the extent to which IWISH properties were staffed and implemented all core components of the IWISH model. For consistency, we will continue to use the Phase 1 fidelity rating structure to assess any changes in IWISH program implementation, to the extent possible. For the IWISH extension period, we will update the Phase 1 fidelity ratings for each IWISH site.

We will assess treatment group properties' fidelity to implementing the core components of the IWISH model for two time periods:

- **The IWISH extension period, including the one-year gap between demonstration periods (October 1, 2020–September 30, 2023).** At the end of the two-year IWISH extension in September 2023, we will update the fidelity measures that rely on qualitative data from the interviews and that reflect the status of the implementation as of the date of the qualitative data collection (planned for Summer 2023).
- **Full six-year IWISH demonstration period (October 1, 2017–September 30, 2023).** Using the fidelity ratings determined for the initial three-year demonstration period and for the extension period, we will develop fidelity ratings for all IWISH properties for the full six-year IWISH demonstration period.

4. Impact Study Data Collection and Analysis

The impact analysis for the Supportive Services Demonstration examines the impact of the IWISH model on housing tenure, transfer to long-term care facilities, and healthcare utilization as residents age. Outcomes are measured using HUD administrative data on housing and residents, linked to Medicare and Medicaid data on healthcare utilization and spending.

For the Phase 2 evaluation, the study team will evaluate the impacts of IWISH during the full six-year demonstration period by replicating the research design and statistical analysis plans for the impact study conducted for the initial three-year demonstration period.

The IWISH evaluation combines residents of the active and passive control group properties into one pooled control group for the impact analysis. The *First Interim Report* shows that the resident characteristics were balanced across the treatment group and control groups when the demonstration started (Turnham et al., 2019). As a result, the impact of IWISH can be estimated as the difference between the average outcomes among residents of IWISH properties and the average outcomes among residents of control group properties. We use multivariable regression to control for variation in resident and property characteristics and improve the precision of our impact estimates.

The main set of analyses for the Phase 2 impact analysis will focus on the cumulative impact of IWISH on housing tenure, transfer to long-term care facilities, and healthcare utilization over the full six-year demonstration period. However, we also will examine the impact of IWISH each year to see whether the relationship between IWISH and the outcome measures vary by year. For the Comprehensive Report (expected in 2026), the Phase 2 evaluation will estimate IWISH's yearly and cumulative impacts during:

- The initial three years of the IWISH demonstration, October 1, 2017–September 30, 2020.
- The extension period, October 1, 2021–September 30, 2023.
- The full demonstration period, October 1, 2017–September 30, 2023.

Our main analysis will maintain the integrity of the cluster-randomized design of the Phase 1 evaluation by using the treatment group and control group properties originally randomized. Our main analysis will include those residents who were already living in the treatment group and control group properties in September 2017 and those who moved in after September 2017 but before October 1, 2018 (i.e., the initial cohort), which is important because it could take more than three years for changes in the outcome measures to emerge. We also will conduct supplemental analyses to explore the effects of the IWISH model when we include additional residents who moved into the properties after September 2018.

Section 4.1 outlines the key research questions for the impact analysis, outcomes of interest, and outcome measures. Sections 4.2 and 4.3 provide details on the data sources, the methodology we will use to estimate impacts, and potential limitations of the analysis. Section 4.4 discusses two design options for HUD to consider that have budget implications but could strengthen our confidence in the results of the impact analysis.

4.1 Research Questions, Outcomes, and Measures

The primary research questions for the impact analysis remain the same since the evaluation began:

- 1) What is the impact of IWISH on housing exits and housing tenure?
- 2) What is the impact of IWISH on transitions to long-term institutional care?
- 3) What is the impact of IWISH on utilization of Medicare- and Medicaid-covered primary care and other non-acute healthcare services?

- 4) What is the impact of IWISH on utilization of Medicare- and Medicaid-covered unplanned hospitalizations and other acute care?

IWISH aims to identify residents' unmet needs and connect them to appropriate healthcare and social services in the community, such as primary care, home and community-based services, or specialty care services. The overarching goal of IWISH is to promote aging in place for residents of HUD-assisted properties, especially by delaying transfers to a nursing facility or other institution for long-term care. Long-term care is costly and, like transfers to acute-care settings, can have negative consequences for the well-being of an older adult.

Any impact of IWISH on housing tenure and transitions to long-term care also could be associated with other important outcomes such as unplanned hospital admissions, emergency department visits, or the use of ambulance services. Unplanned acute-care hospital admissions are a major cost driver for the Medicare and Medicaid programs, especially among dual-eligible beneficiaries (Erdem, 2013; MedPAC, 2016; Komisar and Feder, 2011). Transfers of elderly or disabled people to acute care settings can increase stress and the risk of infection, medical errors, or other trauma or complications. Studies have shown that a substantial portion of hospital admissions and related expenditures are avoidable or preventable (De Brantes et al., 2010; Segal et al., 2014). Furthermore, utilization of other types of unplanned acute care services such as emergency department visits and ambulance trips are likely to occur more frequently than hospital admissions.

Confirmatory and Secondary Outcome Measures

The primary research questions for the impact analysis will be evaluated using 14 outcome measures derived from the data collected for this evaluation.

We specified five “confirmatory” outcome measures for drawing conclusions about IWISH’s impact, based on their relative importance in assessing the extent to which the goals of IWISH are met. In addition to the confirmatory outcomes, we also selected “secondary” outcomes. Secondary outcomes are additional indicators tied to the logic of how the IWISH model is expected to influence outcomes. We will include both confirmatory and secondary measures in the Phase 2 impact analyses of the evaluation of the IWISH demonstration.

Exhibit 4-1 shows the full set of confirmatory and secondary outcome measures to be analyzed for each research question, indicating the main data sources used to create each measure.

If we find an impact on any of the confirmatory measures, we will have strong evidence that IWISH is meeting its goals. If we do not find an impact on the confirmatory outcome but find an impact on one or more of the secondary outcomes—for example, decreases in ambulance trips and all-cause emergency department visits—then we will be able to draw some inferences about the potential of IWISH to reduce utilization of acute care but will be less confident in our conclusions about IWISH’s overall impact.

Exhibit 4-1: Phase 2 Impact Study Research Questions, Outcomes, and Data

Outcome Measure ^a	Data															
	Medicare Fee-for-Service				Medicare Advantage				Medicaid				Other			
	Medicare Inpatient	Medicare Outpatient	Medicare Carrier	Other Medicare Files ^b	Inpatient Encounters	Outpatient Encounters	Carrier Encounters	Other Encounter Files ^c	Inpatient Hospital	Other Services	Long-Term Care	Prescription Drug	Demographics & Eligibility	Medicare Summary File	Minimum Data Set ^d	HUD TRACS Data
RQ. What is the impact of IWISH on housing exits and housing tenure?																
● Residency ended, for any reason				✓				✓			✓			✓	✓	✓
RQ. What is the impact of IWISH on transitions to long-term institutional care?																
● Residency ended, transition to long-term care				✓				✓			✓				✓	✓
Days admitted to a long-term care facility				✓				✓			✓				✓	
RQ. What is the impact of IWISH on utilization of Medicare- and Medicaid-covered primary care and other non-acute healthcare services?																
● Number of days with a primary care visit			✓	✓				✓	✓		✓					
Use of home and community-based services										✓	✓		✓			
New use of specialty care services		✓	✓			✓	✓			✓						
RQ. What is the impact of IWISH on utilization of Medicare- and Medicaid-covered unplanned hospitalizations and other acute care?																
● Total days of unplanned hospitalization	✓				✓				✓							
Unplanned hospital admissions	✓				✓				✓							
Unplanned hospital readmissions within 30 days of previous hospital discharge	✓				✓				✓							
All-cause emergency department visits not resulting in hospital admission	✓	✓	✓		✓	✓	✓		✓	✓						
Ambulance events		✓	✓			✓	✓			✓						
Cross-cutting outcome measures																
Days in the community	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Total fee-for-service medical and drug costs	✓	✓	✓	✓					✓	✓	✓	✓				
Mortality													✓	✓	✓	✓

● = confirmatory outcome

^a All of the utilization measures (such as days of unplanned admissions and hospital readmissions) will be specified as the number of days or events per resident per 1,000 resident months, to accommodate longitudinal analysis and because we expect some loss of the sample due to resident turnover and mortality.

^b Includes Home Health, Hospice, Skilled Nursing Facility, Durable Medical Equipment, and Part D event data.

^c Include Home Health, Skilled Nursing Facility, and Durable Medical Equipment records.

^d The Minimum Data Set is a federal database of clinical/functional assessments of patients residing in Medicare- and Medicaid-certified nursing or skilled nursing facilities.

Cross-Cutting Measures

The study team identified three outcome measures that span multiple research questions. Findings based on these “cross-cutting” measures will support the findings related to more than one confirmatory measure. These measures are shown in Exhibit 4-1, and all will be analyzed as secondary outcome measures.

The first measure is *days in the community*, defined as the number of days that residents were not staying in an institution for long-term care, were not admitted to a facility for planned or unplanned inpatient care, and did not have an outpatient emergency department visit or observation stay. An increase in the number of days in the community means there was a decrease in the number of days a resident needed acute care or was admitted to a long-term care facility.

The second is *total fee-for-service medical and drug costs*, a measure of total healthcare costs for residents enrolled in Medicare or Medicaid FFS plans. A short-term increase in the use of non-acute healthcare services and a longer-term decrease in the use of acute care services will likely be associated with a short-term increase and longer-term decrease in total spending on medical and pharmacy services. Total medical and pharmacy costs will be measured as the combined amount of Medicare and Medicaid FFS spending for all residents.

The third cross-cutting measure is *mortality*. The evaluation has always intended to investigate IWISH’s impact on mortality rates. For Phase 1 of the evaluation, we designated mortality as a secondary outcome rather than a primary outcome because we believed it was unlikely to detect impacts on mortality within Phase 1’s three-year study period. The IWISH extension extends the study period to six years, which we believe could be sufficient time to detect an impact in the Phase 2 evaluation. The evaluation team does not hypothesize as to how the IWISH model may affect residents’ average mortality rates. Structured health and wellness support could lead to improved health and well-being that results in some residents living longer. Conversely, the goal of the IWISH model is to help residents to age in place at their property. If IWISH is successful in prolonging resident tenure and delaying transitions to long-term care, more residents would remain at their properties until they die.

Multiple Comparisons

Evaluating the impact of an intervention on several outcomes introduces an issue commonly referred to as the “multiple testing problem.” The likelihood that some outcomes will have statistically significant estimated impacts only by chance increases with the number of hypotheses tested. For this reason, we have classified the level of evidence by choosing and pre-specifying a single confirmatory measure within a given outcome domain. Outcomes that are designated as secondary or exploratory are also limited in number and we will use them to help interpret the results on confirmatory outcomes, exercising caution in over-interpreting or placing undue emphasis of findings for those non-confirmatory outcomes.

To avoid the appearance of reporting results for outcomes that support claims of IWISH’s success, the study team pre-specified the primary outcomes before data collection and analysis began for the Phase 1 evaluation, and we follow those decisions into Phase 2.

4.2 Data Sources and Collection

The impact study will use several quantitative data sources to determine the impacts of IWISH on healthcare utilization and housing tenure during the initial and extension periods. Like the impact analysis conducted for the Phase 1 evaluation, the impact analysis for Phase 2 will link individual-level HUD TRACS data with Medicare and Medicaid claims and managed care encounter data on the residents of all treatment group and control group properties. However, rather than collecting Medicare and Medicaid data from disparate sources (i.e., the Research Data Assistance Center and seven state Medicaid agencies), as we did for the Phase 1 evaluation, we will gain access to these data through the CCW. The

CCW will provide us with timely access to Medicaid data that is standardized across all U.S. states, through the Transformed Medicaid Statistical Information System (T-MSIS). CCW also will provide us with timely access to complete Medicare managed care encounter data, which we were unable to obtain from the Research Data Assistance Center in time for the Phase 1 evaluation.

To measure the impacts of IWISH, the Phase 2 impact analysis will use the following data sources, which are described in detail below:

- HUD TRACS Administrative Data
- CMS Medicare and Medicaid Data
 - Medicare Claims Data
 - Minimum Data Set 3.0 (MDS)
 - Master Beneficiary Summary Files
 - Medicaid (T-MSIS) Data
- Community Characteristics Public Use data

HUD TRACS Administrative Data

HUD’s Tenant Rental Assistance Certification System is the main system that HUD uses to collect and store data on the individuals and families living in HUD multifamily housing. TRACS contains data for anyone who resides in properties with rental assistance from HUD’s multifamily programs. These data include demographics such as age; race/ethnicity; number of household members; household income and assets; and household-level transactions such as move-ins, annual reexaminations, and exits. HUD’s Office of Policy Development and Research maintains quarterly extracts of individual-level and household-level TRACS data that include the latest available transaction for every person served in HUD’s multifamily programs over the previous 18 months.

The study will use TRACS data to describe key demographic characteristics of residents of all 124 treatment, active control, and passive control group properties (Exhibit 4-2). HUD TRACS data are the main source for the personal identifying information that we will need to identify the residents in the CCW databases, and they are the study’s primary source for measuring rates of exits from housing. The data also will be used to describe the characteristics of IWISH and control group residents that might be associated with healthcare utilization or exits from housing, such as demographics, tenure in the property, and household composition and size.

Exhibit 4-2: Phase 2 HUD Administrative Data Measures

Domain	Subdomain	Data
Resident Characteristics	Individual Demographics	<ul style="list-style-type: none"> • Date of birth • Gender • Race/ethnicity • Disability status • Relationship to head of household • Date of project move-in • Date of project exit (if applicable)
Resident Characteristics	Household Demographics	<ul style="list-style-type: none"> • Household size (family and non-family members) • Number of dependents in household • Annual household income • Income sources

Domain	Subdomain	Data
		<ul style="list-style-type: none"> • Total tenant payment/Rent burden • Months since move-in

For Phase 1 of the evaluation, Abt Associates established a data use agreement (DUA) with HUD to obtain TRACS data for all residents of all properties in the treatment, active control, and passive control groups at four points in time: October/November 2018, January 2019, July/August 2020, and October 2020. For Phase 2, we will update the DUA with HUD and request a final extract of the TRACS data sometime around January 1, 2024, which will include data through September 30, 2023. These data will allow us to identify changes in the characteristics of IWISH residents over time and to capture housing exits through the end of the demonstration’s extension period.

CMS Medicare and Medicaid Data

Medicaid and Medicare data will be accessed and analyzed within the CCW which houses all the data made available by CMS to researchers. Once we establish a DUA with CMS, Abt can immediately access the approved data through a virtual desktop. The CCW provides an efficient online portal for amending DUAs to receive additional types or years of data files not previously requested, should the need arise over the course of a project.

CMS and the CCW prohibit personal identifying information or personal health information from being transferred off the CCW (except with explicit permission), so all quantitative analyses involving Medicare and T-MSIS data will be conducted in the CCW. The CCW allows users to upload external files for use in their analyses, so we will use the CCW’s secure file transfer system to upload finder files or analytic datasets derived from TRACS data to link to the Medicare and Medicaid data for analysis. Abt and HUD will execute a DUA to cover this data transfer and use.

We anticipate that the CCW will have released all data that we expect to use for the final year of the extension period (2023) by no later than December 2024, with the complete and final versions of the files made available no later than September 2025.

Medicare Claims Data

Claims-level data include Research Identifiable Files (RIF), which contain FFS claims for institutional (Part A) and non-institutional (Part B) providers, and managed care (Part C) encounter data. Claims include beneficiary identifiers, providers of service identifiers, dates of service, diagnosis codes, procedure codes, and reimbursement amounts. RIFs are organized by type of claim and include records on Inpatient, Outpatient, Physician/Supplier, Skilled Nursing Facility, Home Health, Hospice, and Durable Medical Equipment cost and use. Encounter records are identical to claims except that they do not contain data regarding managed care payments to providers, because the information is proprietary and protected. RIFs also contain drug event records for all Medicare Part D beneficiaries. This file contains drug identifiers, quantities dispensed, dispense dates, and reimbursement amounts for all drugs dispensed outside of an inpatient or outpatient setting and covered by a beneficiary’s prescription drug plan.

CMS permits the release of unredacted RIFs that include managed care payments only to CMS employees or its contractors. The claims and drug event records will serve as the primary source of data for constructing measures of healthcare service use and spending. Almost all low-income elderly residents of IWISH and control group properties either are eligible for Medicare only or are dually eligible for both Medicare and Medicaid coverage. Even for dual-eligible beneficiaries, Medicare is the primary payer for healthcare services. Medicaid pays for specific services not covered by Medicare (e.g., long-term care) and sometimes covers the cost of premiums, deductibles, co-pays, or co-insurance (benefits vary across states).

Minimum Data Set 3.0 (MDS)

We also will obtain the Minimum Data Set 3.0 (MDS) as part of the RIFs we collect. The MDS is a standardized tool for screening and assessment of health status for all admitted residents of nursing facilities certified to participate in Medicare or Medicaid, regardless of payer. It contains a comprehensive set of items that measure physical, clinical, cognitive, and psychological status. These data will be primarily used to identify residents' admissions to a nursing home for long-term care regardless of whether they are covered by Medicare or Medicaid when they were admitted.³

Master Beneficiary Summary Files

Summary data are contained in the Master Beneficiary Summary File, which includes the following “segments”:

- The **Base A/B/D** segment contains data on Medicare beneficiaries' past and current enrollment status in Parts A, B, and D; dual eligibility status; reasons for entitlement (e.g., disability and end-stage renal disease, in addition to age 65 and older); and receipt of low-income subsidies through Medicaid. The Base A/B/D segment also includes demographic characteristics of beneficiaries (e.g., date of birth, gender, race, and date of death).
- The **Chronic Condition** segment provides beneficiary-level flags for 27 common and chronic conditions in the Medicare and Medicaid populations, including acute myocardial infarction, atrial fibrillation, chronic kidney disease, chronic obstructive pulmonary disorder, depression, diabetes, heart failure, hip/pelvic fracture, rheumatoid/osteoarthritis, stroke/transient ischemic attack, and selected types of cancer.
- The **Other Chronic or Potentially Disabling Conditions** segment contains beneficiary-level flags for 9 mental health and tobacco use conditions, 15 developmental disorder and disability-related conditions, and 9 other chronic physical and behavioral health conditions. CMS developed them specifically to enhance research on the Medicare-Medicaid dually enrolled population.
- The **Cost and Use** segment compiles institutional and non-institutional claims records to calculate summary measures of utilization and expenditures, aggregated by calendar year, for each beneficiary.

Information on enrollment status in the Base A/B/D segment will be important for identifying whether residents should be included in analyses that focus on Medicare utilization and spending or excluded because of gaps in Medicare FFS enrollment and therefore gaps in data on utilization and cost during the baseline and demonstration periods. The Base A/B/D segment also will be the primary source of information on dates of death in analyses of mortality. All other information provided in the Master Beneficiary Summary File will be used primarily for descriptive analyses of baseline characteristics or to construct baseline covariates included in multivariable analyses.

Medicaid (T-MSIS) Data

T-MSIS Analytic Files provide longitudinal, beneficiary-level data on Medicaid eligibility, claims, and encounters. These data include the same beneficiary-level information as the Medicare claims and

³ Medicare does not cover long-term care services. Medicare does cover skilled nursing facility (SNF) stays for rehabilitation after a hospital stay of three or more days. The SNF stay is fully covered for up to 20 days and partly covered for days 21 through 100. Medicare covered stays in a SNF for post-acute care can be identified using the MDS or SNF claims, therefore we plan to use only the MDS to identify all transfers to a nursing facility for long-term care. The MDS does not indicate whether admission to the facility is for post-acute care or long-term care, so we will assume that any MDS admission assessment not preceded by a Medicare claim or Medicaid claim or encounter record for an inpatient hospital stay is for long-term care and not short-term post-acute care.

encounter data discussed above. The format of these data is standardized across every state, making it easy to harmonize the outcome measures related to healthcare costs and utilization across states, as well as between Medicare and Medicaid beneficiaries.

Medicaid data will serve as the primary source of data on healthcare service use and spending for residents eligible for Medicaid only (i.e., younger than age 65 and not qualified for disability or end-stage renal disease insurance). It will supplement Medicare claims data for dual-eligible beneficiaries since Medicare would be the primary payer for most healthcare services.

Community Characteristics Public Use Data

To contextualize the results of the impact study, we will use various publicly available datasets to characterize the neighborhoods and healthcare markets of treatment and control group properties.

The public use datasets we plan to use in the study overall are as follows:

- **CMS Geographic Variation Public Use File.**⁴ This dataset is based primarily on Medicare FFS claims and enrollment data. The current file (updated March 2021) covers calendar years 2007-2019 and has information on demographics, socioeconomic status, spending, and service utilization for beneficiaries by state, county, and Hospital Referral Region. It also incorporates a variety of quality indicators that can be used to analyze relationships between utilization and quality of care offered in the region.
- **Area Health Resource File (AHRF).**⁵ The AHRF was developed by the U.S. Health Resources and Services Administration and includes county, state, and national-level data to characterize the population, healthcare professions, and health facilities across regions, as well as hospital utilization and expenditures and other characteristics of the region's environment. Data are collected and classified based on fiscal year of publication. The current file (publication year 2020-2021) draws from the AMA Physician Masterfile 2019 and the Census County Population Estimates 2020.
- **Distressed Communities Index (DCI).**⁶ The DCI, developed by the Economics Innovation Group using Census Bureau data, examines the spatial distribution of economic well-being across the United States. It combines seven metrics into an index that characterizes the relative economic well-being of a community, which can be defined by ZIP code, city, county, and congressional district. Communities also can be grouped using the index: prosperous, comfortable, mid-tier, at risk, and distressed. The index has been updated most recently to reflect data for years 2014-2018.
- **American Community Survey (ACS).**⁷ Compiled by the U.S. Census Bureau, the ACS provides data on community characteristics (e.g., race, ethnicity, poverty rate, homeownership rate) at the census tract level (and other levels of geography).
- **AARP Livability Index.**⁸ Developed and maintained by AARP (formerly the American Association of Retired Persons), the Livability Index is a web-based tool geared towards older adults that measures community livability based on a weighted average of several components: housing, neighborhood, transportation, environment, health, engagement, and opportunity. The tool also offers

⁴ The CMS Geographic Variation Public Use File is available at: <https://data.cms.gov/summary-statistics-on-use-and-payments/medicare-geographic-comparisons/medicare-advantage-geographic-variation-national-state>

⁵ AHRF data is available at <https://datawarehouse.hrsa.gov/topics/ahrf.aspx>.

⁶ The Distressed Community Index is available at <http://eig.org/dci>.

⁷ ACS data is available at <https://www.census.gov/programs-surveys/acs/data/experimental-data/1-year.html>.

⁸ The AARP Livability Index is available at <https://livabilityindex.aarp.org>.

several independent and composite measures that are used in the Index—e.g., quality of healthcare, access to healthcare and exercise opportunities, prevalence of smoking and obesity, water and air quality, transportation options, proximity to grocers, crime rates, and housing affordability. The components of the Livability Index that will be used for the Phase 2 evaluation are transportation, health, and neighborhood components, cumulative scores which are inclusive of the individual variables listed in Exhibit 4-3.

Exhibit 4-3: Transportation, Health, and Neighborhood Components of AARP Livability Index

Transportation	Health	Neighborhood
<ul style="list-style-type: none"> • Frequency of local transit service • Americans with Disabilities Act–accessible stations and vehicles • Walk trips • Congestion • Household transportation costs • Speed limits • Crash rate 	<ul style="list-style-type: none"> • Smoking prevalence • Obesity prevalence • Access to exercise opportunities • Healthcare professional shortage areas • Preventable hospitalization rate • Patient satisfaction 	<ul style="list-style-type: none"> • Access to grocery stores and farmers' markets • Access to parks • Access to libraries • Access to jobs by transit • Access to jobs by auto • Diversity of destinations • Active density • Crime rate • Vacancy rate

Linking Datasets

We will use TRACS data to update the finder file that we created for the Phase 1 evaluation. These updates will add entry dates and demographic information for all residents of the IWISH control group properties during the initial demonstration period, gap year, and extension period, and exit dates for residents who moved out of the properties. A unique, permanent Abt Study ID has been assigned to every resident in the study population and included in the finder file. The finder file will be provided to the CMS employees or contractors at the CCW to match the residents to Medicare and Medicaid beneficiaries' enrollment, claims, and encounter data based on the personal identifying information.

We will request that CMS match the finder file to its data using Social Security number only, which provides the least restrictive match. If there is a match based on that number but another identifier, such as name, date of birth, or gender, does not match, we will flag the record for further analysis. We will instruct CMS to destroy the personal identifying information once the residents have been matched to Medicare and Medicaid beneficiaries, leaving only the Abt Study ID to be used to link the HUD TRACS data to the Medicare and Medicaid data at the individual level and over time.

After receiving the finder file back from CMS, we will run further tests to analyze the partial matches and determine how the match rates change when we apply restrictions such as date of birth and gender. If there is a substantial difference in the match rate between the Social Security number–only approach and a more restrictive approach, we will analyze the data to see whether we can identify any systematic discrepancies and work with HUD to determine which match criteria to use for the impact analysis dataset.

4.3 Impact Analysis Approach

Our approach to estimate the impact of IWISH on resident outcomes in Phase 2 is consistent with the methodology detailed in the *Research Design and Analysis Plan for Impact Study* produced and approved for the Phase 1 evaluation (see Office of Policy Development and Research, 2021). We will retain the integrity of the cluster-randomized design of that evaluation, using the same cohort of residents at the IWISH and control group properties to estimate the impact of IWISH on resident outcomes over the full six-year demonstration period.

The main set of analyses for the impact study will focus on the cumulative impact of IWISH on housing tenure and healthcare utilization over that period. We also will conduct analyses that examine the impact of IWISH across the initial three-year demonstration period, the one-year gap, and the two-year extension period. We will add analyses that explore the effects of the IWISH model on residents who moved into the properties after September 2018.

The impact study will include two types of analyses to examine the overall impact of the IWISH model:

- **Intent-to-treat**, which will estimate the impact of *offering* housing-based wellness programming and supports under the IWISH model (i.e., everyone residing at the IWISH property). The impact of the IWISH model will be estimated as the difference between the average outcomes among residents of IWISH properties and the average outcomes among residents of control group properties.
- **Treatment-on-the-treated**, which will estimate the impact of *enrolling* in the IWISH model during the initial three-year demonstration period. This analysis is limited to residents who enrolled during the initial three years of the demonstration—because during the extension period, treatment group properties are not required to formally enroll residents into IWISH, and we will not have access to the enrollment data from properties that do continue to formally enroll residents after the initial demonstration period. Essentially, the treatment-on-the-treated estimates are the intent-to-treat estimates weighted by the proportion of IWISH residents who ever enrolled in IWISH.

We also will conduct analyses to examine non-linear trends in the cumulative effect of IWISH on healthcare utilization and costs during the demonstration; the impact of IWISH on subgroups of residents based on demographic and other baseline characteristics such as length of tenure in the property at the time of enrollment; and the extent to which sample attrition due to deaths and housing exits might bias the estimated impact of IWISH on utilization and costs. (See the subsection *Experimental Sample: People and Properties that Exit the Demonstration*, below.)

Experimental Sample

Residents of IWISH and Control Properties at the Start of the Demonstration

An advantage to *cluster*-randomized designs is that they provide an unbiased estimate of a program’s impact when individual-level randomization within groups would be impractical, unethical, or even impossible. Moreover, cluster-randomized designs are more valid than an individual-level randomized design when spillover effects are likely. In the case of IWISH, it is impossible to prevent residents within a property from being exposed to the intervention, because the intervention takes place at the property (“cluster”) level. Therefore, individuals within a property cannot be randomized into or out of treatment—they must *all* be randomized into or out of treatment. Residents who do not enroll in the program still might benefit from the enhanced service coordination, the presence of a nurse on the property, and the programming focused on wellness.

Because of the cluster-randomized design, we expect the measured baseline characteristics of the IWISH and control group properties and residents to have no systematic differences. As reported in the *First Interim Report*, we used a variety of statistical tests to determine that the distributions of baseline characteristics are indeed similar between the residents of the IWISH and control group properties (see Turnham et al., 2019).

We also found that the baseline resident characteristics still were similar between the IWISH and control groups, whether they were residents at baseline or whether they moved in on or before September 30, 2018. So, for the Phase 1 evaluation, we defined the experimental sample to include all residents in an IWISH or control group property at the launch of the demonstration (October 1, 2017) and those who moved in between October 1, 2017, and September 30, 2018.

People Who Moved into SSD Properties after September 30, 2018

We will conduct supplemental analyses to explore the effects of the IWISH Model on residents who moved into the properties after September 30, 2018:

- Residents who moved into treatment and control group properties between October 1, 2018, and when the initial demonstration ended on September 30, 2020.
- Residents who moved in during the gap year, October 1, 2020, to September 30, 2021, before the IWISH extension began.

The first group of additional residents facilitates analysis of the impacts of IWISH on residents not included in Phase 1 of the evaluation because they moved into IWISH properties after the demonstration began, allowing us to explore the impact of IWISH on residents who lived at the property only while IWISH was being implemented. The second group of additional residents allows to distinguish the effects of the IWISH model on residents who moved into the property during the gap year, while some but not all properties were still carrying out the IWISH model.

After pooling these two additional resident populations with the residents of the IWISH and control group properties considered in Phase 1, we will examine whether the characteristics of residents are still balanced across the treatment and control groups:

- If the resident characteristics appear imbalanced, then we cannot assume that the types of residents who exited or entered the properties during the initial demonstration or gap year were randomly sorted between IWISH and control group properties. We would need to analyze the new residents separate from the Phase 1 cohort of residents to achieve unbiased estimates of the impact of IWISH on resident outcomes.
- If the resident characteristics appear balanced, then the larger, pooled IWISH and control groups increase the statistical power of the impact analysis—that is, its ability to measure statistically significant effects of the IWISH model on residents' outcomes.

We define the baseline dates for these additional residents as the date they moved in and measure their outcomes between that date and the remainder of the initial demonstration period, the gap year, and the extension period. The baseline for the Phase 1 cohort will remain as October 1, 2017.

People and Properties That Exit the Demonstration

Consistent with our approach to estimate the impact of IWISH on resident outcomes in the Phase 1 evaluation, our main approach in the Phase 2 evaluation will follow residents' healthcare utilization only while they remain a resident at an IWISH or control group property. We hypothesize that the six core components of the IWISH model and enhanced service coordination focused on residents' health and well-being will both facilitate behavior change and access to better coordinated health care. While behavioral change might persist among former residents of IWISH properties, they would not continue to benefit from coordinated health care that can be fully attributed to the IWISH model. Following resident outcomes after they exit an IWISH property would obscure the cumulative effect of IWISH on residents' healthcare utilization rates.

The impact analysis for the Phase 2 evaluation will compare outcomes for the 40 IWISH properties versus 84 control group properties. Here we describe how we will handle the treatment properties that did not opt to continue in the Phase 2 implementation of IWISH in the impact analysis, and the implications for which control properties will be part of the Phase 2 analysis.

Four properties in the IWISH group (both properties in South Carolina, one property in California, and one in Michigan) opted not to continue in the demonstration's extension. For the same reasons that we do

not follow the healthcare utilization of residents who exit an IWISH or control property, the Phase 2 impact study will also stop following (or “censor”) all data on outcomes of individuals residing at these four treatment properties.

Our decision regarding the related control properties depends on the specific location under consideration as follows:

- *South Carolina.* Because none of the (two) treatment properties in South Carolina continued into the extension, we will also discontinue analysis of residents at all the (three) control group properties in that state.
- *California and Michigan.* One of the 15 IWISH properties in California and one of the seven IWISH properties in Michigan opted to not participate in the demonstration’s extension. As a result, we will retain all or some of the control properties—and the residents in those properties—in those two states. As a sensitivity test, we will also examine the balance of residents’ characteristics between the included California and Michigan treatment and control properties. In the case that the change in sample results in some imbalance, then we will explore two approaches to maintain the integrity of the experimental sample:
 - Weight the treatment and control groups to adjust for the probability of sample inclusion conditional on resident characteristics.⁹
 - Use an iterative process to drop the residents of one or more control group properties in California and/or Michigan and test for balanced resident characteristics after each iteration. If we determine that balance can be achieved after removing certain control properties in either of these two states, then we will also exclude the residents of those select properties for the Phase 2 impact analysis.

The results of impact analyses using alternative approaches will be shared in a report appendix along with any other sensitivity analyses (as we did in the Phase 1 evaluation report).¹⁰

⁹ In the Phase 1 evaluation, we used a straightforward approach proposed by Hayden et al (2005) to examine the extent to which sample attrition due to mortality of housing exits may have biased the estimated impact of IWISH on healthcare utilization. We will use the same approach to adjust for the probability of censoring due to being a resident of the opt-out properties. This approach makes use of baseline characteristics of the residents to weight observations by the likelihood the person would have survived or remained a resident at their property had they been randomized to the other arm of the experiment. Specifically, this approach uses logistic regression to estimate the probability of survival among residents in the treatment group and the control group, respectively. The outcomes of residents in the treatment group are weighted by the fitted probabilities of survival calculated using the model that was estimated for the control group. The outcomes of residents in the control group are weighted by the fitted probabilities of survival calculated using the model that was estimated for the treatment group. The robust variance estimator appropriately adjusted standard errors and confidence intervals.

¹⁰ In the Phase 1 Evaluation Report we conducted sensitivity analyses to test whether our findings differed from our main estimates of IWISH’s cumulative effects on healthcare utilization when we: (1) Do not risk-adjust our comparisons to control for small imbalances in certain characteristics of the randomized IWISH and control groups, (2) weight the treatment and control groups to adjust for potential differences in sample attrition due to mortality, (3) weight the treatment and control groups to adjust for the probability of sample attrition for any reason (including mortality); and, (4) Calculate each resident’s healthcare utilization over the entire demonstration period to follow patterns in their healthcare utilization regardless of whether they moved out during the demonstration.

Impact Analyses

We will use a multivariable generalized linear model (Nelder and Wedderburn, 1972) to estimate the cumulative impact of IWISH on all the outcomes and samples described above, as follows:

$$E(Y_{ij} | W_{ij}, X_i, Z_j) = f(\alpha + \delta W_{ij} + \Gamma_1 X_i + \Gamma_2 Z_j) \quad (1)$$

where

Y_{ij} is the outcome of resident i at property j ;

W_{ij} is the treatment indicator (equal to 1 for IWISH residents and 0 otherwise);

X_i is a vector of resident-level baseline characteristics;

Z_j is a vector of property-level baseline characteristics; and

the Γ s are vectors of coefficients representing the contribution of individual- and property-level characteristics to the variance in the outcome.

In applying a generalized linear model such as this, the function $f(\cdot)$ is the “inverse link function,” which refers to the relationship between the predictor and the outcome’s distribution. The specific inverse link function will depend on the type of outcome variable. For instance, for a continuous outcome such as days of unplanned hospitalization, we will use the identity function, $f(x)=x$; whereas, for a binary outcome such as at least one new visit with a physician specialist (e.g., cardiologist), we would use the inverse logit function, $f(x) = \exp(x) / [1 + \exp(x)]$.

We will use survival analysis to estimate the impact of IWISH on housing tenure, transfers to an institutional setting for long-term care, and mortality. Survival analysis analyzes the expected duration of time until a given event occurs (as opposed to modeling binary measures of whether an event did or did not occur at any time before the end of the demonstration). Survival analysis allows us to test whether IWISH residents were more or less likely than control group residents to exit their property or die at any time during the demonstration, while adjusting for the attrition of residents because of competing reasons. We will conduct survival analyses using a semi-parametric discrete-time model (Jenkins, 1995) estimated with logistic regression, which will model outcomes similar to the multivariable model expressed by Equation (1).

We will use cluster-robust standard errors to ensure valid inferences in the presence of both intra-cluster correlation and serial correlation of outcomes due to repeated measurements for each resident (Kezdi, 2004; Nichols and Schaffer, 2007).

Longitudinal Analyses

The main set of analyses for the impact study will focus on the cumulative impact of IWISH on healthcare utilization over the full six-year demonstration period. We also will conduct experimental analyses that examine the impact of IWISH across the initial three-year demonstration period, the one-year gap, the two-year IWISH extension period, as well as across the six individual years of the full demonstration. It is possible that the cumulative effects of the IWISH program will not immediately affect residents’ utilization of healthcare services or will have a greater or decreasing impact over time.

The equation above can be easily modified to test for a non-linear effect over two or more periods. Equation (1) can be modified as in Equation (2) below.

$$E(Y_{ijt} | T_t, W_{ij}, X_i, Z_j) = f(\alpha + \beta_t T_t + \delta_t (W_{ij} \times T_t) + \Gamma_1 X_i + \Gamma_2 Z_j) \quad (2)$$

where

Y_{ijt} is the outcome of resident i at property j during time period t ;

T_t is a vector of indicators for the time periods (e.g., an indicator for each year of the demonstration);

the vector of coefficients β_t represents the trend in the outcome over time common to IWISH group and control group residents;

the vector of coefficients δ_t is the impact of IWISH in each respective period; and

W_{ij} , X_i , Z_j , and the Γ s are the same as in Equation (1).

The cluster-robust standard error estimator still ensures valid inferences in the presence of both intra-cluster correlation and serial correlation of outcomes due to repeated measurements for each resident.

Intent-to-Treat (ITT) Analyses

ITT analyses compare outcomes for *all residents* of the treatment and control group properties regardless of whether they met the targeted criteria for enrollment activities by IWISH staff. These will be the primary set of analyses for the impact study.

Treatment-on-the-Treated (TOT) Analyses

TOT analyses estimate the effects of enrolling in the IWISH model, using the Instrumental Variable (IV) method, which is equivalent to weighting the intent-to-treat estimates by the proportion of all IWISH residents who ever enrolled in IWISH. The IV method uses the variation in enrollment that is reflected in the cluster-level random assignment of properties to the treatment group and control groups to estimate the impacts of enrollment on outcomes for those residents induced to enroll (Angrist and Imbens, 1991; 1995). The IV method is often expressed as a two-stage model, the first stage predicting enrollment based on the characteristics of all residents of the treatment group and control group properties, and the second stage using the predicted probability of enrollment for all residents as the variable used to show the IWISH model's effectiveness (instead of a binary indicator for residing at a treatment group property).

The IV method uses multivariable regressions estimated in two stages to control for baseline characteristics of the residents that could influence both their decision to enroll in IWISH and their outcome. Luca and Cole (2017) provide an excellent summary of a mathematical derivation of the IV estimator and the description below borrows heavily from their description of the two-stage approach to estimation.

Using the notation above, W_{ij} is an indicator for whether property j was randomly assigned to the treatment group. Let D_i be an indicator for whether resident i enrolled in IWISH. In an IV framework, the IV is W_{ij} , which affects enrollment, D_i , which in turn affects the resident's outcome, Y_{ij} . Let covariate matrices X_i and Z_j include baseline resident and property characteristics that could influence enrollment and outcomes. The structural equation of interest is:

$$E(Y_{ij}|D_i, X_i, Z_j) = f(\alpha_3 + \lambda D_i + \Gamma_1 X_i + \Gamma_2 Z_j) \quad (3)$$

Stage 1: Logistic regression is used to model enrollment in IWISH as a function of the instrument (i.e., assignment to the treatment group) and other exogenous covariates. The regression can be written as:

$$E(D_i|W_{ij}, X_i, Z_j) = f(\alpha_4 + \gamma W_{ij} + \Pi_1 X_i + \Pi_2 Z_j) \quad (4)$$

The estimated coefficient $\hat{\gamma}$ is referred to as the “first-stage effect” of the instrument and will approximately measure the proportion of the sample who enrolled in IWISH. Note that the covariate matrices X_i and Z_j must be the same as the covariate matrices in Equation (3).

Stage 2: Fitted values from the first stage (the predicted probability that resident i enrolled in IWISH) are plugged directly into Equation (3) in place of D_i , the indicator for whether the resident enrolled in IWISH. The estimated coefficient $\hat{\lambda}$ is the treatment effect of interest.

While the basic steps to produce the IV estimates are described as a two-stage approach, the actual IV model is a one-step estimator. In the situation where we can be certain of the sign of the first-stage relationship between assignment to treatment and enrollment, an unbiased and efficient estimator is available for a linear model (Andrews and Armstrong, 2017). For nonlinear models, an asymptotically efficient estimator uses the Generalized Method of Moments (Nichols, 2007).

To ensure the correct standard errors are computed, we will conduct all two-stage estimation procedures in the Stata version 17 statistical package, using packaged routines such as *ivreg2*, *ivpoisson*, *ivprobit*, or *ivtobit*.

Minimum Detectable Effect Sizes

The power properties of impact analyses with a known sample size are summarized by the minimum detectable effect size (MDES). Sample clustering, measured by the intra-cluster correlation (ICC), and unequal-sized clusters (i.e., properties of different sizes) both lower the effective sample size in cluster-randomized experiments, thereby increasing the MDES.¹¹ Exhibit 4-4 shows the smallest detectable differences¹² between residents in the IWISH group and control group for four confirmatory and two cross-cutting outcomes.

Exhibit 4-4. Phase 2 Minimum Detectable Differences in Key Outcome Measures

Outcome	Cohort ^a	Minimum Detectable Difference ^b	Effect Size ^c	Assumed Values ^d			
				Control Average	Control Standard Deviation	IWISH Standard Deviation	Intra-cluster Correlation
Days of unplanned hospitalization per 1,000 Beneficiary Months	Phase 1	66.8 (40.5%)	0.122	165.1	545.8	513.0	.0346
	2017–2018	60.5 (36.6%)	0.111				
	2017–2020	58.6 (35.5%)	0.107				
	September 2020	63.8 (38.7%)	0.117				
	New residents in Phase 2	99.1 (60.0%)	0.182				
Number of primary care visits per 1,000	Phase 1	97.2 (19.6%)	0.158	494.8	623.9	568.0	.0733
	2017–2018	91.8 (18.5%)	0.147				

¹¹ Sample attrition has small consequences for MDES, relative to clustering. In any case, we will measure utilization outcomes on a “per resident per month” basis and therefore we will not exclude from the sample residents who move out of the property during the demonstration.

¹² Based on the MDES 80 percent of the time when rejecting the null hypothesis at the 95 percent significance level ($p < .05$).

Outcome	Cohort ^a	Minimum Detectable Difference ^b	Effect Size ^c	Assumed Values ^d			
				Control Average	Control Standard Deviation	IWISH Standard Deviation	Intra-cluster Correlation
Beneficiary Months	2017–2020	90.3 (18.2%)	0.147				
	September 2020	96.2 (19.4%)	0.154				
	New residents in Phase 2	129.4 (26.2%)	0.207				
Days in the community per calendar quarter	Phase 1	4.0 (5.3%)	0.124	75.7	32.4	30.7	.0333
	2017–2018	3.6 (4.8%)	0.112				
	2017–2020	3.5 (4.6%)	0.109				
	September 2020	3.8 (5.1%)	0.118				
	New residents in Phase 2	6.0 (7.9%)	0.185				
Total fee-for-service Medicare and Medicaid payments per quarter	Phase 1 / 2017–2018 ^e	\$1,215 (22.0%)	0.140	\$5,535	\$8,691	\$8,925	.0433
	2017–2020	\$1,165 (21.0%)	0.134				
	September 2020	\$1,296 (23.4%)	0.149				
	New residents in Phase 2	\$2,197 (39.7%)	0.253				
Probability of housing exit during the demonstration	Phase 1 / 2017–2018 ^e	0.060	0.137	0.266	0.437	0.435	.0498
	2017–2020	0.059	0.129				
	September 2020	0.064	0.139				
	New residents in Phase 2	0.093	0.202				
Probability of transfer to a nursing facility for long-term care	Phase 1 / 2017–2018 ^e	0.017	0.094	0.027	0.162	0.154	.0202
	2017–2020	0.017	0.090				
	September 2020	0.019	0.100				
	New Residents in Phase 2	0.035	0.172				

^a Phase 1 cohort: 4,003 residents at 40 IWISH properties and 9,354 residents at 84 control group properties (utilization, spending, and days in community measures exclude 1,972 IWISH residents and 4,578 control group residents enrolled in Medicare Advantage).
^b 2017–2018 cohort: 4,003 residents at 40 IWISH properties and 9,354 residents at 84 control group properties (utilization and days in community measures exclude 55 IWISH residents and 120 control group residents; fee-for-service spending measure excludes 1,972 IWISH residents and 4,578 control group residents enrolled in Medicare Advantage).
^c 2017–2020 cohort: 5,444 residents at 40 IWISH properties and 12,520 residents at 84 control group properties (utilization and days in community measures exclude 139 IWISH residents and 354 control group residents; fee-for-service spending measure excludes one-half of residents in both groups).
^d September 2020 cohort: 3,210 residents at 36 IWISH properties and 8,375 residents at 81 control group properties (utilization and days in community measures exclude 18 IWISH residents and 62 control group residents; fee-for-service spending measure excludes one-half of residents in both groups).
^e New residents in Phase 2: 472 residents at 34 IWISH properties and 1,299 residents at 80 control group properties (all residents are enrolled in Medicare or Medicaid; fee-for-service spending measure excludes one-half of residents in both groups).

^b Detectable effect sizes for comparing two sample averages or two proportions were computed in Stata 17 using the “power” command. Estimates assume two-sided hypothesis tests, 80 percent power, and a 95 percent significance level. There was an average of 135 (SD=69.0) observations per cluster in the Phase 1 cohort, 124 (SD=64.4) observations per cluster in the September 2020 cohort, and 23 (14.6) observations per cluster in the cohort of new residents in Phase 2.

^c Effect size is calculated as the minimum detectable difference between the treatment group and control group divided by the standard deviation of the control group. Effect size for proportions is equal to the absolute value of $2 * [\arcsine(\text{square root of proportion } 1) - \arcsine(\text{square root of proportion } 2)]$.

^d Assumed values are based on Phase 1 evaluation results.

^e The Phase 1 cohort and 2017–2018 cohort are the same.

Sources: HUD TRACS data, September 2017–December 2020; Centers for Medicare & Medicaid Medicare fee-for-service claims, October 2017–September 2020; Medicaid fee-for-service claims and managed care encounter records from California, Illinois, Maryland, Massachusetts, Michigan, New Jersey, and South Carolina, October 2017–September 2020.

For comparison, we first calculated the MDES based on the sample sizes and results reported in Phase 1 of the evaluation, which *exclude* all Medicare beneficiaries enrolled in Medicare Advantage (managed care) when calculating the impact of IWISH on healthcare utilization and days in the community. We then calculated MDES for four cohorts of residents enrolled in Medicaid, Medicare FFS plans (Parts A and B), or Medicare Advantage, based on when residents moved into the IWISH or control group properties:

- **2017–2018 Cohort:** all residents, aged 62 or older, who resided at the IWISH or control group properties on September 30, 2017, or moved in prior to September 30, 2018. There were 4,003 residents at 40 IWISH properties and 9,354 residents at 84 control group properties. MDES calculations for the confirmatory healthcare utilization measures and days in the community exclude 55 IWISH residents and 120 control group residents who were not enrolled in Medicare FFS, Medicare Advantage, or Medicaid at the beginning of the demonstration. This cohort consists of all residents included in Phase 1 of the evaluation, even those excluded from the Phase 1 impact analysis of healthcare utilization due to enrollment in Medicare Advantage.
- **2017–2020 Cohort:** all residents, aged 62 or older, who resided at the IWISH or control group properties at any time between September 30, 2017, and September 30, 2020, and for at least six months. There were 5,444 residents at 40 IWISH properties and 12,520 residents at 84 control group properties. MDES calculations for the confirmatory healthcare utilization measures and days in the community exclude 139 IWISH residents and 354 control group residents who were not enrolled in Medicare FFS, Medicare Advantage, or Medicaid at the beginning of the demonstration or when they moved in during the demonstration. This cohort expands the 2017–2018 cohort to include all IWISH and control group residents who exited or entered the properties over the full course of the initial demonstration period.
- **September 2020 Cohort:** residents, aged 62 or older, who resided at the IWISH or control group properties on September 30, 2020. The September 2020 cohort excludes residents of four IWISH properties (two in South Carolina, one in California, and one in Michigan) that dropped out of the demonstration extension. Because both IWISH properties in South Carolina dropped out, we also exclude the residents of the three remaining control group properties in South Carolina. There were 3,210 residents at 36 IWISH properties and 8,375 residents at 81 control group properties. MDES calculations for the confirmatory healthcare utilization measures and days in the community exclude 18 IWISH residents and 62 control residents who were not enrolled in Medicare FFS, Medicare Advantage, or Medicaid as of September 30, 2020.

The September 2020 cohort represents the baseline cohort for estimating the impact of IWISH during the extension period. We assume that the same number of residents that resided at the IWISH and control group properties at the end of the initial demonstration period reside at the properties at the start of the demonstration extension (September 30, 2021). On average, according to TRACS data

from September 2015 through September 2020, similar numbers of residents moved into and exited the IWISH and control group properties each year.

- ***New Residents in Phase 2:*** The smallest of the four cohorts consists of residents, aged 62 or older, who moved into an IWISH or control group property after September 30, 2018, and still resided there as of September 30, 2020. This cohort also excludes the four IWISH properties that dropped out of the demonstration extension and three control group properties in South Carolina we excluded. There were 472 residents at 34 IWISH properties and 1,299 residents at 80 control group properties who moved in after the IWISH demonstration started and still resided at the properties at the end of the evaluation's Phase 1. All were enrolled in Medicare FFS, Medicare Advantage, or Medicaid as of September 30, 2020. This cohort would facilitate analysis of the impacts of IWISH on all residents not included in the Phase 1 evaluation because they moved into IWISH properties after the demonstration began, should we wish to explore the cumulative impact of IWISH on residents who moved to IWISH properties after IWISH had already started to be implemented but before the initial demonstration period ended.

The estimates in Exhibit 4-4 are for standard experimental comparisons (intent-to-treat analyses) of two sample means or two proportions and do not account for risk-adjustment based on baseline characteristics of the residents. Gains in efficiency can be had from conditioning on baseline covariates, but the gains tend to be very small. The assumptions for the unadjusted averages in the control group and standard deviation of the outcomes in the IWISH and control groups are based on the results of the Phase 1 evaluation. The table shows the minimum detectable differences between the IWISH and control group residents, as well as their corresponding effect sizes.

Potential gains in the minimal detectable differences between IWISH and control group residents from expanding the number of residents in the IWISH sample appear to be offset by the sample variance and intra-cluster correlation of the healthcare utilization measures. Nearly doubling the sample size of the Phase 1 cohort by including Medicare beneficiaries enrolled in Medicare Advantage (i.e., the 2017–2018 cohort) reduced the minimum detectable difference in days of unplanned hospitalization by only 4 percentage points, number of primary care visits by about 1 percentage point, and days in the community by less than 1 percentage point. Including residents who moved in between 2018 and 2020 (i.e., the September 2020 cohort) increased the 2017–2018 cohort's sample size by one third but reduced the MDES for all measures by only 1 percentage point or less.

The MDES provides another perspective on the magnitude of IWISH's effects by comparing the minimum detectable difference to the measure's variability in the sample. An MDES less than 0.2 is generally considered a small effect size, 0.5 a medium effect size, and 0.8 a large effect size (Cohen, 1969).¹³ The MDES is less than or slightly more than 0.2 for all measures and all cohorts. Therefore, the minimum differences between IWISH and control group residents that would need to be present to detect a statistically significant difference (at the 5 percent level) is relatively small given the variance in the measures observed in Phase 1 of the evaluation. That is, the evaluation is powered to detect relatively small impacts that could feasibly arise during the extension period.

Subgroup Analysis

The study team hypothesizes that residents with more healthcare needs, whether due to older age or poor functional status, might benefit more from the IWISH program than would other residents, and that the impact will become more evident over time. In Phase 1 of the evaluation, we found consistent evidence

¹³ According to Cohen, "a medium effect of 0.5 is visible to the naked eye of a careful observer. A small effect of 0.2 is noticeably smaller than medium but not so small as to be trivial. A large effect of 0.8 is the same distance above the medium as small is below it."

that IWISH was effective at reducing rates of unplanned hospitalizations, outpatient emergency department visits, and ambulance use among the IWISH residents aged 62-64 (who tend to be eligible for Medicaid or Medicare due to disability) and aged 85 and older (who tend to have more chronic and potentially disabling conditions), but not among IWISH residents aged 65-84.

We also hypothesize that differences in the rates at which certain demographic groups engaged with the Wellness Nurses and Resident Wellness Directors, as the Phase 1 implementation study results suggested, could lead to differences in healthcare utilization among the IWISH residents. For instance, the study team found that Hispanic, non-Hispanic American Indian/Alaskan Native, and non-Hispanic White residents had higher rates of visits with IWISH staff during the three-year initial demonstration period than did non-Hispanic African American/Black and non-Hispanic Asian residents, and these differences were statistically significant. We also found that divorced or widowed residents met more frequently with the IWISH staff than married residents did, and residents aged 60 to 64 met with IWISH staff slightly more often than did those ages 65 or older. However, there was no consistent evidence from the Phase 1 impact study to suggest systematic differences in outcomes across resident characteristics other than age.

In Phase 2 of the evaluation, data on numbers of resident visits with IWISH staff is not available to the study team, but we will continue to measure the impact of the model on certain subgroups to determine whether differential impacts of the IWISH model become more evident over time.

The subgroup categories for the Phase 2 evaluation include:

- *Race and ethnicity*: residents who identified as Hispanic; non-Hispanic White, non-Hispanic African American/Black, non-Hispanic Asian, and non-Hispanic other race.
- *Age group*: residents aged 62-64, 65-74, 75-84, and 85 or older at the start of the demonstration or when the residents moved into the property.
- *Household size*: residents who live alone versus those in households with two or more people.
- *Length of tenure*: residents who have lived in the property for less than 1 year, 1-3 years, 3-7 years, 7-12 years, or more than 12 years at the start of the demonstration.
- *High healthcare utilizers*: residents who are in the highest share (a percentile to be determined) of Medicare and Medicaid FFS spending during the 12 months before the demonstration or the 12 months before the date they moved to the IWISH or control group property.
- *Healthcare coverage*: residents enrolled in Medicare FFS plans (Parts A and B) versus Medicare Advantage plans (Part C), as well as residents who did and did not enroll in a Medicare Part D prescription drug plan.
- *Comorbidity status*: for example, residents in certain percentiles of the number of diagnosed comorbidities at baseline (identified through claims based on the validated CCW algorithms), or in certain percentiles of validated comorbidity indices, e.g., the Charlson Comorbidity Index (Charlson et al., 1987).

The Phase 2 evaluation will estimate the impact of IWISH on subgroups following the approach we used for Phase 1. To examine how the effects of IWISH varied between subgroups of residents, whether based on their individual characteristics or the characteristics of the properties at which they reside (described in the next sub-section), we will estimate the impact on confirmatory and secondary outcomes for residents in each subgroup. We will place weight on a given subgroup's impact if that impact is statistically distinguishable from the opposing subgroup's impact. That is, if the impact for younger residents is different from the impact for older residents, then we will have evidence that supports discussion of how

impacts vary according to age. In contrast, if the impacts for younger versus older groups are no different from each other, then we will conclude that age is not a moderator of impacts.

IWISH Contextual Factors to Be Analyzed in Phase 2

The study team will also explore contextual factors that might affect the impact of IWISH, we will use the same approach as that to estimate the impact of IWISH on subgroups described above. We will explore contextual factors for which we have a strong hypothesis (see Exhibit 4-5) on whether they could affect the properties’ fidelity to the model or residents’ outcomes and for which high-quality measures are available. These contextual factors include community factors (e.g., number and accessibility of health and service providers, sociodemographic characteristics, public transportation options, access to nutritious food); property factors (e.g., ownership structure; properties’ physical condition, property size).

As in the Phase 1 evaluation, we will also examine how the impact of IWISH on resident outcomes vary with implementation fidelity to the IWISH model (e.g., staffing of the Resident Wellness Director and Wellness Nurse positions, the extent of resident engagement in IWISH, implementation of IWISH core components and enhanced service coordination). Because we will have data on implementation fidelity from only IWISH properties, these results will be nonexperimental.¹⁴ The resulting estimates will be correlations and not evidence of a causal relationship. However, they can suggest which aspects of the IWISH model could have greater potential to result in positive changes in residents’ healthcare utilization and tenure, or in what context the IWISH model has the most effect.

Exhibit 4-5. Contextual Factors That May Influence the Implementation or Effectiveness of IWISH

Characteristics	Data Sources	Proposed Measures in Phase 2	Hypothesis
Community Characteristics			
Access to transportation	<ul style="list-style-type: none"> • Kaiser Family Foundation, State Health Facts^a • AARP Livability Index^b 	<ul style="list-style-type: none"> • Medicaid non-emergency transportation policy (state-level) • AARP Livability Index “Transportation” component 	<ul style="list-style-type: none"> • Access to transportation facilitates appropriate use of non-emergency medical care which reduces emergency department use and in-patient hospitalizations • Access to transportation facilitates ability to procure healthy food, visit friends and family, and reach community resources (e.g., churches, libraries, government offices)
Access to healthy food	<ul style="list-style-type: none"> • Conduent Healthy Communities Institute, Food Insecurity Index^c 	<ul style="list-style-type: none"> • County Health Rankings Food Insecurity Index ranges from 0 (worst) to 10 (best) and equally weights two indicators of the food environment: limited access to healthy foods and food insecurity 	<ul style="list-style-type: none"> • Access to healthy food facilitates better nutrition which reduces the incidence or exacerbation of chronic diseases

¹⁴ Nonexperimental analyses will use individual-level data on control group residents, but only as a reference point for characterizing the size of IWISH’s effects on IWISH residents’ utilization rates, thereby adjusting for underlying trends in utilization common to both IWISH and control group residents.

Characteristics	Data Sources	Proposed Measures in Phase 2	Hypothesis
Availability of primary care and mental health services	<ul style="list-style-type: none"> Health Resources and Services Administration (data.HRSA.gov)^d 	<ul style="list-style-type: none"> Property is in a HRSA-designated health professional shortage area (defined by census tract) for primary care and/or mental health services 	<ul style="list-style-type: none"> Availability of mental health services facilitates appropriate use of non-emergency medical care which reduces emergency department use and in-patient hospitalizations
Density of social services organizations	<ul style="list-style-type: none"> Urban Institute, National Center for Charitable Statistics^e 	<ul style="list-style-type: none"> Total social services providers per capita 	<ul style="list-style-type: none"> Higher density of social services organizations per capita increases services available, which enables aging in place
Neighborhood income	<ul style="list-style-type: none"> U.S. Census Bureau, American Community Survey (ACS)^f 	<ul style="list-style-type: none"> Median income in the county 	<ul style="list-style-type: none"> Low-income neighborhoods concentrate risk factors, making it harder for IWISH to have an impact on health or tenure
Neighborhood racial diversity (segregation)	<ul style="list-style-type: none"> U.S. Census Bureau, American Community Survey (ACS)^f 	<ul style="list-style-type: none"> Percentage of population White and non-Hispanic 	<ul style="list-style-type: none"> Segregated neighborhoods concentrate risk factors, making it harder for IWISH to have an impact on health or tenure
Overall quality of life index	<ul style="list-style-type: none"> Centers for Disease Control and Prevention / Agency for Toxic Substances and Disease Registry (CDC/ATSDR)^g 	<ul style="list-style-type: none"> Social Vulnerability Index 	<ul style="list-style-type: none"> A lower index score serves as a proxy for lower availability of and access to neighborhood amenities, making it harder for IWISH to have an impact on health or tenure
COVID-19 pandemic severity	<ul style="list-style-type: none"> Centers for Disease Control and Prevention, COVID Data Tracker^h USA Factsⁱ 	<ul style="list-style-type: none"> Peak death rate before vaccine availability, in mid-December 2020 Hospitalizations per capita in a certain month 	<ul style="list-style-type: none"> More covid deaths could have led residents to avoid seeking routine healthcare services, which increases emergency department use and inpatient hospitalizations
Property Characteristics			
Physical inspection score	<ul style="list-style-type: none"> HUD Real Estate Assessment Center (REAC) 	<ul style="list-style-type: none"> Property inspection scores 	<ul style="list-style-type: none"> A low score may lead residents to voluntarily leave for better properties, and so reduces resident tenure A low score indicates safety issues, which lead to unintentional injuries and increases emergency department visits

Characteristics	Data Sources	Proposed Measures in Phase 2	Hypothesis
Type of ownership	<ul style="list-style-type: none"> • HUD Integrated Real Estate Management System (iREMS) 	<ul style="list-style-type: none"> • For profit or nonprofit ownership structure 	<ul style="list-style-type: none"> • Nonprofit ownership may be associated with a greater focus on health and wellness programming for residents
Property size	<ul style="list-style-type: none"> • HUD Integrated Real Estate Management System 	<ul style="list-style-type: none"> • Number of units 	<ul style="list-style-type: none"> • Smaller properties allow IWISH staff to establish more personal relationships with residents leading to improved outcomes.
Service Coordinator prior to IWISH	<ul style="list-style-type: none"> • HUD grant application data 	<ul style="list-style-type: none"> • Whether property had Service Coordinator prior to IWISH 	<ul style="list-style-type: none"> • Service coordinators provide some of the same supports as enhanced staffing under IWISH, which could diminish the impact of IWISH on resident outcomes
IWISH Implementation Characteristics			
Medication self-management support	<ul style="list-style-type: none"> • IWISH staff Interviews and property owner and manager interviews 	<ul style="list-style-type: none"> • Study team rating of extent to which IWISH staff provided medication self-management support to residents 	<ul style="list-style-type: none"> • Medication self-management assistance will lead to better control of chronic conditions which will result in decreased emergency room and inpatient hospital use
Falls prevention programming	<ul style="list-style-type: none"> • IWISH staff Interviews and property owner and manager interviews • Standards for Success service coordinator data 	<ul style="list-style-type: none"> • Study team rating of concordance of falls prevention programming with resident needs based on “frequency and attendance of evidence-based falls prevention programming and proportion of residents with fall risks 	<ul style="list-style-type: none"> • Fall prevention programming will lead to fewer falls which will result in decreased emergency room use, decreased hospitalizations (e.g., for surgery), and increased tenure for residents who would otherwise require nursing facility care
Transitional care	<ul style="list-style-type: none"> • IWISH staff Interviews • Property owner and manager interviews • QA Reports 	<ul style="list-style-type: none"> • Study team rating of the frequency and nature of transitional care activities provided by IWISH staff 	<ul style="list-style-type: none"> • Transitional care facilitates reintegration into the community following a hospitalization, decreasing readmissions or transitions to long term care
Proportion of residents with an individual goals plan	<ul style="list-style-type: none"> • IWISH staff Interviews • Property owner and manager interviews • QA Reports 	<ul style="list-style-type: none"> • Study team rating of how properties conducted goalsetting with residents including the proportion of residents with Individual Healthy Aging Plans 	<ul style="list-style-type: none"> • A higher proportion of IHAPs is associated with more robust engagement with IWISH, leading to better outcomes

Characteristics	Data Sources	Proposed Measures in Phase 2	Hypothesis
Language concordance of IWISH staff with majority of residents	<ul style="list-style-type: none"> • IWISH staff Interviews • Property owner and manager interviews 	<ul style="list-style-type: none"> • Languages spoken by IWISH staff • Languages spoken by IWISH residents • ACS, Percentage of county population who speak English as their primary language 	<ul style="list-style-type: none"> • Language concordance facilitates engagement with IWISH and ultimately leads to better outcomes
Staffing (full vs partial)	<ul style="list-style-type: none"> • IWISH staff Interviews • Property owner and manager interviews • QA Reports 	<ul style="list-style-type: none"> • Number of demonstration months without full RWD staffing • Number of demonstration months without any RWD staffing • Number of demonstration months without full WN staffing • Number of demonstration months without any WN staffing • 	<ul style="list-style-type: none"> • Properties that maintain high IWISH staffing throughout the demonstration will achieve better outcomes than properties with unfilled positions
Staff training	<ul style="list-style-type: none"> • IWISH staff Interviews • Property owner and manager interviews • QA Reports 	<ul style="list-style-type: none"> • Study team rating of extent of initial and ongoing IWISH staff training and support provided to RWDs and WNs 	<ul style="list-style-type: none"> • Higher property investment in IWISH staff training better equips IWISH staff to implement the program robustly which may ultimately lead to better outcomes

^a Kaiser Family Foundation. State Health Facts. Available at <https://www.kff.org/medicaid/state-indicator/non-emergency-medical-transportation-services/>

^b AARP (formerly named as the American association of Retired Persons). Available at <https://livabilityindex.aarp.org/>

^c Healthy Capital District. Food Insecurity Index. Available at <https://www.healthycapitaldistrict.org/indexsuite/index/foodinsecurity>. (Conduent ZIP code-level Food Insecurity Index is available for purchase, but the cost is unknown currently.)

^d Health Resources and Services Administration. Workforce Shortage Areas. Available at <https://data.hrsa.gov/tools/shortage-area/hpsa-find>

^e Urban Institute, National Center for Charitable Statistics. Available at <https://nccs.urban.org/data>

^f U.S. Census Bureau. American Community Survey (ACS). Available at <https://www.census.gov/programs-surveys/acs>

^g Agency for Toxic Substances and Disease Registry (ATSDR). CDC/ATSDR Social Vulnerability Index. Available at <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>

^h Centers for Disease Control and Prevention. Covid Data Tracker. Available at <https://covid.cdc.gov/covid-data-tracker/>

ⁱ USA Facts. U.S. COVID-19 Cases and Deaths by State. Available at <https://usafacts.org/visualizations/coronavirus-covid-19-spread-map>

Certain community, property, and IWISH implementation characteristics also could pose challenges or serve as facilitators to aging in place or influence how IWISH was implemented at the treatment group properties, potentially limiting, or facilitating the potential impact of IWISH on residents’ healthcare utilization and tenure. The Phase 2 evaluation will continue to assess how the effects of the IWISH model vary with community, property, and IWISH implementation characteristics that showed an effect in Phase 1. The study team hypothesizes that if relationships between IWISH and other types of environmental factors exist, they will become more evident as the demonstration is extended. In addition, we propose investigating additional community, property, and implementation characteristics that may be important.

We will consult with HUD as we consider stakeholder feedback on Phase 1 results and further expand the list of community, property, and IWISH implementation characteristics to investigate in Phase 2, as appropriate.

Impact Study Limitations

Since the IWISH demonstration began, CMS has made substantial progress improving the timing and quality of both the Medicaid data and the Medicare encounter data made available for research. As of 2015, each of the seven states in the evaluation submits standardized Medicaid claims, encounter, and eligibility data to CMS through T-MSIS. These data are eventually made available to CMS staff, contractors, and other researchers via the CCW. Data files containing Medicare encounter records—submitted to CMS by managed care organizations serving beneficiaries enrolled in Medicare Advantage (Part C)—also now are available to researchers through the CCW.

Given better data and a longer follow-up period, the findings from the Phase 2 evaluation will add to the Phase 1 evaluation’s important insights for Congress and stakeholders about the impact of IWISH on housing tenure, transitions to institutional long-term care, and costly healthcare utilization. The cluster-randomized design and improved data provide a strong basis for measuring impacts, but the evaluation is not without limitations.

Generalizability

The Supportive Services Demonstration evaluation was designed as a cluster-randomized controlled trial, powered to assess the impacts of IWISH on the residents of the properties where and when the demonstration was implemented. It was not designed specifically to assess the scalability of the IWISH model to all HUD properties or all Medicare beneficiaries aged 62 and older receiving HUD assistance. As with any randomized experiment, we can obtain accurate estimates of IWISH’s effects on residents of properties participating in the demonstration (i.e., “internal validity”), but these estimates might not be useful for a broader group of people, properties, or conditions in which IWISH could potentially be implemented (i.e., “external validity”).

The demonstration properties and their residents reflect the broader universe of HUD-assisted multifamily properties with older adults in some ways but not in others. The demonstration properties were not necessarily representative of all HUD multifamily properties that exclusively or predominately assist older adults. The 124 properties that were randomized to the IWISH and control groups all applied to participate in the demonstration and could differ from other HUD-assisted multifamily properties. As the property owners that applied for the demonstration were interested in obtaining funding for housing-based wellness staff, these properties could have been more likely than is typical to implement wellness staff and programming prior to the demonstration.

Control properties also were more likely to employ Service Coordinators than were all HUD-assisted properties for older adults. Although approximately half of all HUD-assisted properties for older adults are estimated to have Service Coordinators, more than two-thirds of the control group properties had Service Coordinators when the properties applied to be part of the demonstration, and several properties added new Service Coordinators during the demonstration. The study team also learned from the Phase 1 evaluation that many of the health and wellness programming available in IWISH also were available at some of the control group properties.

We can, however, generalize the evaluation’s findings to HUD-assisted residents with low-household incomes, a wide range of backgrounds, and residing in a wide range of communities. The residents of IWISH properties are a racially and ethnically diverse group of people in their 60s, 70s, and 80s, all with very low incomes, with most having already lived at the properties for several years. The properties are in average condition relative to other HUD-assisted multifamily properties and are in a wide variety of neighborhoods, most of which are reported to present one or more challenges to aging in place. Variation

is resident characteristics is substantial across the properties, with properties varying in racial and ethnic composition and age distribution. The types of neighborhoods where the properties are located also vary, including differences in the census-tract poverty rates and other indicators of neighborhood quality.

Managed Care Spending

As in the Phase 1 impact study, in Phase 2 we will analyze Medicare and Medicaid FFS expenditures, and not managed care spending. The Medicare encounter data and the T-MSIS Analytic Files RIFs do not contain information regarding managed care payments to providers because the information is proprietary and protected. CMS only permits the release of unredacted Medicare and T-MSIS Analytic Files RIFs, including managed care payments, to CMS employees or its contractors.

Health Outcomes

Another potential study limitation is that Medicare and Medicaid administrative data do not provide a complete picture of health status or outcomes. The data do not include clinical information (e.g., lab values, patient logs) nor information on residents' lifestyles (e.g., drinking, smoking, sexual activity), self-reported health status, or physical and cognitive functional status (e.g., need for assistance with activities of daily living, social functioning). Although higher levels of healthcare utilization can serve as a proxy for poorer health status, Medicare and Medicaid administrative data cannot be used to determine whether the "right" level of healthcare is provided to any individual resident. Thus, the impact study is still limited in its ability to directly measure the extent to which the IWISH model affects residents' health status, health behaviors, and overall well-being.

Access to Healthcare Services

Although the IWISH model might decrease healthcare utilization among participants, less use of healthcare services also can be attributed to constrained access to those services. Lack of healthcare providers or transportation to those providers could hinder residents of IWISH properties from accessing needed or recommended healthcare services. However, the study population is relatively homogenous socioeconomically, and given the experimental design that randomized properties after stratifying them by region (i.e., CBSAs), we expect that residents face comparable market environments, with presumably equal chance at access to medical care and hospital services over the course of the demonstration. Thus, any differences in healthcare utilization and spending between IWISH and control residents likely can be attributed to IWISH rather than to market-driven differences in IWISH and control residents' ability to access healthcare services.

5. Comprehensive Report

In 2026, the study team will report on the results of the Phase 2 evaluation. This chapter presents an overview of the planned report of findings after six years of IWISH.

5.1 Report of Findings after Six Years of IWISH

The Comprehensive Report will present the complete results of the evaluation’s qualitative and quantitative data collection and analysis. The report will integrate the data sources described in this Research Design document, address the evaluation’s research questions, and discuss the policy implications of the evaluation’s findings. The report will incorporate feedback from HUD and the evaluation’s expert panel.

The Comprehensive Report will cover the following main topics:

- How the IWISH model was implemented by the treatment group properties across the six years of the demonstration and how model implementation in the extension period differed from implementation in the initial three-year period.
- Technical assistance and support provided to IWISH staff.
- How characteristics of residents in IWISH properties affected resident engagement in IWISH.
- Impact of the IWISH model on residents’ housing tenure, including housing exits; mortality; and transitions to long-term institutional care.
- Impact of the IWISH model on residents’ healthcare utilization, including unplanned hospitalizations and use of emergency departments; use of primary and specialty healthcare; and healthcare costs.
- Association of IWISH implementation fidelity, property characteristics, and neighborhood contextual factors with the impact of the IWISH model on housing tenure and healthcare utilization.
- Perceptions of residents, IWISH staff, and property owners and managers on benefits of the IWISH model.
- Policy implications for HUD and other stakeholders.

Exhibit 5-1 presents a tentative organizational structure for the Comprehensive Report. While this structure would have separate chapters on the implementation of the IWISH model and its impacts, findings on implementation would be integrated into the impact chapters to provide context for the impact estimates and support interpretation.

Exhibit 5-1: Comprehensive Report Content and Organizational Structure

Chapter/Topics	Principal Data Sources
Executive Summary	
1. Introduction <ul style="list-style-type: none"> • Study context and research questions • Report objectives and study timeline • IWISH program design • Organization of the report 	Research Design/Data Collection and Analysis Plan (RDDCAP) and other background documents IWISH Operations Manual and other program documents
2. Characteristics of Residents Participating in IWISH <ul style="list-style-type: none"> • Random assignment of properties • Baseline (as of 2017) characteristics of properties, communities, and residents 	Medicare and Medicaid fee-for-service claims and managed care encounter data RDDCAP and other background documents TRACS

Chapter/Topics	Principal Data Sources
<ul style="list-style-type: none"> Changes in characteristics of residents, properties, and communities since baseline 	iREMS data and HUD's Real Estate Assessment Center inspection reports ACS, AARP, and other public community data
3. IWISH Program Implementation <ul style="list-style-type: none"> Extent and variation of implementation fidelity among IWISH properties Changes made to IWISH program implementation in response to COVID-19 pandemic Successes and challenges in IWISH implementation Factors affecting IWISH implementation and fidelity to IWISH model 	IWISH staff interviews Owner and manager interviews Resident interviews SfS data QA Report data
4. Support Provided to IWISH Staff and Implementation <ul style="list-style-type: none"> Training, technical assistance provided to IWISH staff Use of IWISH supportive services funding Sources of funding for health and wellness programming and resident supports not funded through IWISH 	IWISH staff interviews Owner and manager interviews QA Report data
5. Experiences with and Perceptions of the IWISH Model <ul style="list-style-type: none"> Experiences of wellness staff Experiences of property managers and owners Experiences of residents Perceived benefits, strengths, and limitations of IWISH model 	IWISH staff interviews Property owner/manager interviews Resident interviews
6. Comparison of IWISH Model to Service Coordination and Wellness Programming in Non-IWISH Properties <ul style="list-style-type: none"> Comparison of service coordination and health and wellness programming and supports available in IWISH to those available in active control group properties 	Property owner/manager interviews SfS data HUD Multifamily Housing data
7. Impact of IWISH on Housing Tenure and Transitions to Long-Term Care Facilities <ul style="list-style-type: none"> Impact on housing exits Impact on transitions to long-term institutional care Impact on mortality 	TRACS data Medicare and Medicaid claims and encounter data
8. Impact of IWISH on Healthcare Utilization <ul style="list-style-type: none"> Impact on unplanned hospitalizations and other emergency care Impact on utilization of primary care and other non-emergency healthcare services Impact on healthcare costs and cost drivers 	Medicare and Medicaid claims and encounter data
9. Conclusion <ul style="list-style-type: none"> Review of study findings Study limitations Generalizability of study findings Policy implications 	
Appendixes <ul style="list-style-type: none"> A: Analytic Methods B: Data Sources and Measures C: Expanded Results for Implementation Study 	

Chapter/Topics	Principal Data Sources
<ul style="list-style-type: none"> D: Expanded Results for Impact Study 	
References	

5.2 Data Delivery and Replication Protocol

At the end of the project, we will produce a Replication Protocol that will document the data linkage and analyses that we completed to create the analysis dataset and to complete the analyses. This protocol will be a resource should HUD expand or continue the study in future years. The Replication Protocol will consist of sets of SAS and Stata programming code covering the data cleaning and analysis steps. At the end of the study, we will transfer the HUD administrative dataset to HUD with appended information on whether a resident was enrolled in the IWISH program during the initial three years of the demonstration, the date of the resident’s enrollment, and the date (if applicable and available) of the resident’s dis-enrollment from IWISH. Exhibit 5-2 presents an overview of the Replication Protocol documentation.

Exhibit 5-2: Overview of Replication Protocol

Data Component	Programming Code	Narrative Documentation
1. Cleaning and testing the integrity of the individual datasets as they are delivered (HUD, Medicare, and Medicaid data)	SAS	<ul style="list-style-type: none"> Documentation describing the data files received from each source, including the variable names, formats, and definitions Documentation of variables retained for linking the datasets and to use in the analyses, for each data source and file Documentation of procedures used to test the integrity of each data file and to prepare the files for linking the data
2. Linking longitudinal data extracts (HUD, Medicare, and Medicaid data)	SAS	<ul style="list-style-type: none"> Documentation describing which data files were linked and the procedures used
3. Flagging IWISH participants in the HUD dataset using the personal identifiers in the Population Health Logistics system and SfS	SAS	<ul style="list-style-type: none"> Documentation describing the algorithms used to identify IWISH participants and how the accuracy of the algorithm was tested
4. Matching and merging HUD, Medicare, and Medicaid data into one analytic dataset	SAS	<ul style="list-style-type: none"> Documentation describing which data files were merged, the procedures used, any challenges that were encountered, and how they were overcome
5. Constructing analytic measures and variables	SAS	<ul style="list-style-type: none"> Data dictionary for the final analytic dataset(s) Documentation linking sets of code to specific outcomes, independent/descriptive variables used in the analyses in the Comprehensive Report
6. Analyses for the report(s)	Stata	<ul style="list-style-type: none"> Documentation linking sets of code to specific tables or analyses in the Comprehensive Report All data reported in the Comprehensive Report will have associated code so it could be reproduced Documentation in sufficient detail to enable replication in SAS if needed

6. References

- Andrews, I., and T.B. Armstrong. 2017. “Unbiased Instrumental Variables Estimation Under Known First-Stage Sign.” *Quantitative Economics* 8 (2): 479-503.
- Angrist, J.D., and G.W. Imbens. 1995. “Two-Stage Least Squares Estimation of Average Causal Effects in Models with Variable Treatment Intensity.” *Journal of the American Statistical Association* 90 (430): 431-442.
- Angrist, J.D., and G.W. Imbens. 1991. “Sources of Identifying Information in Evaluation Models.” NBER Technical Working Paper No. 117. Cambridge, MA: National Bureau of Economic Research. <https://core.ac.uk/download/pdf/6919605.pdf>
- Benjamini, Y., and Y. Hochberg. 1995. “Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Hypothesis Testing.” *Journal of the Royal Statistical Society: Series B* 57: 289-300.
- Charlson M.E., Pompei P., Ales K.L., and MacKenzie C.R. 1987. “A New Method of Classifying Prognostic Comorbidity in Longitudinal Studies: Development and Validation.” *Journal of Chronic Disease*, 40(5), 373-83.
- Cohen, J. 1969. *Statistical Power Analysis for the Behavioral Sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- De Brantes F., Rastogi A., and Painter M. 2010. “Reducing Potentially Avoidable Complications in Patients with Chronic Diseases: the Prometheus Payment approach. *Health Services Research*, 45(6 Pt. 2), 1854-1871.
- Erdem E., Prada S.I., and Haffer S.C. 2013. “Medicare Payments: How much do Chronic Conditions Matter?” *Medicare & Medicaid Research Review*, 3(2). https://www.cms.gov/mmrr/downloads/mmrr2013_003_02_b02.pdf
- Giardino, E., Vandawalker, M., Kappil T., Robinson, A., and Roby, C. 2021. *Supporting Aging in Place Through IWISH: Second Interim Report from the Evaluation of the Supportive Services Demonstration*. Report prepared for the U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Rockville, MD: Abt Associates. <https://www.huduser.gov/portal/sites/default/files/pdf/Supporting-Aging-in-Place-Through-IWISH-Report-2021.pdf>
- Hainmueller, J. 2012. “Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies.” *Political Analysis* 20 (1): 25-46.
- Hayden, Douglas, Donna K Pauler, David Schoenfeld. 2005. “An Estimator for Treatment Comparisons Among Survivors in Randomized Trials.” *Biometrics* 61(1): 305–310.
- Iacus, S. M., King, G., and Porro, G. (2012). *Causal Inference Without Balance Checking: Coarsened Exact Matching*. *Political analysis*, 20(1), 1-24.
- Jacobson G., and A. Cicchiello, J. P. Sutton, and Arnav Shah. 2021. 2021. *Medicare Advantage vs. Traditional Medicare: How Do Beneficiaries’ Characteristics and Experiences Differ?* The Commonwealth Fund. Issue Brief. <https://www.commonwealthfund.org/publications/issue-briefs/2021/oct/medicare-advantage-vs-traditional-medicare-beneficiaries-differ>

- Jenkins, S.P. 1995. "Easy Estimation Methods for Discrete-Time Duration Models." *Oxford Bulletin of Economics and Statistics* 57 (1): 129-136.
- Kaiser Family Foundation. (2022) State Health Facts: Health Care Expenditures by Service by State of Provider (in millions). <https://www.kff.org/other/state-indicator/health-spending-by-service>.
- Kezdi, G. 2004. "Robust Standard Error Estimation in Fixed-Effects Panel Models." *Hungarian Statistical Review* (9): 96-116.
- Komisar, H.L. and Feder, J. 2011. "Transforming care for Medicare Beneficiaries with Chronic Conditions and Long-term Care Needs: Coordinating Care Across all Services." Report from Georgetown University. Retrieved from: http://www.thescanfoundation.org/sites/default/files/Georgetown_Tnsfrming_Care.pdf
- Luca, D.L., and R. Cole. 2017. *Estimating Program Effects on Program Participants. Evaluation Technical Assistance Brief for OAH Teenage Pregnancy Prevention Grantees*. Washington, DC: Office of Adolescent Health, U.S. Department of Health and Human Services. <https://opa.hhs.gov/sites/default/files/2020-07/estimating-program-effects-on-program-participants-brief.pdf>
- MedPAC. 2016. June 2016 Data Book, Section 4: Dual-eligible Beneficiaries. Retrieved from: <http://www.medpac.gov/docs/default-source/data-book/june-2016-data-book-section-4-dual-eligible-beneficiaries.pdf?sfvrsn=0>
- Nelder, J.A. and Wedderburn, R. W. M. (1972) Generalized Linear Models. *Journal of the Royal Statistical Society. Series A (General)*, 135(3), 370-384.
- Nichols A., and M. Schaffer. 2007. *Clustered Errors in Stata*. <http://repec.org/usug2007/crse.pdf>
- Nichols, A. 2007. "Causal Inference with Observational Data." *The Stata Journal* 7 (4): 507-541.
- Office of Policy Development and Research, U.S. Department of Housing and Urban Development. 2021, January. *Evaluation of the Support Services Demonstration: Research Design and Analysis Plan for Impact Study*. Report prepared by Abt Associates. Washington, DC. <https://www.huduser.gov/portal/sites/default/files/pdf/Impact-Study-Research-Design.pdf>
- Peck, L., Moulton S., Bocian, D.G., Morris, T., and DeMarco, D. 2021. *Long-Term Impact Report: The HUD First-Time Homebuyer Education and Counseling Demonstration*. Report prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Rockville, MD : Abt Associates. <https://www.huduser.gov/portal//portal/sites/default/files/pdf/Long-Term-Impact-Report-HUD-First-Time-Homebuyer-Education-Counseling-Demonstration.pdf>
- Segal, M., Rollins, E., Hodges, K., and Roozeboom, M. 2014. Medicare-Medicaid Eligible Beneficiaries and Potentially Avoidable Hospitalizations. *Medicare & Medicaid Research Review*, 4(1).
- Turnham, Jennifer, Ian Breunig, Elizabeth Giardino, Gabrielle Katz, and Thyria Alvarez. 2019. *Supporting Aging in Place Through IWISH: First Interim Report from the Supportive Services Demonstration*. Report prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Rockville, MD : Abt Associates. https://www.huduser.gov/portal/publications/IWISH_FirstInterimReport.html

U.S. Department of Housing and Urban Development
Office of Policy Development and Research
Washington, DC 20410-6000



May 2023