Wisconsin Division of Public Health (DPH), Department of Health Services WIC: Evaluation of Telehealth Service Delivery Using Online Nutrition Education (ONE) Platform

Final Report

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WIC Wisconsin

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List of Acronyms

CFIR	Consolidated Framework for Implementation Research
CPA	Competent Professional Authority
FNS	Food and Nutrition Service
IRB	Institutional Review Board
MIS	Management Information System
ONE	Online Nutrition Education
PA	Priority Area
RD	Registered Dietitian
RFA	Request for Application
SE	Standard Error
THIS-WIC	USDA/Tufts Telehealth Intervention Strategies for WIC
USDA	U.S. Department of Agriculture
WI	Wisconsin
WIC	Supplemental Nutrition Program for Women, Infants, and Children

Terms and Definitions

Term	Definition
Clinics	WIC clinics are locations where WIC clients receive services.
Comparison	WIC clinics that did not implement the telehealth intervention and where WIC clients had appointments via "usual care" mode.
Early phase	First quarter of implementation.
Intervention	WIC clinics that implemented the telehealth intervention.
Late phase	Final quarter of implementation.
Local agency	WIC administrative entity that oversees clinics where WIC clients receive services.
Open active accounts	ONE accounts activated and in use by the WIC client user.
Open inactive accounts	ONE accounts activated but not currently in use by the WIC client user.
Pending accounts	ONE accounts created but not yet activated by the WIC client user.
Remote	Remote appointments, services, communications, and contacts are those in which a WIC client connects with the WIC clinic from home, work, or some other location rather than in a clinic. In this report, the term "remote" refers to interactions that take place via telehealth, including by video and telephone.
Telehealth	As defined by the U.S. Department of Health and Human Services, telehealth is the use of electronic communication and telecommunications technology to support long-distance clinical healthcare, patient and professional health-related education, public health, and health administration.
Usual care	Standard mode of delivery for WIC appointment. For THIS-WIC, during the COVID-19 pandemic under Federal waivers, usual care in WIC clinics was either telephone-based appointments or in clinic.
WIC benefit redemption	Calculated as the percentage of food benefits issued that are redeemed in whole or in part.
WIC client	All individuals who receive WIC services at the intervention and comparison agencies involved in the THIS-WIC evaluation and represent the entire agency-level caseload, not just those in the THIS-WIC evaluation. In working with the states engaged in this work, the THIS-WIC team recognizes that states differ in how they refer to individuals who receive WIC services. Some states prefer the term "WIC client," whereas others prefer "WIC participant." Because of this and potential confusion with the term "participation" in the context of an evaluation, we use the term "client." We acknowledge that FNS's preferred term is "WIC participant."
WIC Client Survey respondent	Individuals who consented to participate in the study and responded to the THIS-WIC Client Survey. These individuals represent a subsample of all individuals who received WIC services at participating sites (WIC clients).

WIC client telehealth user	Individuals who used the telehealth solution (as documented by telehealth metadata); these individuals may or may not be survey respondents.
WIC retention	Retention in WIC was defined as those WIC clients who had available data on WIC benefit redemption in MIS after 180 days from survey completion date.
WIC Staff Survey respondent	Individuals who consented to participate in the study and responded to the THIS-WIC Staff Survey. These staff delivered nutrition education/breastfeeding support using telehealth at participating sites and agreed to take part in the survey.
WIC staff key informant interview respondent	Individuals who consented to participate in the study and took part in a WIC staff key informant interview. These staff delivered nutrition education/breastfeeding support using telehealth at participating sites and agreed to take part in the interview.

Executive Summary

Background

Telehealth has emerged as an integral approach to offering health services because it enhances access, increases convenience in scheduling and receiving services, and reduces costs. However, factors such as comfort level with digital technology, Internet availability, privacy and security concerns, and accessibility may be barriers to telehealth integration within the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The Consolidated Appropriations Act of 2019 (Public Law 1166) authorized the allocation of $5,000,000 for competitive telehealth grants to (1) supplement the nutrition education and breastfeeding support offered to individuals in the WIC program, and (2) decrease barriers to access WIC services. The U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS) awarded a Cooperative Agreement to Tufts University and collaborators in Telehealth Intervention Strategies for WIC (THIS-WIC) to support the implementation and evaluation of telehealth services in WIC. THIS-WIC awarded grants and evaluated telehealth solutions across seven WIC State agencies: District of Columbia, Georgia, Michigan, North Carolina, South Carolina, Vermont, and **Wisconsin (WI)**. This report describes the implementation and evaluation of telehealth services using Zoom and the Online Nutrition Education (ONE®) platform in **WI**.

Project Overview

To offer telehealth services, WI collaborated with Nutrition Matters to customize the ONE program to deliver WIC nutrition education and breastfeeding support to WIC clients.* The THIS-WIC evaluation in WI assessed the implementation of telehealth services using the ONE program and compared staff-, agency-, and client-level outcomes for intervention (modified telehealth service delivery) and comparison agencies (phone-based or in-person service delivery). Between April 2022 (Q2/2022) and March 2023 (Q1/2023), five local agencies offered telehealth services and served as intervention agencies, and six offered usual care and served as comparison agencies.

Implementation evaluation findings are based on data collected from the WI Management Information System (MIS), State responses to the Implementation Tracking Tool, metadata from the ONE platform, the THIS-WIC Staff Survey, and key informant interviews. Outcome evaluation findings are based on data collected from MIS, metadata from the ONE platform, and the THIS-WIC Client Survey.

* WIC clients refers to all individuals who receive WIC services at the intervention and comparison agencies involved in the THIS-WIC evaluation and represent the entire agency-level caseload, not just those in the THIS-WIC evaluation. The THIS-WIC team recognizes that States engaged in this work differ in how they refer to individuals who receive WIC services. Some States prefer to use the term “WIC client,” whereas other States prefer “WIC participant.” Because of this and potential confusion with the term “participant” in the context of an evaluation, this report uses the term “client.”

Findings

Implementation of ONE in WI

During implementation, WIC agencies experienced considerable staff turnover related to the COVID-19 pandemic. The infant formula crisis contributed to staff burnout. These major external events resulted in considerable variability in staff capacity to adopt telehealth. Staff acknowledged the engagement and support of local and State agency staff, particularly the reduced lag time in responses to questions regarding use of the telehealth platform and data sharing to understand staff and client use and engagement with the telehealth platform. Staff also appreciated the breadth and depth of training resources available and gave high marks to the videos and PDF versions in easy-to-read language.

In general, WIC staff found it easy to use the ONE platform, had favorable attitudes toward delivering WIC services via telehealth, and expressed interest in continuing to use ONE (**Table ES-1**). Staff perceived that offering telehealth services not only aligned the WIC service delivery model with other healthcare providers, but it also addressed travel, time, cost, and other barriers experienced by clients, ultimately building rapport, improving client participation and retention, and expanding access to WIC services. Some staff also noted that offering access to evidence-based resources would help retain WIC clients and elevate the importance of WIC nutrition education.

Table ES-1. Staff Acceptability of Telehealth Appointments and Platform in Early and Late Phases in WI

Statement[a]	Early N=20 Mean (95% CI)	Late N=12 Mean (95% CI)	p-value[b]
I find ONE to be easy to use.	4.12 (3.83, 4.40)	4.32 (3.98, 4.65)	0.122
With telehealth, I am able to provide services for WIC participants who would usually miss their appointments.	4.66 (4.44, 4.89)	4.77 (4.49, 5.04)	0.477
I would like to continue using ONE to provide WIC services.	4.50 (4.26, 4.74)	4.78 (4.42, 5.13)	0.203

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1=Strongly disagree and 5=Strongly agree.

[b] p-values are based on mixed effect linear regression, controlling for repeated measurements at the individual level.

However, staff discussed difficulties with promoting and encouraging clients to use the ONE platform synchronously, and some noted that client circumstances precluded them from synchronous resource sharing. Some staff indicated that synchronous resource sharing increased their appointment time, as they had to assist clients with account setup, password recovery, and navigation and walk them through the process of viewing resources shared

synchronously. Staff also noted that client preferences and comfort should drive the appointment mode.

Cost of ONE in WI

Overall, the startup cost to offer telehealth services was $663,211, of which about 81 percent was spent on contracted services, 10 percent on equipment, and 7 percent on labor. Ongoing median costs per appointment and per enrollment were higher at intervention agencies than at comparison agencies.

Client Experience with ONE in WI

WIC clients found telehealth appointments to be a highly acceptable approach for receiving WIC services and expressed a preference to continue the same way in the future (**Table ES-2**). Metadata on ONE use indicated a slow start but gradual increase in resources accessed over time (from less than 1 percent in Q2/2022 to 25 percent in Q1/2023). Clients who had activated their ONE account accessed resources available on the ONE platform, particularly recipes.

Table ES-2. Client Preference to Receive WIC Services via Telehealth for Future Appointments in Intervention Agencies in WI

Statement	N	Strongly Disagree %	Disagree %	Neither Agree nor Disagree %	Agree %	Strongly Agree %
I would like to receive services the same way at my next WIC appointment.	357	0.0	0.8	8.4	26.6	64.1

Source: THIS-WIC Client Survey

Satisfaction and experience with WIC appointments and intent to change dietary behaviors did not differ significantly between respondents in the intervention and comparison agencies. Breastfeeding initiation and exclusive breastfeeding rates differed significantly between respondents from intervention and comparison agencies, likely due to demographic differences rather than mode of service delivery—breastfeeding practices were assessed immediately after respondents' telehealth appointment, and these practices are not likely to change based on a single appointment.

Recommendations

WIC staff provided the following recommendations:

- A slow rollout will facilitate addressing user (staff and client) issues and challenges in an efficient manner and promote better uptake.
- High-level staff engagement and peer support are critical to ensuring staff comfort and use.

- Comprehensive and ongoing training is critical to prepare staff for providing telehealth services. Depending on their experience, staff may need additional time to become familiar with conducting telehealth appointments and synchronous resource sharing.
- Training staff to promote the use of telehealth services and resources among clients may lead to increased uptake.
- Having support staff to assist clients with account setup, password recovery, and other issues will result in appointments that are completed in the scheduled duration with no adverse consequences for subsequent appointments with other clients.
- Having an integrated system to schedule and conduct telehealth appointments and document outcomes can facilitate staff adoption and use.
- Expanding the topics and languages of resources available in the telehealth platform will facilitate wider access.
- Clients should be provided with the option to schedule appointments in a mode (in-person or remote) that works best for them.
- Marketing telehealth services to clients is necessary to build client confidence in adoption and use.

1. Background

Telehealth technology allows healthcare providers to communicate with patients remotely, through a two-way, synchronous channel. It has emerged as an integral approach to offering healthcare services and could become a standard of care soon. For the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), telehealth may facilitate access to services in rural areas or in areas with staffing shortages, improve efficiency without higher net costs, and reduce travel and wait time, making it convenient to schedule and receive timely care services. However, factors such as comfort level with digital technology, Internet availability, privacy and security concerns, and accessibility dictate the quality of client experience and may be barriers to telehealth integration within WIC. Understanding variations in telehealth use and adoption by staff and clients is necessary to inform telehealth use policies.

The Consolidated Appropriations Act of 2019 (Public Law 1166) authorized the allocation of $5,000,000 for competitive telehealth grants to (1) supplement the nutrition education and breastfeeding support offered to individuals in the WIC program, and (2) decrease barriers to accessing WIC services.[1] The U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS) awarded a Cooperative Agreement to Tufts University and collaborators in Telehealth Intervention Strategies for WIC (THIS-WIC) to support the implementation and evaluation of telehealth services in WIC. Through a competitive Request for Application (RFA) process, state agencies submitted proposals to implement projects focused on one of two Priority Areas (PA):

- PA I: Implement an existing telehealth solution to ensure timely access to nutritional or breastfeeding support for WIC clients by qualified professionals.
- PA II: Develop and implement an online (mobile-friendly) resource or tool to provide nutritional or breastfeeding support to WIC clients that is within the scope of the nutrition education and/or breastfeeding support offered in the WIC clinic by qualified professionals, including Registered Dietitians (RD), Certified Lactation Consultants, and International Board-Certified Lactation Consultants.

THIS-WIC awarded grants and evaluated telehealth solutions across seven WIC state agencies:

- PA I: District of Columbia, Georgia, Michigan, Wisconsin
- PAI II: North Carolina, South Carolina, Vermont

In addition, THIS-WIC provided technical assistance to all agencies throughout the study to support the adoption of telehealth and the evaluation of telehealth interventions. The COVID-19 pandemic sharply increased public and agency attention on remote access to services and elevated the relevance of telehealth solutions. The project was funded and designed before the pandemic, and some aspects of the design were modified to account for USDA COVID-19 waivers. Specifically, prior to COVID-19, THIS-WIC planned to evaluate the impact of delivery of WIC nutrition education and breastfeeding support services via telehealth compared to usual care (i.e., in-person appointments). During COVID-19, with physical presence waivers in place,

the majority of appointments in intervention and comparison agencies were remote and telephone-based. This report focuses on the implementation and outcomes of **telehealth service delivery in WI using the Online Nutrition Education (ONE®) platform**.

1.1 Need for Telehealth Solution in Wisconsin

About 19 percent of WI's WIC population resides in rural parts of the State, affecting both client participation and WIC clinic operations. Annual WIC participation in WI steadily declined from 203,790 in 2008 to 142,220 in 2019: 39,460 pregnant, breastfeeding, and non-breastfeeding postpartum individuals; 73,756 children; and 29,004 infants.[2] From the client perspective, drive time, cost of gas, and access to reliable transportation are the main barriers that families in rural areas face in accessing WIC services. Often, families drive 30 minutes each way and/or travel through challenging weather conditions to get to the nearest WIC clinic for their appointment. All local agencies in WI must have an RD on staff. Few staff are bilingual, so WI WIC relies on telephone interpretation services. Although education materials are available in other languages, they are direct translations from the English versions. These materials are not culturally specific, making it difficult to counsel and connect with WIC clients. Additionally, several local agencies in rural areas face challenges recruiting and retaining RDs to conduct onsite appointments. To ensure that all clinics have access to an RD, several local agencies have hired a remote RD/Competent Professional Authority (CPA) to conduct appointments remotely. WI received THIS-WIC funding to implement and evaluate a telehealth solution to meet a need for digital nutrition education that is engaging, culturally appropriate, and accessible remotely.

1.2 Telehealth Services and Solution Implementation Plan and Evaluation

In collaboration with WI WIC, Nutrition Matters®, WI's nutrition education provider, customized an online, mobile-friendly nutrition education platform: ONE. ONE was developed as a mobile-optimized website, designed to be used on mobile devices without requiring large amounts of memory and data. It includes resources in English and Spanish and can be accessed via computer, tablet, or smartphone.

ONE was designed to support WIC staff by providing nutrition and breastfeeding guidance through access to and synchronous sharing of visual nutrition education tools for CPAs and evidence-based digital nutrition education resources for clients, including educational information, interactive lessons, and recipes (see **Figure 1-1** for CPA interface). All nutrition tools include talking points and sample questions for staff to reference when using the tools in participant-centered counseling. Once established, user profiles are linked to a WIC client's Family ID in MIS. In addition, WIC staff documented ONE tool use during appointments in MIS in the Nutrition Education field. WIC clients have a separate user interface and set up their own account with ONE, often with assistance from WIC staff. Once logged in, WIC clients have access to a variety of nutrition education and breastfeeding articles and resources (see **Figure 1-2** for client user interface). Key features of ONE include the following:

- **Enhanced nutrition education provided by CPAs**: During remote appointments, the platform enables CPAs to access interactive nutrition education tools (visuals and other materials) instantly and share relevant materials in real time with clients directly through ONE by "pushing" these materials to users' ONE accounts. Although ONE does not yet have a built-in video sharing capability at the time of this evaluation, screen sharing between the CPA and client is possible through a third-party method (e.g., videoconferencing via Zoom or Microsoft Teams). The ONE platform also allows CPAs to see what articles have been shared with, and accessed by, WIC clients to support continuity of care.

Figure 1-1. ONE CPA Interface Example

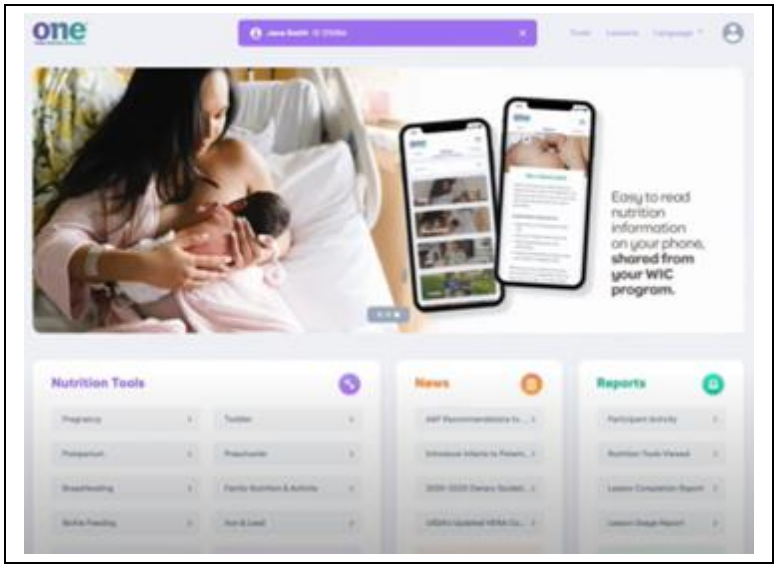
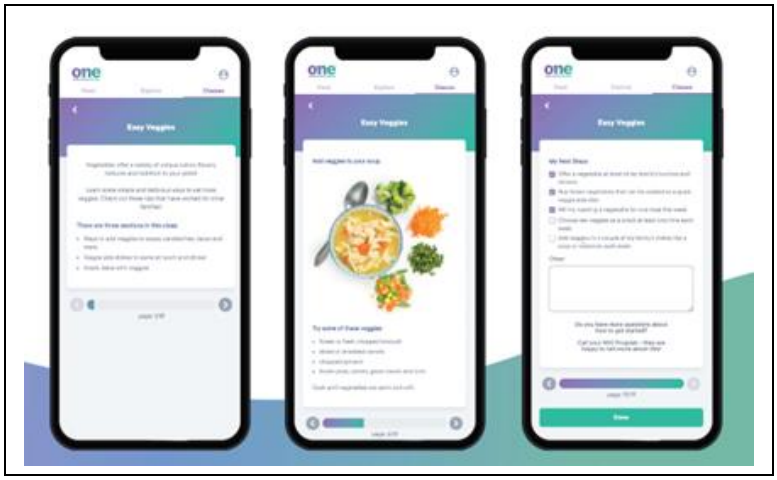


Figure 1-2. ONE Client User Interface Example



- **Supplementary nutrition education**: During remote appointments, CPAs can access additional nutrition resources (such as educational information, recipes, and videos) and share them with clients for enhanced counseling sessions and reference following the appointment.
- **Online secondary nutrition education lessons**: The ONE platform includes 17 shortform interactive nutrition education lessons that can be accessed and completed independently. These lessons can be recommended by CPAs to support WIC clients' individualized goals and pushed to WIC clients via ONE, and the platform allows CPAs to see which lessons have been completed.

In the later phase of implementation, WI also involved Spanish-speaking WIC clients to design, test, and provide feedback on the cultural relevance of the nutrition education tools and materials featured on the ONE platform (see **Appendix WI.5**).

1.2.1 Planned Implementation of ONE

WI planned for staff to use ONE synchronously with WIC clients for remote appointments (i.e., the WIC provider and client both logged into the platform to facilitate real-time resource sharing, including sharing of visual materials to guide education, promote dialogue, and support goal setting). WI planned to reinforce use of these materials during appointments via materials shared with WIC clients after the remote appointment, including for secondary nutrition education. In addition, WI planned to integrate a messaging feature into ONE to allow WIC clients and staff to communicate between appointments, either in real time if both parties were logged in at the same time or in a manner like text messaging.

1.2.2 Evolution of ONE Implementation

Before and during the implementation of ONE, WI made changes to ONE and adjusted the way it was used by participating local agencies in response to staff feedback and input from Nutrition Matters. The messaging feature was not integrated into ONE due to technical complications that made its deployment unfeasible during the THIS-WIC evaluation timeline. However, WIC clients were able to follow up with a CPA with any questions by calling their WIC clinic. In addition, during training and the early phase of implementation, WIC staff communicated that using ONE in conjunction with videoconferencing (e.g., Zoom-based video appointments) was cumbersome. Therefore, the WI State team focused on supporting WIC staff in getting comfortable with using ONE and not requiring or pushing the use of Zoom-based remote telehealth appointments. Ultimately, WI local agency staff primarily used ONE asynchronously, with the WIC staff member logged in and reviewing ONE resources with the client during appointments, but the WIC client was **not** viewing those materials at the same time. In later stages of implementation, some WIC clinics offered ONE with Zoom-based appointments, but utilization remained low. Finally, because of the low client account activation rate, in the later stage of implementation, local agency staff were able to email PDF resources included in the ONE platform and discussed during appointments directly to WIC clients; clients could review these resources synchronously during the appointments or asynchronously at their convenience.

The WI State agency team and the THIS-WIC team worked collaboratively on the evaluation to assess impact and intermediate, process, and cost outcomes, comparing the use of ONE to usual care in select local agencies.

2. Project Methods

WI used a quasi-experimental design to examine whether the use of ONE increased access and reduced costs while increasing or maintaining client satisfaction and other outcomes over a 12-month period. Overall, THIS-WIC used the five-stage model for comprehensive research on telehealth developed by Fatehi and colleagues[3] to guide the overall design of the telehealth research study (see **Appendix WI.1** for more details on the model). The evaluation was focused on the use of ONE for nutrition education during remote appointments with a CPA.

2.1 Research Questions

THIS-WIC examined several research questions to understand the implementation and impact of ONE when added to WIC standard operating procedures for nutrition education (**Table 2-1**) and whether ONE could overcome known barriers to WIC participation and retention by enhancing existing care practices. In the wake of COVID-19, THIS-WIC worked closely with the WI State agency to understand changes to usual practices during implementation (e.g., offering telephone-based appointments as "usual care"). WI Implementation Tracking Tools were created to document and understand service delivery in intervention and comparison agencies throughout the evaluation period.

2.2 WIC Agencies Participating in THIS-WIC Evaluation

Through an open application process, WI selected 13 local agencies, representing each of the State's five regions, to participate in the assessment. These agencies were split between rural and urban designation* and randomized to the intervention (n=7) or comparison (n=6) group. Local agency engagement funds were allocated to agencies participating in the grant; the funds were specific to grant activities. Comparison agencies were offered access to ONE after the conclusion of the THIS-WIC evaluation, followed by a wider statewide rollout. Shortly after the project began, two agencies (one intervention and one comparison) dropped out. Ultimately, the ONE evaluation included six WIC agencies in the intervention group and five WIC agencies in the comparison group. **Appendix WI.1** lists the local agencies involved in the evaluation.

2.3 Data Sources for THIS-WIC Evaluation

This study used newly collected and extant quantitative and qualitative data to assess processes and outcomes. The data sources included (1) Management Information System (MIS) data, (2) telehealth metadata collected directly by ONE, (3) Client Survey data, (4) Staff Survey data, (5) staff key informant interview data, (6) implementation data, and (7) cost data. **Appendix WI.1** lists the leader for developing and collecting these data.

* Rural areas were defined as counties in which 50 percent or more of the total population reside in a rural area as defined by the 2010 census.

Table 2-1. Staff-, Agency-, and Client-Level Research Questions in WI

Staff and Agency Levels	
▪ What was the staff attitude toward the telehealth solution? ▪ What was the staff level of readiness to implement the telehealth solution? ▪ What was the staff level of satisfaction with the telehealth solution? ▪ What was the staff level of telehealth solution adoption? ▪ What was the staff acceptability of the telehealth solution?	▪ What was the perceived feasibility of using the telehealth solution to provide WIC services? ▪ Did staff perceive telehealth services to make WIC services more accessible for WIC clients? ▪ Did offering telehealth services affect staff travel (frequency and time) to clinics? ▪ What was the startup cost of a telehealth solution in WIC? ▪ What was the ongoing cost of offering WIC services at the intervention and comparison agencies?
Client Level	
▪ What was the level of telehealth solution adoption among clients in the intervention agencies? ▪ What was the level of satisfaction with WIC services in the intervention and comparison agencies? ▪ What was the perceived acceptability (accessibility and feasibility) of WIC services in the intervention and comparison agencies? ▪ What were the perceived barriers to attending WIC appointments in the intervention and comparison agencies? ▪ What was the intent to change dietary behaviors in the intervention and comparison agencies?	▪ What was the daily fruit and vegetable intake in the intervention and comparison agencies? ▪ How did rates of breastfeeding initiation and duration differ among those in the intervention and comparison agencies? ▪ What was the food benefit redemption among those in the intervention and comparison agencies? ▪ What was the client retention rate among those in the intervention and comparison agencies?

2.3.1 Management Information System Data

WI's MIS included administrative data at two levels: the microlevel (individual-level MIS data from WIC clients who complete the Client Survey) and the macrolevel (aggregate MIS data from all clients at participating local agencies). See **Appendix WI.2** for the list of MIS data provided by WI.

2.3.2 Telehealth Solution Metadata

The metadata included variables to indicate client status on ONE account activation, such as number of clients with account created but not yet activated (pending), number of clients with open active accounts, number of clients with open inactive accounts, and percentage of active accounts. The metadata also captured information on sharing and use of ONE tools/resources, number of lessons completed, and recipes viewed. See **Appendix WI.2** for a list of variables in the metadata.

2.3.3 Client and Staff Surveys

2.3.3.1 Client Survey

The Client Survey was developed by THIS-WIC using existing valid/reliable tools[4-18] to assess accessibility, barriers, satisfaction, and attitudes toward using telehealth. WI reviewed the survey to ensure that it captured key aspects of its telehealth solution, that it had a low respondent burden and easy-to-follow format, and that the literacy level was appropriate for the WIC clients served. The Client Survey was pilot tested with WIC clients (n=11) in a local agency not participating in the THIS-WIC evaluation, and the average survey completion time was less than 5 minutes. Pilot testing results were used to clarify wording and improve navigability. The final survey included 37 questions, with an expected respondent burden of 10 minutes. The survey was translated into universal Spanish. See **Appendix WI.3** for the English- and Spanish-language versions of the Client Survey.

2.3.3.2 Staff Survey

THIS-WIC developed the Staff Survey to assess staff satisfaction with telehealth, accessibility and acceptability of the solution, and staff attitudes toward and readiness for telehealth use. The survey items are drawn from reliable/valid instruments,[9, 16, 19-25] along with additional demographic questions and covariates (e.g., years of experience working at WIC). As with the Client Survey, a research survey methodologist reviewed the Staff Survey to ensure comprehension and readability. The final staff English-language survey included 25 questions, and the average completion time was 15 minutes. See **Appendix WI.3** for the Staff Survey.

2.3.4 Staff Key Informant Interviews

Local WIC agency staff and directors implementing ONE were invited to participate in key informant interviews. The interview guides were developed by THIS-WIC in collaboration with the state agencies; the questions were informed by the RE-AIM[26] (Reach, Effectiveness, Adoption, Implementation, and Maintenance) Framework and Consolidated Framework for Implementation Research (CFIR)[27] to assess key implementation aspects (e.g., relative advantage, compatibility, complexity, trialability). Once developed, the guide was tested and refined based on a mock interview conducted with a THIS-WIC Advisory Board member who is a former WIC State agency director. Interview findings were used to understand the diffusion of telehealth solutions, activities undertaken to ensure successful implementation, and modifications to workflow to address challenges.

Interviews were scheduled for 60 minutes. See **Appendix WI.3** for the discussion guide for staff and local agency director interviews.

2.3.5 Telehealth Solution Implementation Data

Telehealth implementation data were obtained from two sources: a 46-item Implementation Tracking Tool completed by the WI WIC State agency project team in the early, mid, and late phases of implementation; and a summary of quarterly guided discussions with local agency staff, led by WI State agency leads.

2.3.5.1 Implementation Tracking Tool

To assess implementation adoption, the THIS-WIC project management team developed the Implementation Tracking Tool with a menu of 46 implementation strategies (e.g., identify and prepare champions) from the Expert Recommendations for Implementing Change (ERIC) study.[28] THIS-WIC projects were not expected to implement all 46 strategies but rather to select those that aligned best with their overall goals. See **Appendix WI.3** for the Implementation Tracking Tool.

2.3.5.2 Quarterly Guided Discussions

The WI WIC State agency tracked implementation of ONE at intervention agencies quarterly. Questions were developed by the WI State agency team. See **Appendix WI.3** for the discussion guide.

2.3.6 Telehealth Solution Startup and Ongoing Implementation Cost Data

To understand the costs of implementing and sustaining delivery of WIC services via telehealth compared with usual care, THIS-WIC collected startup cost data from the intervention agencies and ongoing costs from intervention and comparison agencies. Examples of startup costs included purchase of videoconference software license/app development, purchase of new equipment, and staff training. Ongoing costs are those required to deliver nutrition education and breastfeeding services. For intervention agencies that implemented ONE, ongoing costs for the period after the solution was implemented included annual costs related to maintaining the telehealth solution (e.g., ongoing training, licensure, administrative time). See **Appendix WI.3** for the ongoing cost tracking tool.

2.4 Data Collection for THIS-WIC Evaluation

The Tufts University Institutional Review Board (IRB) was the IRB of record for all aspects of the ONE evaluation. The Tufts IRB reviewed all protocols and data collection materials for the Staff Survey, key informant staff interviews led by THIS-WIC, the Client Survey, MIS data collection, and telehealth metadata collection by the WI State agency and/or local agencies.

Before the start of data collection, THIS-WIC principal investigators and study personnel completed human subject protection training, in line with the requirements of the IRB overseeing the protocol. In addition, THIS-WIC designed and provided virtual training delivered via Zoom to state and local agency personnel relevant to their involvement in the project. The training covered implementation and evaluation aspects of the work, including details on the study and an overview of human subjects' research protection. This training was recorded to be available as a refresher and for new staff who came on board after the start of implementation.

2.4.1 Management Information System Data

At the study's onset, WI provided microlevel data weekly to THIS-WIC, allowing the study team to review the data and provide WI feedback to address data quality and integrity questions. After the processes were established, WI reported these microlevel data monthly for the rest of the study. WI also reported macrolevel data quarterly for all intervention and comparison agencies.

2.4.2 Telehealth Solution Metadata

WI provided quarterly deidentified telehealth metadata from intervention agencies. These data were captured by ONE at each local intervention agency and were collected directly in ONE and/or documented in WI's MIS and delivered to the THIS-WIC team quarterly during the intervention period.

2.4.3 Client and Staff Surveys

2.4.3.1 Client Survey

WI used Alchemer (Alchemer, Louisville, CO), a secure web-based survey platform, to program and administer the Client Survey. Clients at intervention and comparison agencies were invited to complete the survey. After completing an eligible nutrition education or breastfeeding support session, WIC clients received a survey link via email or text message or directly via ONE. WI had planned to send the survey link to clients from intervention agencies directly via ONE. However, survey completion rates were low due to the low use of ONE, resulting in a change in data collection methodology by adding email or text message survey links for both the intervention and comparison groups. WIC clients who completed a survey were eligible to be entered to receive one of eight $25 fuel gift cards drawn randomly every quarter over the study period and distributed by the WI State agency. The WI State agency provided deidentified client survey data for intervention and comparison agencies to THIS-WIC.

2.4.3.2 Staff Survey

WI provided a list of eligible staff (n=27) (i.e., those who were responsible for delivering nutrition education/breastfeeding support at intervention agencies) and their email addresses to THIS-WIC. THIS-WIC sent an invitational email with a link to the Staff Survey to all eligible staff. In WI, surveys were distributed electronically through Qualtrics three times during the intervention: (1) in the first quarter after implementation began (early phase), (2) at a second timepoint for staff who did not have the opportunity to use the telehealth solution during the first quarter (e.g., low client uptake of solution), and (3) in the last quarter of project implementation (late phase). Up to two email reminders were sent to eligible staff who did not complete a survey, and reminders were sent 1 week and 2 weeks after the initial outreach. Incentives were not provided to WIC staff for completion of surveys, in compliance with federal and/or state policies.

2.4.4 Staff Key Informant Interviews

The THIS-WIC team used a semi-structured interview guide to conduct key informant interviews via Zoom in the early and late phases (first and last quarter) of the project implementation period. The interviews were scheduled for 1 hour and audio recorded digitally. Incentives were not provided to WIC staff for completion of key informant interviews, in compliance with federal and/or state policies.

2.4.5 Telehealth Solution Implementation Data

Implementation data were collected using two methods—WI State agency led quarterly guided discussions (**Appendix WI.4**) with local agency staff and responses to the implementation tracking menu (**Appendix WI.4**)—for the startup (pre-implementation), midway, and endpoint or late phase of implementation.

2.4.6 Telehealth Solution Startup and Ongoing Implementation Cost Data

For startup costs, THIS-WIC extracted data from original project budgets provided by each subgrantee at the time of award. This included information on all staff working on startup activities (both paid for from the grant and in-kind contributions), equipment used in startup activities (both paid for from the grant and in-kind contributions), and contracted services supporting startup activities. THIS-WIC followed up with WI State agency staff to obtain missing data and clarify cost-related questions, and updated the cost tracking tools to ensure all costs were captured prior to analysis. This information included program implementation and evaluation for staff members and other resources, identified in-kind staff and resources not listed in budgets, and details on the services provided in contracts.

For ongoing costs of delivering services, the WI State agency completed an Excel-based cost collection tool reporting on the resources used to provide services in 1 month and the number of clients served. The tool captured all staff, infrastructure and equipment, supplies, contracted services, overhead, and travel used for providing services at intervention and comparison agencies. The resource data were combined with the reported number of monthly appointments and enrollments to generate the cost per appointment and enrollment. THIS-WIC collected costs for a typical month prior to telehealth implementation for fiscal year 2019 (initial) and an average of the first 6 months (midpoint) and last 6 months (endpoint) of implementation. THIS-WIC reviewed completed cost instruments submitted by the WI State agency to ensure that data entries were correct and reasonable and conducted follow-up to resolve data issues.

2.5 Sample Description for THIS-WIC Evaluation

Primary data were collected from the WIC Client and Staff Surveys. Key informant interviews were also conducted with WIC staff.

2.5.1 Client Survey Sample Size, Response Rate, Respondent Characteristics, and Representativeness

WIC clients who received nutrition education during a remote appointment with a CPA were eligible to take part in the evaluation. Respondents had to be 18 years of age or older and fall into one or more of the following categories: pregnant, non-breastfeeding postpartum, breastfeeding, or the parent/guardian of a participating infant or child in the WIC program. With a 5 and 10 percent response rate, the number of target survey completes was 1,201 and 2,396, respectively.

Following their WIC appointment, 8,233 clients were invited, and 26.8 percent consented to complete the survey. Of those who consented, 98 percent completed the survey and 97.5

percent were successfully linked with the MIS identifier. The analysis that did not include demographic variables derived from the MIS included all completed surveys. Analysis involving MIS data to describe the characteristics of survey respondents and regression controlling for demographic characteristics was limited to the data from matched respondents. Overall, 84.1 percent of respondents were in comparison agencies, and 16.9 percent were in intervention agencies. Differences in response rates between the intervention and comparison agencies may be attributable to the fact that (1) in the early phase, intervention site surveys were distributed via the ONE platform after their appointment (survey distribution was later changed to email or text to address the issue with participants not activating their ONE accounts and therefore not getting the survey) (see **Section 2.4.3**); and (2) a large number of survey responses came from a large urban agency in the comparison group, likely driving the response rate for comparison agencies.

Overall, about half of respondents self-identified as non-Hispanic White and slightly less than 20 percent as Hispanic (18.9%). More than half (53.6%) of respondents were between 26 and 35 years of age; slightly more than two-thirds (67.5%) of respondents had some high school education (grades 9 to 12), and about one-third (29.2%) had completed some college education (1 to 5 years). About 90 percent of respondents preferred to read in English, and fewer respondents in the intervention than comparison agencies preferred to speak and/or read in Spanish (4.8% vs. 8.8%). About one-quarter of respondents had received WIC services for less than 1 year, and a similar percentage had received WIC services for 5 years or more. About 40 percent of respondents had a high-risk WIC client in their household. This was comparable for intervention and comparison agencies (see **Table WI.1.8**). MIS data flags for high-risk clients were used to identify percentage of high-risk clients at intervention and comparison agencies.

The aggregate MIS data and Client Survey data were used to generate balance tables and assess the representativeness of survey respondents. This analysis compared respondents' sociodemographic characteristics, duration of WIC participation, and high-risk status with those of clients at the intervention and comparison agencies. See **Appendix WI.1** for sample size calculations, response rate, sociodemographic characteristics, and representativeness of WIC Client Survey responses.

2.5.2 Staff Survey Sample Size, Response Rate, and Respondent Characteristics

All staff involved in the delivery of nutrition education/breastfeeding support at intervention agencies were invited to participate in the Staff Survey. Thirteen unique staff members responded to the survey in the early and late phases. The number of staff invited and the number of staff who completed the early phase survey was 27 and 23, respectively (85% response rate). The number of staff invited and the number of staff who completed the late phase survey was 24 and 17, respectively (71% response rate). Since WIC agencies experienced turnover and hired new staff, the same survey was administered in the early and late phases.

Respondents in the early and late phases were comparable in age, race/ethnicity, role at WIC, years of WIC experience, and travel to other WIC clinics. WIC staff were primarily RDs and

breastfeeding support staff, and about 40 percent had worked in WIC for more than 12 years. All staff surveyed in the early phase traveled to provide service before the COVID-19 pandemic, whereas about 85 percent did so in the late phase. See **Appendix WI.1** for sample size and characteristics of survey respondents in the early and late phases.

2.5.3 Staff Key Informant Interviews Sample Size and Response Rate

In the early phase, all staff who completed the Staff Survey were invited to participate in the key informant interviews. In the late phase, all staff who used the telehealth solution for nutrition education and breastfeeding support were invited to participate in the key informant interview, regardless of their survey completion status. The response rate to the key informant interviews was 41 percent in the early phase and 33 percent in the late phase. See **Appendix WI.1** for the sample size and response rate for each WIC agency.

2.6 Analytic Approach

2.6.1 Aggregate MIS Analysis

For WI, WIC administrative data included WIC client characteristics, certification information, nutrition and risk assessment, nutrition education, retention in WIC, and WIC food benefit redemption. WI also linked the Client Survey identifier with the client-level MIS data. Aggregate MIS data were also used to examine agency-level trends in breastfeeding initiation and exclusive breastfeeding for the intervention and comparison agencies. Descriptive analyses were used to analyze the data and present the findings. All analyses were conducted in SAS 9.4. Crosstabulations and chi-square statistics were used to examine the differences in client characteristics between intervention and comparison agencies. See **Appendix WI.1** for details.

2.6.2 ONE Metadata

Metadata on ONE use were captured by the ONE platform for each participating local agency. This included data on the number of pending, open active, open inactive, and closed accounts; the number of articles shared by staff and viewed by clients; and the number of recipes accessed by clients. WI State agency staff generated and provided quarterly report summaries to THIS-WIC. Descriptive analyses were used to examine counts of resources used in each quarter of telehealth implementation. All analyses were conducted in Excel.

2.6.3 Client and Staff Surveys

2.6.3.1 Client Survey

The client outcomes evaluation examined the experiences of WIC clients who received WIC services and completed a Client Survey in one of the WIC clinics participating in the evaluation between April 1, 2022, and March 31, 2023. One intervention agency was excluded from the outcome analysis because less than five respondents completed the survey; thus, the analysis included five intervention agencies and five comparison agencies. Client Survey data were

analyzed using descriptive statistics, cross-tabulations, and unadjusted and multivariate regression.

Descriptive statistics include respondent and household demographics, availability and comfort with technology, attitudes toward telehealth intervention, and respondent behaviors (fruit and vegetable consumption and breastfeeding). Crosstabulations for categorical variables present proportions among those who provided data (i.e., missing values were excluded from the analysis) by group (intervention and comparison). Descriptive statistics for continuous variables present medians and interquartile ranges (25th percentile – 75th percentile) because the data on household income and household size were skewed.

Significance tests compare respondent demographics and household characteristics, availability and comfort with technology, and behaviors between survey respondents in the intervention and comparison agencies. For categorical variables, chi-square tests for independence were used. For continuous variables, the median test was used; this test examines whether the two samples come from the same population by assessing the distribution of sample scores around the median instead of comparing the actual median values. Analyses to assess client outcomes (satisfaction index, barriers, and behavior change intentions) used unadjusted hierarchical linear regression models comparing differences in means for intervention and comparison agencies. For the client satisfaction index, demographic/ household variables that demonstrated statistically significant differences between intervention and comparison agencies were entered into multivariable hierarchical linear regression. See **Appendix WI.1** for details.

2.6.3.2 Staff Survey

Descriptive analyses were conducted to examine the Staff Survey data. Chi-square tests were performed to examine differences in responses from early- to late-phase surveys. When analyzing the staff outcomes, attempts were made to adjust for biases in standard error estimates due to repeated measurements whenever feasible. For ordinal/continuous outcomes, the analysis adjusted for the unique participant ID numbers as a random effect and corrected for repeated measurements. However, given the small sample size, the same adjustments could not be made for categorical outcomes, which have more stringent sample size requirements. Instead, these data were analyzed as if the two time points are not related. All analyses were conducted in Stata 18 (StataCorp LLC, College Station, TX, USA).

2.6.4 Staff Key Informant Interviews

All interviews were conducted in English, audio recorded, and transcribed by Zoom verbatim. Each transcript was reviewed for accuracy and corrected to reflect actual dialogue spoken by listening to the audio recording. Before undertaking analysis, three THIS-WIC team members created a preliminary codebook, with codes deductively informed primarily by the CFIR[27] and the Evaluation Framework for Telemedicine.[29] Graduate research assistants (n=5) with coursework and prior experience in qualitative analyses also coded interviews. A single codebook was used for both early- and late-phase coding. To start, coders independently coded the same four transcripts from the different WIC State agency projects. Coders met to compare

codes, arrive at a final determination, and update the codebook if necessary. Additional details of establishing interrater reliability are provided in the technical appendix (**Appendix WI.1**).

2.6.5 ONE Implementation

The analysis of the implementation tracking menu involved tabulating the startup, midpoint, and endpoint status for each menu strategy to assess change. The startup measures were considered the implementation plan, and the change from startup to midpoint and endpoint measures were considered indicative of readiness. In addition to understanding the readiness for implementation, these data were also used to provide context for the staff- and client-level outcomes. See **Appendix WI.1** for details.

Data on staff and client use of ONE at each local intervention agency were collected directly in ONE or documented in WI's MIS system. Descriptive analyses were conducted using Tableau Prep (version 2023.1) and Microsoft Excel (version 2308) to examine implementation.

2.6.6 ONE Startup and Ongoing Cost Analysis

Cost analysis was conducted to understand the (1) startup cost, (2) ongoing service delivery cost, and (3) ongoing cost per enrollment and appointment. To understand the costs of sustaining the WIC program with telehealth compared with usual care, we assessed differences in ongoing service delivery costs per enrollment and per appointment in intervention and comparison agencies. Specifically, we assessed changes in ongoing service delivery costs from pre-implementation to post-implementation in intervention and comparison sites and then compared the changes between the two groups of sites. All costs were adjusted to 2023 dollars using the Consumer Price Index. All analyses were completed in Microsoft Excel (version 2308) and Stata 18. See **Appendix WI.1** for details.

3. Results: Implementation of Telehealth Services Using ONE

Between Q2/2022 and Q1/2023 (April 2022 through March 2023), 11 local agencies participated in the 12-month telehealth evaluation (six intervention and five comparison). This chapter presents implementation outcomes (process and cost). Data sources for findings included in this chapter include the Staff Survey, staff key informant interviews, telehealth metadata, implementation data, and startup and ongoing cost data. Chapter 4 presents the client experience with telehealth and the primary and secondary outcomes.

3.1 Attitudes Toward Telehealth

WIC staff had positive attitudes toward offering telehealth services due to their ability to increase accessibility to WIC services and increase client participation and retention (CFIR constructs: *innovation advantage*, *outer setting*, *inner setting*, and *characteristics of individuals*[*]) through remote appointments. Statements centered around (a) making WIC services more accessible to clients by addressing such barriers as transportation, travel time and costs, and scheduling conflicts for clients with care responsibilities; and (b) allowing clients to have a stress-free appointment from the comfort of their home. In the early phase, staff noted that offering telehealth was critical to keeping the WIC services accessible amid the COVID-19 pandemic. Staff also described instances where they would be at a clinic on a limited number of days, making it challenging for clients to work with these limited time slots, and stated that telehealth made it feasible for them to see clients on more days, thereby eliminating scheduling conflicts. In the late-phase interviews, staff reiterated these benefits for the clients and noted that clients appreciate the flexibility in scheduling appointments and the ability to review nutrition materials at their own time. The following are Illustrative quotes from the early- and late-phase interviews:

> *"I think it really plays a role in equitable access. whether it be lack of transportation, whether it be, you know, people who are living in rural areas." (Staff participant 6)*
>
> *"You know, they can realistically probably take a 15-minute break for a phone call or Zoom but like to leave work and drive 15 minutes, minute by minute, and then drive back to work like this, you know it's just adding a lot more barriers." (Staff participant 19)*
>
> *"They can do a lot of these things in the comfort of their own home instead of in a clinic where they're trying to also watch their child and trying to listen to us when they're in their own home, especially with kids with special needs." (Staff participant 4)*

[*]As described in Chapter 2, qualitative data were analyzed deductively using the CFIR Framework, and inductively. To align project findings with the broader implementation science literature, we noted alignment with CFIR constructs when appropriate.

> *"They don't have to take their kids out of school, and they don't have to figure out a car, and their partner is working and like, there's just so many things that add up to go against someone using WIC are coming to WIC appointments." (Staff participant 30)*
>
> *"I think it's been very successful, for our families who have it who have used it, you know. I think they really appreciate having that flexibility of not having to meet a very specific WIC appointment time and doing it on their own, and having that education lesson that they can tailor to something that they're experiencing in their life at that time." (Staff participant 6)*

Staff noted that offering telehealth appointments has provided clients the flexibility of scheduling appointments at their convenience (i.e., not constrained by their work or daily routine and clinic schedule), resulting in more appointments kept and more clients retained in the program. Staff commented that their enrollment counts have "increased dramatically," and telehealth has "allowed families to continue in the program even after they don't need formula for their child(ren)." Finally, some staff noted that many families enrolling during/after the COVID pandemic had never visited the clinic (due to waivers in place); therefore, they are used to telehealth appointments and likely to continue receiving telehealth services in the future. Some staff also expressed optimism about client retention and noted that "maybe more people will stay in the program rather than thinking that's a lot of work for me to have to stay…."

> *"Our no-show rates are like 3%, so, we're really connecting well with families through, you know, what is our phone-based telehealth model." (Staff participant 12)*
>
> *"I think it helps us in retaining more families in the program." (Staff participant 4)*
>
> *"We've had a time where families would drop off as soon as the kids return because they're like well I don't need formula anymore. And there were many more good components to our program. So, this kind of gives them just a view of how we can help support their families and continue so they continue with us until they turn five." (Staff participant 4)*

Staff perceived that telehealth services are useful in promoting heath equity among WIC clients. Staff also considered telehealth to be an integral part of WIC's health equity strategies (see **Table 3-1**).

Table 3-1. Staff Attitudes Toward Usefulness of Telehealth in WI

Statement[a]	Early N=20 Mean (95% CI)	Late N=12 Mean (95% CI)	p-value[b]
Telehealth is useful in promoting health equity among my WIC participants.	4.5 (4.2, 4.7)	4.5 (4.2, 4.8)	0.861
Telehealth should be a part of all WIC organization's health equity strategies.	4.5 (4.2, 4.8)	4.3 (3.9, 4.7)	0.398

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1=Strongly disagree and 5=Strongly agree.

[b] All p-values are based on mixed effect linear regression, controlling for repeated measurements at the individual level.

3.2 Readiness to Implement ONE

Data on perceived readiness to implement ONE were obtained from three sources: (1) the Implementation Tracking Tool completed by WI State agency staff at the early, midpoint, and endpoint of telehealth implementation; (2) Staff Surveys in the early and late phases; and (3) key informant interviews with WIC administrators and staff in the early and late phases.

3.2.1 Telehealth Implementation Strategies

At startup, WI selected 16 strategies for implementation and by endpoint had implemented 19 strategies. By endpoint, WI had assessed readiness and identified barriers and facilitators, conducted audits and provided feedback, purposefully reexamined implementation, and developed/organized quality monitoring systems to facilitate implementation. WI had centralized technical assistance, promoted adaptability and used data experts, developed academic partnerships, captured and shared local knowledge, identified and prepared champions, organized WIC staff implementation Teams meetings, and identified early adopters. Finally, WI State agency staff had developed and distributed educational materials, offered dynamic training and conducted ongoing training, facilitated relay of telehealth breastfeeding/nutrition data to staff and reminded WIC staff and clients about the telehealth solution, intervened with WIC clients to enhance uptake and adherence, and changed record systems (i.e., MIS) to document use of ONE. See **Appendix WI.4** for details.

3.2.2 Staff Training

None of the Staff Survey respondents had prior experience delivering services via telehealth. The WI state WIC agency provided training to all local agency staff at the intervention agencies. Initial training on ONE was conducted in Q3/2021 and Q4/2021 (summer/fall 2021), with check-ins and refresher trainings offered in Q4/2021 and Q1/2022. As seen in **Table 3-2**, the number of hours staff received telehealth training to implement ONE varied considerably and ranged from less than 2 hours to 8 or more hours. Although mode preference for delivery of nutrition education did not differ significantly in the early and late phases, the frequency of using the

telehealth solution for nutrition education was significantly different in the early and late phases. In the early phase, half of the Staff Survey respondents used the telehealth solution daily, and the remaining staff used it weekly; in the late phase, none of the staff used it daily, with slightly more than 40 percent using it weekly and the remaining staff using it monthly. There were no significant differences in mode preference or frequency of telehealth use for breastfeeding education; however, these data should be interpreted with caution as this question was not answered by all staff in the late-phase survey.

Table 3-2. Telehealth Training Duration and Frequency of Use in Early and Late Phases in WI

Variables	%		p-value[a]
	Early Phase	Late Phase	
Hours of training	N=20	N=9	0.357
0 to <2 hours	15.0	0.0	
2 to <5 hours	25.0	44.4	
4 to <6 hours	20.0	33.3	
6 to <8 hours	20.0	0.0	
8 or more hours	20.0	22.2	
WIC appointment mode preference (Nutrition)	N=14	N=10	0.466
In-person	42.9	37.5	
Phone and ONE	42.9	25.0	
Phone	14.3	25.0	
Other	0.0	12.5	
Frequency of telehealth solution use (Nutrition)	N=20	N=9	<0.001*
Daily	50.0	0.0	
Weekly	50.0	44.4	
Monthly	0.0	55.6	
WIC appointment mode preference (Breastfeeding)	N=8	N=2	0.747
In-person	37.5	50.0	
Phone and ONE	62.5	50.0	
Phone	0.0	0.0	
Other	0.0	0.0	
Frequency of telehealth solution use (Breastfeeding)	N=9	N=3	0.135
Daily	33.3	0.0	
Weekly	55.6	33.3	
Monthly	11.1	66.7	

Source: THIS-WIC Staff Survey

[a] p-values are based on chi-square tests.

* p<0.05

Key informant interviews also provided insights into the training offered to staff. Several statements captured the strengths and limitations of the training provided to staff (CFIR constructs: *inner setting* and *implementation process*). WIC staff varied in their takeaways from the training they received before launching ONE. Several staff referenced the impact of delays in launch following the training, noting that this lag required them to retrain themselves before launch. In this context, staff noted that, in the future, training should be conducted after all plans are finalized; some also recommended future trainings and a refresher training in the middle of the study.

> *"…we had it where we did the training and then all of a sudden, we had this gap of time before we actually got to start implementing it so it's like all right, I got to review everything again." (Staff participant 4)*
>
> *"I think the only challenge was that we retrained on it, and then it got pushed… our start date got pushed and pushed and so, by the time we came to use it, a lot of that training had kind of left our mind, so we had to really go back and retrain ourselves prior to the start date but otherwise the information that was given and the training received was good." (Staff participant 16)*
>
> *"Having possibly a training like right before we went live with it, and then maybe having another training, possibly in the middle of the study, might have just been helpful to just for some refreshers, and maybe to talk about some of the ways where we could have maybe taken advantage of it a little bit more with the tools we had available in our clinic." (Staff participant 22)*

Overall, staff felt that the training was brief, covered a lot of material, but fell short in preparing them to present the solution to the clients. They recommended a script to use in the early phase of the launch as well as additional information on the background for the pilot and potential plans to continue these efforts beyond the pilot study.

> *"I think it's just promoting it, it was difficult initially because I didn't really know… like I knew what I was promoting but I didn't know how it was really going to help them like I didn't have like this is a pilot study, so we don't really know how great it really is." (Staff participant 17)*

In the early phase, some staff noted that training documents and videos clarified the process of using the telehealth platform for appointments, whereas others felt that training was not interactive, and they were not able to understand the entire process of using the system. They also felt that, although they understood the process of launching the appointments and using the ONE platform, interactive sessions and/or role plays to help them see the client side of the solution would have been useful, particularly in the early phase of the launch when they were less familiar with and less prepared to use the platform. Finally, staff reported that the instructions for adding information into the database were not addressed clearly in the training. Some staff found the process of entering data confusing and felt the need for training to walk

through step-by-step instructions, whereas others reflected that having time to explore the website before launch helped them become familiar with the process.

> *"I think just being able to be hands on like having the list of different activities to try to do, and for us to go ahead and try them out was very beneficial." (Staff participant 4)*
>
> *"So, I guess it was a little challenging because it was maybe like this goes back to the training of seeing exactly what they see on their end versus what we're seeing on our end, which is a little challenging, and I found myself saying a lot of like 'okay now, what are you seeing now, what are you seeing now'." (Staff participant 16)*
>
> *"It was really hard to picture, how it was going to look before you did it… I feel like there wasn't anything showing me. Like I almost wish I could have seen it role played or something like I had a very hard time envisioning and how I would utilize it. But again, once you kind of have all the pieces it makes more sense." (Staff participant 30)*
>
> *"I guess looking back, it is nice to have like a website that we can play around with before it is live. That was helpful because I was able to kind of do things back and forth with myself and just kind of see how it worked." (Staff participant 17)*

In the late phase, staff appreciated the additional training to clarify how to assist clients with their accounts. They also acknowledged that the additional short video clips clarified the process and content in the telehealth platform.

> *"It was effective by like having an example participant, and like understanding how to get them having an account and then knowing how the system works for them getting their survey." (Staff participant 4)*
>
> *"It definitely helped in the process to then have that second round of what is it, … was it five or six short Vimeo clips that kind of broke down the different phases of the process. So, once they watched those, it sort of brought everything together and made it feel much more manageable. But I was certainly glad that those were added because I didn't feel like the initial you know big one hour video was helping bring it all together for everybody, and myself included, you know, I was feeling just as kind of overwhelmed and confused as they were." (Staff participant 10)*
>
> *"I think the video. The videos of them actually using it, I think the videos and the training videos that _____ [telehealth solution] provided for us and that were asked for, and then that they provided as well really were helpful when done in a virtual way. I think that was very helpful to have that, rather than just a step by step of how to do it, which is helpful as well. But the actual video of them showing it to us was very helpful." (Staff participant 16)*

3.3 Satisfaction with Telehealth Solution

Staff satisfaction with ONE did not differ significantly over time (**Table 3-3**). Similarly, there was no difference in preference for WIC appointments with ONE and WIC appointments in-person over time.

Staff shared various factors that affected their level of satisfaction with offering telehealth services. For example, staff highlighted the enthusiasm, engagement, and support from the leadership and valued the leadership's proactive approach to data sharing on staff usage and client engagement with the solution. Staff varied in their level of preparedness to implement the solution after the training; some felt comfortable using the ONE platform, whereas others noted that it took time to become familiar with the materials, understand the functionality of the platform, and create buy-in from clients (CFIR construct: *innovation characteristics and characteristics of individuals*). Staff indicated that appointments took longer because of the additional time required to assist clients with setting up accounts, orienting them to the resources, and recovering their passwords (CFIR construct: *implementation process*).

Table 3-3. Satisfaction with Telehealth in Early and Late Phases among Staff Survey Respondents in WI

Statement[a]	Early N=20 Mean (95% CI)	Late N=12 Mean (95% CI)	p-value[b]
Overall, I am satisfied with ONE.	4.15 (3.76, 4.55)	4.24 (3.73, 4.76)	0.709
I prefer WIC appointments with ONE over WIC appointments that are in-person.	3.08 (2.55, 3.62)	3.20 (2.63, 3.76)	0.387

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1=Strongly disagree and 5=Strongly agree.

[b] p-values are based on mixed effect linear regression, controlling for repeated measurements at the individual level.

Staff found it rewarding when clients logged into the system and/or turned on video during Zoom appointments (synchronous use of ONE) because the clients were more engaged, and they got a glimpse into their client's life to make the information more relevant and establish a rapport (CFIR construct: *characteristics of individuals*). Finally, staff noted that telehealth services may work better for nutrition education than for breastfeeding education, which involves seeing and supporting latching and other techniques.

"One of the biggest things I found helpful [with the] check-in meetings with the state were other local agencies … giving their feedback on what's working what's not and it really just helped…." (Staff participant 30)

"I think it might be more difficult for a newer dietitian that might not know all the information that's in there. So, you know, for a newer dietitian or a newer CPA it's almost better to go through that whole system like a client to see what's being shared so then they're aware of all the tips that we give for WIC." (Staff participant 4)

"But yeah, now that I had some time to just look at the participants and things it helps me and explaining it so much better." (Staff participant 16)

"Nobody knows what their participant ID is. So possibly, if they use, I don't know how secure that would be if they use the PIN number that they use with their WIC card. That could be maybe a benefit, or you know something they remember but they wouldn't know what their WIC ID is. But maybe, yeah, maybe that PIN number or the last 4 digits of their WIC card number that might work a little better for them." (Staff participant 16)

"I think our biggest challenge is initially the extra time it was taking for us to explain it to our participants and getting them to sign up was a little challenging and frustrating at times when we have to move along with other appointments and things." (Staff participant 16)

"That was probably just the biggest struggle. They do like [telehealth solution], and they do use it well but also, you know, getting staff to buy in with it to get families to buy into it. That was a struggle." (Staff participant 1)

"I think it's rewarding, especially because I know that I'm giving that information. I think it's especially rewarding when a participant is willing to open it during the visit and utilize it along with me. You know, I can kind of explain the different sections, you know, the different areas, how to use it…" (Staff participant 30)

3.4 Adoption of Telehealth Services

Adoption of telehealth services at intervention agencies was assessed using data gathered from the WI State agency during quarterly discussions with local agency staff, MIS, and key informant interviews.

3.4.1 State Agency Led Quarterly Discussions with Local Agency Staff

To support staff with telehealth implementation, the WI State agency scheduled regular meetings with local agency staff using telehealth to address ongoing issues and to understand their experience with implementing ONE. In the first quarter, staff from seven intervention agencies participated in this data collection activity. One agency withdrew from the study after implementation began, and follow-up responses for Q4/2022 through Q2/2023 were provided by staff from six intervention agencies.

Across all four quarters, WIC staff and clients responded positively to the high-quality visual materials in ONE, the range of topics available, and the ease and immediacy of being able to share materials electronically. Despite this positive experience, staff use of ONE declined steadily over time (**Table 3-4**). In the early phase, local agencies experienced challenges in using ONE because it was not fully integrated into MIS. WI worked with Nutrition Matters to address these challenges. In the late phase, ONE was integrated with MIS, which allowed automatic and manual documentation of ONE lessons in MIS. Staff also noted the time burden to explain how to open and use the telehealth platform with their clients. In general, although staff encouraged WIC clients to open ONE during remote appointments, most clients preferred to do so after the appointment. In these situations, staff reviewed the content available on ONE with WIC clients during appointments and shared these materials so their clients could view them later. Consistent with findings from the key informant interviews, WI State agency discussions with local agency staff indicated that appointments took longer because of the additional time required to help clients set up their accounts and get up to speed with and comfortable using ONE. Time constraints resulting from longer appointments to help clients set up their accounts and orient them to the platform, competing priorities, the cumbersome nature of using multiple platforms at the same time (e.g., ONE and MIS), and staff resistance were barriers to using ONE as much as possible and contributed to its declining use over time.

Table 3-4. Trends in ONE Use and Appointment Length from Q2/2022 to Q1/2023 in WI

Question	Q2/2022	Q3/2022	Q4/2022	Q1/2023
	Number of Local WIC Agencies			
Do you feel that WIC staff use ONE as much as possible?[a]				
Yes	4	1	2	1
ONE use for nutrition education by appointment type[a,b]				
Certification	3	3	3	2
Mid-certification	5	2	1	1
Re-certification	2	0	1	1
Benefit issuance	1	1	2	1
All appointments	1	1	0	0
Secondary education/follow-ups	0	1	2	3
Comparing using ONE to not using ONE during remote services, describe the length of appointments[c]				
Longer	7	4	5	3
Shorter	0	0	0	0
About the same	0	2	1	1

Source: WI State agency's compilation of local agency staff responses

[a] Two agencies did not respond to this question.

[b] Numbers do not add up because respondents could select all that applied.

[c] Response choices included "longer," "shorter," and "about the same."

3.4.2 ONE Use for Nutrition Education

WIC staff started using ONE for remote sessions in Q2/2022. Across all agencies, the number of times ONE was used was the highest in Q2/2022 with a steady decline in use over time (**Table 3-5**). Additionally, the number of remote sessions using ONE varied considerably across agencies (see **Appendix WI.4**). Reasons for variability within and across clinics and decline in all clinics were not examined, but discussions with WI State agency staff suggest that staff turnover, fatigue, and competing priorities contributed to these trends. WIC staff used nutrition resources from ONE during and after appointments with clients. Consistent with the findings on declining use of ONE over time, the number of articles shared with clients also declined over time (see **Table 3-5**). In Q2/2022, staff across all intervention agencies shared 1,115 articles with WIC clients through the ONE platform; by Q1/2023, this number had decreased to 196. The most shared articles were in the "baby" category, which includes information on feeding children 3 to 12 months of age, including transitioning to solid foods and infant self-feeding. In the late phase, staff sent articles via email, and these data were not tracked in metadata or otherwise; therefore, the number of articles shared in the late phase is an underestimate.

Table 3-5. ONE Use for Nutrition Education from Q3/2022 to Q1/2023[a] in WI

Number of ...	Q2/2022	Q3/2022	Q4/2022	Q1/2023
Remote sessions using ONE	1,648	780	533	171
Articles shared	1,115	641	423	196

Source: ONE metadata, WI State agency

[a] Data for each quarter were pulled on the following dates: Q2/2022: 7/20/2022; Q3/2022: 10/17/222; Q4/2022: 2/24/2023; and Q1/2023: 5/16/2023.

3.5 Acceptability of Telehealth Solution

As seen in **Table 3-6**, staff agreed with the statement that ONE was an acceptable way to provide WIC services and useful for them as WIC staff. Staff acceptability did not change from the early to the late phase.

Table 3-6. Acceptability of ONE in Early and Late Phases among Staff Survey Respondents in WI

	Early Phase	Late Phase	
	N=20	N=12	
Statement[a]	Mean (95% CI)		p-value[b]
ONE is an acceptable way to provide WIC services.	4.41 (4.08, 4.74)	4.34 (3.96, 4.71)	0.595
ONE is useful for me as WIC staff.	4.38 (4.14, 4.62)	4.25 (3.96, 4.54)	0.297

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1=Strongly disagree and 5=Strongly agree.

[b] p-values are based on mixed effect linear regression, controlling for repeated measurements at the individual level.

Findings from the key informant interviews indicate that staff considered telehealth to be an important part of providing services and recognized the need to provide clients a choice (of phone or telehealth) and let them decide what works best for them (CFIR construct: *innovation advantage and characteristics of individuals*). Staff appreciated the backend tracking on the platform that indicated what resources their clients reviewed, which made it easier for other staff to step in or follow up with the client, as needed. Staff noted that clients perceive telehealth to be a reliable source of information and hoped that this "elevates the WIC dietitian ... who you can go to for nutrition information when you need it." Finally, staff also discussed flexibility in work mode and the ability to make effective use of the WIC clinic space.

> *"I think overall our WIC participants aren't ... they got really used to phone calls so like in a perfect world it would have been really nice to be like on a Zoom call and be able to pull it up on screen and screen share. Very few of our participants we give an option 'do you want to do Zoom, or would you like to do it on the phone', and most people just prefer, like a phone call while they're doing things." (Staff participant 19)*
>
> *"It helps us like communicate without communicating so because you can see if someone shared this with them and then we can plan it in our system as well. So, it's more of just that we can see more of what we talked about, or of what we want the client to review. So, they don't have to ask us directly it's more of just 'Oh, I see that you sent this' and then they can follow up with a client, I think that helps with our interpersonal communication." (Staff participant 3)*
>
> *"... clients that have used it have navigated it well. Because if we give them one thing to look at, we find that they're moving on to other things, to find other things to look at. Not what maybe they've looked at initially what we've sent them, but they've navigated well enough to find other things [they] are interested in seeing. So, I think that… that's the nice thing about the website, it's just so user friendly." (Staff participant 26)*
>
> *"You know, telehealth has been great for clients and staff… because of WIC being remote, it's actually opened up our clinics for other things, because we're not in there. So, staff are working remotely or in offices and other locations, and our WIC clinics are currently used as COVID clinics right now." (Staff participant 26)*

3.6 Feasibility of Using Telehealth Solution

Staff found the ONE platform easy to use and flexible to interact with (**Table 3-7**). Agreement with the statement, "learning to use ONE was easy for me" was higher in the late phase than in the early phase of implementation. Although not significant, there was a trend in staff indicating that ONE was easier and more flexible to use over time.

Table 3-7. Feasibility of Using Telehealth in Early and Late Phases among Staff Survey Respondents in WI

Statement[a]	Early Phase N=20 Mean (95% CI)	Late Phase N=12 Mean (95% CI)	p-value[b]
Learning to use ONE was easy for me.	3.73 (3.41, 4.06)	4.20 (3.80, 4.60)	0.008*
I find ONE to be easy to use.	4.12 (3.83, 4.40)	4.32 (3.98, 4.65)	0.122
I find ONE to be flexible to interact with.	3.88 (3.51, 4.26)	4.05 (3.50, 4.60)	0.591

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1=Strongly disagree and 5=Strongly agree.

[b] p-values are based on mixed effect linear regression, controlling for repeated measurements at the individual level.

* p<0.05

Emergent themes from key informant interviews provide additional evidence of the facilitators and barriers to using ONE (CFIR constructs: *innovation characteristics, inner setting, and implementation process*). Overall, staff described the platform as "modern, friendly to look at, and easy to use" and noted that the materials included for the clients were appealing and easy to use. Experienced staff indicated that they were familiar with all the WIC nutrition education materials and therefore found it easy to learn ONE, but newer staff may require additional time to do so. Some staff felt that "the platform itself is pretty easy to use ... and navigate ...," whereas others expressed a desire to simplify the interface, and some thought it would be beneficial to integrate it with phone appointments. Staff also wanted an easier way to assist clients with their forgotten passwords and thought that "...having the website pinned on their home screen ... so it looks like an app on their phone where they can easily click on it" would help with clients' sustained use. Staff also discussed the need to expand and update the resource library and to add resources in languages other than English and Spanish.

> *"I was worried about toggling between the WIC website for documentation and I'm like WIC or _____ [telehealth solution], and then you throw other things into it, maybe their families or something and you're trying to document for that. It's just a lot of windows to go through on top of that now…" (Staff participant 17)*
>
> *"I think even just the main screen I like. How simple it is with the little tabs, for you know, lessons, tools, explore. I like that. I like how they, you know, if we recommend lessons, it pops up right there for them to see it yeah, I really like the simplicity of the main screen right when they sign on." (Staff participant 6)*
>
> *"I think it's a lot of work to like send these out to people and send the links out to people and then people don't like, open the links because they look like a*

scam or whatever and so they don't necessarily like trust it…" (Staff participant 17)

"I don't have any solutions to this, but I feel like after they activate their accounts and then we talk to them 3 months later and we want them to go back into their account, they don't remember their password or how to get in. So, I'm not sure what the solution is to that, or what the easiest way, but… and we just resend them the link, and then tell them to change, you know ask for a new password, if they can't remember it. So yeah, that's a little challenging." (Staff participant 16)

"I wish it was more. maybe like an app or something where it would like send them a notification on their cell phone… But it would be better if there was some way to notify them versus them not knowing until you know, like once they log into it. Then they can see like, Oh, my gosh! Help me send messages, or whatever." (Staff participant 19)

3.7 Improved Accessibility of WIC Services for Clients

Staff providing WIC services via telehealth perceived that it improved accessibility to WIC services for clients (**Table 3-8**). Staff reported an increase in their ability to reach participants who face challenges accessing clinics due to traffic or distance and those who typically miss their appointments.

Table 3-8. Staff Perceptions of Improved Accessibility to WIC Services for Clients Because of Telehealth in Early and Late Phases in WI

Statement[a]	Early N=20 Mean (95% CI)	Late N=12 Mean (95% CI)	p-value[b]
With telehealth, I am able to provide services for WIC participants who have difficulty accessing a clinic because of traffic or distance.	4.62 (4.38, 4.86)	4.73 (4.47, 4.99)	0.223
With telehealth, I am able to provide services for WIC participants who would usually miss their appointments.	4.66 (4.44, 4.89)	4.77 (4.49, 5.04)	0.477
I would like to continue using ONE to provide WIC services.	4.50 (4.26, 4.74)	4.78 (4.42, 5.13)	0.203

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1=Strongly disagree and 5=Strongly agree.

[b] p-values are based on mixed effect linear regression, controlling for repeated measurements at the individual level.

During key informant interviews, staff noted that continuing to offer telehealth services aligns with the delivery of other healthcare services and the overall objectives of WIC (CFIR constructs: *innovation characteristics, outer setting, inner setting, characteristics of individuals, and implementation process*). Staff were acutely aware of their clients' lifestyle and routine and

acknowledged the role of telehealth services in increased client participation and retention. Staff noted that their clients were able to step out of their workplace or talk with staff from the comfort of their home, or while taking care of chores, which helped with client participation and retention.

> *"We have removed those, the variety of barriers, for people making appointments, whether it be transportation, I mean you know, we are in an urban/suburban setting. But, you know, people still have to travel, you know, or had to travel to the clinic to get those WIC benefits, complete the appointment. And some of them didn't have a car to do that and were taking multiple buses to get to that appointment or arranging rides. So that's been huge." (Staff participant 12)*
>
> *"Well, how fair is it that the population where we go is only able to see us twice, two days, out of a month like that doesn't make sense, so they're limited, and if we were doing more phone appointments that would be opened up." (Staff participant 17)*
>
> *"Our no-show rates are like 3%. So, we're really connecting well with families through, you know, what is our phone-based telehealth model." (Staff participant 12)*
>
> *"I think it helps us in retaining more families in the program." (Staff participant 13)*
>
> *"Telehealth like this pilot and having this information could help with caseload in keeping it easier for clients to use WIC, while still meeting the requirements for USDA." (Staff participant 26)*

3.8 Frequency of Travel and Travel Time

The Staff Survey asked respondents how long they worked at WIC. Staff who worked at WIC for 2 years or more (21 out of 23 in the early phase and 14 out of 17 in the late phase) were asked whether their job included traveling to one or multiple WIC clinics prior to the COVID-19 pandemic. In the early phase, all respondents reported traveling to one or more WIC clinics before the pandemic; and in the late phase, about 70 percent reported traveling for work before the pandemic. As seen in **Table 3-9**, the frequency of travel and travel time to other clinics did not differ significantly from the early phase to the late phase of telehealth implementation. About 70 percent of staff in the early phase and 50 percent of staff in the late phase spent 30 minutes or less traveling to other WIC clinics.

Table 3-9. Frequency of Travel and Travel Time to Other WIC Sites among Staff Survey Respondents in Early and Late Phases in WI

Question[a]	%		p-value[b]
	Early	Late	
On average, how frequently did your job require you to travel to these other WIC clinic sites?	N=21	N=12	0.744
More than 1 time per week	42.9	25	
1 time per week	4.8	8.3	
More than 1 time per month	9.5	16.7	
1 time per month	42.9	50	
On average, how many minutes of your workday did you spend traveling to these other WIC clinic sites?	N=19	N=12	0.410
15 mins or less	31.6	16.7	
16–30 mins	36.8	33.3	
31–60 mins	26.3	25	
61 mins or more	5.3	25	

Source: THIS-WIC Staff Survey

[a] Only staff who indicated they had to travel were asked these questions.

[b] p-values are based on chi-square tests.

3.9 Startup Cost to Implement Telehealth Solution

The startup period for implementing the telehealth solution in WI was from April 2021 to March 2022. Over this 12-month period, WI incurred $663,221 to set up the telehealth solution (**Table 3-10**). This translated to an average monthly cost of $55,268. During the startup phase, the single biggest expense was for contracted services (to support integration of ONE with the current MIS), accounting for 81 percent of total spending. Other resource categories included equipment (computer web cameras, web meeting licenses, training supplies, printed training materials, and equipment needed to create videos), accounting for 10 percent of total spending, followed by labor (7%) and indirect costs (1%).

Table 3-10. Telehealth Solution Startup Costs (April 2021–March 2022) in WI

Resource Category	Cost	Percentage of Total Cost
Labor	$47,128	7
Equipment	$68,836	10
Indirect	$7,226	1
Contracted services	$540,030	81
Total (12 months)	$663,221	100
Average per month (12 months)	$55,268	N/A

Source: Cost tracking data, WIC State agency

3.10 Ongoing Cost to Implement Telehealth Solution

Average ongoing costs of service delivery per enrollment are shown in **Table 3-11**, for each study group and for the three timepoints of the telehealth solution implementation. During the pre-implementation period, the average cost per enrollment was slightly higher in the intervention agencies than the comparison agencies ($16 vs. $14 per enrollment). The average cost per enrollment in the intervention agencies increased slightly (up to $18 per enrollment) at 6 and 12 months after implementation. In contrast, the average cost per enrollment in the comparison agencies decreased to $10 and $8, respectively, at 6 and 12 months after implementation. The mean and median estimates for intervention and comparison agencies at each timepoint are similar, indicating minimal skewness of the data. The minimum and maximum values show the spread of the estimates, indicating that average ongoing service delivery costs varied across agencies.

Table 3-11. Per Enrollment Cost at Intervention and Comparison Agencies in WI

	Pre-Implementation (FY2019)		Post-Implementation			
			6 Months (Apr–Sep 2022)		12 Months (Oct–Mar 2023)	
Value	Comparison (N=4)	Intervention (N=6)	Comparison (N=4)	Intervention (N=6)	Comparison (N=4)	Intervention (N=6)
Mean	$14	$16	$10	$18	$8	$18
Median	$15	$15	$10	$15	$9	$15
Min	$7	$8	$8	$8	$4	$8
Max	$21	$24	$12	$37	$10	$47

Source: Cost tracking data, WIC State agency

As seen in **Table 3-12**, average per-appointment costs in the pre-implementation period were substantially lower for intervention agencies ($51) than comparison agencies ($93). After the introduction of the telehealth solution, per appointment costs at 6 and 12 months post-implementation increased slightly in the intervention agencies ($63 and $64, respectively) but decreased in the comparison agencies ($47 and $40, respectively). The differences in mean and median estimates were larger for per-appointment costs than for per-enrollment costs, but the estimates were still relatively consistent.

Table 3-12. Per Appointment Cost at Intervention and Comparison Agencies in WI

	Pre-Implementation (FY2019)		Post-Implementation			
			6 Months (Apr–Sep 2022)		12 Months (Oct–Mar 2023)	
Value	Comparison (N=4)	Intervention (N=6)	Comparison (N=4)	Intervention (N=6)	Comparison (N=4)	Intervention (N=6)
Mean	$93	$51	$47	$63	$40	$64
Median	$110	$58	$40	$59	$34	$53
Min	$24	$28	$21	$25	$11	$25
Max	$128	$72	$87	$111	$81	$159

Source: Cost tracking data, WIC State agency

3.11 Summary of Findings

The WI state WIC agency selected 11 local WIC agencies to participate in the THIS-WIC evaluation. Eighteen (18) clinics (one had 11 satellite locations) implemented the telehealth solution across these 11 local agencies. Key findings include the following:

- **Staff attitude**: WIC staff had favorable attitudes toward the use of telehealth with a high level of awareness about the ability to reach clients in rural areas and clients with transportation, childcare, or other constraints. Offering telehealth services aligned with modern health care and providing clients with a choice of telehealth will help ensure access to services for all.
- **Staff readiness**: WIC staff had no prior experience delivering telehealth services. Therefore, WI implemented several strategies to prepare staff for implementation. For example, the WI State agency conducted trainings, centralized technical assistance, promoted adaptability, identified and prepared champions, organized WIC staff implementation team meetings, offered dynamic and ongoing trainings, and reminded staff and clients about using the telehealth services and telehealth solution platform. WI also updated its MIS to allow staff to document use of ONE tools manually during remote sessions and worked with Nutrition Matters to integrate ONE with MIS to support automatic as well as manual documentation of ONE use. Although the WI State agency provided support, most staff noted that the lag between training and implementation required them to review and understand the system again. After offering telehealth services, staff noted that the training could have been strengthened by including some information on how to market the solution to the clients and practice/role play to understand the client view of the platform. Staff appreciated that these were added to the training during the implementation and evaluation periods.
- **Staff satisfaction**: Overall, staff satisfaction with offering services through ONE was high. Staff noted that the PDF and video materials on the platform were comprehensive and of high quality. Some senior staff noted that they were familiar with the WIC resources, but newer staff may need additional time to understand the breadth of

resources available and to become familiar with the system. To accommodate differences in learning preferences, staff expressed a desire for videos and information in languages other than English and Spanish; they also noted the need to ensure that the materials are updated to reflect current knowledge. Staff highlighted the high level of collaboration across all participating agencies and clinics, which allowed them to discuss and address problems in real time. Staff shared the high level of support provided by the state and local agency staff, particularly when supervisors shared data on usage at the staff and agency levels. However, staff also noted that offering telehealth increased the length of appointments as they had to spend considerable time marketing the solution to the clients, helping them to set up their accounts, walk them through the process of using the platform, and assist them with password recovery. Once these issues were resolved, staff found telehealth to be rewarding as they could interact with the clients and build rapport.

- **Staff adoption**: Metadata on trends in telehealth platform use over time reported by local agency directors reveal that most staff did not use the platform for resource sharing as much as possible, with declining use over time. Although staff set up more accounts and shared articles in the initial quarters, these activities declined over time. Instead of sending clients links to articles and resources on the ONE platform, staff emailed PDF documents to the clients, and these resource-sharing practices are not captured or reflected in the metadata. Thus, the level of staff adoption is higher than that captured by the metadata. State agency staff also noted that staff turnover and fatigue contributed to the varying levels of staff adoption overall and within agencies.
- **Staff acceptability**: Staff found ONE to be an acceptable way to provide WIC services and felt that the documentation on resource sharing was helpful. Staff noted that understanding what resources were shared and reviewed by the clients made it easier for other staff to step in and maintain continuity of care. Staff also appreciated the flexibility in work mode and the ability to use the clinic space effectively for other emergent activities (such as COVID-19 clinics). Finally, although staff favored telehealth services, they acknowledged that clients should be provided flexibility in choosing how they would like to schedule appointments and receive WIC services.
- **Perceived feasibility**: In general, staff noted that it was easy to learn how to use the telehealth platform and that it was easy to use and interact with the platform. Some staff noted that the system was simple to use, and the displays were meaningful. Others reported navigation challenges and felt that despite efforts to send links to ONE resources to clients, clients did not open the links, and staff wanted a seamless and straightforward approach to encourage client uptake.
- **Improved accessibility of WIC services for WIC clients**: Staff reported that they were able to provide services to clients having difficulty accessing a clinic because of traffic or distance and those who usually missed their appointments. Staff had a high level of understanding of barriers faced by clients and reported that telehealth services make it feasible for clients to keep their appointments. Staff noted that they would like to continue using ONE to provide services.

- **Travel to other WIC clinics to provide services**: Staff noted that telehealth had reduced the frequency of travel to other clinics, but their travel time had increased (likely because they were commuting from home and not a base clinic).
- The **startup cost** to offer telehealth services was $663,211, of which about 81 percent was spent on contracted services, 10 percent was spent on equipment, and 7 percent was spent on labor.
- The **median ongoing cost per enrollment** was $15 at 6 and 12 months for intervention agencies and $10 and $9, respectively, for comparison agencies. The median cost per enrollment before THIS-WIC was $15 at both intervention and comparison agencies. The median cost per enrollment did not change at intervention agencies, but it decreased at comparison agencies.
- The **median ongoing cost per appointment** at 6 and 12 months was $59 and $53, respectively, at intervention agencies and $40 and $34, respectively, at comparison agencies. The median cost per appointment was $110 at comparison agencies and $58 at intervention agencies. The costs per appointment decreased considerably at comparison agencies, but they remained relatively constant at intervention agencies.

4. Results: Client Experiences with Telehealth Services and ONE Use

WI implemented ONE, an innovative tool that enabled WIC staff at intervention agencies to share nutrition and breastfeeding information with WIC clients during remote appointments and allowed clients to review the materials synchronously during their appointment or asynchronously after their appointment. Client Survey responses, MIS data, and telehealth metadata spanning the intervention period, April 2022 through March 2023 (Q2/2022 through Q1/2023), were used to assess client use of telehealth services and resources and to examine outcomes for respondents in intervention and comparison agencies.

4.1 Acceptability of Telehealth Services

WIC clients in the intervention agencies responded to a series of questions about their experience with their most recent telehealth appointment. As seen in **Table 4-1**, almost all respondents agreed or strongly agreed that they could hear the WIC nutrition educator clearly and that it was easy to figure out how to use and receive WIC services through telehealth. Most respondents (about 86%) also agreed or strongly agreed that the way they received WIC services was easier than going to a WIC clinic, and they would like to receive services the same way at their next WIC appointment. Finally, slightly less than 20 percent of respondents agreed or strongly agreed that their WIC appointment was shorter than usual when receiving care, and slightly more than 20 percent disagreed or strongly disagreed that their appointment was shorter than usual when receiving care.

Among respondents who used the ONE platform, most disagreed or strongly disagreed that they had trouble accessing the telehealth platform, agreed or strongly agreed that the telehealth platform was simple to use for their WIC appointment, and agreed or strongly agreed that the content of the telehealth solution was in a language they could read. Among the small number of respondents who used the ONE platform paired with Zoom for video-based, synchronous appointments, experiences were mixed with regard to their ability to see the WIC nutrition educator; however, most strongly agreed that they could easily talk to the WIC nutrition educator.

Acceptability of telehealth appointments may differ between English- and Spanish-speaking clients. In interviews conducted with Spanish-speaking WIC clients, several indicated that they were unfamiliar with ONE and were not sure if they used ONE to receive nutrition information (**Appendix WI.5**).

Table 4-1. Client Survey Respondents' Attitudes Toward Telehealth Services in Intervention Agencies in WI

Statement	N	% Strongly Disagree	% Disagree	% Neither Agree nor Disagree	% Agree	% Strongly Agree
	All Respondents					
I could hear the WIC nutrition educator clearly.	358	0.0	1.1	0.0	23.7	75.1
It was easy to figure out how to use and receive WIC services.	358	0.0	0.3	0.8	23.5	75.4
My WIC appointment was shorter than usual when receiving care.	358	4.2	18.4	60.6	9.5	7.3
The way I received WIC services was easier than going to a WIC clinic.	358	0.0	0.8	13.4	28.8	57.0
I would like to receive services the same way at my next WIC appointment.	357	0.0	0.8	8.4	26.6	64.1
	Respondents Who Used ONE Platform Without Video During Appointment					
The telehealth platform was simple to use for my WIC appointment.	30	0.0	0.0	3.3	30.0	66.7
I had trouble accessing the telehealth platform.	30	53.3	30.0	13.3	3.3	0.0
The content of the telehealth solution was in a language I could read.	30	0.0	0.0	3.3	26.7	70.0
	Respondents Who Used ONE Platform Paired with Zoom					
I could see the WIC nutrition educator clearly.	5	20.0	0.0	60.0	0.0	20.0
I could easily talk to the WIC nutrition educator.	87	0.0	0.0	1.1	23.0	75.9

Source: THIS-WIC Client Survey, intervention agencies only

NOTE: Includes 31 respondents who indicated that their most recent appointment was onsite at the WIC clinic.

4.2 Adoption and Use of ONE Resources

The ONE platform directly captured metadata on WIC client activity. This included data on the number of pending, open active, open inactive, and closed accounts. The WI State agency captured these data each quarter.

4.2.1 Trends in ONE Account Activation

The number of pending accounts increased from Q2/2022 to Q1/2023, reflecting an increase in the number of new accounts set up by WIC staff but pending activation by WIC clients (**Table 4-2**). The decrease in the number of open active accounts over time and the corresponding

increase in the number of open inactive accounts is indicative of a steady decline in ONE use over time. The increase in account setup and decrease in ONE use over time was consistent across agencies (**Appendix WI.4**).

Table 4-2. Change in Pending, Open Active, and Open Inactive ONE Accounts from Q2/2022 to Q1/2023[a] in WI

Number of ...	Q2/2022	Q3/2022	Q4/2022	Q1/2023
Pending accounts	679	837	984	1056
Open active accounts	593	677	321	209
Open inactive accounts	0	114	634	781

Source: ONE metadata, WI State agency

[a] Data for each quarter were pulled on the following dates: Q2/2022: 7/20/2022; Q3/2022: 10/17/222; Q4/2022: 2/24/2023; and Q1/2023: 5/16/2023.

4.2.2 Trends in ONE Resources Viewed

WIC staff used many nutrition resources from the telehealth library during appointments with WIC clients, and they shared these with the clients for review at their convenience. As seen in **Table 4-3**, the overall percentage of shared articles viewed by clients increased over time; less than 1 percent viewed the articles in Q2/2022, and 25 percent viewed them in Q1/2023. The most-viewed articles were in the "toddler" category, which includes resources for feeding children 1 to 2 years of age. These resources include sample menus, information on toddler appetite, and foods rich in iron. Resource viewing varied across agencies, but factors contributing to this variability were not assessed. Anecdotal information gathered by the WI State agency from WIC staff suggests that although the number of clients reviewing ONE resources was less than expected, clients using ONE viewed several resources on their own, not just those sent by staff. Additionally, WIC staff sent PDF documents via email, which were not tracked in the ONE platform. The option to email PDFs was popular with both staff and WIC clients and a highly requested feature. However, inability to track whether emails were viewed limited the ability to understand how many resources shared via email were read by clients.

Table 4-3. Trends in ONE Articles Shared and Viewed and Recipes Accessed by WIC Clients from Q2/2022 to Q1/2023[a] in WI

Variable	Q2/2022	Q3/2022	Q4/2022	Q1/2023
Articles shared by WIC staff (N)[b]	1,115	64	423	196
Articles viewed by WIC clients (%)	0.2	0.1	16.8	24.5
ONE recipes accessed by WIC clients (N)	109	96	85	130

Source: ONE metadata, WI State agency

[a] Data for each quarter were pulled on the following dates: Q2/2022: 7/20/2022; Q3/2022: 10/17/2022; Q4/2022: 2/24/2023; and Q1/2023: 5/16/2023.

[b] Counts are for articles shared via ONE; articles shared via PDF are not included in counts.

The ONE platform included recipes that could be accessed by WIC clients after activating their accounts. Although staff were not required to promote recipes as part of WI's ONE intervention, these data suggest that WIC staff did promote them, likely as a feature and benefit of ONE. As seen in **Table 4-3**, the number of recipes accessed by WIC clients varied over time; however, the reasons for these variations are not clear.

Findings from interviews with a small number of Hispanic clients highlight concerns about their ability to access ONE; they recommended creating videos or expanding the current video to provide basic, step-by-step instructions on how to access ONE for Spanish-speaking clients. Respondents also expressed interest in cooking demonstration and nutrition education videos that include child-friendly, healthy recipes from diverse cultures. Finally, these respondents also noted that social interaction and engagement with other mothers and WIC staff were important to them, and they would like to connect with an online community through WIC as this is considered a trusted source of nutrition information (**Appendix WI.5**).

4.3 Barriers to Accessing WIC Services

4.3.1 Availability of Technology at Home

Most survey respondents had access to a smartphone and computer at home. As seen in **Table 4-4**, more than 90 percent had a smartphone, and a similar proportion had a computer or Chromebook at home. Respondents connected to the Internet primarily using home connect (about 75 percent) followed by cellular connect (nearly 25 percent). Among those who used home connect, slightly more than 5 percent encountered problems often, and about 30 percent encountered problems sometimes when connecting to the Internet. Among those not using home connect, common reasons for not doing so included Internet cost (nearly 40 percent), followed by the ability to connect somewhere else (about 20 percent).

4.3.2 Comfort with Technology and Frequency of Videochat Use

Overall, 51.5 percent of the survey respondents were very confident with their use of technology, and 33.4 percent were somewhat confident; 3.3 percent indicated they were very uncertain when it came to the use of technology (**Table 4-5**). About 25 percent of respondents used videochat daily to communicate with and stay connected with friends and family, and an additional 19.6 percent used it about two times per week. Less than 10 percent never used videochat to stay connected with friends and family, and 11.5 percent used it less than once per month. Slightly more respondents from the comparison agencies than intervention agencies were very confident about their use of technology (52.6% vs. 46.8%). The frequency of videochat use differed between the comparison and intervention agencies, with respondents from the comparison agencies reporting greater use than those in the intervention agencies.

Table 4-4. Availability of Technology at Home among Client Survey Respondents, Overall and in Intervention and Comparison Agencies in WI

Availability and Use of Technology	%			p-value[a]
	Overall	Intervention	Comparison	
Which of the following do you have at home?[b]	N=2,004	N=378	N=1,626	
Desktop/laptop computer	50.5	60.1	48.3	<.001*
Tablet computer	31.7	33.3	31.3	0.445
Chromebook	11.9	10.8	12.1	0.492
Smartphone	93.6	92.9	93.7	0.535
Other	0.6	0.5	0.7	0.748
No device	1.5	0.8	1.7	0.188
How do you most often connect to the Internet?	N=2,000	N=378	N=1,622	0.780
Home connect	73.7	74.6	73.4	
Public connect	1.5	1.3	1.5	
Cellular connect	23.6	23.3	23.6	
Do not connect	1.3	0.8	1.4	
	Among Those Who Use Home Connect			
How often do you have problems with the speed, reliability, or quality of Internet connection at home in a way that makes it hard to do things you need to do online?	N=1,461	N=280	N=1,181	0.190
Often	6.5	5.4	6.8	
Sometimes	31.0	30.4	31.2	
Rarely	39.8	45.4	38.5	
Never	21.8	18.6	22.5	
Don't know	0.9	0.4	1.0	
	Among Those Who Do Not Use Home Connect			
What is the most important reason why you do not connect to the Internet at home?	N=441	N=81	N=360	0.589
Not available	0.5	0	0.6	
Internet cost	37.9	37.0	38.1	
Device cost	11.6	14.8	10.8	
I can connect somewhere else	23.1	18.5	24.2	
I don't want to	14.3	18.5	13.3	
Privacy/security	12.7	11.1	13.1	

Source: THIS-WIC Client Survey

[a] p-values are based on chi-square test. For other devices at home, 25% or more of the cells have expected counts less than 5, so chi-square may not be a valid test.

[b] Percentages do not add up to 100 because respondents could select all that applied.

* $p<0.05$

Table 4-5. Comfort with Technology and Frequency of Videochat Use among Client Survey Respondents, Overall and in Intervention and Comparison Agencies in WI

Comfort with Technology	Overall	Intervention	Comparison	p-value[a]
	%			
When it comes to the use of technology, which of the following best describes you?	N=2,001	N=378	N=1,623	0.002*
Very uncertain	0.7	0.5	0.7	
Somewhat uncertain	3.3	2.6	3.5	
Neither confident nor uncertain	8.1	7.1	8.3	
Somewhat confident	33.4	41.8	31.4	
Very confident	51.5	46.8	52.6	
Don't know	3.0	1.1	3.5	
How often do you use video chat to communicate with and stay connected with family and friends?[b]	N=1,999	N=377	N=1,622	0.010*
Daily	23.8	23.6	23.9	
2 times per week	19.6	17.5	20.0	
1 time per week	16.0	22.5	14.5	
2 times per month	9.7	7.4	10.2	
1 time per month	9.5	10.3	9.2	
Less than one time per month	11.5	9.8	11.9	
Never	8.4	7.7	8.5	
Don't know	1.7	1.1	1.8	

Source: THIS-WIC Client Survey

[a] p-values are based on chi-square tests. For other devices at home, 25 percent or more of the cells have expected counts less than 5, so chi-square may not be a valid test.

* $p<0.05$

4.3.3 Administrative-, Individual-, and Staff-level Barriers

Client Survey respondents responded to several questions on barriers to accessing WIC services for their most recent WIC appointment. Barriers included administrative factors (receiving a specific appointment time and experiencing long wait times), individual-level factors (transportation, childcare, and getting off work), and staff interactions (language barriers, racial/ethnic barriers, and Internet connectivity). As seen in **Table 4-6**, scores for all measures ranged from 2.6 to 2.9, indicating low frequency of experiencing barriers. The frequency of experiencing barriers at their most recent WIC appointment did not differ significantly between respondents from intervention and comparison agencies.

Findings from interviews with Hispanic clients indicate that creating a separate login account to access ONE was perceived as a barrier because it involved locating the link to the website and remembering the log-in information and led to confusion about how ONE and WIC relate to each other (**Appendix WI.5**).

Table 4-6. Barriers to Accessing WIC Services among Client Survey Respondents in Intervention and Comparison Agencies in WI

Barriers[a]	Intervention (n=394)	Comparison (n=1,712)	Δ (95% CI)	p-value[b]
	Mean (SE)			
Not given a specific appointment time	2.7 (0.12)	2.7 (0.11)	0.07 (0.30, 0.43)	0.683
Wait too long	2.9 (0.06)	2.8 (0.05)	0.09 (0.09, 0.27)	0.296
Transportation issues	2.8 (0.05)	2.7 (0.04)	0.02 (0.12, 0.16)	0.812
Childcare issues	2.7 (0.05)	2.7 (0.03)	0.04 (0.10, 0.17)	0.571
Difficulty getting off work	2.7 (0.06)	2.6 (0.04)	0.07 (0.10, 0.23)	0.380
WIC staff language barrier	2.9 (0.07)	2.8 (0.06)	0.07 (0.15, 0.28)	0.504
WIC staff racial/ethnic barrier	2.7 (0.10)	2.6 (0.09)	0.11 (0.20, 0.42)	0.450
No or poor Internet connection	2.8 (0.06)	2.8 (0.04)	0.04 (0.10, 0.19)	0.530

Source: THIS-WIC Client Survey

[a] On a scale of no/never to frequently, please mark (X) if you experienced any of the following barriers to attending your WIC appointment, with the following response options: 0=frequently, 1=occasionally, 2=a little, and 3=never.

[b] Hierarchical linear regression models (unadjusted) were used to compare differences in means for intervention and comparison agencies.

4.4 Satisfaction with WIC Appointment

The unadjusted mean client satisfaction level with their most recent WIC appointments was high and not significantly different for survey respondents from intervention and comparison agencies (**Table 4-7**). Although the level of satisfaction differed significantly by number of years the respondent/child received WIC services and language used at home, the inclusion of these and other control variables in the multivariate regression did not change the relationship between exposure to telehealth and satisfaction with WIC services (**Table 4-8**). Thus, satisfaction with WIC services was just as high for telehealth as it was for WIC services delivered via usual care.

Table 4-7. Satisfaction with WIC Appointment among Client Survey Respondents in Intervention and Comparison Agencies in WI

Client Satisfaction	Intervention (n=399)	Comparison (n=1,712)	Δ (95% CI)	p-value[a]
	Mean (SE)			
Client Satisfaction Index[b]	93.7 (0.73)	93.6 (0.46)	0.18 (-1.85, 2.21)	0.840

Source: THIS-WIC Client Survey

[a] Hierarchical linear regression models (unadjusted) were used to compare differences in means for intervention and comparison agencies.

[b] Client satisfaction index (range: 20−100) is based on 8 items (interitem correlation, alpha = 0.89).

Table 4-8. Multivariable Regression Examining Satisfaction with WIC Appointment Among Client Survey Respondents in Intervention and Comparison Agencies in WI

Independent Variable	Coefficient	Std Error	t-value	Pr > |t|
Intercept	94.09	0.93	101.23	<.001*
Condition				
Intervention	-0.04	0.74	-0.06	0.96
Comparison	0.00			
Household annual income	-0.03	0.24	-0.12	0.90
Household size	-0.21	0.16	-1.29	0.20
Number of years WIC services received				
1–2 years	1.79	0.64	2.81	0.005*
3–4 years	0.56	0.71	0.79	0.43
5 or more years	1.11	0.70	1.59	0.11
Less than 1 year	0.00			
Place of residence				
Rural	0.13	0.62	0.21	0.84
Suburban	-0.05	0.65	-0.08	0.94
Urban	0.00			
Language used at home				
Spanish	-2.57	0.91	-2.81	0.005*
Other	-6.32	1.91	-3.31	0.001*
English	0.00			

Source: THIS-WIC Client Survey

* p<0.05

4.5 Retention in WIC

Six months after completing the survey, more than 90 percent of Client Survey respondents continued to receive WIC services (**Table 4-9**). More respondents from intervention than comparison agencies were retained in WIC for at least 6 months.

4.6 Intent to Change Dietary Behaviors

In general, the intent to change dietary behaviors following their most recent WIC appointment was comparable for respondents in the intervention and comparison agencies. As seen in **Table 4-10**, mean scores for intentions to “change how I eat” and “how I feed my family” ranged from 3.6 to 3.8, indicating that survey respondents were neutral or agreed with these statements. The mean score for the perceived value of WIC nutrition education (i.e., taught me things that will help me choose nutritious foods for me or my family) was 4.2, indicating that respondents agreed or strongly agreed that the lesson would help them make healthy choices.

Table 4-9. Client Survey Respondents' Retention in WI WIC[a]

Respondent Retention	Overall	Intervention	Comparison	p-value[b]
	N=1,280	N=330	N=950	
	%			
Retained for 180 days or more[c]	92.34	95.45	91.26	0.014*

Source: WI MIS linked to Client Survey data

[a] Analysis was restricted to respondents who completed the Client Survey in the first 6 months of the intervention.

[b] p-values are based on chi-square test.

[c] Availability of data on WIC benefit redemption after 180 days of survey completion was used as a proxy for retention.

* p<0.05

Table 4-10. Intent to Change Dietary Behaviors Following the WIC Nutrition Education Lesson among Client Survey Respondents, Overall and in Intervention and Comparison Agencies in WI

Statement[a]	Intervention (n=394)	Comparison (n=1,712)	Δ (95% CI)	p-value[b]
	Mean (SE)			
After my WIC nutrition education lesson, I wanted to change how I eat.	3.7 (0.11)	3.6 (0.09)	0.08 (-0.24, 0.41)	0.563
After my WIC nutrition education lesson, I wanted to change how I feed my family.	3.8 (0.11)	3.7 (0.09)	0.08 (-0.23, 0.40)	0.573
My WIC nutrition education lesson taught me things that will help me choose nutritious foods for me or my family.	4.2 (0.09)	4.2 (0.07)	0.03 (-0.22, 0.29)	0.768

Source: THIS-WIC Client Survey

[a] Response options: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree

[b] Hierarchical linear regression models (unadjusted) were used to compare differences in means for intervention and comparison agencies.

4.7 Daily Fruit and Vegetable Intake

Following their most recent WIC appointment, respondents reported their daily fruit and vegetable intake, with response options ranging from none to 4 or more cups. As seen in **Table 4-11**, less than 5 percent of the respondents did not eat any fruit and about 3 percent did not eat any vegetables. Almost one-third (30%) of respondents ate ½ cup to 1 cup of fruit, and a similar proportion ate 1 to 2 cups of fruit, with similar patterns for vegetable intake. In general, fruit and vegetable intake following respondents' WIC appointment was comparable for the intervention and comparison groups.

Table 4-11. Daily Fruit and Vegetable Intake among Client Survey Respondents, Overall and in Intervention and Comparison Agencies in WI

Variable	Overall	Intervention	Comparison	p-value[a]
	%			
Fruits per day	N=1,953	N=376	N=1,577	0.325
None	3.2	4.3	3.0	
1/2 cup or less	12.2	13.3	11.9	
1/2 to 1 cup	28.7	30.3	28.3	
1 to 2 cups	30.5	30.6	30.4	
2 to 3 cups	15.9	14.4	16.3	
3 to 4 cups	5.3	4.8	5.4	
4 or more cups	4.2	2.4	4.6	
Vegetables per day	N=1,940	N=375	N=1,565	0.485
None	3.1	2.7	3.2	
1/2 cup or less	16.6	18.7	16.2	
1/2 to 1 cup	29.1	31.7	28.4	
1 to 2 cups	27.5	26.1	27.8	
2 to 3 cups	14.2	12.3	14.6	
3 to 4 cups	6.4	5.1	6.7	
4 or more cups	3.1	3.5	3.1	

Source: THIS-WIC Client Survey

[a] p-values are based on chi-square tests.

4.8 Breastfeeding Practices

Data captured in WI's MIS were used to assess the association between breastfeeding behavior and WIC service delivery. This analysis was restricted to WIC households with at least one infant. As seen in **Table 4-12**, a greater proportion of WIC respondents in the intervention than in the comparison agencies ever breastfed (88% vs. 72%) and exclusively breastfed their infant for 6 months (29% vs. 17%).

4.9 Trends in Breastfeeding Initiation and Exclusive Breastfeeding

Shortly before the intervention began in Q1/2022, 78.5 percent of WIC clients in the intervention agencies and 69 percent in the comparison agencies had initiated breastfeeding, and 14 percent in intervention agencies and 10 percent in comparison agencies breastfed exclusively for 6 months (**Table 4-13**). Over the intervention period, rates of breastfeeding initiation and exclusive breastfeeding remained constant or improved slightly for WIC clients in both intervention and comparison agencies. For example, from Q1/2022 to Q2/2023, rates of breastfeeding initiation improved by 2 percentage points for those in the intervention agencies and 6 percentage points for those in the comparison agencies. Similarly, from Q1/2022 to

Q2/2023, rates of exclusive breastfeeding improved by 2 percentage points for those in the intervention agencies and 4 percentage points for those in the comparison agencies.

Table 4-12. Breastfeeding Practices of Client Survey Respondents, Overall and in Intervention and Comparison Agencies in WI

Breastfeeding Practice[a]	Overall	Intervention	Comparison	p-value[b]
	%			
Ever breastfed	N=694	N=101	N=593	0.002*
Yes	74.1	88.1	71.7	
No	25.9	11.9	28.3	
Exclusively breastfed	N=695	N=101	N=594	0.005*
Yes	18.7	28.7	17.0	
No	81.3	71.3	83.0	

Source: WI MIS; data were collected between Q2/2022 and Q1/2023.

[a] Breastfeeding behavior is reported for households with at least one infant (0–12 months) during the intervention period.

[b] p-values are based on chi-square tests.

* p<0.05

Table 4-13. Trends in Breastfeeding Initiation and Exclusive Breastfeeding for 6 Months among WIC Clients in Intervention and Comparison Agencies Using Administrative Data in WI

Local Agency	Q1/2022	Q2/2022	Q3/2022	Q4/2022	Q1/2023	Q2/2023
	%					
Ever Breastfed						
Intervention agencies	78.5	80.6	82.0	81.5	80.5	80.4
Comparison agencies	69.0	68.6	71.6	73.0	74.6	75.4
Exclusive Breastfeeding						
Intervention agencies	14.0	14.0	15.0	14.8	15.5	N/A
Comparison agencies	10.0	13.0	14.0	12.7	14.4	N/A

Source: WI MIS

NOTE: Data on exclusive breastfeeding were missing for Rusk County and Oneida County across all quarters and for two local agencies in Q1/2022 and Q4/2022. Data on breastfeeding initiation were available through Q2/2023, and data on exclusive breastfeeding were available through Q1/2023 for all agencies.

4.10 WIC Benefit Redemption Patterns

WIC benefit redemption patterns were examined for the month following the completion of the WIC appointment/Client Survey using MIS data. About two-thirds of the survey respondents redeemed between 10 and 90 percent of their WIC benefits in the month after their telehealth

appointment (**Table 4-14**). About one-fifth of survey respondents redeemed less than 10 percent of their WIC benefits in the month after Client Survey completion, and a similar percentage redeemed more than 90 percent of their benefits. WIC benefit redemption patterns did not differ for survey respondents in the intervention and comparison groups.

Table 4-14. WIC Benefit Redemption Following Client Survey Completion in WI

Benefit Redemption	Overall	Intervention	Comparison	p-value[a]
	%			
	N=826	N=95	N=731	0.444
<10%	18.52	18.75	18.47	
10 to 90%	63.08	67.37	62.52	
>90%	18.40	13.68	19.02	

Source: WI MIS linked to Client Survey data

[a] p-value is based on chi-square test.

4.11 Summary of Findings

WIC clients in the intervention agencies received services via phone or Zoom and ONE, accessing nutrition and breastfeeding resources either synchronously during the appointments or asynchronously after the appointment, via ONE or emailed PDF documents. WIC clients in the comparison agencies received services via phone and resources via postal mail. This chapter described client experiences with telehealth services and compared outcomes for clients in the intervention and comparison agencies. Key findings include the following:

- **Acceptability of telehealth services and ONE:** Client Survey respondents who received WIC services via telehealth appointment found it acceptable (agree or strongly agree) to do so. Most respondents indicated that the way they received WIC services was easier than going to a WIC clinic and expressed a preference to continue receiving services the same way at their next appointment. Respondents who used the ONE platform asynchronously found it easy to access and simple to use, and they felt that the language was easy to read. Respondents who used ONE with Zoom (synchronously) found it easy to talk with their WIC nutrition educator, but responses were mixed in terms of their ability to see them.
- **Adoption and use of ONE platform and resources**: Among the small number of users with an active account, the percentage of shared articles viewed by clients increased over time; less than 1 percent viewed the articles in Q2/2022, and 25 percent viewed them in Q1/2023. These data may underestimate adoption and use because WIC staff sent PDF documents via email, but data on client's use (i.e. open and read) of these PDFs are not available. Further, anecdotal information from WIC staff suggests that clients who used the ONE platform also browsed materials other than those shared by the staff. Interviews with Hispanic clients highlight the need to include videos on nutrition education topics, particularly demonstrations of diverse, child-friendly, healthy recipes.

These clients also recommended creating an online community to promote social interaction and engagement with other mothers, because WIC is considered a trusted source of information by clients, and mothers would be willing to join this community.

- **Barriers to accessing WIC services**: In general, most Client Survey respondents had a computer and Smartphone and Internet connection at home. Additionally, most were confident or very confident about using technology, and less than 10 percent had never used videoconferencing to communicate with family and friends. Respondents had favorable experiences with their appointments. Mean barrier scores did not differ between those in the intervention and comparison agencies, which may be due to comparison agencies also delivering WIC services via phone. Interviews with Hispanic clients indicate confusion about the relationship between WIC and ONE, with a need for better integration with current WIC technology for seamless access to resources, along with a step-by-step instructional video on how to access Spanish-language materials.
- **Satisfaction with WIC appointment**: Consistent with a low frequency of barriers, Client Survey respondents in the intervention and comparison agencies had high levels of satisfaction with their WIC appointment. Regression-adjusted mean satisfaction scores were comparable for respondents in the intervention and comparison agencies, but they were lower for people who used Spanish (or a language other than English) at home and for those who received WIC services for 1 to 2 years than for those who received services for less than 1 year.
- **Retention in WIC**: The overall unadjusted retention rate in WIC was above 90 percent for Client Survey respondents in the intervention and comparison agencies. Retention rates were about four percentage points higher for survey respondents in intervention agencies than for respondents in comparison agencies (95.45% vs. 91.26%).
- **Intent to change dietary behaviors**: Client Survey respondents in the intervention and comparison agencies have similar scores (3.6 to 3.8 on a 5-point agreement scale) for intent to change their dietary behaviors (i.e., how they ate, how they feed their family) and the usefulness of lessons to make healthy choices (4.2 on a 5-point agreement scale).
- **Fruit and vegetable intake**: Thirty percent of respondents ate ½ cup to 1 cup of fruit per day, and a similar proportion ate 1 to 2 cups of fruit, with similar patterns for vegetable intake. In general, fruit and vegetable intake following respondents' WIC appointment was comparable for the intervention and comparison groups.
- **Breastfeeding practices**: Unadjusted analysis of breastfeeding practices indicates that a greater proportion of survey respondents in the intervention than in the comparison agencies ever breastfed (88% vs. 72%) and exclusively breastfed their infant for 6 months (29% vs. 17%). These rates of breastfeeding initiation and exclusive breastfeeding are higher among survey respondents than in the MIS aggregate data from the intervention and comparison agencies. MIS data from Q1/2022 (pre-intervention) to Q2/2023 (end of intervention) were used to examine breastfeeding practices for all clients in the intervention and comparison agencies. At the intervention agencies, breastfeeding initiation increased from 79% to 80%, and the exclusive

breastfeeding rate increased from 14% to 16%. At comparison agencies, breastfeeding initiation rates increased from 69% to 75%, and exclusive breastfeeding increased from 10% to 14%; reasons for these differences are unclear.

- **WIC benefit redemption:** Unadjusted analysis of WIC benefit redemption rates indicates that about 63 percent of survey respondents redeemed between 10 and 90 percent of their WIC benefits in the month following their telehealth appointment, with about 20 percent redeeming less than 10 percent and a similar percentage redeeming more than 90 percent. These redemption patterns are comparable in the intervention and comparison agencies.

5. Conclusions and Lessons Learned

Telehealth has emerged as an integral approach to offering healthcare services because it may offer enhanced access to services, convenience in scheduling and receiving services, and cost savings by eliminating the need for transportation. However, factors such as comfort level with digital technology, Internet availability, privacy and security concerns, and accessibility may be barriers to telehealth integration within WIC. The goal of the THIS-WIC project was to develop a robust evidence base regarding telehealth solutions in WIC and to understand whether and how telehealth influences impact intermediate, process, and cost outcomes.

The project intended to deliver WIC nutrition education and breastfeeding support to WIC clients at intervention agencies through telehealth and at comparison agencies through in-person appointments. Project launch was delayed due to the COVID-19 pandemic, amid several changes to WIC service delivery at intervention agencies, including delays in launching telehealth services. Similarly, to ensure continuity in services, COVID-19 waivers enabled all WIC agencies, including those at the comparison agencies, to conduct phone-based appointments.

WI collaborated with Nutrition Matters to customize the ONE platform, which could be accessed by authorized clients using a mobile device, tablet, or computer. The WI State agency team planned for their local agencies to use ONE synchronously with WIC clients wherein the CPAs would be able to share resources with clients in real time, mimicking resource sharing and discussion during in-person appointments. To facilitate active discussion, the ONE platform would integrate chat functionality and Zoom-based videoconferencing. Due to technical challenges, these integrated features were not available during this project. WI also planned to send additional nutrition education and breastfeeding resources to clients following their telehealth session and to encourage independent use of these resources on the ONE platform. ONE allows CPAs to see what articles and recipes have been viewed by WIC clients and what lessons have been completed, supporting continuity of care.

To accommodate the shift in service delivery, the evaluation of THIS-WIC in WI was adjusted to assess the implementation of ONE; implementation, cost, and client-level outcomes were compared for modified telehealth service delivery vs. phone-based service delivery. Implementation evaluation findings are based on data collected from MIS, State responses to the Implementation Tracking Tool, metadata from the ONE platform, and the Staff Survey and key informant interviews. Outcome evaluation findings are based on data collected from MIS, metadata from the ONE platform, and the Client Survey.

5.1 Implementation of Telehealth Services in WI

Between April 2022 (Q2/2022) and March 2023 (Q1/2023), five local agencies offered telehealth services and served as intervention agencies; six offered usual care and served as comparison agencies. WIC staff generally perceived a high need to offer remote services to their clients and believed that offering telehealth appointments and sharing ONE resources was necessary to

offer services that align with those offered by other health care providers. Staff also noted that doing so would be in keeping with the overall mission of WIC and expand access to those unable to come in for in-person appointments due to lack of transportation, distance, inclement weather, or other reasons.

None of the staff had any experience with telehealth before this project, and staff received ongoing training in various modes. Staff noted that the delayed launch required staff to retrain themselves on the resources available on the ONE platform and the process of using the telehealth solution. Staff gave higher ratings on the ease of learning the telehealth platform in the late phase than in the early phase, reflecting the benefits gained from additional training to support use. Experienced educators indicated that they were familiar and comfortable with using and sharing resources on the telehealth platform, but newer staff may need additional time to become familiar with all the available resources so they could send along relevant information to their clients. Staff appreciated the breadth and depth of resources available and gave high marks to the videos and PDF versions in easy-to-read language. Some staff noted that clients struggled to find reliable nutrition resources online, and offering access to evidence-based resources would help retain them in WIC and elevate the importance of WIC nutrition education for them.

During implementation, staff acknowledged the engagement and support of local and WI State agency staff, particularly the reduced lag time in responses to questions and the data sharing to understand staff and client use and engagement with the telehealth platform. Because of the COVID-19 pandemic, WIC agencies experienced considerable turnover, and the infant formula crisis limited the extent to which staff used telehealth for nutrition and breastfeeding education. Although staff valued synchronous resource sharing during appointments, they needed to extend the appointment time to explain the telehealth solution to the clients and assist them with account setup, navigation, or password recovery. Staff also struggled to promote and encourage clients to use the ONE platform synchronously, and some noted that client circumstances precluded them from synchronous resource sharing. Subsequently, staff relied on asynchronous learning and sent links to the ONE platform or emailed PDFs that clients could review at their convenience.

Staff who used the telehealth solution synchronously highlighted the benefits of doing so, including the ability to build rapport with the clients, understand their busy schedules and lifestyle, and use their expressions and reactions to guide the discussion. Staff noted that some of their clients were not comfortable with technology and stressed that clients should be given flexibility in choosing how they would like to schedule their appointments and receive WIC services. Overall, staff found telehealth to be an acceptable way to provide WIC services and expressed a preference to continue scheduling telehealth appointments. Staff recommended expanding the resource library and offering materials in languages other than English and Spanish.

Staff traveled less frequently but spent more time traveling to other clinics to provide services. Staff also noted that offering telehealth services provided them with work flexibility and allowed them to use the clinic space for other activities (such as COVID-19 clinic). The startup cost to

offer telehealth services was $663,221, of which about 81 percent was spent on contracted services, 10 percent was spent on equipment, and 7 percent was spent on labor. The ongoing median costs per appointment and per enrollment were higher at intervention agencies than at comparison agencies.

5.2 Client Experience and Outcomes

In general, most Client Survey respondents had a computer and Smartphone at home and were confident about using technology. Findings from the Client Surveys at intervention agencies indicate a high level of acceptability to receive WIC services via telehealth appointments (synchronously and asynchronously). Respondents who had activated their ONE account accessed resources available on the ONE platform, particularly recipes. Metadata on ONE use indicated a slow start but a gradual increase in resources accessed over time (increase from less than 1 percent in Q3/2022 to 25 percent in Q1/2023). Respondents also expressed a preference to continue receiving WIC services the same way for their next appointment.

The collective findings on respondents' satisfaction and experience with WIC appointments and intent to change dietary behaviors indicate that telehealth resulted in outcomes that were comparable to usual care in a pandemic situation. Survey respondents from the intervention and comparison agencies had similar scores for level of satisfaction with their WIC appointment and barriers to accessing WIC services. The intent to change dietary behaviors and daily fruit and vegetable intake were also similar for respondents in the intervention and comparison agencies.

Overall rates of breastfeeding initiation and exclusive breastfeeding varied among respondents in the intervention and comparison agencies. These differences may be due to demographic differences rather than service delivery mode. Because breastfeeding practices were assessed immediately after their telehealth appointment and these practices are not likely to change based on a single appointment, factors contributing to these differences were not examined. Retention rates in WIC exceeded 90 percent for both groups, with slightly higher rates for those in the intervention group.

5.3 Lessons Learned

Telehealth is a viable approach to deliver WIC services to clients. Telehealth services can involve a phone-based appointment with synchronous or asynchronous resource sharing. Staff note that clients should be provided flexibility in how they would like to receive WIC services.

Comprehensive training is essential to preparing staff for providing telehealth services. Depending on their experience, staff may need additional time to become familiar with the resources on the ONE platform. Staff also need extensive training, which includes understanding the logistics of setting up appointments, helping clients to set up accounts and navigate the resources, and marketing/promoting the use of resources to clients.

High-level staff engagement and support are critical for staff uptake. Staff acknowledge the feedback from the supervisors as vital to understanding the impact of telehealth and appreciate their timely response to emergent issues. However, staff experienced challenges during

implementation, stemming from the lack of an integrated system to schedule and conduct appointments and document outcomes.

Despite the longer appointment duration, staff prefer telehealth appointments. Staff note that telehealth appointments are longer because of the added time to assist clients with setting up their accounts, recovering passwords, or becoming familiar with the system. Although staff note that this adversely affects their subsequent appointments, they are also keenly aware of the barriers to attending in-person appointments and attribute higher participation and retention rates to the availability of telehealth services. Staff who use the video functionality appreciate the rapport building and connections with the clients, which ultimately lead to better engagement. Similarly, clients who complete an appointment via telehealth prefer to receive services the same way for future appointments.

5.4 Implications

Telehealth is a relatively new approach to providing services to WIC clients, and findings from this evaluation demonstrate the potential of increasing reach, promoting participation, and reducing attrition. The equality in satisfaction with WIC services and the absence of statistical significance in outcomes demonstrates the feasibility of delivering remote services successfully without diminishing the quality and impact of WIC. It is also likely that telehealth was limited to one contact over the intervention period because the study took place during the COVID-19 pandemic. Ongoing use of and exposure to resources on the telehealth platform may lead to long-term changes in outcomes. Additional studies and evaluations are needed to demonstrate its efficacy, particularly as WIC resumes offering in-person services (i.e., usual care). Understanding and deploying strategies to increase awareness, comfort, and use of the ONE platform synchronously may increase client use of resources on ONE. The findings from this evaluation suggest that flexibility in providing telehealth services is essential. Training staff on the process and promotion of telehealth platform resources may lead to increased use of telehealth.

The findings on the cost of ongoing service delivery should be interpreted with caution. First, to assess changes in service delivery costs associated with telehealth implementation, the pre-implementation period was set to FY2019 (i.e., before the start of the COVID-19 pandemic), because services in intervention and comparison agencies were virtual during the height of the pandemic. This resulted in a 2.5-year gap between the study pre-implementation and post-implementation periods. Changes in staffing and reporting systems during this period may have affected the quality of the data reported for the pre-implementation period in both intervention and comparison agencies. Other factors and changes in service delivery (beyond implementation of the telehealth solution) may have also affected the costs incurred during the post-implementation period. Most importantly, comparison agencies continued to offer virtual services to their clients during the post-implementation period. Second, the evaluation abstracted startup cost data by reviewing budget documents, and WI local agency staff completed the ongoing cost data collection tool. WI State agency staff expressed concerns about the availability and accuracy of ongoing cost data for various reasons, including the

burden of reporting the requested data, local agency staff's limited experience in administrative and financial data reporting, and variation in staff experience with administrative and financial data across agencies. Third, the sample size of local agencies for the client outcome analysis was small, with five intervention agencies and four comparison agencies. The small sample size means that atypical costs at one or two agencies could have a big effect on the overall average. The distribution of cost estimates was widespread, and no agency was different enough to warrant exclusion from the analysis. Finally, agency-level costs can vary for reasons beyond telehealth or traditional delivery models, such as socioeconomic composition of the clients, geographical differences, or provider turnover. For example, agencies that experience higher provider turnover may have higher costs because additional resources are spent on recruiting, hiring, training, and onboarding new staff. Studies with a larger sample size can statistically control for these confounding factors, but we were not able to do so in this study given the limited sample size. Therefore, in addition to the limitations noted above, the increasing costs among intervention agencies and decreasing costs among comparison agencies may be caused by other factors unrelated to the mode of delivery, such as changes in staffing, the level of services or administrative tasks that agencies are required to provide, and WIC participation.

5.5 Strengths and Limitations

This evaluation has several strengths and limitations. The strengths of the evaluation include the mixed methods design, emphasis on effectiveness and implementation outcomes, large number of participating agencies, and staff and client participation in the evaluation. The evaluation employed a randomized study design and included a relatively large number of agencies in both the intervention and comparison groups. The clients from participating agencies represented the most in need of telehealth services, providing insights into the feasibility of improving service delivery for those most in need.

In the context of understanding telehealth service delivery, the Staff Survey response rate for the early and late phase surveys was high. Additionally, the extensive metadata on ONE use and the tracking conducted by the WI State agency team provided contextual information on implementation and highlight the real time adaptations made by the WI State agency to improve implementation.

In the context of understanding client satisfaction and experiences, the percentage of invited clients who consented to take part in the evaluation and completed the Client Survey exceeded the target response rate of 5 to 10 percent. The availability of client level MIS data and the high match rate (survey respondents with MIS data) indicate that survey respondents were generally representative of the clients at participating agencies.

This evaluation has several limitations. The COVID-19 pandemic reshaped usual care service delivery; in-person appointments were replaced with phone appointments. Thus, the mode of service delivery was phone for the intervention and comparison agencies, but nutrition education and breastfeeding resources were shared via ONE or emailed as PDFs at intervention agencies and either discussed over the phone or sent via postal mail to WIC clients at comparison agencies. Additionally, the COVID-19 pandemic affected the timeline and the

approach to using the ONE platform for resource sharing with clients; staff turnover, baby formula crises during the implementation period, and staff burnout also limited capacity to promote telehealth use among clients in the intervention agencies. Thus, outcomes related to service delivery across intervention and comparison agencies could not be examined.

As noted in **Section 5.4**, there were limitations related to reporting of cost data. These included the lag between the pre-implementation period, which was pre-COVID-19, and the implementation period, changes in staff and financial reporting systems, as well as burden associated with data collection.

As noted in **Section 2.5.1**, 84.1 percent of Client Survey respondents were in the comparison agencies, and 16.9 percent were in the intervention agencies. this difference in response rate in the intervention and comparison agencies may be attributable to differences in mode of survey distribution and a greater response for one large comparison agency. The high degree of imbalance in response rates should increase total variation beyond the nominally expected level, which would reduce precision in the test of the intervention effect.

Finally, comparable client-/respondent-level outcomes in the intervention and comparison agencies should not be interpreted as evidence of the absence of improvements. In addition to the similarity in mode of service delivery, it is possible that implementing the intervention in the absence of the COVID-19 pandemic may have produced different results. Additional studies are needed to evaluate the effectiveness of telehealth services compared to in-person appointments, assess factors that affect synchronous use of resources during appointments, and assess client perspectives on facilitators and barriers to using resources via a telehealth platform.

5.6 Sustainability

Following the THIS-WIC evaluation, WI plans to roll out the ONE platform across all agencies in the State. Guided by the evaluation findings, WI will provide flexibility to agencies to use ONE in accordance with each agency's needs and capacity. Specifically, agencies may use ONE synchronously or asynchronously for any time of appointment. Additionally, agencies will move toward primarily sharing resources electronically.

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